THE IMPORTANCE OF PESTICIDES AND OTHER PEST MANAGEMENT PRACTICES IN U.S. COTTON PRODUCTION

Prepared by

The National Agricultural Pesticide Impact Assessment Program (NAPIAP)

United States Department of Agriculture

June 1993

NAPIAP Report Number 1-CA-93

PREFACE

This project is a cooperative effort of the State Universities and the U.S. Department of Agriculture under the National Agricultural Pesticide Impact Assessment Program (NAPIAP). State Extension scientists from cotton producing states representing the disciplines of plant pathology, nematology, weed science, entomology and plant physiology participated with U.S. Department of Agriculture agencies (Agricultural Research Service, Extension Service, Economic Research Service) in planning, coordinating and implementing this study.

The intent of the assessment was to determine the effect on cotton production of the withdrawal of individual and groups of pesticides. For purposes of analysis and explanation, data was collected on the economically-important pests, pesticide usage, and non-pesticide pest management practices.

NAPIAP gratefully acknowledges the assistance of Mrs. Betty Gibson in preparation of the manuscript.

ACKNOWLEDGMENTS

Appreciation is expressed to the discipline leaders, state specialists, and to all others who gave so generously of their time in the development of information and in the preparation of the report. The following individuals were major contributors to the cotton commodity assessment project:

USDA Participants
- Ronald A. Davis, ARS, Project Leader
- Craig Osteen, ERS
- Kent L. Smith, ARS

Discipline Leaders
- Charles Allen, Texas, Insects
- Earl Minton, ARS, (Retired) Diseases/Nematodes
- James Supak, Texas, Harvest Aids/Growth Regulators
- Dave Weaver, Texas, Weeds

Respondents

Alabama
- William S. Gazaway
- Mike Patterson
- Ron Smith

Arizona
- Paul Baker
- Jon Chernicky
- Dick Hine
- Leon Moore
- Theo Watson

Arkansas
- Claude Bonner
- Donn Johnson
- M. C. McDaniel

California
- Mike Davis
- Harold Kempen
- Tom Leigh
- Eric Natwick

Florida
- Barry Brecke
- Hugh Peacock
- Richard Sprenkel

Georgia
- Steve Brown
- James Hadden
- Gary Herzog
- William Lambert

Louisiana
- Jack Baldwin
- Pat Colyer
- Jerry Graves
- Dearl Sanders

Mississippi
- Don Blasingame
- John Byrd
- Bob Head

Missouri
- Barry Sims
- Al Wrather

New Mexico
- Emroy Shannon

North Carolina
- Jack Bacheler
- Jack Bailey
- Alan York

Oklahoma
- J. C. Banks
- Miles Karner
- Ervin Williams, Jr.

South Carolina
- Bruce Martin
- Ed Murdock
- Mitchell Roof

Tennessee
- Rich Caron
- Bob Hayes
- Gary Lentz
- Melvin Newman

Texas
- Charles Allen
- Paul Baumann
- John Bremer
- Tom Fuchs
- Allen Knutson
- Joseph P. Krausz
- Jim Leser
- Robert Metzer
- John Norman
- Roy Parker
- J.W. Stewart
- James Supak
- Dave Weaver

Virginia
- P. M. Phipps

LIST OF TABLES

TABLES IN TEXT Page

TABLES IN APPENDIX A

TABLES IN APPENDIX B

List of Tables -- continued Page

EXECUTIVE SUMMARY

Cotton production is a heavy consumer of pesticide chemicals. About 10% of the agricultural pesticide sales in the United States for 1989 were for cotton production purposes. This report estimates that the loss of insecticides, herbicides, fungicides, harvest-aid chemicals, plant growth regulators, and nematicides would result in catastrophic losses: insecticides -- 28% of the U.S. cotton crop or 3.9 million bales, herbicides -- 27% or 3.7 million bales, fungicides -- 18% or 2.4 million bales, fungicide seed treatments or harvest-aid chemicals -- 17% or 2.3 million bales, plant growth regulators -- 4.9% or 670,000 bales, and nematicides -- 1.6% or 210,000 bales. Losses would not only be limited to quantity effects but also quality effects such as reduced lint strength and grassy bales. Other secondary effects include increased soil erosion due to increased tillage, increased hand labor, delayed harvest, increasing pest problems, reduced harvester efficiency, increased production costs and others. Clearly, pesticide chemicals play an important role in cotton production.

The loss of chemical groups of pesticides would also have a significant impact on cotton yields. The unavailability of pyrethroid insecticides would result in losses of 11% or 1.6 million bales, organophosphate insecticides -- 8.0% or 1.1 million bales, dinitroaniline herbicides -- 7.0% or 950,000 bales, substituted urea herbicides -- 4.6% or 620,000 bales, carbamate insecticides -- 4.1% or 550,000 bales, organic arsenical herbicides -- 2.7% or 370,000 bales, and triazine herbicides -- 1.6% or 210,000 bales.

The loss of individual pesticides will generally have a much more limited effect, basically because of the availability of alternative pesticides and practices. For example, the most important pesticide, from the national standpoint of loss of use is estimated to be fluometuron. If this herbicide was unavailable and alternatives were used in its place, an estimated 4.1% of the U.S. cotton crop or about 550,000 bales of cotton would be lost. Other important pesticides and the losses to cotton resulting from their withdrawal from use are: aldicarb, mepiquat chloride, or ethephon -- 1.7% or 230,000 bales; arsenic acid -- 1.2% or 170,000 bales; prometryn -- 1.0% or 140,000 bales; thidiazuron -- 0.7% or 99,000 bales; metalaxyl -- 0.7% or 98,000 bales; carboxin or acephate -- 0.6% or 85,000 bales; and trifluralin or PCNB -- 0.5% or 70,000 bales. Without the use of alternatives in their place, the losses from these same pesticides are expected to be much greater.

Non-chemical management practices are extensively used and play an important role in cotton production. Important practices include mechanical cultivation (practiced on 94% of the U.S. cotton acreage), conservation of natural enemies (75%), scouting (62%), resistant cultivars (61%), seed bed design (54%), crop residue destruction (49%), crop rotation (31%), environmental defoliation or freeze (29%), date of planting (29%), and earlier maturing varieties (27%). These methods are not usually useful pest management tools by themselves, but are important adjuncts to the chemical tools that are available for cotton pest management.

Agricultural pests of cotton are listed and ranked in this paper by economic importance. Across the cottonbelt, the worst disease complex of cotton is seedling diseases, followed by nematodes and Verticillium wilt. The worst weeds are pigweed and members of its genus, followed by Sorghum species, and morningglory species. Among insect pests, the worst is the bollworm/budworm, followed by bollweevils and thrips. These were considered to be the worst pests nationally, although they may not be the most important pests in certain regions or localities.

In general, the economic analysis shows that banning a single cotton pesticide would cause relatively small aggregate economic losses, because cost-effective alternatives would be available in many areas. The major exceptions are potential actions on fluometuron, an herbicide, and aldicarb, an insecticide/nematicide. The domestic economic losses of banning fluometuron would be about $110 million and aldicarb would be about $90 million.

However, banning major pesticide families or groups of alternatives for pest problems would have much larger effects on cotton production and consumption. For example, the loss of all pyrethroid insecticides, by regulatory action or resistance, would result in a domestic economic loss of about $600 million, while banning any single pyrethroid insecticide would result in an economic loss of less than $5 million. Similar results occur with all seed treatment fungicides, desiccants and defoliants, carbamate insecticides, organophosphate insecticides, dinitroaniline herbicides, organic arsenical herbicides, substituted urea herbicides, and triazine herbicides. These results demonstrate that if chemical alternatives are sequentially removed by regulatory action or become ineffective due to resistance, at some point the benefits of the remaining alternatives will increase dramatically even though their efficacy is unchanged. They also demonstrate that there is a benefit to having several alternatives available that is not captured by simply comparing one pesticide to its alternatives.

Bans of the major cotton pesticide groups, fluometuron, or aldicarb would probably result in cotton production decreases large enough to increase cotton price. The loss of production and resulting higher prices would cause consumer losses. The higher cotton prices would increase revenues to cotton producers not using the affected pesticide or group. However, users of banned pesticides would incur financial losses, even though prices would increase.

Some regions could suffer severe financial losses while others incur little impact. For example, the voluntary cancellation of arsenic acid, a desiccant, caused an estimated economic loss of about $50 million to producers in Texas and Oklahoma but had little impact elsewhere. In general, the Delta and Southeastern States would be more vulnerable than other U.S. cotton producing regions to the economic losses resulting from regulatory actions on or pest resistance to cotton pesticides, particularly major groups, because these two regions generally have more severe pest problems and rely more heavily on pesticides than other cotton producing regions. Also, isolated groups of producers could suffer severe financial losses, because the alternatives for their atypical pest problems are not effective, even though the aggregate economic loss of the regulatory action would be small.

TABLE OF CONTENTS

INTRODUCTION

Cotton production in the United States consumed about 10% of the agricultural pesticide sales in the U.S. in 1989 (Kimm 1991). Despite this heavy reliance upon pesticides and other pest management practices, it was estimated in 1990 that the percent loss of potential yield from cotton due to pests was 10.0% for diseases (Blasingame 1991), 6.4% for insects (Head 1991), and 6.9% for weeds (Byrd 1991). Quality effects on cotton caused by pests are yet another factor to consider. Grassy bales, low-strength lint, and sticky lint are all pest-related factors that reduce cotton value (Ashworth et al. 1971; Tollefson 1991). Without the use of pesticides, U.S. cotton yields are expected to decline by about 72% (GRC Economics 1990). Clearly, the need for pest management in cotton is great. Furthermore, the loss of any one pest management practice has the potential for negative repercussions on cotton yield and quality.

Several studies have recently evaluated the status of pesticide use in cotton. Recently, an evaluation was made of the total usage of all agricultural chemicals and farming practices on cotton for the year 1989 (Crutchfield 1990). Others have reported on individual segments of the cotton pesticide usage in the U.S. with special consideration to the importance of those uses (Suguiyama and Osteen 1988, Osteen and Suguiyama 1988). None have looked at the entire picture of cotton pest management usage with consideration to the effect on cotton production of single and group pesticide withdrawals.

The purpose of this study was to determine the effect on cotton production of the withdrawal of individual and groups of pesticides. For purposes of analysis and explanation, we also collected data on the economically-important pests, pesticide usage, and non-pesticide pest management practices.

METHODS

A questionnaire (Appendix A) was developed by a core group of state and federal scientists representing all disciplines in the survey including an agricultural economist. Depending on the discipline, certain changes were made in the insecticide questionnaire presented here. The questionnaires were mailed in June of 1990 to one state or federal scientist per state in each discipline. We asked these scientists for their expert opinions based on their knowledge of current research data, surveys, and field conditions in their region. Responses from the questionnaires were entered into a computerized data base to allow the generation of data sorted by state and pesticide. These lists were mailed to the same scientists and they were asked to compare their answers with those of other states and make any appropriate corrections or revisions. The resulting data are listed and summarized in Appendix B.

Acreage and yield figures used in all computations are based on a 5-year average (weighted by yearly acreage for yield) from 1984-88 data taken from official USDA data (Jewell 1987, 1989).

Certain assumptions were necessary in order for this survey to be concise and representative of average annual cotton production (i.e. to avoid the year to year variation in pest infestations and consequent pesticide usage). First, we asked our respondents to reference their answers to an average year of pest infestations (over the last 5 years) but with pest management practices available and used in 1990. Second, we asked them to limit their answers to economically-important pests and those practices used on a significant portion (generally 1% or more) of the cotton acreage in their state.

Disease Control Strategies and the Impact of Their Withdrawal

by

Earl B. Minton

Ten cotton diseases were mentioned by 16 reporting states as being of economic importance. On a Beltwide basis, the seedling disease complex is the most important, ranked first by 8 states and either second or third by the remaining states. This disease is followed in descending order of importance by nematodes, Verticillium wilt, boll rot, Fusarium wilt, Phymatotrichum root rot, leaf spots and root rots, Ascochyta blight, bacterial blight, and crumple leaf virus. The seedling disease complex was rated as the most important in Alabama, Arizona, Florida, Missouri, Oklahoma, Tennessee, Texas and Virginia. Nematodes were the most important in Louisiana and South Carolina. Verticillium wilt was the most important in Arizona, California, and New Mexico. Boll rot was ranked first in Georgia, Mississippi, and North Carolina. One of these four diseases was also ranked as the second or third most economically important disease(s) in all states with the exception that Fusarium wilt ranked third in Florida and Oklahoma and Phymatotrichum root rot was ranked second in Arizona and third in Texas.

Table 1. Ranking of economically-important cotton diseases by impact on yield.

Diseases	States																USA[1]
	AL	AZ	AR	CA	FL	GA	LA	MS	MO	NM	NC	OK	SC	TN	TX	VA	
Seedling diseases	1	3	1	2	1	3	3	2	1	3	2	1	2	1	1	1	1
Nematodes	2	6	4	3	2	2	1	4	2	2	3	5	1	5	2	3	2
Verticillium wilt	5	1	3	1	5		6	3	5	1		2		3	4		3
Boll rots	3	5	2	4	4	1	2	1	3	4	1	7	3	2	5	2	4
Fusarium wilt	4		5	5	3	4	4	6	4			3	4	7	6		5
Phymatotrichum root rot		2			9		7			5		9			3		6
Leaf spots and root rots	8	4	6		7	5		5		6		8	6	6			7
Ascochyta blight	6				8	5	7	8	6	8		4	5	4			8
Bacterial blight	7				6	5	5	7		7		6	7				9
Crumple leaf virus		7															10

[1] USA rankings were achieved by: 1) multiplying a state's or region's acreage in cotton production by 10 for a pest ranking of 1 within that state, 9 for 2,..., and 1 for 10 or more and 2) adding the resulting numbers by pest from all reporting states and regions together, and then 3) taking the resulting pest scores for the USA and numerically ranking the highest pest score as number 1, the second highest as 2, and so on.

Each of the 10 diseases listed above caused significant economic losses in one or more areas. Their local importance may not have been reflected by the state-wide ranking or the Beltwide ranking because of the total acreage affected and the overall severity. The Beltwide ranking, however, gives an idea of the economic impact of each disease nationally (Table 1).

The use patterns of fungicides and nematicides to control target diseases and nematodes of cotton is shown in Appendix B, Table 1. The timing of treatment, rate of application, and number of applications, target pest and percentage of acreage treated for each use pattern are included in the table. All chemicals except mancozeb and aldicarb - and those in only certain states - were applied once annually. The rate of application of all materials except 1,3-dichloropropene, aldicarb, chloroneb, PCNB, mancozeb, and fenamiphos was less than 1 lb of active ingredient per acre. The seedling disease complex is caused by several fungal pathogens and nematodes and insects can increase the severity of this complex. Individual fungicides control a very narrow spectrum of fungi, thus a mixture of fungicides must be used to control the seedling disease complex.

Most cottonseed are treated with fungicides, but additional fungicides must be used as hopper box or in-furrow applications in some areas to provide the desired level of disease control. Captan (20% of the acreage), carboxin (60% of the acreage), etridiazole (9% of the acreage), metalaxyl (61% of the acreage), and PCNB (24% of the acreage) were used the most widely. Mancozeb was the only fungicide used to control cotton rust. Aldicarb (19% of the acreage), 1,3-dichloropropene (4% of the acreage) and fenamiphos (0.8% of the acreage) are used to control nematodes of cotton (Table 2). Aldicarb is also used at lower rates to control early season insects (Appendix B, Table 2). An extensive survey-research program is underway to identify the major nematode species present and their impact on cotton production. Preliminary results indicate that nematodes may have a more adverse effect on cotton production than previously thought. The above nematicides and new ones, as they become available, may be more widely used in cotton production following the completion of the survey-research program.

Management practices are an important and integral part of disease and nematode control programs. The non-pesticide control practices used and the target pests they control are shown by state in Appendix B, Table 5. A summary of these practices, Table 3, showed that disease resistant cultivars are grown on 61% of the acreage, and seed bed designs are used on 54%. Cultivation to bury crop residues, crop rotation and delayed planting are used on 34, 31, and 25%, respectively, of the acreage. Irrigation management and sanitation are used on

Table 2. Individual fungicides and nematicides, U.S. acreage treated, alternative treatments and impact on cotton yield.[1]

Individual Fungicide/ Nematicide Lost	% of Acres Treated	U.S. Acres Treated (Millions)	Fungicide/Nematicide Use (Thousands lbs ai)	Alternatives ( ) = No. of States Listing	% Yield Impact		Impact on Lint (Million lbs)	
					W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
Fungicides								
Metalaxyl	61	6.7	77	etridiazole (10), PCNB (8), carboxin (7), fenaminosulf (1), chloroneb (1)	-0.7	-2.6	-49.0	-175.7
Carboxin	60	6.5	206	PCNB (10), etridiazole (6), captan (5), thiram (4), chloroneb (3), metalaxyl (3), TCMTB (1),	-0.6	-2.5	-42.7	-170.5
PCNB	24	2.6	1,336	carboxin (8), metalaxyl (7), chlorneb (4), captan (3), etridiazole (2), mancozeb (2), imazalil (1), TCMTB (1), thiram (1),	-0.5	-2.4	-35.8	-167.3
Captan	20	2.2	40	carboxin (5), PCNB (4), thiram (4), chloroneb (2), etridiazole (1), metalaxyl (1),	-0.2	-1.0	-13.0	-69.4
Etridiazole	9	.9	222	metalaxyl (10), PCNB (2), carboxin (1)	-0.0	-0.7	0.6	-47.5
Chloroneb	4	0.4	32	PCNB (5), metalaxyl (3), carboxin (1), etridiazole (1)	0.0	-0.1	0.0	-7.6
Thiram	4	0.4	9	captan (2), carboxin (2), dicloran (1), PCNB (1)	-0.1	-0.3	-9.5	-20.9
Mancozeb	0.9	0.1	208	PCNB (2), copper sulfate (1), etridiazole (1), grama grass control (1), metalaxyl (1)	-0.1	-0.1	-4.2	-6.2
TCMTB	*	*	1	carboxin (1), PCNB (1)	0.0	*	0.0	-0.1

Continued--

Table 2. (cont.) Individual fungicides and nematicides, U.S. acreage treated, alternative treatments and impact on cotton yield.[1]

Individual Fungicide/ Nematicide Lost	% of Acres Treated	U.S. Acres Treated (Millions)	Fungicide/Nematicide Use (Thousands lbs ai)	Alternatives ( ) = No. of States Listing	% Yield Impact		Impact on Lint (Million lbs)	
					W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
Nematicides								
Aldicarb	19	2.1	1,518	fenamiphos (12), 1,3-D (6), rotation (1)	-0.4	-1.6	-24.9	-108.0
1,3-Dichloropro= pene	4	0.4	13,691	aldicarb (6), fenamiphos (3), metam-sodium (1)	-0.1	-0.3	-9.9	- 23.6
Fenamiphos	0.8	0.1	127	aldicarb (9), 1,3-D (3)	0.0	*	0.0	-1.2

* Very small number (X); | X | < 0.1
[1] For more detail see Appendix B, Table 1 and 9.

smaller percentages of the total acreage. Each of these practices and others are important in the area where they are used. These non-pesticide practices do not provide the level of disease control needed; therefore, they must be used in combination with pesticides to minimize disease losses. Cotton producers have used integrated practices (management and pesticides) for disease control for many years. Because of the high acreage of continuous cropped cotton in many areas and the wide host range of the pathogens, management practices alone are not practical means of disease control. No doubt, management practices have reduced the overall use of pesticides.

Table 3. Non-pesticide disease and nematode management practices used on cotton on more than 1% of total U.S. acreage.[1]

Control Practice	U.S. % of Acreage Treated	U.S. Acreage Treated (Millions)
Resistant cultivars	61	6.7
Seed bed design	54	6.0
Bury crop residues	34	3.7
Crop rotation	31	3.4
Delayed planting	25	2.7
Sanitation	5	0.5
Irrigation Management	3	0.3

[1]For more detail see Appendix B, Table 5.

The impact of the loss of individual fungicides and nematicides on cotton production and alternative materials that could be used are shown in Table 2. A substantial loss would occur even if alternative pesticides or non-pesticide management practices are used. However, much greater losses would occur if alternative practices are not used. Among individual fungicides, the most serious negative impact on yield will be the loss of metalaxyl (0.7%) and carboxin (0.6%) followed by PCNB (0.5%). If an individual fungicide, plus all of the alternatives listed were to be unavailable, yield will be reduced the most by eliminating metalaxyl (2.6%), followed by carboxin (2.5%), PCNB (2.4%), etridiazole (0.7%), and captan (1.0%). For nematicides, the loss of aldicarb would result in the most serious yield reduction (0.4%), followed by 1,3-dichloropropene (0.1%). If aldicarb were lost, plus the listed alternatives, yield would be reduced by 1.6%. Loss of 1,3-dichloropropene and the listed alternatives, would result in a yield reduction of 0.3%. In addition to yield reduction, the use of alternatives would increase costs because of the necessity to replant. If two or more pesticides were lost at the same time, the impact on yield would exceed that caused by adding together the loss of each individually. Alternative pesticides are not always available to replace those currently being used. Also, yield losses could be greater in the future if less effective pesticides are used. An increase in inoculum level of pests could occur without the use of effective fungicides or nematicides which would result in more severe disease.

Table 4 gives the fungicide and nematicide groups, percentage of acreage treated, alternative treatments and the percent and lint yield losses with and without alternatives. Fungicide seed treatment occurred on 98% of the acreage, foliar fungicides were used on 0.2% of the acreage and nematicides on 24% of the acreage. The loss of all fungicide seed treatments with the alternatives listed will likely result in a yield loss of 17%. The loss of all nematicides with alternatives would likely cause a yield reduction of 1.6%. If all fungicide seed treatments were removed from the market, alternative means of control would include delayed planting, crop rotation, raised seedbeds, higher seeding rates, biological control and cultivation. Alternative means of controlling nematodes if all nematicides were lost would include resistant varieties, crop rotation, fallow, subsoiling and cover crops (Table 4).

During the last few years, improved formulations of pesticides and the development of more effective materials through new chemistry have resulted in reduced rates of application of some pesticides. These advancements plus the development of more effective management practices for disease control have resulted in less potential adverse effects of these pesticides on the environment. A wide selection of pesticides is desirable since they reduce the potential for the development of resistance of organisms from the continuous use of a narrow range of pesticides. When there is more than one pesticide available to control each pathogen or nematode an effective substitute chemical is available for use if a material is suddenly unavailable.

Disease loss estimates are based on yield reductions. It is well known that some diseases reduce the quality of the crop. The quality of the crop is receiving more emphasis. Additional research is needed to determine the effects of diseases and nematodes on both crop quantity and quality.

Detailed information from individual states is listed and summarized by pesticide in Appendix B, Tables 1, 5, 9 and 13.

Table 4. Disease and nematode groups, acreage treated, alternative treatments and impact on cotton yields with and without availability of alternatives.[1]

Groups Lost	% of U.S. Acres Treated	U.S. Acres Treated (millions)	Alternatives () = No. of States Listing Each Alternative	% Yield Impact		Impact on Lint (Millions lbs)	
				W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
Fungicide Seed Treatments	98	10.7	delayed planting (4), crop rotation (3), raised seed beds (2), higher seeding rate (1), cultivation (1) Biological Control (1)	-17	-19	-1,187.0	-1,270.0
Foliar Fungicides	0.2	0.02	control of grama grass (1), copper sulfate (1)	-0.1	-0.1	-4.2	-5.4
All Nematicides	24	2.6	Resistant varieties (7), crop rotation (6), fallow (1), subsoiling (1), cover crops (1)	-1.6	- 2.4	-105.9	-165.9

[1] For more detail see Appendix B, Table 13.

Insect Control Strategies and the Impact of Their Withdrawal

by

Charles T. Allen

State entomologists across the Cotton Belt provided information ranking the importance of cotton pests in their state/region. The bollworm/tobacco budworm complex was ranked as the most important pest of cotton in the U.S. (Table 5).

Table 5. Ranking of economically-important cotton insects by impact on yield.

Insects	States and regions[1]																						USA[2]
	AL	AZ	AR	CA		FL	GA	LA	MS	MO	NM	NC	OK	SC	TN	TX							
				36	37											19	20	21	23	24	25	26	
Boll/budworms	1	3	2	3	3	1	2	1	1	1	1	1	1	1	1	2	1	2	3	2	1	1	1
Boll weevils	1	4	1	8	8	2		2	2	4			2		2	1	2	1	2	1	5	5	2
Thrips	4	10	4	6	6	4	5	3	4	3	3	3	5	2	5	4	5		5		2	7	3
Lygus bugs	5	2	3	1	1	8	3	5	3	2	6			5	3		9		6		5		4
Fleahoppers		11	5				4	6	7	7	2		3	8	7	3	3	4	1	3	4	3	5
Spider mites	6	6	6	2	2	6	7	7	6	6	4		4	6	6	5	8	3	4		5	6	6
Cotton aphid	3				7	5	6	4	10		5	4	6	4		7	4	5	7	4	3	2	7
Armyworms	2	5		4	4	3	1	8	5		9			3		6	7	7		6	4	6	8
Pink bollworm		1		5	5					7	7										5	4	9
Grasshoppers									8		5									5	5	7	10
Stink bugs		7		7	7				9			5		7	4						6		11
Whitefly		9		7	7	7	9	9	8							9							12
Cutworms					9				8							8	6	6					13
Leaf perforator		8		9	9						8												14
Euro. corn borer							10			5		2		4									15
Soybean looper							8																16

[1] Regions were taken from Figure 2 in Osteen and Suguiyama (1988). Region 21 includes region 22, and region 26 includes region 27.

[2] USA rankings were achieved by: 1) multiplying a state's or region's acreage in cotton production by 10 for a pest ranking of 1 within that state, 9 for 2,..., and 1 for 10 or more and 2) adding the resulting numbers by pest from all reporting states and regions together, and then 3) taking the resulting pest scores for the USA and numerically ranking the highest pest score as number 1, the second highest as 2 and so on.

Bollworms/budworms were ranked as the most important pest in their region by 13 of the 22 entomologists surveyed. Additionally, this pest complex was ranked 1st, 2nd or 3rd by all 22 respondents.

The boll weevil was ranked the second most important pest of cotton across the cotton belt. The boll weevil was ranked as the most important cotton pest by entomologists from 5 of 22 regions across the belt. Twelve respondents ranked boll weevil as one of the top 3 pests in their region. Respondents from Mid-South and Southwestern regions ranked boll weevils higher than did those from other regions.

Overall, thrips were third in economic importance. Thrips were ranked among the top 3 pests by 6 of the 22 respondents, but were not ranked as the most important pest in any area. Thrips were ranked as more important in the South, Southeast and Southwest production areas. Lygus bugs were the fourth most economically-important pests. Lygus bugs were ranked as the most important pest in 2 of 22 regions surveyed. Lygus were reported as most important in the West and Mid-South. Cotton fleahopper was 5th in economic importance to U.S. cotton producers. Cotton fleahopper was ranked as the number 1 pest of cotton by 1 respondent. Fleahopper was ranked in the top 3 by 7 respondents. Fleahopper was ranked as more important by respondents from the southwest than from other areas. Spidermites were the 6th ranked group in overall economic importance to U.S. cotton producers. Spidermites were ranked among the top 3 most damaging pests by respondents only in California. Spidermites were ranked as more important in the West and Southwestern production areas.

Cotton aphid was the 7th most damaging cotton pest. Cotton aphids were ranked among the top 3 most damaging pests by 3 of the 22 respondents. Cotton aphids were reported to be more important in the Southwestern and Southern production areas. Armyworms were ranked number 8 in economic importance. Armyworms were ranked as the most important pest in 1 state, Georgia. Four respondents ranked armyworms among the 3 most important pests on cotton in their states. Armyworms were reported as more important in Southeastern production. Pink bollworms were listed as the most damaging pest in Arizona. They were reported to be an important pest mainly in the West and Southwest. Other important pests listed in order of the economic damage they cause are: grasshoppers, stink bugs, whitefly, cutworms, leaf perforator, European cornborer and soybean looper (Table 5).

Insecticide use patterns and their target insects are shown in Appendix B, Table 2. More U.S. cotton acres are treated with aldicarb than with any other insecticide active ingredient. Survey respondents indicated use of aldicarb on 3.1 million cotton acres (29% of all U.S. acreage). Aldicarb treatments are entirely soil applied, with most of the treated-acres receiving treatment in-furrow, at-planting applications and other acres receiving side-dress applications. Most of these treatments targeted thrips, but some were intended for control of other sucking insect pests (Lygus bugs, whiteflies, mites and aphids). Most respondents felt that aldicarb was effective, especially against thrips.

Dicrotophos was used on 2.7 million U.S. cotton acres (25%). Dicrotophos was used only as a foliar spray for the control of sucking insects such as thrips, aphids, cotton fleahoppers, plant bugs, whiteflies and stinkbugs. Good efficacy against thrips, cotton fleahoppers and plant bugs was reported. Somewhat lower efficacy was reported for control of cotton aphid. Methyl parathion was used on 2.5 million acres (23% of U.S. acres) as a foliar spray against boll weevil and other insects. Efficacy against boll weevil was good in most of the Delta States, but poorer in Louisiana and Texas. Acephate was used on about 2.0 million cotton acres (19% of U.S. acres). It was applied both at-planting and as a foliar spray. Acephate was used mostly for control of sucking insect pests, and was rated effective against Lygus bugs and fleahoppers and somewhat less effective against aphids and whiteflies. Some use against pink bollworm and bollworm/budworm was reported. Efficacy against these pests was mediocre.

Azinphosmethyl was used on some 1.7 million U.S. cotton acres (15% of U.S. acres) as a foliar spray primarily for boll weevil control. Efficacy was generally considered good to very good. In California and Arizona, azinphosmethyl was used against pink bollworm. Thiodicarb was used on about 1.9 million acres of U.S. cotton (18% of the U.S. acreage) as a foliar spray primarily against bollworm/budworm (larvae and eggs) and armyworms. Efficacy was generally rated good, but not superior. Dimethoate was reported as being used on about 1.6 million U.S. cotton acres (15% of the U.S. acreage) as a foliar spray against a number of sucking insect pests. Efficacy was variable. Profenofos was used on about 1.4 million acres of cotton (13% of the U.S. acreage) as a foliar spray against a broad spectrum of cotton pests (bollworm/budworm, armyworm, spidermite, aphids, and white flies). Efficacy was variable by pest and area.

Cyhalothrin was used on about 1.5 million U.S. cotton acres (14% of U.S. acres). It was used as a foliar spray, mostly postbloom against bollworm/budworm, but also against armyworms, boll weevil, European corn borers, pink bollworm and cotton leaf perforator. Cyhalothrin was rated very good against bollworm/budworm. Cypermethrin was used on about 1.4 million U.S. cotton acres (12% of the U.S. acreage). It was applied as a foliar spray primarily postbloom against bollworm/budworm, but also against pink bollworm and other pests. Against bollworm/budworm it was considered effective. Chlorpyrifos was used on an estimated 1.3 million acres (12% of the U.S. acreage).

It was used as a foliar spray mostly postbloom against a wide range of pests. Efficacy was variable. Esfenvalerate was used on approximately 1.2 million acres (11% of the U.S. acreage). Esfenvalerate was used mainly postbloom against bollworm/budworm. Control was rated as effective. Cyfluthrin was applied to about 1.2 million U.S. cotton acres (11% of the U.S. acreage). It was used as a foliar postbloom spray in most applications. The target pest was mainly bollworm/budworm. Cyfluthrin was generally considered effective. Oxamyl was used on about 0.9 million cotton acres (8% of the U.S. acreage). It was used primarily as a foliar prebloom against boll weevils, but was also used to control Lygus bugs, fleahoppers and cotton leaf perforator. Effectiveness was variable.

Methamidophos was used on about 0.8 million U.S. cotton acres (7% of the U.S. acreage). Used as a foliar spray against a number of insects, it was reported to vary in effectiveness. Methomyl was also used on about 0.8 million U.S. cotton acres (7% of total). It was used on a number of pests as a foliar spray. One of the most important uses mentioned was bollworm/budworm eggs. Control was variable by pest and location. Dicofol was used on 0.7 million cotton acres (7% of the U.S. acreage). It was used as a foliar spray against mite pests. The efficacy of Dicofol was considered good, but not outstanding. A number of other products were used on fewer than 900,000 acres (Table 6).

Although sulfur was applied to only 1% of U.S. cotton acres, 3.6 million pounds were used. This amounted to more pounds of active ingredient than any other product. Sulfur was followed by decreasing amounts of methyl parathion (3.5 million pounds), malathion (2.2 million pounds), profenofos (2.2 million pounds) and aldicarb (2.2 million pounds). Insecticides with uses of between 1 and 2 million pounds included: thiodicarb (1.9 million), chlorpyrifos (1.8 million), acephate (1.6 million), dicofol (1.6 million) and azinphosmethyl (1.2 million). A number of products were used in amounts less than 1 million pounds (Table 6).

Several non-chemical practices and techniques were reported as important in controlling the insect pests of cotton. These practices are listed in Table 7. Conservation of natural enemies was reported as common practice on 75% of U.S. cotton acreage, or 8.3 million acres. It was recognized as important, but rated only mediocre as a means of economic damage prevention/control. Scouting was reported as being used on 62% of U.S. cotton acres (6.8 million acres). It was recognized as very important. Crop residue destruction was recognized as a key component to managing cotton insect pests. It was used on 49% of U.S. cotton acres representing some 5.4 million acres. Crop residue destruction was considered fairly effective. Manipulation of date of planting was used on 29% of U.S. cotton acres or 3.1 million acres. It was considered only moderately effective. Insect

Table 6. Individual insecticides, U.S. acreage treated, insecticide use, and yield impact.[1]

Insecticide Lost	% of U.S. Acreage Treated	U.S. Acres Treated (Thousands)	Insecticide Use (lbs ai) (Thousands)	% Yield Impact		Impact on Lint (Millions lbs)	
				W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
Acephate	19	2030	1621	-0.64	-2.22	-43.3	-151.5
Aldicarb	29	3126	2195	-1.74	-4.84	-118.5	-330.1
Avermectin	<1	3	<1	*	*	-0.1	-0.3
Azinphosmethyl	15	1686	1213	-0.10	-3.62	-7.1	-246.4
Bacillus thuringiensis	3	331	23	-0.07	-0.17	-5.1	-11.6
Bifenthrin	3	314	31	-0.05	-0.36	-3.7	-24.4
Carbaryl	<1	54	44	*	-0.02	**	-1.7
Carbofuran	<1	28	28	0.01	-0.04	1.0	-2.6
Chlorpyrifos	12	1283	1805	-0.05	-1.63	-3.4	-111.4
Cyfluthrin	11	1175	136	*	-3.24	-0.3	-221.2
Cyhalothrin	14	1511	128	-0.02	-3.70	-1.5	-252.2
Cypermethrin	12	1353	212	*	-3.02	-0.3	-205.7
Dicofol	7	724	1607	-0.04	-0.57	-2.4	-38.7
Dicrotophos	25	2728	991	-0.22	-2.30	-14.9	-157.1
Diflubenzuron	2	212	75	-0.06	-0.27	-3.9	-18.5
Dimethoate	15	1590	565	-0.18	-1.39	-12.5	-94.8
Disulfoton	5	537	291	0.00	-0.53	0.0	-36.4
Endosulfan	4	464	380	-0.01	-0.29	-0.8	-19.5
Esfenvalerate	11	1236	122	*	-2.82	-0.3	-191.9
Fenvalerate	<1	61	43	*	-0.13	-0.2	-8.8
Flucythrinate	<1	21	2	*	-0.07	-0.1	-5.0
Gossyplure	<1	79	<1	0.00	-0.22	0.0	-15.3
Lindane	<1	60	6	0.00	-0.02	0.0	-1.3
Malathion	5	589	2246	-0.01	-1.17	-1.0	-79.9
Methamidophos	7	790	665	-0.39	-0.71	-26.5	-48.5
Methidathion	1	145	272	0.07	-0.21	4.7	-14.2
Methomyl	7	809	349	-0.04	-0.58	-2.5	-39.8
Methyl parathion	23	2494	3478	-0.16	-5.09	-10.6	-347.3
Naled	<1	48	36	0.00	-0.02	0.0	-1.6
Oxamyl	8	890	454	*	-1.40	0.2	-95.5
Oxydemeton-methyl	2	267	137	*	-0.12	**	-8.2
Parathion	1	140	128	0.00	-0.05	0.0	-3.4
Permethrin	1	143	35	-0.03	-0.45	-2.1	-30.9
Phorate	2	197	175	0.02	-0.17	1.3	-11.9
Profenofos	13	1448	2231	-0.02	-0.78	-1.4	-53.5
Propargite	5	544	942	0.00	-0.82	0.0	-56.0
Sulfur	1	120	3600	0.00	-0.23	0.0	-15.7

Continued--

Table 6. (cont.) Individual insecticides, U.S. acreage treated, insecticide use, and yield impact.[1]

Insecticide Lost	% of U.S. Acreage Treated	U.S. Acres Treated (Thousands)	Insecticide Use (lbs ai) (Thousands)	% Yield Impact		Impact on Lint (Millions lbs)	
				W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
Sulprofos	5	568	988	-0.01	-0.57	-0.7	-38.8
Thiodicarb	18	1937	1878	-0.02	-1.37	-1.3	-93.2
Tralomethrin	5	530	34	*	-1.69	-0.3	-115.5
Trichlorfon	<1	<1	<1	0.00	*	0.0	**

* Very small negative number (NN); | NN | <0.01

** Very small negative number (NN); | NN | <0.1, but >0.01

[1]For details see Appendix B, Tables 2 and 10.

Table 7. Non-pesticide insect management practices used on cotton on more than 1% of total U.S. acreage.[1]

Non-Chemical Practice	% of Acreage Where Practiced	U.S. Acreage (Millions)
Conservation-natural enemies	75	8.3
Scouting	62	6.8
Crop residue destruction	49	5.4
Date of planting	29	3.1
Resistant cultivars	15	1.6
Pheromone systems	12	1.3
Maturity enhancement	4	0.4
Crop rotation	2.8	0.3
Fast fruiting cultivars	2.2	0.2
Eradication programs	1.1	0.1

[1]For more detail see Appendix B, Table 6.

resistant cotton cultivars were used on 15% of U.S. cotton acreage or 1.6 million acres. Resistant varieties were reported to have only mediocre ability to prevent damage. Pheromone systems for pest suppression were reportedly used on 12% of the U.S. cotton acreage, or 1.3 million acres. Effectiveness ranged from excellent to ineffective. Maturity enhancement was reported used on some 4% of the U.S. acreage, or 0.4 million acres. Effectiveness was variable by pest and location. Crop rotation was used on about 2.8% or the U.S. cotton acreage, or 0.3 million acres. Effectiveness was ranked mediocre. Fast fruiting cultivars were reportedly used on 2.2% of the U.S. acres or 0.2 million acres. Effectiveness was ranked mid-scale. Eradication programs were mentioned by one state, South Carolina. This effected 1.1% of the U.S. cotton crop or 0.1 million acres. Eradication was ranked very effective. Other practices are used on less than 1% of the acreage but still important in cotton crop production (Table 7, and Appendix B, Table 6).

In Table 6, yield impact is discussed under circumstances in which the currently available alternative insecticides are used, and also under circumstances where alternative insecticides are either unavailable, or not used. Examining losses when alternative insecticides are available and are used, the largest yield losses are associated with loss of the compound aldicarb. Respondents estimated loss of 1.7% of the U.S. cotton yield if aldicarb were lost (with the current alternative chemistry used). This amounted to 118.5 million pounds of lint or 237 thousand bales. The loss of acephate with alternative insecticides used was estimated to result in losses of 0.64% of U.S. cotton yield. This would result in a loss of 43.3 million pounds of lint (86,600 bales). If methamidophos were lost and alternative insecticides were used a loss of 0.39% of the U.S. cotton yield would occur. Losses of lint would total some 26.5 million pounds or 53,000 bales. The loss of dicrotophos would also cause lint losses in the 0.22% range (with alternative insecticides available), 14.9 million pounds of lint or 29,800 bales. If dimethoate were lost and alternatives were used, a 0.18% yield loss would occur. This would amount to a loss of some 12.5 million pounds (25,000 bales) of U.S. cotton.

Loss of methyl parathion with the present compliment of alternative insecticides used would mean the loss of an estimated 0.16% of U.S. yield. This translates into losses of about 10.6 million pounds of cotton lint or 21,200 bales. The loss of azinphosmethyl with replacement by the available alternatives would result in a loss of approximately 0.1% of U.S. cotton, 7.1 million pounds or 14,200 bales. If Bacillus thuringiensis were lost and replacement products were used, U.S. cotton lint losses would be in the 0.07% range, 5.1 million pounds of lint or 10,200 bales. Loss of methidathion with alternatives available would bring about a 0.07% U.S. yield increase, 4.7 million pounds or 9,400 bales. If bifenthrin were lost and the currently available alternatives were used, about 0.05% of U.S. cotton yield would be lost, 3.7 million pounds of lint, or 7,400 bales. The loss of chlorpyrifos with alternatives would cause estimated yield losses of about 0.05%, 3.4 million pounds or 6,800 bales. Loss of any of the remaining insecticides, assuming the currently available alternatives could be used, would result in losses of .03% of the U.S. lint production or less (Table 6, Appendix B-Table 10).

Assuming that an individual insecticide was lost and the currently available alternatives were either not available or were not used, survey respondents were asked to estimate the impact of the loss. Loss of methyl parathion if alternatives were not used would result in lint losses of 5.09%, 347.3 million lbs of cotton or 694,600 bales lost. Without alternatives, the loss of aldicarb would result in a 4.84% yield loss to the U.S. cotton crop, 330.1 million pounds of lint or 660,200 bales. Loss of cyhalothrin without alternatives would cause an estimated 3.70% yield loss, 252.2 million pounds or 504,400 bales. Loss of cyfluthrin was estimated to produce a 3.24% yield loss, 221.2 million pounds or 442,400 bales. If cypermethrin were lost and alternatives were unavailable, a 3.02% yield loss was projected, 205.7 million pounds of cotton lint or 411,400 bales. Loss of esfenvalerate without alternatives was estimated to cause a 2.8% loss of lint, some 191.9 million pounds, or 383,800 bales. Without alternatives, the loss of acephate was projected to reduce yields 2.22%, 151.5 million pounds or 303,000 bales. Loss of dicrotophos without alternatives would cause a loss of 2.30% of U.S. cotton, 157.1 million pounds of lint lost, or 314,200 bales. Loss of chlorpyrifos would result in production losses of about 1.63%, 111.4 million pounds of lint or 222,800 bales. If tralomethrin was lost and alternative insecticides were not used 1.69% of U.S. cotton would be lost, 115.5 million pounds of lint, or 231,000 bales. Assuming oxamyl was lost without alternatives, U.S. cotton losses would reach approximately 1.40%, 95.5 million pounds or 191,000 bales. Loss of dimethoate would result in a yield decrease of about 1.39%, 94.8 million pounds or 189,600 bales. If thiodicarb was lost without the available alternatives, lint production would fall by an estimated 1.31%, 93.2 million pounds or 186,400 bales. Loss of malathion without the available replacements would cause losses estimated at 1.37% of U.S. production, 79.9 million pounds of cotton, or 159,800 bales. Loss of other individual pesticides without replacement would result in losses of less than 1% of U.S. production (Table 6, Appendix B-Table 10).

Table 8 and Appendix B, Table 14 detail the respondents professional opinions regarding loss of entire classes of insecticides. They were asked to provide information on the impact of loss of pesticide classes with currently available alternatives used, and not used against the target pests of the lost class. Loss of all insecticides, while allowing use of alternative non-insecticidal techniques was estimated to have a yield impact of 28.35%. This would mean a loss of about 1.9 billion pounds of U.S. cotton production or almost 3.8 million bales. Loss of the pyrethroid class assuming insecticide from other classes could be used would cause 11.47% yield loss, 782 million pounds or 1.56 million bales. Loss of the organophosphate insecticide class would result in a decrease of about 8.04% in U.S. cotton yields, 548 million pounds or about 1.1 million bales. If the carbamate insecticide class was lost, but other classes remained, losses would reach an estimated 4.07%, 277 million pounds or 554,000 bales. The impact of losing the class of biological insecticides would be a cotton yield reduction of about 0.08%, 6 million pounds or about 12,000 bales. (Table 8; Appendix B, Table 14).

Finally, survey respondents were requested to provide information about the consequences of loss of an insecticide class when alternative chemical classes and/or non-chemical management techniques were either unavailable, or not used. Assuming all insecticides were lost without non-chemical management strategies, U.S. losses were estimated at 34.19%, 2.3 billion pounds or 4.6 million bales. The loss of the pyrethroid

Table 8. Yield impact and use of insecticide groups used on more than 1% of the U.S. Cotton Acreage.[1]

Lost Pesticide Group	% of U.S. Acres Treated	U.S. Acres Treated (Millions)	% Yield Impact		Impact on Lint (Millions lbs)	
			W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
All Insecticides	82	9.0	-28.35	-34.19	-1,933	-2,330
Biologicals	5	0.5	-0.08	-1.42	-6	-97
Carbamates	40	4.4	-4.07	-14.57	-277	-993
Organophosphates	71	7.7	-8.04	-22.26	-548	-1,517
Pyrethroids	54	6.0	-11.47	-22.93	-782	-1,563

[1]For more detail see Appendix B, Table 14.

class when alternative insecticides or non-chemical techniques are not used would result in a loss estimated at 22.93%, 1.6 billion pounds or 3.2 million bales. When loss of the organophosphate class was considered without chemical or non-chemical control practices, cotton lint yield would be reduced by about 22.26%, 1.5 billion pounds or 3.0 billion bales. Carbamate loss without alternative products or technology would result in a 14.57% yield loss nationally, 993 million pounds or 2.0 million bales. Loss of the biologicals with no available control of the pests against which this group is used would result in a loss of 1.42% of U.S. cotton production, 97 million pounds or 194,000 bales (Table 8; Appendix B, Table 14).

Weed Control Strategies and the Impact of Their Withdrawal

by

Dave Weaver

Thirty-six genera were mentioned by the 14 reporting states as economically important weeds. Ipomoea was ranked as the most important weed genus in 8 states followed by Xanthium in 3, Amaranthus in 2, Solanum in 1 and Cyperus in 1 (Table 9).

Table 9. Ranking of economically-important cotton weeds by impact on yield.

Weeds[3]	States and regions[1]														USA[2]
	AL	AZ	AR	CA 37	FL	GA	LA	MS	MO	NC	OK	SC	TN	TX	
Amaranthus	8	4	6	1	5	12	5	9	8	14	2	3	5	1	1
Sorghum	7	7	4	4		13	6	3	7	13	3	8	2	3	2
Ipomoea	1	1	1	3	3		1	1	1	1	4	1	3	6	3
Solanum		2		2				12			1			2	4
Cyperus	6	1	11	8	4	3	4	6	11	6	4	4	9	4	5
Xanthium	3	9	3	9	1	1	2	2	2	2		2	1	7	6
Proboscidea														5	7
Cynodon	5	6	7	5				5	11	10	7	9	7	12	8
Sida	2		2			7	3	6	3	3		7	4		9
Euphorbia	8	8	5			11	7	4	4	19		10	5		10
Echinochloa		5	9	6			11	10	13		6			13	11
Franseria														8	12
Digitaria	12		10		6	10	9	7	5	7	5		6		13
Convolvulus		8		7							8			13	14
Helianthus											10			9	15
Physalis		3		10			13							14	16
Panicum	10	9	12		8	4	13		12	16	9			12	17
Anoda	11		8				12	11	10	18			11	13	18
Eleusine					6	14	10	7	9	9		6	6		19
Cassia	4				2	2		12		4		5	10		20
Sesbania		8					5	9							21
Salvia														10	22
Salsola														11	23
Abutilon	5								6	17			8		24
Brachiaria							8	10	12	8			11		25
Brunnichia								8							26
Ampelamus								8							27
Ambrosia	9							12	14	12			12		28
Croton	11					8				5					29
Polygonum								11		11			13		30
Acanthospermum						5									31
Desmodium					7	6									32
Portulaca								13							33
Melochia					5	9									34
Chenopodium										15					35
Richardia					9										36

1 Regions were taken from Figure 2 in Osteen and Suguiyama (1988).
2 USA rankings were achieved by: 1) multiplying a state's or region's acreage in cotton production by 10 for a pest ranking of 1 within that state, 9 for 2,..., and 1 for 10 or more, and 2) adding the

numbers by pest from all reporting states and regions together, and then 3) by taking the resulting pest scores for the USA and numerically ranking the highest pest score as number 1, the second highest as 2, and so on.
[3] Weeds are listed by genera.

Amaranthus and Cyperus were listed as important weeds in all 14 states. Xanthium, Ipomoea and Sorghum were mentioned by 13 states. Other frequently listed genera included Cynodon, Digitaria, Euphorbia and Panicum.

Table 10 lists the herbicides used in cotton, the estimated U.S. acreage treated and herbicide use, including all application patterns. Column 5 gives alternative treatments if the herbicide of choice was withdrawn from the market. Columns 6 and 8 show the average estimated yield loss if the herbicide in column 1 was lost, but the alternatives in column 5 were still available. Yield loss if the herbicide of choice plus the alternatives were not available are listed in columns 7 and 9.

Trifluralin, the most widely used herbicide (60% of the acreage), was applied to as much as 75% of the acreage in Texas and to as little as 35% in Arkansas (Appendix B, Table 11). Fluometuron, used on 35% of the cotton acreage, was applied preemergence, postemergence and layby, primarily in the mid south and southeastern states.

Pendimethalin and MSMA were used on over 20% of the acreage. MSMA, applied alone and in combination with other postemergence herbicides, is reported as a single entry which accounts for all acreage sprayed. The same is true for other herbicides applied in tank mixtures, as well as individual treatments.

Among individual herbicides, the most serious impact on yield will be the loss of fluometuron (4.1%) followed by prometryn (1.0%). If an individual herbicide, plus all of the alternatives listed were to be unavailable, yield will be reduced the most by eliminating fluometuron (13.1%) followed by trifluralin (10.4%), cyanazine (6.1%) and MSMA (5.7%).

In addition to yield reduction the use of alternatives will have the following secondary effects: 1) increased cost of cotton production, 2) reduced control of certain weed species, 3) reduced lint quality due to grassy bales and delayed harvest, 4) increased probability of cotton injury, 5) increased need for cultivation and hand-hoeing and 6) increased herbicide carryover to rotational crops.

Non-chemical methods of weed management which are presently used in concert with herbicides, are listed in Table 11.

Table 10. Individual herbicides, acreage treated, herbicide use, alternative treatments and impact on cotton yield with and without availability of alternatives.[1]

Individual Herbicides Lost	% of U.S. Acres Treated	U.S. Acres Treated (Thousands)	Herbicide Use (thousand lbs ai)	Alternatives ( ) = No. of States Listing Each Alternative	% Yield Impact		Impact on Lint (millions lbs)	
					W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
Trifluralin	60	6,608	5,165	Pendimethalin (14), Metolachlor (4), Norflurazon (2)	-0.5	-10.4	-34.1	-707.4
Fluometuron	35	3,858	3,577	Diruon (8), Methazole (8), Prometryn (7), Norflurazon (6), DSMA/MSMA (4), Hoeing (2), Cyanazine (1), Metolachlor (1)	-4.1	-13.1	-276.0	-886.4
Pendimethalin	27	2,981	2,632	Trifluralin (14), Norflurazon (3), Sethoxydim (1), Metholachlor (1)	*	- 5.0	-0.5	-331.0
MSMA	25	2,693	6,526	DSMA (11), Hand-hoeing (2), Cyanazine (1), Cultivation (1)	-0.1	- 5.7	-6.4	-389.5
Cyanazine	19	2,129	1,752	Prometryn (10), Methazole (8), Oxyflorfen (7), Fluometuron (6), Diuron (4), Linuron (2), Lactofen (2), Metolachlor (1), Norflurazon (1)	-0.1	- 6.1	-3.9	-418.0
Glyphosate	19	2,053	1,643	Fluazifop-P-Butyl (6), Paraquat (5), DSMA/MSMA (3), Hand-hoeing (3), Sethoxydim (2), Cultivation (2)	-0.4	- 1.7	-24.9	-116.0
Prometryn	18	2,009	2,424	Fluometuron (7), Methazole (6), Cyanazine (6), Diuron (2), Hand-hoeing (2), Metolachlor (1), Pendimethalin (1), Trifluralin (1)	-1.0	- 3.4	-69.9	-234.4
Fluazifop-P-butyl	17	1,915	304	Sethoxydim (14), Glyphosate (3), DSMA/MSMA (1), Fenoxaprop (1)	-0.4	- 2.3	-29.5	-157.6
Norflurazon	16	1,731	1,579	Fluometuron (6), DSMA/MSMA (5), Pendimethalin (3), Trifluralin (3), Diuron (2), Cyanazine (1), Methazole (1), Cultivation (1)	-0.2	- 3.9	-16.6	-266.0

Continued--

Table 10. (cont). Individual herbicides, acreage treated, herbicide use, alternative treatments and impact on cotton yield with and without availability of alternatives.

Individual Herbicides Lost	% of U.S. Acres Treated	U.S. Acres Treated (Thousands)	Herbicide Use (thousands lbs ai)	Alternatives ( ) = No. of States Listing Each Alternatives	% Yield Impact W/Alt.	% Yield Impact W/O Alt.	Impact on Lint (millions lbs) W/Alt.	Impact on Lint (millions lbs) W/O Alt.
Sethoxydim	10	1,042	228	Fluazifop-P-Butyl (14), Glyphosate (3), DSMA/MSMA (1), Fenoxyprop (1)	-0.1	- 1.3	- 5.5	- 87.9
Diruon	8	864	389	Cyanazine (6), Fluometuron (4), Prometryn (2), Methazole (2), Lactofen (1), Linuron (1), Norflurazon (1)	-0.1	- 2.8	- 8.8	-188.4
DSMA	8	836	2,346	MSMA (11)	-0.1	- 2.3	- 3.1	-155.4
Methazole	4.5	493	474	Fluometuron (7), Prometryn (3), Cyanazine (2), Diruon (1)	*	- 1.1	- 2.1	- 72.6
Metolachlor	2.2	243	293	Trifluralin (2), DSMA/MSMA (2), Cyanazine (1), Fluometuron (1), Norflurazon (1), Pendamethalin (1), Alachlor (1)	*	- 0.3	- 1.2	- 22.5
Oxyfluorfen	2.1	232	90	Cyanazine (5), Prometryn (2), Fluometuron (1), Lactofen (1)	*	- 0.8	- 2.7	- 54.2
Paraquat	1.9	206	130	Glyphosate (7), Cultivation (3)	0.0	- 0.3	0.0	- 18.4
Linuron	1.5	159	145	Cyanazine (4), Diruon (3), Fluometuron (1), Prometryn (1)	0.0	- 0.1	0.0	- 7.3
Lactofen	0.5	52	9	Cyanazine (2), Prometryn (1)	0.0	- 0.1	0.0	- 7.6
Alachlor	0.3	32	48	Metolachlor (1)	0.0	- 0.1	0.0	- 6.6
Fenoxaprop-ethyl	0.1	5	0.8	Sethoxydim (2), Fluazifop-P-Butyl (2)	0.0	*	0.0	- 0.3

*Very small negative number (X); | X | < 0.1

[1]For more detail see Appendix B, Tables 2 and 7.

Table 11. Non-pesticide weed management practices used on cotton on more than 1% of total U.S. acreage.[1]

Practice	% of U.S. Acreage Treated	U.S. Acreage Treated (millions)
Cultivation (Mechanical)	94	10.3
Scouting	45	4.9
Crop Rotation	25	2.7
Hand Hoeing	21	2.3
Cultural Management	4	0.4

[1]For more detail see Appendix B, Table 7.

Percentage of cotton acreage and actual cotton acreage on which each method is practiced is indicated; however, several of the alternatives may apply to the same acreage.

Table 12 gives the herbicide groups (for those chemicals that fit into categories), acreage treated, alternative treatments and the yield loss with and without alternatives. The impact of the loss of all herbicides is also considered. Dinitroanilines (trifluralin and pendimethalin) were applied to 88% of the acreage, triazines (cyanazine and prometryn) to 37%, substituted ureas (diuron, fluometuron and linuron) to 35%, organic arsenicals (DSMA and MSMA) to 33% and acetanilids (alachlor and metolachlor) to 2.5%.

Yield reduction by a single group with alternatives was highest with the loss of dinitroanilines (7%), followed by substituted ureas (4.6%) organic arsenicals (2.7%), and triazines (1.5%). The loss of all herbicides will result in a yield reduction of 27%. The loss of herbicide groups, plus the alternatives listed in Table 12 column 4 will lead to yield losses ranging from 21% for dinitroanilines to 0.5% for acetanilids.

If all herbicides were removed from the market, alternative means of weed control would include the following: crop rotation, cultivation, hand-hoeing and flame cultivation. These nonchemical methods are more feasible in states where yield and profit potential are higher because total dependence on these alternatives increases the cost of production.

Table 12. Cotton herbicide groups used on more than 1% of U.S. Acreage, acreage treated, alternative treatments and impact on cotton yield with and without availability of alternatives.[1]

Herbicide Groups Lost	% of U.S. Acres Treated	U.S. Acres Treated (Millions)	Alternatives () = No. of States Listing Each Alternative	% Yield Impact W/ Alt.	% Yield Impact W/O Alt.	Impact on Lint (millions lbs) W/Alt.	Impact on Lint (millions lbs) W/O Alt.
All Herbicides	98	10.7	Cultivation (14), Hand-hoeing (11), Crop Rotation (6), Flame Cultivation (2)	- 27	- 77	-1,865	-5,220
Dinitroanilines	88	9.7	Fluazifop-P-Butyl (8), Sethoxydim (8), Acetanilids (6), Triazines (4), Norflurazon (3), Hoe (3), Cultivation (2), Arsenicals (2), Cyanazine (1), DCPA (1), Fenoxaprop (1), Fluometuron (1), Methazole (1), Metolochlor (1), Diphenyl ethers (1), Diruon (1), Prometryn (1), Organic acid (1), Ureas (1)	- 7	- 21	-475	-1,462
Triazines	37	4.1	Substituted Ureas (6), Methazole (6), Oxylfuorfen (3), Diuron (3), Hand-hoeing (2), Acetanilids (1), Ureas (2), Cultivation (2), Diphenyl ethers (2), Metolachlor (1), Norflurazon (1), Fluometuron (1)	- 1.5	-12.3	-106	-837
Substituted Ureas	35	3.8	Triazines (12), Norflurazon (6), Methazole (5), DSMA/MSMA (3), Hand-hoeing (1), Cyanazine (1), Metolachlor (1), Cultivation (1), Diphenyl ethers (1)	- 4.6	-16.4	-311	-1,115
Organic Arsenicals	33	3.6	Norflurazon (5), Fluazifop-P-Butyl or Sethoxydim (3), Triazines (1),Fluometuron (4), Methazole (3), Cultivation (4), Acetanilids (3), Hand-hoeing (4), Cyanazine (1), Glyphosate (2), Ureas (1), Oxyfluorfen (1), Others (2), Dipehyl ethers (1)	- 2.7	- 8.8	-187	-601
Acetanilids	2.5	0.3	Organic Arsenicals (4), Dinitroanilines (3), Cyanazine (1), Norflurazon (1)	*	- 0.5	-2.1	-31.9

* Very small negative number (X); | X | <0.1
[1] For more detail see Appendix B, Table 15.

If all herbicides were withdrawn from the market the secondary effects include: 1) cotton production will cease in many areas, 2) production costs will increase, 3) less cotton will be planted 4) increased tillage will increase soil erosion and 5) no-till production will be impossible.

Detailed information by individual states is included in Appendix B, Tables 3, 7, 11 and 15.

Plant Growth Regulator and Harvest-Aid Chemicals Strategies and the Impact of Their Withdrawal

by

James R. Supak

Plant growth regulators, boll openers, defoliants and desiccants are widely used by cotton producers to manage plant development, prepare mature crops for earlier harvest and harvest scheduling (Table 13). Fourteen states were included in this survey. During this period, it was estimated that approximately 31, 26, 83, and 31 percent of the cotton acreage was treated with PGRs, boll openers, defoliants and desiccants, respectively (Table 14).

Only one PGR (mepiquat chloride) and one boll opener (ethephon) were noted in the survey. Usage of defoliants was related to their efficacy. Phosphorotrithioate was the most widely used defoliant (37% of the acreage) and was also rated as being the most effective. Arsenic acid was rated as the most effective desiccant even though paraquat dichloride was used on more acres. Although classified as a desiccant, paraquat dichloride is frequently used at below labeled rates and in combination with defoliants to promote leaf shedding. Consequently, it is more heavily used than arsenic acid (Tables 13 and 14).

Projected yield losses (nationwide) due to cancellation of individual chemicals with use of alternative chemical and non-chemical practices was approximately 1.7% for the PGR, 1.7% for the boll opener, <0.1 to 0.7% for the defoliants and 0.2 to 1.2% for the desiccants. Without use of the alternatives, potential yield loss percentages were 1.8, 2.7, <0.1 to 4.8 and 2.1 to 2.4 for the PGR, boll opener, defoliants and desiccants, respectively (Table 14).

No chemical alternatives were available for mepiquat chloride except in one state whereas other defoliants or desiccants could be substituted for the loss of ethephon or for individual defoliants and desiccants (Table 14). Non-chemical alternatives for the PGRs included intensified insect control. For individual defoliants, non-chemical alternatives included: waiting for a freeze, earlier maturing varieties and reduced N use. Waiting for a freeze was considered to be the only practical substitute for the desiccants (Table 15).

Secondary impacts due to the loss of individual products included reductions in lint quality, delayed harvest, lower harvesting efficiency, increased production costs, poorer

Table 13. Number of states using, ai used, average number of applications per chemical and the efficacy ratings of defoliants, PGRs and desiccants.[1]

Harvest-Aid/PGR	No. States Reporting Use	Chemical Use (Thousands lbs ai)	Average No. Applications Annually	Efficacy Rating (1-5)*
A. PGRs				
Mepiquat chloride	14	105	2.4	2.4
B. Boll Opener				
Ethephon	14	3,140	1.0	2.2
C. Defoliants				
Phosphorotrithioate	13	6,060	1.2	1.9
Thidiazuron	13	273	1.1	2.3
Sodium Chlorate	9	9,934	1.1	2.5
Dimethipin	12	165	1.0	3.1
Endothall	7	38	1.0	3.6
D. Desiccants				
Arsenic Acid	4	6,182	1.0	1.7
Paraquat Dichloride	11	674	1.1	3.0

* 1 = very good; 5 = very poor.
[1]For details see Appendix B, Table 4.

Table 14. Acreage treated, alternatives, and the yield impact with and without chemical alternatives to replace the loss of individual defoliants, PGRs and desiccants.[1]

Harvest-Aid/PGR (Trade Name)	% of U.S. Acreage Treated	U.S. Acreage Treated (Millions)	Chemical Alternatives [() = No. States Listing alternative]	% Yield Impact		Impact on Lint (millions lbs)	
				W/Alt.	W/O Alt.	W/Alt.	W/O Alt.
A. PGRs							
Mepiquat Chloride (Pix)	31	3.4	None (14); Paraquat (1)	- 1.7	- 1.8	-117.4	-123.0
B. Boll Opener							
Ethephon (Prep)	26	2.8	Paraquat (8); Def (5); Dropp (3); Harvade (1)	- 1.7	- 2.7	-115.3	-186.7
C. Defoliants							
Phosphorotrithioate (Def/Folex)	37	4.1	Dropp (10); Harvade (9); De-Fol (5); Prep (3); Paraquat (1)	*	- 4.8	-2.4	-330.0
Thidiazuron (Dropp)	22	2.4	Def (11); Harvade (6); De-Fol (3); Prep (1)	- 0.7	- 2.9	-49.6	-194.3
Sodium Chlorate (De-Fol)	16	1.8	Def (8); Dropp (3); Harvade (2); Paraquat (1)	*	- 1.2	-1.8	-82.8
Dimethipin (Harvade)	4	0.4	Def (10); Dropp (3); De-Fol (2); Paraquat (1)	*	- 0.3	-1.1	-22.1
Endothall (Accelerate)	4	0.4	Paraquat (4); Def (2); Dropp (2); Prep (1); De-Fol (1)	*	*	-0.2	-1.6
TOTAL	83	9.2		- 0.8	- 9.2	-55.1	-630.8
D. Desiccants							
Paraquat Dichloride (Paraquat)	19	2.1	Arsenic Acid (3); De-Fol (3); Dropp (2); Harvade (2); Def (1); Accelerate (1); Prep (2)	- 0.2	- 2.4	-10.3	-166.2
Arsenic Acid	13	1.4	Paraquat (4); De-Fol (2); Dropp (1); Def (1)	- 1.2	- 2.1	-83.6	-142.9
TOTAL	31	3.4		- 1.4	- 4.2	-96.1	-285.3

* Very small negative number (X); | X | < 0.1
[1] For details see Appendix B, Table 12.

Table 15. Non-chemical options used on cotton in place of individual defoliants, PGRs and desiccants on more than 1% of the total U.S. cotton acreage.[1]

Non-Chemical Practice	No. States Reporting	U.S. Acres Where Practiced (%)	U.S. Acreage Where Practiced Millions)
A. PGRs and Boll Openers			
Intensified Insect Control	2	6	0.7
B. Defoliants			
Earlier Maturing Varieties	5	27	2.9
Wait for Freeze	8	8	0.9
Reduced N Use		2	0.2
Pick w/o Defoliation	1	1	0.1
C. Desiccants			
Wait for Freeze	6	29	3.2

[1]For details see Appendix B, Table 8.

defoliation, excessive plant growth, regrowth and increased pest problems (Table 16).

Potential yield losses due to cancellation of chemical groups with use of alternative chemical and nonchemical options were 17% for all defoliants and desiccants and 5% of all PGRs and boll openers. Without alternatives, estimated losses increased to 27% for all defoliants and desiccants and 7% for all PGRs and boll openers. Waiting for a freeze was identified as the primary non-chemical option for the loss of all defoliants and desiccant (Table 17).

Secondary impacts due to loss of chemical groups included reduced fiber quality, delayed harvest, increased production costs, more insect and disease problems, reduced harvester efficiencies and reduced cotton acreage (Table 18).

Detailed information by individual states is included in Appendix B, Tables 4, 8, 12 and 16.

Table 16. Secondary effects due to loss of individual defoliants, PGRs and desiccants with use of available alternative(s).

Secondary Effect	Chemical Lost								
	Def	Dropp	De-Fol	Harvade	Accelerate	Pix	Prep	Paraquat	Arsenic Acid
	---No. States Reporting Secondary Effect---								
Reduced Lint Quality	10	10	5	10	2	10	10	9	4
Delayed Harvest	1	1	1	2	2	6	7	3	1
Lower Harvesting Efficiency	2	1	1	2	0	0	1	1	1
Increased Cost	6	2	3	2	0	0	2	0	1
Poorer Defoliation	2	0	0	2	0	0	0	0	0
Excessive growth	0	0	0	0	0	2	0	0	0
Regrowth	0	3	0	0	0	0	0	0	0
Increased Pest Problems	0	1	0	0	0	4	0	0	0

Table 17. Yield impact, use and chemical and non-chemical alternatives that could be substituted for loss of all defoliants, desiccants and PGRs.[1]

CHEMICAL GROUP LOST	% of U.S. Acres Treated	U.S. Acres Treated (millions)	% Yield Impact		Impact on Lint (millions lbs)		Chemical Alternatives [() = No. States Reporting Use]	Non-Chemical Alternatives [() = No. States Reporting Use]
			W/Alt.	W/O Alt.	W/Alt.	W/O Alt.		
All Defoliants and Desiccants	81	8.9	17	27	1,143	1,826	Prep (1); PGRs (2); Glyphosate (1); Arsenics (1)	Freeze (7); Reduced N (4); Determinate varieties (3); None (2)
All PGR and Boll Opener	45	4.9	5	7	333	461	Paraquat (1)	Determinate varieties (7); Reduced N (4); Water management (3); Short season production system (3); Early planting (1)

[1]For details see Appendix B, Table 16.

Table 18. Secondary effects resulting from the loss of chemical groups with use of available alternatives.

Secondary Effect	Chemical Group Lost	
	Defoliants/Desiccants	PGR/Boll Opener
	----No. States Reporting Secondary Effect----	
Reduced Lint Quality	14	8
Delayed Harvest	3	8
Increased Production Costs	4	5
More Disease, Insect Problems	1	6
Reduced Harvester Efficiency	3	1
Less Cotton Acreage	5	0

Potential Economic Effects of Banning Cotton Pesticides

by

Craig Osteen

Introduction

Pesticides are widely used in U.S. cotton production to prevent yield losses from weeds, insects, diseases, and nematodes. Chemicals are also widely used to regulate growth and to desiccate and defoliate cotton before harvesting. Consequently, U.S. Environmental Protection Agency (USEPA) pesticide regulatory decisions could have substantial impacts on U.S. cotton production. This section discusses the potential economic effects of hypothetical bans of selected, important pesticides used in cotton production, based upon the cotton assessment data discussed in earlier sections (Appendix B).

Economic Methods

The benefits of a pesticide's use in the production of a crop are generally measured by the aggregate economic loss of banning or restricting its use. That aggregate loss is typically measured by the sum of impacts on consumers and producers of the crop. However, some producers or regions could incur severe financial losses even though the aggregate loss of a regulatory action is small, which may create issues of equity.

Estimation of benefits begins by examining the effects of a proposed action on production. Pesticide bans force farmers to use alternative methods of pest control and production, which may change cost and yield per acre. The degree to which cost per unit of output increases depends upon the relative cost-effectiveness of the alternative methods. If these changes reduce output sufficiently, cotton price will rise. As a result, consumers would suffer losses from reduced consumption and higher prices; farmers would modify future planting decisions, affecting the production and prices of such alternative crops as corn, soybeans, sorghum, wheat, and other grains.

Cost and yield changes per treated acre were estimated for each pesticide and pesticide family examined below in each State where they were used. Yield changes were obtained directly from the cotton assessment database (Appendix B). Cost changes were estimated for switching from the pesticide or pesticide family in question to the alternative controls by considering prices, application rates, and number of applications of the alternative controls. Agchemprice (1992) was the source of most pesticide prices. A national summary of acreage treated, yield changes, and cost changes for each pesticide and family is presented in Table 19. Yield losses per planted acre show the change in U.S. production assuming that cotton acreage remains constant and no other adjustments occur.

The economic effects of banning each pesticide or pesticide family were evaluated with AGSIM, an econometric simulation model of supply and demand for major field crops developed by C.R. Taylor of Auburn University (Taylor, 1990). AGSIM estimates prices, production, and acreage of corn, soybeans, cotton, wheat, grain sorghum, barley, and oats in major production regions. (Estimates of prices, production, and acreage are simulated for research purposes and are not official USDA forecasts.) Given those changes, AGSIM computes crop income changes and consumer losses. Consumer losses result from higher prices and lower consumption and are measured by change in consumer surplus. Net U.S. aggregate economic effect of a regulatory action is the sum of domestic consumer and producer effects. The aggregate consumer, producer, and net effects presented in report are four-year averages summed across all crops to account for effects of cotton price changes on the prices, returns, and production of other crops.

When supply effects caused estimated price changes of less than one percent, price and acreage changes were assumed to be negligible, and the total economic loss was estimated as the cost change plus the value of production lost. Production losses were then valued at $0.581 per pound, the 1984-88 average, and cotton acreage was assumed to be the 1984-88 average.

The Econometric Simulation Model

AGSIM links supply and demand relationships in a recursive adjustment process. When the cost of production or per-acre yield for a particular commodity is altered in one simulated year, the expected profits for that commodity relative to all others are also altered, inducing shifts in planting decisions in the next year. The sum of acreage of crops for each region is a function of average crop return over fixed and variable costs, acreage planted in previous years, and the expected commodity program diversion payment for the current year. Total production is determined for each region from the acreage function and an associated per-acre production function for that region. Total production is the sum of regional production. Quantity supplied is production plus inventories.

National demand is estimated for cotton lint used for exports, stocks, and milling; hay; grains used for exports and stocks; grains and oils used for food; soybeans and soybean meal and oil products used for crushing, exports, and stocks; grains and oils used for feed; and cottonseed. Equating supply and demand functions yields excess demand functions for each crop, and simultaneously solving the excess demand functions determines market prices and use patterns for the commodities. The simulated prices enter into the acreage response functions for the following year. The model also includes a component for livestock products.

The model simulates commodity markets before and after the regulatory change, computing changes in prices, quantities, and acreage. It then calculates the effects on farm income, some direct purchasers of agricultural commodities, consumers, and food processors. The model separates domestic and foreign consumer surplus because some policymakers may be primarily interested in domestic consumer effects.

AGSIM is divided into 10 USDA major production regions (plus Alabama) of which 7 (plus Alabama) produce cotton. To simplify presentation, the regional cotton results were recombined into effects for four widely-recognized major cotton-producing regions: The Delta (Arkansas, Louisiana, Mississippi, Missouri, and Tennessee), which includes the AGSIM Corn Belt and Delta States and 80 percent of the cotton in the Appalachian States; the Southeast (Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia), which includes the AGSIM Alabama and Southeastern States and 20 percent of the cotton in the Appalachian States; the Southern Plains (Oklahoma and Texas), which is the same as in AGSIM; and the West (Arizona, California, and New Mexico), which contains the AGSIM Mountain and Pacific States. The allocation of the AGSIM Appalachian region, which includes cotton production in North Carolina, Tennessee, and Virginia, to the Delta and the Southeast was based on 80 percent of the cotton acreage in that region for 1984-88 being located in Tennessee and 20 percent in North Carolina and Virginia.

Per-Acre Effects

To examine the local and regional effects of the potential actions, changes in per-acre cotton returns were estimated for the major production regions. These changes were computed for acres treated and acres not treated with the pesticide in question and acres eligible and ineligible for commodity program payments. Cotton acres planted on farms not participating in commodity programs and "flex-acres" planted to cotton on participating farms are ineligible for deficiency payments. Under commodity program provisions, 15 percent of the farmer's crop base, in addition to idled acres, are not eligible for program payments. These so-called "flex acres" can be planted to cotton or some other crops without losing crop base. Other cotton acres on participating farms are eligible for deficiency payments.

The simplest case to evaluate is that where supply does not change enough to significantly increase cotton price. If cotton price is not affected, cotton acres not treated with the pesticide (untreated acres) will not be affected, and the per-acre loss for treated acres becomes:

$$-P_0dY - dC$$

where:

P_0 = market price before the action
dY = change in yield per-acre
dC = change in cost per-acre

If the supply reduction of a regulatory action is large enough to noticeably increase cotton price, the effects on growers in different areas becomes more complicated. Higher cotton prices affect revenues for all cotton producers and reduce deficiency payments for commodity program participants. Higher cotton prices would increase revenue for untreated acres, because the yields and costs would not be affected. The change in per-acre net returns for untreated acres ineligible for commodity program payments (untreated-ineligible acres) becomes (Osteen and Suguiyama, 1988):

$$(P_1-P_0)Y$$

where:

P_1 = market price after the action
Y = average yield per acre before the action

Also, the losses on acres treated with the banned pesticide would be offset, at least somewhat, by the higher cotton prices. The impacts on treated acres ineligible for commodity program payments (treated-ineligible acres) that continue to produce cotton include changes in costs and yields (Osteen and Suguiyama, 1988):

$$(P_1-P_0)Y - P_1dY - dC$$

Whether or not returns on treated-ineligible acres increase or decrease depends on the relative magnitudes of the pest losses, cost changes, and price increases.

Commodity program participation modifies the effects of price changes on per-acre returns, if market price before the action is less than target price. If $P_0 < TP$, returns per acre eligible for deficiency payments will change as follows:

$$(P_1-P_0)Y - PY[(\text{Min } TP,P_1)-(\text{Max } P_0,LR)] - P_1dY - dC$$

where:

PY	=	farm program yield
TP	=	target price
LR	=	nonrecourse loan rate
(Min TP,P_1)	=	minimum of target price or market price after action
(Max P_0,LR)	=	maximum of loan rate or market price before action

If TP $\geq P_0$, deficiency payments are not paid and the per-acre impacts on participants are computed in the same way as for nonparticipants, shown above.

Increases in cotton price will reduce deficiency payments that supplement the income of program participants when target price exceeds market price. The reduced payments will, at least partially, offset the revenue gains of higher prices. The effect is to reduce gains and increase monetary losses to cotton program participants caused by the pesticide ban relative to those of nonparticipants. Presumably, participants will be able to absorb the losses better than nonparticipants because their income prior to the regulatory action is supplemented by deficiency payments. To simplify calculation of per-acre effects on acres eligible for deficiency payments, it is assumed that, on average, the farm program payment yield equals average yield. A comparison showed 1986-91 average farm program yield for cotton in major producing regions to be comparable to average actual yield for that time period. Under current legislation, program yields are frozen, so it is assumed that changes in actual yields do not affect program yields and deficiency payments. Under these assumptions, the revenue per untreated acre eligible for commodity program payments (untreated-eligible acres) would not change, because the gain in market revenues is exactly offset by a loss in deficiency payments when $P_1 \leq$ TP. The impact per treated acre eligible for commodity program payments (treated-eligible acres) that continues to produce cotton becomes:

$$-P_1dY - dC$$

In the future, the assumptions about program yields and per-acre effects on program participants may no longer hold. Average actual yields are increasing while program yields are frozen, so that average yield will exceed program yields in the future. If market price increases as a result of a regulatory action, market revenue would increase more than program payments would decrease. As a result, returns on untreated-eligible acres would increase, but the increase would be less than that for untreated-ineligible acres. For treated-eligible acres, the revenue gain would offset part of the loss, but there would be a greater loss or smaller gain than on comparable treated-ineligible acres.

Because per-acre returns vary widely between cotton producing regions, percent changes in per-acre cotton returns were computed to demonstrate relative severity of losses. The monetary losses were expressed as a percentage of the 1984-88 average of gross value of production minus variable cash expenses (excluding high and low years) for each region published by the Economic Research Service (ERS)(McElroy and others, 1989 and USDA, 1991). Currently, ERS does not include government payments in the cost-of-production estimates for cotton, so the percentage losses for treated-eligible acres are overestimated.

The economic effects should be viewed as rough estimates, because there are many sources of uncertainty. The estimates of pesticide use, yield loss, and choices of alternative practices are based on expert estimates. For example, Table 19 shows assessment estimates and USDA survey estimates of use to be close for some pesticides and to diverge widely for some other pesticides (Crutchfield, 1990). Some of the divergences in use estimates may be justified. For example, cotton insecticide use varies from year to year because pest infestations and weather vary. The cost and yield changes may be overestimated by an unknown amount, because not all possible adjustments available to cotton producers were necessarily considered. Similarly, many of the economic variables are not precise. Pesticide prices are based on suggested retail price lists and information from registrants, which may not be what farmers actually pay. As a result, cost change estimates could vary from actual changes by several dollars per acre. Also, the economic model for estimating price changes and welfare effects should not be viewed as precise. There is no statistical measure of accuracy or precision for the economic estimates.

Results

The effects of the potential bans of individual pesticides or major pesticide groups on the aggregate U.S. economy, regions, and localities, as well as on returns for treated and untreated acreage are now examined.

Aggregate Economic Effects

The aggregate economic effects of a potential action depend upon the extent of the pesticide's use, the severity of the pest problem, and the cost-effectiveness of alternative controls. By examining the effects of actions on single pesticides and major groups of pesticides, this analysis demonstrates the importance of the interdependence of pesticide regulatory decisions to cotton production. Pesticide regulatory decisions are interdependant, because previous regulatory actions, such as registrations and cancellations, define what chemical alternatives are available and influence the economic and risk effects of subsequent regulatory actions (Osteen and Kuchler, 1987, and Osteen and Szmedra, 1989). When there are several effective chemical alternatives for a pest problem and nonchemical alternatives are less effective, the group of chemical alternatives would be valuable, but the benefits of any individual chemical alternative would be low. However, if chemical alternatives are sequentially removed by the regulatory process or become ineffective due to pest resistance, at some point the benefits of the remaining alternatives will increase dramatically even though their efficacy is unchanged. Interdependence implies that there is a benefit to having several alternatives available that is not captured by comparing one pesticide to its alternatives.

Single Pesticides

In general, banning a single cotton pesticide would cause a relatively small aggregate economic loss, although some growers and regions could suffer severe losses. Bans of fluometuron or aldicarb stand out as exceptions. Bans of either of these materials are the only ones that would show noticeable effects on cotton prices. Of all the individual pesticides examined, a ban of fluometuron, an herbicide, would have the largest domestic economic loss of $106 million per year (domestic plus foreign loss of $179 million); cotton prices would increase by 3 percent and cotton income would decline by $7 million (Table 20). The economic loss of banning fluometuron would be comparable in magnitude to a ban of all triazine herbicides. A ban of aldicarb, an insecticide/nematicide, would cause a net domestic loss of $89 million (domestic plus foreign loss of $167 million), increase cotton prices by 2 percent, and reduce cotton income by $1 million.

In most cases, the supply effects of banning a single pesticide would have negligible impacts on cotton prices, and U.S. cotton income would decline. Of the remaining pesticides, the largest aggregate impacts would be caused by bans of carboxin ($24 million loss) and metalaxyl ($69 million loss), which are seed treatment fungicides; acephate, an organophosphate insecticide ($28 million loss); arsenic acid, a desiccant ($52 million loss); thidiazuron, a defoliant ($32 million loss); ethephon ($32 million loss) and mepiquat chloride ($43 million loss), which are growth regulators; trifluralin, a dinitroaniline herbicide ($24 million loss); and prometryn, a triazine herbicide ($46 million loss). A ban of any other material would cause a loss of $20 million or less.

Major pesticide families and groups

Banning major pesticide families or all alternatives for major pest problems is another story. Banning all seed treatment fungicides, all desiccants and defoliants, or all pyrethroid insecticides would cause the largest aggregate losses in the study. Domestic losses would exceed $600 million; domestic and foreign losses would exceed $900 million; and cotton prices would increase as much as 12 percent for each pesticide group (Table 20). Bans of all seed treatments or desiccants/defoliants would cause cotton income to fall about $140 million. If all the pyrethroid insecticides were banned or became ineffective due to pest resistance, cotton income would fall $170 million.

Banning organophosphate insecticides, dinitroaniline herbicides, or carbamate insecticides would cause the next most severe losses. If all organophosphate insecticides were banned, the net domestic loss would be about $380 million (domestic and foreign loss would be about $620 million), and cotton prices would increase about 8 percent. The net domestic loss from banning all dinitroaniline herbicides would be about $340 million per year (domestic and foreign loss would be about $520 million), and cotton price would increase about 6 percent. The net domestic loss of banning all carbamates would be about $230 million (domestic and foreign loss would be about $387 million), and cotton price would increase about 5 percent.

The net domestic loss from banning all organic arsenical, triazine, or substituted urea herbicides would be $100-$200 million per year. Domestic plus foreign loss would be $200-$300 million for organic arsenicals or substituted ureas and $170 million for triazines. For these groups, cotton price would increase 4 percent (for substituted ureas) or less. Cotton income would decrease if any of these groups were banned, except if substituted ureas were banned, then cotton income would rise.

The Interdependence of Regulatory Decisions

These results help to demonstrate the importance of the interdependence of pesticide regulatory actions to cotton production. In the cases above, the loss from banning the major group or family would generally be several times greater than banning any single member. Dinitroaniline herbicides (pendimethalin and trifluralin) are a good example. Pendimethalin would be a widely-used alternative if trifluralin were banned and vice-versa. The domestic loss from banning the dinitroanilines would be about $336 million per year (Table 20). However, given current pesticide use, the loss from banning pendimethalin alone would be about $1 million. The loss from banning trifluralin alone would be about $26 million. This shows that if either one of the dinitroaniline herbicides were banned, the benefits of the remaining one would increase dramatically.

Perhaps the pyrethroid insecticides are the most striking example. The domestic benefits of the entire group exceed $600 million (Table 20). However, the benefit of each single pyrethroid is less than $5 million, assuming that all other pyrethroids are available. Benefits of organic arsenicals, triazines, substituted ureas, fungicide seed treatments, carbamate insecticides, organophosphate insecticides, and desiccants and defoliants show similar patterns.

These results show that a sequence of regulatory actions on alternative controls, such as pyrethroid insecticides, could be very important to cotton production, even though many of the individual regulatory actions would cause small economic losses. Since many major pesticide groups are valuable to cotton production, reducing the number of alternatives over time by regulatory action or pest resistance, without developing new cost-effective alternatives, could ultimately cause substantial economic losses.

Comparison to Results of Previous Studies

Aldicarb and pyrethroid insecticides provide cases for comparison with previous studies. The aggregate estimate for aldicarb in this study compares favorably with that in a 1991 USDA assessment, which estimated the loss of banning aldicarb use on cotton to be $89 million, assuming a constant price (USDA, 1991). However, the economic loss estimate for aldicarb in this study is about 3 times greater than that in USEPA's preliminary assessment of aldicarb benefits, published in 1988, which estimated the loss on cotton to be $20-29 million (USEPA, 1988). USEPA assumed that there would be no yield loss but that pest control costs would increase.

Osteen and Suguiyama (1988) estimated the net domestic loss of losing all pyrethroids to be about $800 million and the net domestic and foreign loss to be about $1.4 billion, which are 40-50 percent greater than the aggregate loss estimates in this study. The differences in the estimates of the two studies are not large given that the expert yield loss estimates were made about 5 years apart by different people. During that 5-year period, pest infestations, the availability of alternative controls, pesticide efficacy, and expert perceptions of pesticide efficacy and pest damages may have changed, which would contribute to the differences in the two estimates.

User, Nonuser, Regional and Local Effects

Pesticide regulatory actions generally would not affect the cost, yields, and returns of all growers and regions equally, because: 1) Pest infestations are not distributed uniformly across the cotton belt, and 2) No pesticide is used by all cotton growers. The effects that a ban has on yields and costs for different growers and regions will reflect the distribution of the pesticide's use, the severity of pest problems controlled by the material, and the comparative cost-effectiveness of the pesticide and its alternative control practices. The impacts on producers will be affected by price changes and commodity program participation. Also, severe losses may discourage production in those regions where they occur, while higher prices may encourage production elsewhere.

Regional or local effects can become important policy issues if some growers or regions bear severe losses relative to others. One could ask if it is fair for a regulatory action to inflict a severe loss on a small group of producers or a region. While the cotton assessment cannot resolve the issue of equity, it does provide information to identify situations where severe losses could occur.

Users and Nonusers

The results show that, in general, larger losses per acre treated with pesticides affected by a ban would result from those potential actions on chemicals or groups that would increase price than from actions that would not increase price (Table 21). This would occur despite price increases offsetting losses for treated-ineligible acres. Bans of dinitroanilines, organic arsenicals, substituted ureas, pyrethroids, all desiccants and defoliants, or seed treatments would reduce returns on treated acres by 50-100 percent in some regions, primarily in the Southeast or Southern Plains. Bans of seed treatments, desiccants and defoliants, or pyrethroids would create the largest gains for untreated-ineligible acres, because these potential bans would increase cotton prices more than other potential actions would. In some cases, returns to treated-ineligible acres would actually increase in some regions, because yield losses in such regions would be offset by price increases caused by large losses in one or more other regions.

Many of the potential actions would cause greater losses on treated acreage in one or two regions than in the remaining regions. The Southeast would most often incur the largest relative losses on treated acreage from those actions, especially if major groups were banned. Bans of major groups of herbicides would cause larger percentage losses in net revenue in the Southeast than in the other regions. Bans of pyrethroid or organophosphate insecticides would cause larger percentage losses in the Southeast and Delta States than in other regions. The West would most often incur the smallest relative losses. Bans of desiccants and defoliants or seed treatments would have the largest percentage impacts on treated acreage in the Southern Plains. A ban of all pyrethroid insecticides (or widespread ineffectiveness due to resistance) would cause the largest losses on treated acreage of any action on insecticides in all regions and the largest of any action on any group of pesticides in the Delta and the West. This result shows the importance of pyrethroid insecticides across the cotton belt.

Actions on groups of pesticides that would cause the biggest losses per treated acre vary by region. In the Delta States, a ban of the pyrethroid insecticides would cause the largest losses followed by bans of organophosphate insecticides, carbamate insecticides, desiccants and defoliants, and seed treatments. In the Southeast, a ban of substituted urea herbicides would cause the largest per-acre losses followed by a ban of pyrethroid insecticides. Bans of desiccants and defoliants, organic arsenical herbicides, and dinitroaniline herbicides would also cause large losses in the Southeast. In the Southern Plains, bans of seed treatment fungicides or desiccants and defoliants would cause the largest per-acre losses. A ban of pyrethroid insecticides would cause the largest per-acre losses among insecticides in the Southern Plains. In the West, a ban of pyrethroid insecticides would cause the largest losses, followed by bans of organic arsenical or dinitroaniline herbicides.

Bans of aldicarb and fluometuron, which are the only two cases where a ban of an individual pesticide would significantly increase price, would cause large per-acre losses on treated acres, despite the price increase. A ban of aldicarb would cause the largest per-acre losses of all individual insecticides - over 25 percent in the Southeast and Southern Plains. Similarly, a ban of fluometuron would cause the largest losses on treated acres of any single pesticide in the Delta (more than 20 percent) and, except for aldicarb, in the Southeast (more than 20 percent).

Regional Effects

The agricultural economies of the Southeastern States and, to a lesser degree, the Delta States are particularly vulnerable to the impacts of regulatory actions on cotton pesticides, especially if major groups became unavailable. The AGSIM results show that actions on cotton insecticides, particularly on major groups, would generally reduce income from cotton by the largest percentage of cotton value in the Delta and Southeast; actions on seed treatments and desiccants and defoliants would reduce income by the largest percentage in the Delta, Southeast, and Southern

Plains; and actions on herbicides would reduce income by the largest amount in the Delta and Southeast (Table 22). However, important exceptions to these generalities occur, which include losses in the West from potential actions on dinitroaniline or triazine herbicides. Most actions on single pesticides would change cotton income by less than 1 percent of cotton value in most regions. Important exceptions include the effects of potential actions on aldicarb in the Southeast (18 percent reduction), fluometuron in the Delta (8 percent reduction), arsenic acid in the Southern Plains (4 percent reduction), and phosphorotrithioate in the Southeast (5 percent reduction).

The AGSIM results also show that many actions, particularly actions on major pesticide groups, could discourage cotton production in the Southeast and Delta States and encourage it elsewhere in the U.S. (Table 23). According to AGSIM, the Southeast would generally incur reductions in cotton acreage exceeding 30 percent if pyrethroids, organophosphates, desiccants and defoliants, dinitroanilines, organic arsenicals, or substituted ureas were no longer available. Actions on single materials generally would have small impacts on regional income and cotton acreage. Exceptions include the effects of potential bans of aldicarb on the Southeast, arsenic acid on the Southern Plains, fluometuron on the Delta, and phosphorotrithioate on the Southeast.

The more severe effects on cotton income and acreage in the Southeast and Delta States are a reflection of the generally more severe pest problems in those regions than in the rest of the cotton belt. First, a higher proportion of the acreage in the Southeast and Delta States is treated with most of the pesticides in this study, particularly herbicides and insecticides, than is the acreage in the West and Southern Plains (Table 24). Second, in most cases, treated acreage in the Southeast and Delta States would suffer more severe percentage losses without the pesticides in question than would treated acreage in the Southern Plains and West, as discussed earlier in this section. Finally, the acreage shifts reflect changes in cotton returns relative to returns from other crops, the prices and returns of which may have also be changed as a result of the action, in each region.

The loss of major pesticide groups, aldicarb, or fluometuron could potentially affect land values, because of their effects on cotton prices and income. The likelihood of effects on land values would depend upon how long it would take to find effective alternatives, that is to say, how many years farmers would suffer higher pest losses or control costs, and how important cotton production is to a region's economy. The longer farmers in a region go without an effective control and suffer losses, the more likely would be effects on land values. For reasons discussed above and because cotton is important to their agricultural economies, the Southeast, and to a lesser extent, the Delta States would be most vulnerable to reductions in land values. Reduced land values in these two regions would be more likely to occur if all pyrethroids, organophosphates, carbamates, seed treatments, or desiccants and defoliants were banned or became ineffective due to resistance. The loss of dinitroaniline, organic arsenical, triazine, or substituted urea herbicides or aldicarb could also reduce land values in the Southeast. The loss of all seed treatments or desiccants and defoliants would be the most likely scenarios to reduce land values in the Southern Plains. However, many of the other scenarios could increase land values in the Southern Plains because of higher cotton prices, particularly bans of all pyrethroids, organophosphates, or substituted ureas. Regulatory actions would probably have little impact on land values in the West, because the area is less dependant on pesticides and cotton makes a smaller proportional contribution to its economy than to the other regions' economies.

Local Effects

Even though a pesticide ban might cause a small aggregate economic loss and have no significant impact on price, some farmers or regions could suffer severe financial losses because of localized pest or production problems. This could occur if a localized pest potentially caused severe yield losses. If no cost-effective alternative is available, a ban of a single chemical could cause severe yield and financial losses. Per-acre losses in the small area could be much greater in such a case than for a pesticide that would cause losses across a larger area. Good examples are mancozeb and arsenic acid.

Mancozeb, before the registrant voluntary canceled its registration for foliar use on cotton, was used to treat cotton rust on less than 1 percent of U.S. cotton acreage, primarily in Arizona and New Mexico (Table 19). Based on information in the cotton assessment, the aggregate loss of cancelling mancozeb was estimated to be about $3 million (Table 20), but loss per treated acre exceeded $100 (48 percent of net revenue per acre in the West) (Table 21). Compare that with metalaxyl, which is used for seedling diseases on about 60 percent of U.S. cotton acreage (Table 19). The aggregate loss of banning metalaxyl would be $69 million, the largest of any single fungicide (Table 20). However, per-acre losses would average about $10, considerably less than for mancozeb, and would vary from about 3 percent of per-acre net revenue in the West to 15 percent in the Southern Plains (Table 21).

Arsenic acid provides the most dramatic example of one region absorbing a large loss, while other regions are largely unaffected. Arsenic acid has been widely used to desiccate cotton in the Southern Plains before stripper harvesting, but its registration was voluntarily cancelled by the registrant. According to the cotton assessment, about 12 percent of U.S. cotton acreage was treated (Table 19). The economic loss of banning arsenic acid is estimated to be $52 million (Table 20), concentrated in the Southern Plains, with per-acre losses of $35-$40, approximately 60 percent of per-acre net returns (Table 21). Only a ban of all desiccants and defoliants or of all seed treatments would cause greater per-acre losses in the Southern Plains than estimated for the arsenic acid ban.

Summary

The USDA/State cotton pesticide assessment provides information to help evaluate the effects of proposed USEPA pesticide regulatory actions. In general, the results show that banning a single cotton pesticide would cause relatively small aggregate economic losses, because cost-effective alternatives would be available in many areas. Despite that, isolated groups of farmers or production regions could suffer severe losses, because effective alternatives would not be available for their atypical pest problems and growing conditions. The Delta and Southeast would be particularly vulnerable to the impacts of regulatory actions on cotton pesticides. Growers who use pesticides that become banned could suffer severe financial losses, despite cotton price increases. In addition, sequentially banning effective alternatives for major pest problems or members of important pesticide families would ultimately result in severe aggregate losses.

Table 19-- Cotton pesticides: cotton acreage treated; yield losses and cost changes if the pesticide or group is not available

Chemical(s) Lost	Acreage Treated: NASS	Acreage Treated: Assessment	Yield loss/acre: Treated	Yield loss/acre: Planted	Cost change/ treated acre
	Percent				$/acre
Insecticides					
Pyrethroids	NA	55	-22.7	-12.5	NC
Cyhalothrin	7	14	*	*	1
Cypermethrin	20	12	*	*	2
Esfenvalerate	13	11	*	*	1
Permethrin	3	2	-.1	*	*
Organophosphates	NA	70	-11.4	-8.2	NC
Acephate	7	18	-2.9	-.7	1
Azinphosmethyl	12	15	-.7	-.1	*
Dicrotophos	25	14	-1.1	-.3	2
Dimethoate	8	15	-1.1	*	2
Disulfoton	*	5	*	*	*
Malathion	5	5	*	*	1
Methamidophos	2	7	-3.6	-.4	*
Methyl parathion	25	23	*	*	1
Phorate	*	2	*	*	6
Profenofos	6	13	*	*	2
Sulprofos	2	5	*	*	2
Carbamates	NA	42	-11.0	-5.0	-1
Aldicarb	16	33	-6.0	-2.0	-2
Methomyl	3	7	*	*	1
Thiodicarb	5	18	*	*	1
Others					
Dicofol	5	7	-.3	*	7
Propargite	4	5	*	*	2
Herbicides					
Dinitroanilines	85	89	-8.5	-7.3	6
Pendimethalin	21	28	*	*	<1
Trifluralin	64	61	-.9	-.5	<1
Organic arsenicals	29	32	-7.9	-2.7	8
DSMA	7	8	-.6	-.1	*
MSMA	21	25	-.4	-.1	<1
Triazines	31	38	-4.0	-1.8	6
Cyanazine	15	20	-.3	*	6
Prometryn	16	18	-5.3	-1.1	2
Substituted Ureas	34	33	-12.9	-4.7	-1
Fluometuron	31	29	-10.7	-3.4	-3
Diuron	3	8	-1.9	-.2	5
Others					
Fluazifop	8	18	-2.6	-.4	1
Glyphosate	14	19	-2.0	-.4	2
Norflurazon	19	16	-2.2	-.4	-7
Sethoxydim	1	9	-1.3	-.1	*

Continued --

Table 19- Cotton pesticides: cotton acreage treated; yield losses and cost changes if the pesticide or group is not available -- Continued

Chemical(s) Lost	Acreage Treated: NASS	Acreage Treated: Assessment	Yield loss/acre: Treated	Yield loss/acre: Planted	Cost change/ treated acre
	Percent				$/acre
Fungicides					
Seed treatments	NA	99	-18.3	-17.9	-4
Captan	NA	20	-.7	-.2	NC
Carboxin	NA	59	-1.2	-.6	NC
Etridiazole	NA	9	-.1	*	2
Metalaxyl	NA	61	-1.5	-.9	5
PCNB	NA	21	-2.6	-.7	-3
Thiram	NA	4	-3.4	-.1	NC
Mancozeb 1/	*	<1	-20.3	-.1	-7
Desiccants and Defoliants					
All desiccants and defoliants	50	75	-21.2	-17.2	-7
Arsenic acid 2/	3	12	-14.0	-1.3	3
Dimethepin	3	4	-1.0	-.1	*
Endothall	4	4	-.1	*	4
Paraquat dichloride	10	17	-1.2	-.2	-2
Phosphorotrithioate	35	35	-.1	*	3
Sodium chlorate	11	15	-.1	*	4
Thidiazuron	10	21	-4.4	-.9	-3
Plant Growth Regulators					
Ethephon	19	26	-8.0	-2.4	-22
Mepiquat chloride	25	29	-5.4	-1.8	-8

NA = NASS estimate not available.
NC = Not computed.
* = Negligible.
1/ No longer registered for foliar application.
2/ Voluntarily cancelled.

Table 20--Aggregate Economic Effects of Hypothetical Bans of Cotton Pesticides

Chemical(s) Lost	Cotton: Output change	Cotton: Price change 1/	Cotton: Income change	Welfare Effects: Domestic: Income Change	Welfare Effects: Domestic: Consumer Loss	Welfare Effects: Net Effect: Domestic	Welfare Effects: Net Effect: Domestic +Foreign
	Percent		---------------$ Millions				----------------
Insecticides							
Pyrethroids	-14	12	-172	228	-835	-607	-950
Cyhalothrin	*	**	-2	-2	**	-2	-2
Cypermethrin	*	**	-3	-3	**	-3	-3
Esfenvalerate	*	**	-2	-2	**	-2	-2
Permethrin	*	**	-1	-1	**	-1	-1
Organophosphates	-10	8	-78	213	-590	-377	-615
Acephate	*	**	-28	-28	**	-28	-28
Azinphosmethyl	*	**	-5	-5	**	-5	-5
Dicrotophos	*	**	-15	-15	**	-15	-15
Dimethoate	*	**	-11	-11	**	-11	-11
Disulfoton	*	**	**	**	**	**	**
Malathion	*	**	-1	-1	**	-1	-1
Methamidophos	*	**	-12	-12	**	-12	-12
Methyl parathion	*	**	-13	-13	**	-13	-13
Phorate	*	**	-1	-1	**	-1	-1
Profenofos	*	**	-6	-6	**	-6	-6
Sulprofos	*	**	-2	-2	**	-2	-2
Carbamates	-6	5	-42	146	-379	-233	-387
Aldicarb	-3	2	-1	106	-195	-89	-167
Methomyl	*	**	-3	-3	**	-3	-3
Thiodicarb	*	**	-3	-3	**	-3	-3
Others							
Dicofol	*	**	-6	-6	**	-6	-6
Propargite	*	**	-2	-2	**	-2	-2
Herbicides							
Dinitroanilines	-8	6	-139	116	-450	-336	-515
Pendimethalin	*	**	-3	-3	**	-3	-3
Trifluralin	*	**	-24	-24	**	-24	-24
Organic arsenicals	-4	3	-22	87	-228	-141	-235
DSMA	*	**	-2	-2	**	-2	-2
MSMA	*	**	-6	-6	**	-6	-6
Triazines	-3	2	-37	46	-154	-108	-170
Cyanazine	*	**	-14	-14	**	-14	-14
Prometryn	-1	**	-46	-46	**	-46	-46
Substituted Ureas	-6	4	28	179	-323	-144	-277
Fluometuron	-4	3	-7	56	-162	-106	-179
Diuron	*	**	-10	-10	-10	-10	-10
Others							
Fluazifop	*	**	-19	-19	**	-19	-19
Glyphosate	*	**	-19	-19	**	-19	-19
Norflurazon	*	**	-4	-4	**	-4	-4
Sethoxydim	*	**	-4	-4	**	-4	-4

Continued --

Table 20--Aggregate Economic Effects of Hypothetical Bans of Cotton Pesticides --Continued

Chemical(s) Lost	Cotton: Output change	Cotton: Price change 1/	Cotton: Income change	Welfare Effects: Domestic: Income Change	Welfare Effects: Domestic: Consumer Loss	Welfare Effects: Net Effect: Domestic	Welfare Effects: Net Effect: Domestic +Foreign
	Percent		$ Millions				
Fungicides							
Seed treatments	-15	12	-139	308	-900	-608	-935
Captan	*	**	-8	-8	**	-8	-8
Carboxin	*	**	-24	-24	**	-24	-24
Etridiazole	*	**	-2	-2	**	-2	-2
Metalaxyl	-1	**	-69	-69	**	-69	-69
PCNB	-1	**	-19	-19	**	-19	-19
Thiram	*	**	-6	-6	**	-6	-6
Mancozeb 2/	*	**	-3	-3	**	-3	-3
Desiccants and Defoliants							
All desiccants and defoliants	-15	12	-146	281	-909	-628	-990
Arsenic acid 3/	-1	**	-52	-52	**	-52	-52
Dimethepin	*	**	-2	-2	**	-2	-2
Endothall	*	**	-2	-2	**	-2	-2
Paraquat dichloride	*	**	-7	-7	**	-7	-7
Phosphorotrithioate	*	**	-14	-14	**	-14	-14
Sodium chlorate	*	**	-8	-8	**	-8	-8
Thidiazuron	-1	**	-32	-32	**	-32	-32
Plant Growth Regulators							
Ethephon	-2	**	-32	-32	**	-32	-32
Mepiquat chloride	-2	**	-43	-43	**	-43	-43

* = Output reduction of less than 1 percent.
** = Negligible.
1/ Price changes are simulated for research purposes and are not official USDA forecasts.
2/ No longer registered for foliar application.
3/ Voluntarily cancelled.

Table 21--Effects on per-acre returns for acres treated and untreated, eligible and ineligible for program payments, by region 1/

Chemical/Group	Delta		Southeast		Southern Plains		West		U.S.	
	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated
	Percent of Average Net Returns									
Insecticides										
Carbamates										
Eligible 2/	-51	0	-35	0	-44	0	-3	0	-46	0
Ineligible 2/	-35	14	-17	18	-23	20	9	11	-27	15
Aldicarb										
Eligible	-14	0	-35	0	-49	0	-3	0	-27	0
Ineligible	-7	7	-26	8	-40	8	2	5	-16	7
Methomyl	-2	NA	-2	NA	*	NA	-9	NA	-3	NA
Thiodicarb	*	NA	-4	NA	-8	NA	-2	NA	-2	NA
Organophosphates										
Eligible	-67	0	-61	0	-27	0	-5	0	-55	0
Ineligible	-44	23	-34	27	5	30	13	18	-21	24
Acephate	-2	NA	-2	NA	*	NA	-17	NA	-9	NA
Azinphosmethyl	*	NA	*	NA	-5	NA	-8	NA	-3	NA
Dicofol	*	NA	*	NA	*	NA	-4	NA	-4	NA
Dicrotophos	-8	NA	-3	NA	-2	NA	-2	NA	-6	NA
Dimethoate	-2	NA	*	NA	*	NA	-7	NA	-4	NA
Disulfoton	*	NA	-1	NA	*	NA	-6	NA	-1	NA
Malathion	-1	NA	*	NA	-5	NA	-2	NA	-2	NA
Methamidophos	*	NA	-3	NA	*	NA	-9	NA	-7	NA
Methyl parathion	-3	NA	-9	NA	-8	NA	-8	NA	-5	NA
Phorate	-8	NA	-7	NA	-3	NA	-5	NA	-7	NA
Propargite	*	NA	*	NA	*	NA	-2	NA	-2	NA
Profenofos	-2	NA	-13	NA	-17	NA	*	NA	-2	NA
Sulprofos	-3	NA	-1	NA	*	NA	-1	NA	-2	NA
Pyrethroids										
Eligible	-101	0	-100	0	-62	0	-61	0	-98	0
Ineligible	-66	35	-57	38	-13	47	-31	28	-53	35
Cyhalothrin	-2	NA	-3	NA	*	NA	-2	NA	-2	NA
Cypermethrin	-5	NA	*	NA	*	NA	-1	NA	-2	NA
Esfenvalerate	-1	NA	-3	NA	*	NA	-2	NA	-1	NA
Permethrin	-7	NA	-5	NA	*	NA	*	NA	-3	NA

Continued --

Table 21--Effects on per-acre returns for acres treated and untreated, eligible and ineligible for program program payments, by region -- Continued 1/

Chemical/Group	Delta		Southeast		Southern Plains		West		U.S.	
	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated
	Percent of Average Net Returns									
Herbicides										
Dinitroanilines										
Eligible	-14	0	-61	0	-47	0	-32	0	-50	0
Ineligible	3	17	-40	20	-23	23	-18	13	-24	15
Pendimethalin	-2	NA	*	NA	-3	NA	*	NA	-1	NA
Trifluralin	-5	NA	-4	NA	-5	NA	*	NA	-4	NA
Organic Arsenicals										
Eligible	-25	0	-67	0	-18	0	-33	0	-33	0
Ineligible	-16	8	-56	12	-5	10	-25	7	-23	9
DSMA	*	NA	-20	NA	*	NA	*	NA	-2	NA
MSMA	*	NA	*	NA	-2	NA	-32	NA	-1	NA
Substituted Ureas										
Eligible	-27	0	-114	0	3	0	-4	0	-41	0
Ineligible	-14	13	-97	18	27	18	8	7	-27	14
Fluometuron										
Eligible	-32	0	-34	0	7	0	-8	0	-31	0
Ineligible	-23	8	-23	11	18	10	-2	7	-22	9
Diuron	-11	NA	-3	NA	-3	NA	-2	NA	-9	NA
Triazines										
Eligible	-11	0	-27	0	-30	0	-15	0	-24	0
Ineligible	-5	5	-21	6	-23	7	-10	4	-16	6
Cyanazine	-5	NA	-7	NA	*	NA	-3	NA	-3	NA
Prometryn	-4	NA	-4	NA	-30	NA	-18	NA	-15	NA
Others										
Fluazifop	-10	NA	-22	NA	-7	NA	-5	NA	-7	NA
Glyphosate	-4	NA	*	NA	-18	NA	*	NA	-12	NA
Norflurazon	*	NA	-20	NA	*	NA	*	NA	-3	NA
Sethoxydim	-4	NA	-12	NA	-3	NA	*	NA	-5	NA

Continued --

Table 21--Effects on per-acre returns for acres treated and untreated, eligible and ineligible for program payments, by region -- Continued 1/

Chemical/Group	Delta		Southeast		Southern Plains		West		U.S.	
	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated
	Percent of Average Net Returns									
Other										
All Desiccants/Defoliants										
Eligible	-56	0	-77	0	-124	0	-37	0	-103	0
Ineligible	-19	33	-32	45	-74	49	-7	30	-44	36
Arsenic acid 3/	*	NA	*	NA	-62	NA	*	NA	-62	NA
Dimethepin	-4	NA	-5	NA	*	NA	*	NA	-3	NA
Endothall	-22	NA	-4	NA	-5	NA	*	NA	-3	NA
Paraquat dichloride	-11	NA	-19	NA	*	NA	*	NA	-3	NA
Phosphortrithioate	*	NA	-21	NA	-3	NA	*	NA	-4	NA
Sodium chlorate	-6	NA	-3	NA	-7	NA	-2	NA	-4	NA
Thidiazuron	-20	NA	-14	NA	*	NA	-3	NA	-9	NA
Plant Growth Regulators										
Ethephon	-17	NA	-4	NA	*	NA	*	NA	-8	NA
Mepiquat chloride	-9	NA	-21	NA	-8	NA	-9	NA	-9	NA
Seed Treatments										
Eligible	-51	0	-36	0	-148	NE	-4	0	-92	0
Ineligible	-15	35	8	44	-101	NE	24	28	-36	29
Captan	-16	NA	*	NA	*	NA	-1	NA	-2	NA
Carboxin	-6	NA	*	NA	-3	NA	*	NA	-4	NA
Etridiazole	-2	NA	-5	NA	-2	NA	*	NA	-2	NA
Mancozeb 4/	-2	NA	*	NA	*	NA	-48	NA	-13	NA
Metalaxyl	-11	NA	-4	NA	-15	NA	-3	NA	-9	NA
PCNB	-8	NA	-5	NA	-7	NA	*	NA	-8	NA
Thiram	-11	NA	*	NA	*	NA	*	NA	-11	NA

See footnotes on next page.

Footnotes for Table 21.

* = Loss smaller than $1 per acre.
NA = Not appropriate, insignificant price change means no impact on nonusers.
NE = Not estimated, all acres treated.

1/ Returns are an average of gross receipts minus variable cash costs for 1984-88 (excluding low and high years), commodity program payments per acre were not reported and are not included. The percentage losses for program participants are overstated, because program payments are not included in net revenue. The regions are defined as follows. Delta: Arkansas, Louisiana,Mississippi, Missouri, Tennessee; Southeast: Alabama, Florida, Georgia, North Carolina, South Carolina, Virginia; Southern Plains: Oklahoma, Texas; West: Arizona, California, New Mexico.

2/ Impacts were differentiated for acres eligible and ineligible for commodity program payments only when significant price changes were estimated. Program deficiency payments will be affected only when price changes.

3/ Voluntarily cancelled.

4/ No longer registered for foliar use.

Table 22--Effects of Hypothetical Bans on Regional Cotton Income. 1/

Chemical/Group	Delta	Southeast	Southern Plains	West	U.S.
	Percent of Cotton Value				
Insecticides					
Pyrethroids	-20	-15	10	2	-4
Cyhalothrin	*	*	*	*	*
Cypermethrin	*	*	*	*	*
Esfenvalerate	*	*	*	*	*
Permethrin	*	*	*	*	*
Organophosphates	-17	-15	7	7	-2
Acephate	*	*	*	-1	*
Azinphosmethyl	*	*	*	*	*
Dicrotophos	*	*	*	*	*
Dimethoate	*	*	*	*	*
Disulfoton	*	*	*	*	*
Malathion	*	*	*	*	*
Methamidophos	*	*	*	*	*
Methyl parathion	*	*	*	*	*
Phorate	*	*	*	*	*
Profenofos	*	*	*	*	*
Sulprofos	*	*	*	*	*
Carbamates	-10	-3	3	4	-1
Aldicarb	1	-18	**	1	**
Methomyl	*	*	*	*	*
Thiodicarb	*	*	*	*	*
Others					
Dicofol	*	*	*	*	*
Propargite	*	*	*	*	*
Herbicides					
Dinitroanilines	4	-21	-4	-5	-3
Pendimethalin	*	*	*	*	*
Trifluralin	*	*	-1	*	*
Organic Arsenicals	-5	-25	4	3	*
DSMA	*	*	*	*	*
MSMA	*	*	*	*	*
Triazines	*	-9	1	-1	*
Cyanazine	*	-1	*	*	*
Prometryn	*	*	-1	-1	-1
Substituted Ureas	-6	-33	7	5	**
Fluometuron	-8	*	4	3	*
Diuron	*	*	*	*	*
Others					
Fluazifop	*	*	*	*	*
Glyphosate	*	*	-1	*	*
Norflurazon	*	-3	*	*	*
Sethoxydim	*	*	*	*	*

Continued--

Table 22--Effects of Hypothetical Bans on Regional Cotton Income.-- Continued

Chemical/Group	Delta	Southeast	Southern Plains	West	U.S.
			Percent of Cotton Value		
Fungicides					
Seed Treatments	-6	-7	-22	13	-3
Captan	*	*	*	*	*
Carboxin	-1	*	-1	*	*
Etridiazole	*	*	*	*	*
Metalaxyl	-2	-1	-2	*	-1
PCNB	-1	-1	*	*	*
Thiram	*	*	*	*	*
Mancozeb 2/	*	*	*	*	*
Desiccant/Defoliants					
All desiccants and defoliants	-6	-12	-8	4	-3
Arsenic acid 3/	*	*	-4	*	-1
Dimethipin	*	*	*	*	*
Endothall	*	*	*	*	*
Paraquat dichloride	*	*	*	*	*
Phosphorotrithioate	*	-5	*	*	*
Sodium chlorate	*	*	*	*	*
Thidiazuron	-2	-2	*	*	*
Plant Growth regulators					
Ethephon	-2	*	*	*	*
Mepiquat chloride	-1	-3	*	*	*

* = Decrease of less than 1 percent of cotton value.
** = Increase of less than 1 percent of cotton value.
1/ Cotton income in AGSIM regions was recombined into four regions in the following manner: The Delta includes the AGSIM Delta States, Corn Belt and 80 percent of the Appalachian States. The Southeast contains the AGSIM Alabama, Southeastern States, and 20 percent of the Appalachian States. The Southern Plains is the same as in AGSIM. The West contains the AGSIM Mountain and Pacific States.
2/ No longer registered for foliar application.
3/ Voluntarily cancelled.

Table 23--Change in Cotton Acreage Caused by Hypothetical Bans, by Region 1/

Chemical/Group	Delta	Southeast	Southern Plains	West	U.S.
			Percent		
Insecticides					
Carbamates	-2	-26	2	1	-1
Aldicarb	-2	-32	*	*	-1
Organophosphates	-9	-36	4	2	-1
Pyrethroids	-9	-36	7	**	**
Herbicides					
Dinitroanilines	-1	-37	2	**	**
Organic Arsenicals	-4	-42	2	1	-1
Substituted Ureas	-8	-60	3	2	-2
Fluometuron	-9	-3	2	1	-1
Triazines	-2	-20	*	*	**
Others					
Seed Treatments	-4	-30	9	5	3
Desiccants/Defoliants	-2	-33	5	5	2
Arsenic acid 2/	**	*	**	*	*
Phosphorotrithioate	-2	-12	*	*	**

* = Increase of less than 1 percent.
** = Decrease of less than 1 percent.
1/ Cotton acreage in AGSIM regions was recombined into four regions in the following manner: The Delta includes the AGSIM Delta States, Corn Belt and 80 percent of the Appalachian States. The Southeast contains the AGSIM Alabama, Southeastern States, and 20 percent of the Appalachian States. The Southern Plains is the same as in AGSIM. The West contains the AGSIM Mountain and Pacific States.
2/ Voluntarily cancelled.

Table 24 -- Acreage Treated With Selected Pesticides, by Region.

Chemical	Delta	Southeast	Southern Plains	West	U.S.
	Percent of planted acres				
Insecticides					
Pyrethroids	93	99	39	27	55
Cyhalothrin	24	31	9	4	14
Cypermethrin	13	22	13	4	12
Esfenvalerate	18	18	10	4	11
Permethrin	2	7	*	2	2
Organophosphates	95	79	59	63	70
Acephate	27	25	9	34	19
Azinphosmethyl	25	14	14	5	15
Dicrotophos	41	29	24	2	25
Dimethoate	25	11	7	22	15
Disulfoton	7	11	4	13	5
Malathion	7	14	4	2	5
Methamidophos	10	4	*	28	8
Methyl parathion	51	22	13	7	23
Phorate	2	5	2	*	2
Profenofos	27	18	3	23	13
Sulprofos	14	5	1	4	5
Carbamates	70	84	25	31	42
Aldicarb	46	78	20	30	33
Methomyl	18	6	3	4	7
Thiodicarb	46	40	5	2	18
Others					
Dicofol	2	*	*	36	7
Propargite	4	1	*	24	5
Herbicides					
Dinitroanilines	79	98	97	76	89
Pendimethalin	34	43	20	35	28
Trifluralin	45	58	74	45	61
Organic Arsenicals	84	86	7	3	32
DSMA	24	11	1	0	8
MSMA	60	75	6	3	25
Triazines	69	54	17	49	38
Cyanazine	51	51	*	15	20
Prometryn	16	3	17	32	18
Substituted Ureas	94	97	2	3	33
Fluometuron	85	82	1	*	29
Diuron	23	16	1	2	8
Others					
Fluazifop	35	10	14	4	17
Glyphosate	7	1	25	37	19
Norflurazon	50	42	*	*	16
Sethoxydim	20	12	6	2	9

Continued--

Table 24 -- Acreage Treated With Selected Pesticides, by Region.-- Continued

Chemical	Delta	Southeast	Southern Plains	West	U.S.
	Percent of planted acres				
Fungicides					
Seed Treatments	99	99	100	93	99
Captan	9	12	12	70	20
Carboxin	59	31	77	17	59
Etridiazole	33	14	19	4	20
Metalaxyl	88	54	58	29	61
PCNB	53	43	3	19	29
Thiram	14	*	*	*	4
Mancozeb 1/	2	*	*	1	1
Desiccants/Defoliant	86	95	79	73	80
Arsenic acid 2/	*	2	25	*	13
Endothall	2	3	5	7	5
Paraquat dichloride	16	5	20	21	18
Phosphorotrithioate	52	70	25	34	37
Sodium chlorate	9	7	9	54	16
Thidiazuron	37	40	19	3	22
Plant Growth Regulators					
Ethephon	48	35	11	33	26
Mepiquat chloride	47	38	15	39	29

1/ No longer registered for foliar application.
2/ Voluntarily cancelled.

REFERENCES

Agchemprice. DPRA Incorporated. Manhattan, KS; 1992.

Ashworth, L.J. Jr., Rice, R.E., McMeans, J.L., and Brown, C.M. The relationship of insects to infection of cotton bolls by Aspergillus flavus. Phytopathology 61:488-493; 1971.

Byrd, J.D. Jr. Report of the 1990 cotton weed loss committee. 1991 Proceedings Beltwide Cotton Conference, p. 949; 1991.

Blasingame, D. 1990 Cotton disease loss estimate committee report. 1991 Proceedings Beltwide Cotton Conference, p. 133; 1991.

Crutchfield, S.R. Cotton agricultural chemical use and farming practices in 1989: An overview of survey results. Staff Report No. Ages 9076, U.S. Dept. of Agr., Econ. Res. Serv; U.S. Dept. of Agr., Econ. Res. Serv; 1990.

GRC Economics. The value of crop protection chemicals and fertilizers to American Agriculture and the consumer. Available from: GRC Economics, Washington Harbour, 901 31st Street, N.W., Washington, DC 20007; 1990.

Head, R.B. Cotton losses to insects. 1991 Proceedings Beltwide Cotton Conference, p. 602-607; 1991.

Jewell, L.D. (ed.) USDA Agricultural statistics 1987. Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, 541 p.; 1988.

Jewell, L.D. (ed.) USDA Agricultural statistics 1989. Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, 547.; 1990.

Kimm, V.J. An EPA update on Federal pesticide issues of major interest to cotton producers. 1991 Proceedings Beltwide Cotton Conference, p. 14-16; 1991.

McElroy, R., Ali, M., Dismukes, R. and Clausen, A. Cost of production for major U.S. crops, 1975-87. Staff Report No. Ages 89-22, U.S. Dept. of Agr., Econ. Res. Serv; 1989.

Osteen, C., and Suguiyama, L. Losing chlordimeform use in cotton production: Its effects on the economy and pest resistance. AER-587. U.S. Dept. Agr., Econ. Res. Serv; 1988.

Osteen, C., and Kuchler, F. Pesticide regulatory decisions: production efficiency, equity, and interdependence. Agribusiness 3:307-22; 1987.

Osteen, C.D., and Szmedra, P.I. Agricultural pesticide use trends and policy issues. AER-622, U.S. Dept. Agr., Econ. Res. Serv.; 1989.

Suguiyama, L., and Osteen, C. The economic importance of cotton insects and mites. USDA-ERS Agri. Econ. Rep. No. 599, 33 p.; 1988.

Taylor, C.R. AGSIM User's Manual, Version 90.2. Staff Paper ES89-11, Dept. of Ag. Econ. and Rural Soc., Auburn U.; 1990.

Tollefson, S. Insect management strategies for producing quality cotton in the desert southwest. 1991 Proceedings Beltwide Cotton Conference, p. 50-54; 1991.

USDA, ERS. Costs of production -- major field crops, 1989. ECIFS-9; 1991.

USDA, ES. The biological and economic and economic assessment of aldicarb. Submitted to USEPA on April 17, 1991.

USEPA, OPP. Aldicarb special review technical document. June 1988.

APPENDIX A

Pesticide Impact Questionnaire

APPENDIX A

COTTON - INSECTS

STATE - __________

UNITED STATES DEPARTMENT OF AGRICULTURE
NATIONAL AGRICULTURE PESTICIDE IMPACT ASSESSMENT PROGRAM
COTTON COMMODITY ASSESSMENT

1. IDENTIFICATION OF PRODUCTION REGIONS -- Use the map on page 7 of Osteen & Suguiyama (1988) to determine production regions for cotton used in this questionnaire. This map was developed by State Extension and Research Scientists familiar with cotton production.

A. DETERMINE WHETHER YOU WANT TO USE REGIONS -- It is not necessary to report data for your state by regions. Irregardless of whether you use regions or simply report data for your state as a whole, the final data will be summarized by state. However, if you feel that the accuracy of your state data will be enhanced by dividing your state into production regions, please do so. Be aware though, that dividing your state into regions will significantly increase your paperwork in all stages of this survey. If you choose to report state data, proceed to page 3.

B. IF YOU USE REGIONS -- Please limit yourself to the regions within your state as described on the following page. List here the region(s) you have selected and the average planted and harvested cotton acreage for each region.

Region and its number	Acreage	
	Planted	Harvested

2. PEST RANKING -- Provided on the next page, Table 1, are rankings of insect pests of cotton developed from the past five years of published results (1984-1988) in the Proceedings of the Beltwide Cotton Production Research Conferences. These rankings are based upon economic damage with the worst pest receiving a rating of 1. Pests with the same reported economic damage received the same rating. Pests with no reported economic damage in a state are not ranked.

A. REVIEW THE RANKING FOR YOUR STATE -- If you feel the ranking presented in Table 1 for your state is an accurate representation for the past 5 years indicate this somewhere on the chart and move on to question 3 on page 5.

Otherwise, proceed to part B.

B. CORRECT YOUR STATE'S RANKING -- If you feel your state's ranking is not correct or requires additions, fill in the correct ranking in one of the blank right columns. Please put your state's name at the top, and rank only those pests that cause economic damage starting with the worst pest as ranking number 1.

C. RANKING OF REGIONS -- If you feel you cannot accurately rank the pests in your entire state, you may choose to rank pests by region within your state. Put the code(s) of the region(s) you chose in question 1 at the head of the blank column(s) in the chart and rank the pests that cause economic damage for each region listed.

APPENDIX A

Table 1. Ranking of economically-important cotton insect pests.

Pests	States												USA	New Ranking	
	AL	AZ	AR	CA	GA	LA	MS	NM	OK	SC	TN	TX			
Boll/budworms	2	3	2	3	3	2	1	1	1	1	1	1	1		
Boll weevils	1	4	1	8	1	1	2	9	2		5	3	2		
Lygus bugs	4	2	3	1	4	4	3	2		5	2	7	3		
Fleahoppers		11	5		5	5	7	3	3	8	7	2	4		
Thrips	3	10	4	6	6	3	4	4	5	2	4	4	5		
Spider mites	7	6	6	2	8	6	6	6	4	6	6	5	6		
Pink bollworm		1		5				5				8	7		
Armyworms	5	5		4	2	7	5	7		3		10	8		
Stink bugs		7		7			9	8		7	3		9		
Cotton aphid	6				7	7	10	8		4		6	10		
Grasshoppers							8	8				6	11		
Whitefly		9		7			8						12		
Cutworms							8						13		
Euro. corn borer										4			14		
Leaf perforator		8		9				10				9	15		

3. USE OF PESTICIDES -- On the following table, Table 2, you are asked to list information on the current use patterns of insecticides in your state as a whole, or regions within your state if you chose this option. In the 'Percent of acreage treated' column (right side of form) circle the word 'State' if you are reporting for an entire state or fill in the region number(s) you listed on page 1 if you are reporting for 1 or more regions.

A. PESTICIDES USED -- List only those insecticides currently used in your state or region(s) within your state. Please only use common names. The following list is included to assist in identifying insecticides currently used.

acephate (Orthene)
aldicarb (Temik)
azinphosmethyl (Guthion)
bifenthrin (Capture)
B.t.
 (Dipel, Javelin, Thuricide)
carbaryl (Sevin, Sevimol)
chlorpyrifos (Lorsban)
cyfluthrin (Baythroid)
cyhalothrin (Karate)
cypermethrin (Ammo, Cymbush)
dicofol (Kelthane)
dicrotophos (Bidrin)
diflubenzuron (Dimilin)
dimethoate (Cygon, De-fend)
disulfoton (Di-Syston)
endosulfan (Thiodan)
esfenvalerate (Asana)
ethion (Nialate)
fenvalerate (Pydrin)
flucythrinate (Pay-off)
gossyplure (Pink bollworm
 pheromone)
malathion (Cythion)
methidathion (Supracide)
methamidophos (Monitor)
methomyl (Lannate, Nudrin)
methyl parathion (Penncap M)
naled (Dibrom)
oxamyl (Vydate)
oxydemeton-methyl
 (Metasystox R)
parathion
permethrin (Ambush, Pounce)
phorate (Thimet)
phosphamidon (Swat)
propargite (Comite)
profenofos (Curacron)
phosmet (Imidan)
sulprofos (Bolstar)
thiodicarb (Larvin)
tralomethrin (Scout)
trichlorfon (Dylox, Proxol)

Table 2. Pesticide use patterns, target pests, and acreage treated for cotton insecticides.

Pesticide	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests/efficacy**	% of acreage treated

* Pesticide timing: AP = at planting, SD = sidedress, FPR = foliar-prebloom, FPO = foliar-postbloom.

** Pesticide efficacy is on 1 to 5 scale; 1 is very good and 5 is very poor.

B. PESTICIDE RATES AND TIMING -- Give the pesticide rate (lb ai/acre/treatment) that is generally used; this may be a range. Next, indicate the timing of the pesticide application(s) using the preferred designations listed in the footnote at the bottom of the chart. Finally, give the average number of applicatons for this pesticide. If a pesticide has two clearly different use patterns, it may be desirable to list two separate entries for that pesticide.

C. TARGET PESTS AND PESTICIDE EFFICACY -- Now list the target pests for each pesticide use pattern. Following each target pest draw a slash (/) and indicate the efficacy of the given pesticide on that pest using a scale of 1 (very good) to 5 (very poor). Equally effective pesticides should receive the same rating.

D. PERCENT OF ACRES TREATED -- What percent of the cotton acreage in your state as a whole or regions within your state is treated with each use pattern? Please give a number from 1 to 100. Again, we prefer that this information be reported for the entire state. If this is not desirable, use the regions which you gave in question 1.

4. NON-PESTICIDE CONTROL PRACTICES -- In the following table, Table 3, you are asked to indicate non-pesticide (biological, cultural, etc.) control practices that are used in your state as a whole or regions within your state. We would like you to limit yourself to those practices used on 1% or more of the planted cotton acreage in your area. Your responses should be based upon pest infestations in an average year.

A. CONTROL PRACTICES -- Examples of practices you may choose to use are listed on the chart. You may use these or ignore them. Additional practices may be added to the list as you wish.

B. TARGET PESTS AND EFFICACY OF CONTROL PRACTICE -- List here the pest(s) at which the control practice is specifically directed. Following each target pest draw a slash (/) and indicate the efficacy of the given control practice on that pest using a scale of 1 (very good) to 5 (very poor). Equally effective control practices should receive the same rating.

C. PERCENT OF ACREAGE WHERE PRACTICED -- In this column show the percentage (1-100) of the planted cotton acreage where each practice you have chosen is practiced in your state as a whole or regions within your state.

APPENDIX A

COTTON - INSECTS

Table 3. Non-pesticide control practices for cotton insects.

Control Practice	Target pests/efficacy*	% of acreage where practiced

* Control practice efficacy is on a 1 to 5 scale; 1 is very good and 5 is very poor.

5. IMPACT OF PESTICIDE CANÇELLATIONS -- In order to determine the benefits of insecticides to cotton production, we are asking three basic questions concerning the loss of insecticides on cotton in this section. First, what will be the impact of the loss of individual insecticides on cotton production? Second, what will be the impact of the loss of groups of related insecticides on cotton production? And finally, what will be the impact of the loss of all insecticides on cotton production?

Part I. LOSS OF INDIVIDUAL ACTIVE INGREDIENTS -- In this part we address the impact of the loss of individual insecticides. Your responses should be based upon the use of currently-registered pesticides for pest infestations in an average year.

NOTE: If you are reporting data for 2 or more state regions, you must first make enough copies of the following table, Table 4, in order to have a copy for each region.

A. LOST INSECTICIDES -- Copy the insecticides you listed as being used in your area on cotton in Table 2 onto column 1 of the following table, Table 4. If you have tank or product mixes, address each ai separately.

B. ALTERNATIVE CONTROLS -- To the right of each insecticide listed in column 1, list the alternatives that would be used in your state as a whole or regions within your state in place of that insecticide should it be withdrawn from use. These alternatives may be other insecticides or non-pesticide controls. After each alternative listed place a slash (/), then a percentage figure which is your best estimate of how much of the acreage currently treated by the "lost" insecticide would be treated with the alternative.

Table 4. Impact of the loss of individual insecticides on cotton production and use of alternative controls.

"Lost" insecticide	Alternatives used if pesticide is lost / % used*	Yield impact** in percent (%) if insecticide is lost and alternatives are:		Secondary effects
		used	not used	

* Percentage used denotes the percentage of the acreage currently treated by the "lost" pesticide that would be treated with the alternative. Alternatives may be other pesticides or non-pesticide controls.

** Yield impact may be plus (+) or minus (-) and should represent the effect on the cotton acreage currently treated with the "lost" insecticide in column 1.

e.g. If the "lost" insecticide was guthion and in Table 2 it was indicated to be used on 40% of the planted acreage, and the alternative pest controls would be carbaryl, malathion and use of resistant varieties, then the entry might appear as: carbaryl/60; malathion/25; resistant var./10. This indicates that a maximum of 95% of the acreage currently treated with guthion would be treated with alternative practices and that at least 5% would not be treated.

C. YIELD IMPACT -- Estimate the percentage (0-100) yield change on the acreage currently treated with the insecticide in column 1 should that insecticide be removed. Identify increases with a (+) and decreases with a (-).

1. ALTERNATIVES USED -- First, make an estimate with the assumption that all alternatives mentioned in the previous column will be used as indicated.

2. ALTERNATIVES NOT USED -- Next, make an estimate with the assumption that no alternatives will be used.

D. SECONDARY EFFECTS -- Make note here of any secondary effects, if any, due to the use of alternatives (i.e. development of pest resistance, increased cost of control, reduction in quality of cotton, pests not controlled, etc.).

Part II. LOSS OF GROUPS OF RELATED INSECTICIDES -- In this part we address the impact of the loss of groups of related insecticides using Table 5. This part is very similar to Part I, where we looked at individual insecticides. Again, your responses should be based upon the use of currently-registered pesticides for pest infestations in an average year.

NOTE: If you are reporting data for 2 or more state regions, you must first make enough copies of the following chart in order to have one for each region.

A. INSECTICIDE GROUPS -- Listed below are groups of insecticides that could be removed simultaneously from use. These groups are also listed in the first column on Table 5. Trade names for the listed common names are on page 5.

BIOLOGICALS (B.t., gossyplure, other pheromones, etc.)
CARBAMATES (acephate, aldicarb, carbaryl, oxamyl, etc.)
ORGANOPHOSPHATES (azinphosmethyl, chlorpyrifos, dicrotophos, disulfoton, dimethoate, ethion, malathion, methidathion, methamidophos, methyl parathion, monocrotophos, naled, oxydemeton-methyl, parathion, phorate, phosphamidon, profenofos, phosmet, sulprofos, trichlorfon, etc.)
PYRETHROIDS (bifenthrin, cyfluthrin, cyhalothrin, cypermethrin, esfenvalerate, fenvalerate, flucythrinate, permethrin, tralomethrin, etc.)
SULFITES (endosulfan, propargite, etc.)
ALL INSECTICIDES

B. ALTERNATIVE CONTROLS -- To the right of each insecticide group listed in column 1, list the alternatives that would be used in your state as a whole or regions within your state in place of that insecticide group should it be withdrawn from use. These alternatives may be other insecticide groups, individual insecticides, or non-pesticide controls. After each alternative listed place a slash (/), then a percentage figure which is your best estimate of how much of the acreage currently treated by the "lost" insecticide group would be treated with the alternative.

Table 5. Impact of the loss of groups of insecticides on cotton production and use of alternative controls.

"Lost" insecticide group	Alternatives used if pesticide group is lost / % used*	Yield impact** in percent (%) if pesticide group lost and alternatives are:		Secondary effects
		used	not used	

* Percentage used denotes the percentage of the acreage currently treated by the "lost" pesticide group that would be treated with the alternative. Alternatives may be other pesticide groups, individual pesticides, or non-pesticide controls.

** Yield impact may be plus (+) or minus (-) and should represent the effect on the cotton acreage currently treated with the "lost" insecticide group in column 1.

C. YIELD IMPACT -- Estimate the percentage (0-100) yield change on the acreage currently treated with the insecticide group in column 1 should that insecticide be removed. Identify increases with a (+) and decreases with a (-).

1. ALTERNATIVES USED -- First, make an estimate with the assumption that all alternatives mentioned in the previous column will be used as indicated.

2. ALTERNATIVES NOT USED -- Next, make an estimate with the assumption that no alternatives will be used.

D. SECONDARY EFFECTS -- Make note here of any secondary effects, if any, due to the use of alternatives (i.e. development of pest resistance, increased cost of control, reduction in quality of cotton, pests not controlled, etc.).

APPENDIX B

Pesticide Impact Data

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
1,3-DICHLOROPROPENE	AL	37.	PPJ	1.	NEMATODES(1)	1.	3.36	124.32
1,3-DICHLOROPROPENE	AZ	30.	PPJ	1.	ROOTKNOT NEMATODE(3)	5.	20.8	624.
1,3-DICHLOROPROPENE	CA	30.	PPJ	1.	ROOTKNOT NEMATODE(3)	30.	374.7	11241.
1,3-DICHLOROPROPENE	FL	20.	PPJ	1.	ROOTKNOT NEMATODE(3)	2.	0.5	10.
1,3-DICHLOROPROPENE	GA	40.	PPJ	1.	NEMATODES(2)	15.	37.65	1506.
1,3-DICHLOROPROPENE	NC	30.	PPJ	1.	NEMATODES(1)	0.1	0.098	2.94
1,3-DICHLOROPROPENE	SC	30.	PPJ	1.	NEMATODES(2)	5.	6.1	183.
						U.S. Totals >		13691.
ALDICARB	AL	1.25	IF	1.	NEMATODES(1)	5.	16.8	21.
ALDICARB	AR	0.5	IF	1.	NEMATODES(4)	60.	321.	160.5
ALDICARB	CA	0.5	IF	1.5	ROOTKNOT NEMATODE(2)	20.	249.8	187.35
ALDICARB	FL	0.9	IF	1.	ROOTKNOT NEMATODE(2)	60.	15.	13.5
ALDICARB	GA	0.9	IF	1.	NEMATODES(4)	85.	213.35	192.01
ALDICARB	LA	0.74	IF	1.	ROOTKNOT AND RENIFORM NEMATODES(3)	45.	288.9	213.79
ALDICARB	MO	0.87	IF	1.	ROOTKNOT NEMATODE(3)	20.	37.	32.19
ALDICARB	MS	1.	IF	1.	ROOTKNOT & RENIFORM NEMATODE(3)	10.	107.3	107.3
ALDICARB	NC	0.5	IF	1.	NEMATODES(1)	2.8	2.744	1.372
ALDICARB	NM	1.	IF	1.	NEMATODES(3)	10.	8.3	8.3
ALDICARB	SC	0.7	IF	1.	NEMATODES(3)	90.	109.8	76.86
ALDICARB	TN	0.6	IF	1.	ROOTKNOT & RENIFORM NEMATODE(1), INSECTS(1)	50.	199.5	119.7
ALDICARB	TX	0.75	IF	1.	NEMATODES(3)	10.	512.8	384.6
ALDICARB	VA	0.65	IF	1.	NEMATODE SUPPRESSION(4)	10.	0.2	0.13

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
						U.S. Totals >		1518.6
CAPTAN	AL	0.013	ST	1.	SEEDLING DISEASES(2)	30.	100.8	1.3104
CAPTAN	AR	0.018	ST	1.	SEED DECAY & SEEDLING DISEASES(2)	50.	267.5	4.815
CAPTAN	AZ	0.018	ST	1.	DAMPING-OFF(RHIZOCTONIA & THIELAVIOPSIS)(3)	70.	291.2	5.2416
CAPTAN	CA	0.018	ST	1.	DAMPING-OFF(PYTHIUM OR RHIZOCTONIA)(3)	70.	874.3	15.737
CAPTAN	NM	0.018	ST	1.	DAMPING-OFF(3)	70.	58.1	1.0458
CAPTAN	OK	0.015	ST	1.	SEEDLING DISEASES(2)	30.	124.5	1.8675
CAPTAN	TX	0.019	ST	1.	SEEDLING DISEASES(2)	10.	512.8	9.7432
						U.S. Totals >		39.761
CARBOXIN	AL	0.005	ST	1.	SEEDLING DISEASES(2)	15.	50.4	0.2318
CARBOXIN	AR	0.022	ST	1.	SEED DECAY & SEEDLING DISEASES(2)	99.	529.65	11.652
CARBOXIN	AZ	0.011	ST	1.	DAMPING-OFF(RHIZOCTONIA & THIELAVIOPSIS)(3)	30.	124.8	1.3728
CARBOXIN	CA	0.012	ST	1.	SEEDLING DISEASES(RHIZOCTONIA)(2)	20.	249.8	2.9976
CARBOXIN	FL	0.012	ST	1.	SEEDLING DISEASES(2)	70.	17.5	0.21
CARBOXIN	GA	0.02	ST	1.	SEEDLING DISEASES(2)	50.	125.5	2.51
CARBOXIN	LA	0.013	ST	1.	SEED DECAY AND SEEDLING DISEASES(2)	95.	609.9	7.9287
CARBOXIN	MO	0.02	ST	1.	SOILBORNE PATHOGENS(2)	100.	185.	3.7
CARBOXIN	MS	0.012	ST	1.	SEEDLING DISEASES(2)	20.	214.6	2.5752
CARBOXIN	NC	0.011	ST	1.	SEEDLING DISEASES(RHIZOCTONIA)(2)	20.	19.6	0.2156
CARBOXIN	NM	0.012	ST	1.	DAMPING-OFF(3)	30.	24.9	0.2988
CARBOXIN	OK	0.009	ST	1.	SEEDLING DISEASES(2)	4.	16.6	0.1494

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CARBOXIN	OK	0.012	ST	1.	SEEDLING DISEASES(2)	30.	124.5	1.494
CARBOXIN	SC	0.012	ST	1.	SEEDLING DISEASES(2)	50.	61.	0.732
CARBOXIN	TN	0.012	ST	1.	SEEDLING DISEASES(2)	30.	119.7	1.4364
CARBOXIN	TX	0.041	ST	1.	SEEDLING DISEASES(2)	80.	4102.4	168.2
CARBOXIN	VA	0.022	ST	1.	SEEDLING DISEASES(2)	90.	1.8	0.0396
						U.S. Totals >		205.74
CHLORONEB	AL	2.	IF	1.	SEEDLING DISEASES(2)	1.	3.36	6.72
CHLORONEB	AL	0.034	ST	1.	SEEDLING DISEASES(2)	1.	3.36	0.1142
CHLORONEB	CA	0.034	ST	1.	SEEDLING DISEASES(RHIZOCTONIA)(2)	5.	62.45	2.1233
CHLORONEB	MS	0.034	ST	1.	SEEDLING DISEASES(3)	1.	10.73	0.3648
CHLORONEB	OK	0.018	ST	1.	SEEDLING DISEASES(2)	20.	83.	1.4608
CHLORONEB	SC	0.034	ST	1.	SEEDLING DISEASES(3)	5.	6.1	0.2074
CHLORONEB	TX	0.081	ST	1.	SEEDLING DISEASES(3)	5.	256.4	20.768
						U.S. Totals >		31.759
ETRIDIAZOLE	AL	0.25	IF	1.	SEEDLING DISEASES(2)	15.	50.4	12.6
ETRIDIAZOLE	AR	0.22	IF	1.	SEEDLING DISEASES(2)	20.	107.	23.54
ETRIDIAZOLE	LA	0.22	IF	1.	SEEDLING DISEASES(2)	45.	288.9	63.558
ETRIDIAZOLE	MO	0.18	IF	1.	PYTHIUM(3)	10.	18.5	3.33
ETRIDIAZOLE	MS	0.25	IF	1.	SEEDLING DISEASES(2)	25.	268.25	67.063
ETRIDIAZOLE	NC	0.25	IF	1.	DAMPING-OFF(1)	5.	4.9	1.225
ETRIDIAZOLE	OK	0.37	IF	1.	SEEDLING DISEASES(3)	1.	4.15	1.5355

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ETRIDIAZOLE	OK	0.013	ST	1.	SEEDLING DISEASES(3)	3.	12.45	0.1619
ETRIDIAZOLE	SC	0.31	IF	1.	SEEDLING DISEASES(2)	10.	12.2	3.782
ETRIDIAZOLE	TN	0.25	IF	1.	SEEDLING DISEASES(2)	22.	87.78	21.945
ETRIDIAZOLE	TX	0.22	IF	1.	SEEDLING DISEASES(2)	1.5	76.92	16.922
ETRIDIAZOLE	TX	0.25	IF	1.	SEEDLING DISEASES(2)	0.5	25.64	6.41
ETRIDIAZOLE	VA	0.25	IF	1.	SEEDLING DISEASES(1)	10.	0.2	0.05
						U.S. Totals >		222.12
FENAMIPHOS	AL	1.25	IF	1.	NEMATODES(5)	1.	3.36	4.2
FENAMIPHOS	CA	3.	IF	1.	ROOTKNOT NEMATODE(2)	0.01	0.1249	0.3747
FENAMIPHOS	FL	1.6	IF	1.	ROOTKNOT NEMATODE(4)	8.	2.	3.2
FENAMIPHOS	GA	1.6	IF	1.	NEMATODES(4)	1.	2.51	4.016
FENAMIPHOS	LA	0.9	IF	1.	ROOTKNOT AND RENIFORM NEMATODES(4)	1.	6.42	5.778
FENAMIPHOS	MS	1.6	IF	1.	ROOTKNOT NEMATODE(4)	1.	10.73	17.168
FENAMIPHOS	NC	1.	IF	1.	NEMATODES(2)	1.2	1.176	1.176
FENAMIPHOS	SC	1.5	IF	1.	NEMATODES(3)	5.	6.1	9.15
FENAMIPHOS	TX	1.6	IF	1.	SEEDLING DISEASES(4)	1.	51.28	82.048
						U.S. Totals >		127.11
IMAZALIL	SC	0.006	ST	1.	SEEDLING DISEASES(3)	5.	6.1	0.0342
						U.S. Totals >		0.0342
MANCOZEB	AR	2.	IF	1.	SEEDLING DISEASES(3)	10.	53.5	107.

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
MANCOZEB	AZ	1.	F	2.5	COTTON RUST(2)	5.	20.8	52.
MANCOZEB	LA	2.4	IF	1.	SEEDLING DISEASES(3)	1.	6.42	15.408
MANCOZEB	MS	2.4	IF	1.	SEEDLING DISEASES(4)	1.	10.73	25.752
MANCOZEB	NM	1.	F	3.	COTTON RUST(2)	3.	2.49	7.47
						U.S. Totals >		207.63
METALAXYL	AL	0.125	IF	1.	SEEDLING DISEASES(2)	10.	33.6	4.2
METALAXYL	AL	0.002	ST	1.	SEEDLING DISEASES(2)	60.	201.6	0.4435
METALAXYL	AR	0.09	IF	1.	SEEDLING DISEASES(2)	40.	214.	19.26
METALAXYL	CA	0.002	ST	1.	SEEDLING DISEASES(PYTHIUM)(1)	40.	499.6	1.0991
METALAXYL	FL	0.08	IF	1.	SEEDLING DISEASES(2)	10.	2.5	0.2
METALAXYL	FL	0.002	ST	1.	SEEDLING DISEASES(2)	50.	12.5	0.0275
METALAXYL	GA	0.005	ST	1.	SEEDLING DISEASES(2)	30.	75.3	0.3765
METALAXYL	LA	0.09	IF	1.	SEEDLING DISEASES(2)	6.	38.52	3.4668
METALAXYL	LA	0.002	ST	1.	SEED DECAY AND SEEDLING DISEASES(2)	97.	622.74	1.37
METALAXYL	MO	0.07	IF	1.	PYTHIUM(1)	10.	18.5	1.295
METALAXYL	MO	0.005	ST	1.	PYTHIUM(1)	100.	185.	0.925
METALAXYL	MS	0.125	IF	1.	SEEDLING DISEASES(2)	5.	53.65	6.7063
METALAXYL	MS	0.08	IF	1.	SEEDLING DISEASES(2)	5.	53.65	4.292
METALAXYL	MS	0.002	ST	1.	SEEDLING DISEASES(2)	90.	965.7	2.1245
METALAXYL	NC	0.1	IF	1.	DAMPING-OFF(1)	7.4	7.252	0.7252
METALAXYL	NC	0.14	IF	1.	DAMPING-OFF(PYTHIUM ONLY)(1)	1.4	1.372	0.1921
METALAXYL	NC	0.14	IF	1.	DAMPING-OFF(PYTHIUM ONLY)(1)	5.2	5.096	0.7134

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
METALAXYL	NC	0.002	ST	1.	SEEDLING DISEASES(PYTHIUM)(2)	20.	19.6	0.0431
METALAXYL	NC	0.004	ST	1.	SEEDLING DISEASES(2)	60.	58.8	0.2587
METALAXYL	OK	0.1	IF	1.	SEEDLING DISEASES(3)	1.	4.15	0.415
METALAXYL	OK	0.004	ST	1.	SEEDLING DISEASES(2)	5.	20.75	0.0913
METALAXYL	SC	0.085	IF	1.	SEEDLING DISEASES(2)	45.	54.9	4.6665
METALAXYL	SC	0.004	ST	1.	SEEDLING DISEASES(2)	45.	54.9	0.2416
METALAXYL	TN	0.125	IF	1.	SEEDLING DISEASES(1)	2.	7.98	0.9975
METALAXYL	TN	0.002	ST	1.	SEEDLING DISEASES(3)	95.	379.05	0.8339
METALAXYL	TX	0.125	IF	1.	SEEDLING DISEASES(2)	2.	102.56	12.82
METALAXYL	TX	0.003	ST	1.	SEEDLING DISEASES(2)	60.	3076.8	9.5381
METALAXYL	VA	0.003	ST	1.	SEEDLING DISEASES(2)	90.	1.8	0.0058
						U.S. Totals >		77.328
PCNB	AL	1.5	IF	1.	SEEDLING DISEASES(1)	37.5	126.	189.
PCNB	AR	0.9	IF	1.	SEEDLING DISEASES(2)	60.	321.	288.9
PCNB	AZ	1.	IF	1.	DAMPING-OFF(RHIZOCTONIA & THIELAVIOPSIS)(4)	5.	20.8	20.8
PCNB	CA	1.25	IF	1.	RHIZOCTONIA(1)	0.01	0.1249	0.1561
PCNB	CA	0.02	ST	1.	SEEDLING DISEASES(RHIZOCTONIA)(2)	25.	312.25	6.245
PCNB	FL	0.9	IF	1.	SEEDLING DISEASES(2)	5.	1.25	1.125
PCNB	GA	0.02	ST	1.	SEEDLING DISEASES(2)	50.	125.5	2.51
PCNB	LA	0.9	IF	1.	SEEDLING DISEASES(3)	51.	327.42	294.68
PCNB	LA	0.013	ST	1.	SEED DECAY AND SEEDLING DISEASES(2)	96.	616.32	8.0122
PCNB	MO	0.7	IF	1.	RHIZOCTONIA(3)	20.	37.	25.9

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PCNB	MO	0.02	ST	1.	RHIZOCTONIA(3)	100.	185.	3.7
PCNB	MS	1.	IF	1.	SEEDLING DISEASES(2)	20.	214.6	214.6
PCNB	MS	0.8	IF	1.	SEEDLING DISEASES(2)	5.	53.65	42.92
PCNB	NC	2.	IF	1.	DAMPING-OFF(2)	0.1	0.098	0.196
PCNB	NC	3.	IF	1.	DAMPING-OFF(2)	0.5	0.49	1.47
PCNB	NC	1.2	IF	1.	DAMPING-OFF(2)	5.	4.9	5.88
PCNB	NC	1.	IF	1.	DAMPING-OFF(1)	12.4	12.152	12.152
PCNB	NC	0.018	ST	1.	SEEDLING DISEASES(2)	60.	58.8	1.029
PCNB	NC	0.011	ST	1.	SEEDLING DISEASES(RHIZOCTONIA)(2)	20.	19.6	0.2156
PCNB	NM	1.	IF	1.	DAMPING-OFF(2)	5.	4.15	4.15
PCNB	OK	1.	IF	1.	SEEDLING DISEASES(3)	1.	4.15	4.15
PCNB	OK	1.5	IF	1.	SEEDLING DISEASES(3)	1.	4.15	6.225
PCNB	OK	0.009	ST	1.	SEEDLING DISEASES(2)	1.	4.15	0.0382
PCNB	OK	0.026	ST	1.	SEEDLING DISEASES(3)	3.	12.45	0.3237
PCNB	OK	0.018	ST	1.	SEEDLING DISEASES(2)	5.	20.75	0.3631
PCNB	SC	1.25	IF	1.	SEEDLING DISEASES(2)	10.	12.2	15.25
PCNB	TN	1.	IF	1.	SEEDLING DISEASES(2)	22.	87.78	87.78
PCNB	TN	0.8	IF	1.	SEEDLING DISEASES(2)	1.	3.99	3.192
PCNB	TX	0.9	IF	1.	SEEDLING DISEASES(2)	1.5	76.92	69.228
PCNB	TX	1.	IF	1.	SEEDLING DISEASES(2)	0.5	25.64	25.64
PCNB	TX	0.003	ST	1.	SEEDLING DISEASES(2)	0.2	10.256	0.0318
PCNB	VA	1.	IF	1.	SEEDLING DISEASES(1)	10.	0.2	0.2
PCNB	VA	0.013	ST	1.	SEEDLING DISEASES(2)	90.	1.8	0.0234

TABLE 1. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
						U.S. Totals >		1336.1
TCMTB	AL	0.004	ST	1.	SEEDLING DISEASES(2)	1.	3.36	0.0141
TCMTB	OK	0.007	ST	1.	SEEDLING DISEASES(2)	20.	83.	0.5561
						U.S. Totals >		0.5702
THIRAM	AL	0.009	ST	1.	SEEDLING DISEASES(3)	1.	3.36	0.0292
THIRAM	AR	0.018	ST	1.	SEED DECAY AND SEEDLING DISEASES(3)	50.	267.5	4.815
THIRAM	LA	0.026	ST	1.	SEED DECAY AND SEEDLING DISEASES(2)	20.	128.4	3.3384
THIRAM	OK	0.009	ST	1.	SEEDLING DISEASES(2)	3.	12.45	0.1183
THIRAM	SC	0.018	ST	1.	SEEDLING DISEASES(3)	20.	24.4	0.4392
						U.S. Totals >		8.7401

* Pesticide timing: F = foliar, HB = hopper box, IF = in furrow, PPJ = preplant-injected, ST = seed treatment.
** Pesticide efficacy is on a 1 to 5 scale; 1 is very good and 5 is very poor.

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ACEPHATE	AL	0.2	FPR	1.	THRIPS(2)	40.	134.4	26.88
ACEPHATE	AR	0.2	AP	1.	THRIPS(1)	15.	80.25	16.05
ACEPHATE	AZ	0.75	FPO	1.	LYGUS BUG(1)	30.	124.8	93.6
ACEPHATE	AZ	0.75	FPR	1.	LYGUS BUG(1)	30.	124.8	93.6
ACEPHATE	CA36	1.	FPO	1.	PINK BOLLWORM(3)	5.	2.5	2.5
ACEPHATE	CA36	1.	FPR	1.	SOUTHERN GARDEN LEAFHOPPER(1)	5.	2.5	2.5
ACEPHATE	CA37	0.006	AP	1.	THRIPS(1)	3.	36.	0.216
ACEPHATE	CA37	0.75	FPO	2.	LYGUS BUGS(2)	30.	360.	540.
ACEPHATE	CA37	0.5	FPR	1.	THRIPS(1), CUTWORMS(3)	6.	72.	36.
ACEPHATE	FL	0.056	AP	1.	THRIPS(3)	95.	23.75	1.33
ACEPHATE	FL	0.75	FPO	1.1	WHITEFLIES(3)	95.	23.75	19.594
ACEPHATE	GA	0.67	FPO	1.	WESTERN FLOWER THRIPS(1)	1.	2.51	1.6817
ACEPHATE	GA	0.18	FPR	1.	THRIPS(1)	5.	12.55	2.259
ACEPHATE	LA	0.75	AP	1.	THRIPS(2)	5.	32.1	24.075
ACEPHATE	LA	1.	FPR	1.5	HELIOTHIS(3)	7.	44.94	67.41
ACEPHATE	LA	0.2	FPR	1.5	THRIPS(1)	12.	77.04	23.112
ACEPHATE	LA	0.22	FPR	1.	PLANT BUGS(1)	14.	89.88	19.774
ACEPHATE	MO	0.67	AP	1.	THRIPS(2)	1.	1.85	1.2395
ACEPHATE	MO	0.62	FPR	1.	PLANT BUGS(2)	0.3	0.555	0.3441
ACEPHATE	MS	1.	AP	1.	THRIPS(1.5)	10.	107.3	107.3
ACEPHATE	MS	0.5	FPO	1.	HELIOTHIS(2)	5.	53.65	26.825
ACEPHATE	MS	0.87	FPO	1.	WHITEFLIES(1.5)	10.	107.3	93.351
ACEPHATE	MS	0.87	FPO	2.	HELIOTHIS(3)	5.	53.65	93.351

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ACEPHATE	MS	0.27	FPR	2.	PLANT BUGS(1.5)	12.	128.76	69.53
ACEPHATE	MS	0.3	FPR	1.	THRIPS(1.5)	20.	214.6	64.38
ACEPHATE	NC	0.09	AP	1.	THRIPS(2), APHIDS(3)	20.	19.6	1.764
ACEPHATE	NC	0.25	FPR	1.	THRIPS(3)	20.	19.6	4.9
ACEPHATE	NM	0.25	FPR	1.	COTTON FLEAHOPPER(1)	1.	0.83	0.2075
ACEPHATE	OK	1.	AP	1.	THRIPS(1), FLEAHOPPER(1)	10.	41.5	41.5
ACEPHATE	SC	0.2	FPR	1.5	THRIPS(2)	10.	12.2	3.66
ACEPHATE	TN	0.62	AP	1.	THRIPS(2)	2.	7.98	4.9476
ACEPHATE	TN	0.62	FPR	1.	PLANT BUGS(2)	1.	3.99	2.4738
ACEPHATE	TX19	0.19	FPR	1.	FLEAHOPPER(1)	25.	75.	14.25
ACEPHATE	TX20	0.8	AP	1.	THRIPS(2), APHIDS(3)	6.	20.49	16.392
ACEPHATE	TX20	0.5	FPR	1.	APHIDS(2)	9.	30.735	15.368
ACEPHATE	TX20	0.225	FPR	1.5	FLEAHOPPER(1)	30.	102.45	34.577
ACEPHATE	TX21	0.75	FPR	1.	APHID(3)	8.	5.2	3.9
ACEPHATE	TX23	0.18	FPR	2.	THRIPS(2), FLEAHOPPERS(2), COTTON APHIDS(2)	12.	16.8	6.048
ACEPHATE	TX24	0.25	FPR	1.	FLEAHOPPER(1)	1.	11.028	2.757
ACEPHATE	TX25	0.188	AP	1.	THRIPS(3)	3.	84.	15.792
ACEPHATE	TX25	0.188	FPR	1.5	THRIPS(1)	1.	28.	7.896
ACEPHATE	TX25	0.25	FPR	1.2	FLEAHOPPERS(1)	2.	56.	16.8
ACEPHATE	TX26	0.25	FPR	1.	COTTON FLEAHOPPER(1)	1.	3.95	0.9875
						U.S. Totals >		1621.1
ALDICARB	AL	0.45	AP	1.	THRIPS(1)	65.	218.4	98.28

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ALDICARB	AR	0.5	AP	1.	THRIPS(1)	70.	374.5	187.25
ALDICARB	AZ	1.5	AP	1.	LYGUS BUG(1), WHITEFLY(1)	5.	20.8	31.2
ALDICARB	AZ	0.6	SD	1.	LYGUS BUG(1), WHITEFLY(1)	20.	83.2	49.92
ALDICARB	CA36	2.25	SD	1.	SWEET POTATO WHITEFLY(2), MITES(3), S. GARDEN LEAFHOPPER(2)	75.	37.5	84.375
ALDICARB	CA37	2.	AP	1.	THRIPS(1), APHIDS(1)	15.	180.	360.
ALDICARB	CA37	2.5	SD	1.	LYGUS BUGS(1.5), MITES(2.5)	17.	204.	510.
ALDICARB	FL	0.5	AP	1.	THRIPS(1)	25.	6.25	3.125
ALDICARB	GA	0.525	AP	1.	THRIPS(1)	70.	175.7	92.242
ALDICARB	LA	0.5	AP	1.	THRIPS(1)	50.	321.	160.5
ALDICARB	MO	0.4	AP	1.	THRIPS(1)	7.	12.95	5.18
ALDICARB	MS	0.42	AP	1.	THRIPS(1)	35.	375.55	157.73
ALDICARB	NC	0.525	AP	1.	THRIPS(1)	94.	92.12	48.363
ALDICARB	NM	0.375	AP	1.	THRIPS(1)	8.	6.64	2.49
ALDICARB	OK	0.46	AP	1.	THRIPS(1)	5.	20.75	9.545
ALDICARB	SC	0.4	AP	1.	THRIPS(2)	80.	97.6	39.04
ALDICARB	TN	0.4	AP	1.	THRIPS(1)	10.	39.9	15.96
ALDICARB	TX20	0.5	AP	1.	THRIPS(1), APHIDS(2)	9.4	32.101	16.05
ALDICARB	TX21	0.4	AP	1.	THRIPS(1), APHIDS(2)	12.	7.8	3.12
ALDICARB	TX23	0.5	AP	1.	THRIPS(2)	15.	21.	10.5
ALDICARB	TX24	0.375	AP	1.	THRIPS(1)	1.	11.028	4.1355
ALDICARB	TX25	0.35	AP	1.	THRIPS(1)	30.	840.	294.
ALDICARB	TX26	0.375	AP	1.	THRIPS(1)	8.	31.6	11.85

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
						U.S. Totals >		2194.9
AVERMECTIN	TX21	0.009	FPO	1.	SPIDER MITES(1.5)	5.	3.25	0.0292
						U.S. Totals >		0.0292
AZINPHOSMETHYL	AL	0.25	FPO	5.	BOLL WEEVILS(1)	35.	117.6	147.
AZINPHOSMETHYL	AR	0.25	FPO	2.	BOLLWEEVIL(2)	20.	107.	53.5
AZINPHOSMETHYL	AR	0.25	FPR	2.	BOLLWEEVIL(2)	30.	160.5	80.25
AZINPHOSMETHYL	AZ	0.5	FPO	4.	PINK BOLLWORM(1)	15.	62.4	124.8
AZINPHOSMETHYL	CA36	0.37	FPO	2.	PINK BOLLWORM(1)	50.	25.	18.5
AZINPHOSMETHYL	CA37	0.75	FPO	3.5	PINK BOLLWORM(3.5)	1.	12.	31.5
AZINPHOSMETHYL	LA	0.25	FPO	1.5	BOLL WEEVIL(1)	10.	64.2	24.075
AZINPHOSMETHYL	LA	0.25	FPR	1.5	BOLL WEEVIL(1)	10.	64.2	24.075
AZINPHOSMETHYL	MO	0.184	FPR	1.	BOLL WEEVIL(1)	5.	9.25	1.702
AZINPHOSMETHYL	MS	0.25	FPO	3.	BOLL WEEVIL(1)	10.	107.3	80.475
AZINPHOSMETHYL	MS	0.25	FPR	2.	BOLL WEEVIL(1)	15.	160.95	80.475
AZINPHOSMETHYL	OK	0.25	FPO	2.	BOLL WEEVIL(1)	4.	16.6	8.3
AZINPHOSMETHYL	OK	0.25	FPR	1.	BOLL WEEVIL(1)	4.	16.6	4.15
AZINPHOSMETHYL	TN	0.184	FPR	1.	BOLL WEEVIL(1)	40.	159.6	29.366
AZINPHOSMETHYL	TX19	0.25	FPO	2.	BOLL WEEVIL(2.5)	90.	270.	135.
AZINPHOSMETHYL	TX19	0.25	FPR	1.	BOLL WEEVIL(2.5)	90.	270.	67.5
AZINPHOSMETHYL	TX20	0.25	FPO	2.	BOLL WEEVIL(1)	33.	112.69	56.347
AZINPHOSMETHYL	TX20	0.25	FPR	1.	BOLL WEEVIL(1)	33.	112.69	28.174

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
AZINPHOSMETHYL	TX21	0.25	FPO	4.	BOLL WEEVIL(1)	100.	65.	65.
AZINPHOSMETHYL	TX21	0.25	FPR	2.	BOLL WEEVIL(1)	60.	39.	19.5
AZINPHOSMETHYL	TX23	0.25	FPO	2.	BOLL WEEVIL(1)	70.	98.	49.
AZINPHOSMETHYL	TX23	0.25	FPR	1.	BOLL WEEVIL(1)	40.	56.	14.
AZINPHOSMETHYL	TX24	0.25	FPO	2.	BOLL WEEVIL(1)	7.	77.196	38.598
AZINPHOSMETHYL	TX24	0.25	FPR	1.	BOLL WEEVIL(1)	7.	77.196	19.299
AZINPHOSMETHYL	TX25	0.25	FPR	1.	BOLL WEEVIL(1)	1.	28.	7.
AZINPHOSMETHYL	TX25	0.125	FPR	1.5	THRIPS(2)	1.	28.	5.25
						U.S. Totals >		1212.8
BACILLUS THURINGIENSIS	AL	0.06	FPO	1.	SOYBEAN LOOPERS(2)	5.	16.8	1.008
BACILLUS THURINGIENSIS	AL	0.055	FPO	1.	BOLLWORM(4)	2.	6.72	0.3696
BACILLUS THURINGIENSIS	AZ	0.06	FPO	2.	BEET ARMYWORM(3), TOBACCO BUDWORM(3)	1.	4.16	0.4992
BACILLUS THURINGIENSIS	CA37	0.05	FPO	2.	CABBAGE LOOPER(2.5), BEET ARMYWORM(3)	7.	84.	8.4
BACILLUS THURINGIENSIS	FL	0.06	FPO	1.2	LOOPERS(2)	5.	1.25	0.09
BACILLUS THURINGIENSIS	GA	0.05	FPO	2.	SOYBEAN LOOPER(2)	5.	12.55	1.255
BACILLUS THURINGIENSIS	OK	0.06	FPO	1.	BOLLWORM(3)	0.5	2.075	0.1245
BACILLUS THURINGIENSIS	SC	0.06	FPR	2.	BOLL/BUDWORM(2)	5.	6.1	0.732
BACILLUS THURINGIENSIS	TX20	0.035	FPR	1.5	BOLL/BUDWORM(4)	3.5	11.953	0.6275
BACILLUS THURINGIENSIS	TX23	0.04	FPO	1.	BOLL/BUDWORM LARVAE(3)	1.	1.4	0.056
BACILLUS THURINGIENSIS	TX24	0.06	FPR	1.	BOLLWORM(2)	4.	44.112	2.6467
BACILLUS THURINGIENSIS	TX25	0.05	FPR	1.	BOLL/BUDWORM(2)	5.	140.	7.

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
						U.S. Totals >		22.809
BIFENTHRIN	AL	0.06	FPO	1.	SPIDER MITES(1)	5.	16.8	1.008
BIFENTHRIN	AL	0.06	FPO	1.	APHIDS(1)	2.	6.72	0.4032
BIFENTHRIN	AR	0.06	FPO	1.	APHIDS(1), SPIDERMITES(2)	2.1	11.235	0.6741
BIFENTHRIN	AZ	0.05	FPO	2.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	5.	20.8	2.08
BIFENTHRIN	CA36	0.06	FPO	2.	CARMINE MITE(1), PINK BOLLWORM(1)	20.	10.	1.2
BIFENTHRIN	FL	0.075	FPO	1.	APHIDS(2)	5.	1.25	0.0938
BIFENTHRIN	LA	0.06	FPO	1.	HELIOTHIS(1), APHIDS(2), MITES(2)	2.	12.84	0.7704
BIFENTHRIN	MO	0.074	FPO	1.	APHIDS(1)	8.	14.8	1.0952
BIFENTHRIN	MS	0.05	FPO	2.	APHIDS(1)	15.	160.95	16.095
BIFENTHRIN	NC	0.05	FPO	1.	FALL ARMYWORM(4), EUROPEAN CORN BORER(3), HELIOTHIS(1)	0.5	0.49	0.0245
BIFENTHRIN	OK	0.07	FPO	1.	APHID(1), BOLLWORM(1), MITES(1)	1.	4.15	0.2905
BIFENTHRIN	SC	0.05	FPO	1.3	BOLL/BUDWORM(1), MITES(2), APHIDS(1)	1.	1.22	0.0793
BIFENTHRIN	TN	0.07	FPO	1.	APHIDS(1)	7.	27.93	1.9551
BIFENTHRIN	TX21	0.05	FPO	1.	SPIDER MITES(3), BOLL/BUDWORMS(1)	6.	3.9	0.195
BIFENTHRIN	TX23	0.06	FPO	1.	SPIDER MITES(3)	1.	1.4	0.084
BIFENTHRIN	TX25	0.07	FPO	1.3	SPIDER MITES(2), BOLL/BUDWORM(1)	2.	56.	4.9
						U.S. Totals >		30.948
CARBARYL	CA37	1.25	FPO	1.	CABBAGE LOOPER(3), CRICKETS(1)	1.	12.	15.
CARBARYL	CA37	0.66	FPR	1.	ALFALFA LOOPER(3), CUTWORM(1.5), CRICKETS(1)	1.	12.	7.92
CARBARYL	OK	0.75	FPO	1.	FLEAHOPPER(2), WEEVIL(2)	0.5	2.075	1.5562

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CARBARYL	OK	0.75	FPR	1.	FLEAHOPPER(2), WEEVIL(2)	0.5	2.075	1.5562
CARBARYL	TX25	0.5	FPR	1.3	FLEAHOPPERS(3)	1.	28.	17.5
							U.S. Totals >	43.533
CARBOFURAN	TX25	1.	AP	1.	THRIPS(3)	1.	28.	28.
							U.S. Totals >	28.
CHLORPYRIFOS	AL	0.5	FPO	1.	APHIDS(2), MITES(3)	6.	20.16	10.08
CHLORPYRIFOS	AR	0.25	FPO	1.	APHIDS(3), PLANT BUGS(1)	6.	32.1	8.025
CHLORPYRIFOS	AR	0.75	FPO	1.	SPIDERMITES(2)	1.	5.35	4.0125
CHLORPYRIFOS	AR	0.5	FPR	1.	CUTWORM(1)	1.	5.35	2.675
CHLORPYRIFOS	AZ	0.5	FPO	1.	BEET ARMYWORM(1)	15.	62.4	31.2
CHLORPYRIFOS	AZ	0.5	FPR	1.	BEET ARMYWORM(1)	15.	62.4	31.2
CHLORPYRIFOS	CA36	1.	FPO	2.	BEET ARMYWORM(1), SWEET POTATO WHITEFLY(1), PINK BOLLWORM(3)	10.	5.	10.
CHLORPYRIFOS	CA37	0.75	FPO	1.	BEET ARMYWORM(2.5), MITES(4), LYGUS BUGS(3)	15.	180.	135.
CHLORPYRIFOS	CA37	0.75	FPR	1.	BEET ARMYWORM(2.5), MITES(4), LYGUS BUGS(3)	30.	360.	270.
CHLORPYRIFOS	FL	0.87	FPO	1.	FALL ARMYWORM(3), CUTWORMS(4)	10.	2.5	2.175
CHLORPYRIFOS	GA	0.87	FPO	3.	BEET ARMYWORM(2)	7.	17.57	45.858
CHLORPYRIFOS	GA	0.5	FPO	3.	SPIDER MITES(3)	2.	5.02	7.53
CHLORPYRIFOS	GA	0.87	FPR	1.	CUTWORM(1)	0.1	0.251	0.2184
CHLORPYRIFOS	LA	0.27	FPO	1.	APHIDS(2)	9.	57.78	15.601
CHLORPYRIFOS	LA	0.22	FPR	1.	PLANT BUGS(2)	5.	32.1	7.062
CHLORPYRIFOS	MS	0.75	FPO	3.	APHIDS(2.5)	8.	85.84	193.14

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CHLORPYRIFOS	MS	0.5	FPO	4.	HELIOTHIS(2)	15.	160.95	321.9
CHLORPYRIFOS	MS	1.	FPO	2.	MITES(2.5), BEET ARMYWORMS(2.5)	30.	321.9	643.8
CHLORPYRIFOS	MS	0.5	FPR	2.	PLANT BUGS(1)	5.	53.65	53.65
CHLORPYRIFOS	OK	0.28	FPO	1.	APHIDS(1)	2.5	10.375	2.905
CHLORPYRIFOS	SC	0.6	FPO	1.	PLANT BUGS(2), COTTON APHIDS(3), FALL ARMYWORM(4)	6.	7.32	4.392
CHLORPYRIFOS	TX20	0.75	FPR	1.	CUTWORM(2)	0.4	1.366	1.0245
CHLORPYRIFOS	TX21	0.5	FPO	1.	APHID(3)	11.	7.15	3.575
						U.S. Totals >		1805.
CYFLUTHRIN	AL	0.028	FPO	4.	BOLL/BUDWORMS(1)	30.	100.8	11.29
CYFLUTHRIN	AR	0.03	FPO	3.	BOLL/BUDWORMS(1)	32.	171.2	15.408
CYFLUTHRIN	AZ	0.04	FPO	5.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	12.	49.92	9.984
CYFLUTHRIN	FL	0.037	FPO	4.	BOLLWORMS(1)	65.	16.25	2.405
CYFLUTHRIN	FL	0.037	FPR	2.	BOLLWORMS(1)	65.	16.25	1.2025
CYFLUTHRIN	GA	0.029	FPO	5.	BOLL/BUDWORM(1)	20.	50.2	7.279
CYFLUTHRIN	LA	0.03	FPO	6.	HELIOTHIS(1)	26.	166.92	30.046
CYFLUTHRIN	MO	0.037	FPO	1.	BOLL/BUDWORM(1)	10.	18.5	0.6845
CYFLUTHRIN	MS	0.04	FPO	2.	HELIOTHIS(1.5)	17.	182.41	14.593
CYFLUTHRIN	NC	0.029	FPO	2.8	HELIOTHIS(1), EUROPEAN CORN BORER(3), FALL ARMYWORM(5)	12.	11.76	0.9549
CYFLUTHRIN	NM	0.031	FPO	1.	HELIOTHIS(1)	10.	8.3	0.2573
CYFLUTHRIN	OK	0.029	FPO	3.	BOLLWORM(1), WEEVIL(2)	4.	16.6	1.4442
CYFLUTHRIN	SC	0.03	FPO	2.	BOLL/BUDWORM(1)	15.	18.3	1.098
CYFLUTHRIN	TN	0.037	FPO	1.	BOLL/BUDWORM(1)	10.	39.9	1.4763

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CYFLUTHRIN	TX19	0.035	FPO	1.	BOLLWORM(2), TOBACCO BUDWORM(2)	2.5	7.5	0.2625
CYFLUTHRIN	TX20	0.03	FPO	1.5	BOLL/BUDWORM(2)	4.4	15.026	0.6762
CYFLUTHRIN	TX21	0.03	FPO	2.	BOLL/BUDWORMS(1)	22.	14.3	0.858
CYFLUTHRIN	TX23	0.03	FPO	1.	BOLL/BUDWORM LARVAE(1)	1.	1.4	0.042
CYFLUTHRIN	TX24	0.33	FPO	1.	BOLLWORM(1), BUDWORM(1), BOLL WEEVIL(1)	8.	88.224	29.114
CYFLUTHRIN	TX25	0.04	FPO	1.3	BOLL/BUDWORM(1)	4.	112.	5.6
CYFLUTHRIN	TX26	0.031	FPO	1.	HELIOTHIS(1)	14.	55.3	1.7143
						U.S. Totals >		136.39
CYHALOTHRIN	AL	0.025	FPO	4.	BOLL/BUDWORMS(1)	30.	100.8	10.08
CYHALOTHRIN	AR	0.025	FPO	3.	BOLL/BUDWORMS(1)	26.	139.1	10.432
CYHALOTHRIN	AZ	0.03	FPO	5.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	12.	49.92	7.488
CYHALOTHRIN	FL	0.032	FPO	4.	BOLLWORMS(1)	20.	5.	0.64
CYHALOTHRIN	FL	0.032	FPR	2.	BOLLWORMS(1)	20.	5.	0.32
CYHALOTHRIN	GA	0.025	FPO	5.	BOLL/BUDWORM(1)	20.	50.2	6.275
CYHALOTHRIN	LA	0.032	FPO	6.	HELIOTHIS(1)	27.	173.34	33.281
CYHALOTHRIN	MO	0.032	FPO	1.	BOLL/BUDWORM(1)	20.	37.	1.184
CYHALOTHRIN	MS	0.033	FPO	3.	HELIOTHIS(1.5)	25.	268.25	26.557
CYHALOTHRIN	NC	0.025	FPO	2.8	HELIOTHIS(1), EUROPEAN CORN BORER(2.5), FALL ARMYWORM(4)	54.	52.92	3.7044
CYHALOTHRIN	NM	0.03	FPO	1.	HELIOTHIS(1)	15.	12.45	0.3735
CYHALOTHRIN	OK	0.029	FPO	3.	BOLLWORM(1), WEEVIL(2)	8.	33.2	2.8884
CYHALOTHRIN	SC	0.025	FPO	2.	BOLL/BUDWORM(1)	40.	48.8	2.44
CYHALOTHRIN	TN	0.032	FPO	1.	BOLL/BUDWORM(1)	25.	99.75	3.192

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CYHALOTHRIN	TX19	0.03	FPO	1.	BOLLWORM(2), TOBACCO BUDWORM(2)	2.5	7.5	0.225
CYHALOTHRIN	TX20	0.03	FPO	1.5	BOLL/BUDWORM(1)	4.4	15.026	0.6762
CYHALOTHRIN	TX21	0.03	FPO	2.	BOLL/BUDWORMS(1)	22.	14.3	0.858
CYHALOTHRIN	TX23	0.03	FPO	1.	BOLL/BUDWORM LARVAE(1)	10.	14.	0.42
CYHALOTHRIN	TX24	0.03	FPO	1.	BOLLWORM(1), BUDWORM(1), BOLL WEEVIL(1)	10.	110.28	3.3084
CYHALOTHRIN	TX25	0.04	FPO	1.3	BOLL/BUDWORM(1)	8.	224.	11.2
CYHALOTHRIN	TX26	0.03	FPO	1.	HELIOTHIS(1)	19.	75.05	2.2515
						U.S. Totals >		127.79
CYPERMETHRIN	AL	0.05	FPO	4.	BOLL/BUDWORMS(1)	20.	67.2	13.44
CYPERMETHRIN	AR	0.06	FPO	1.	BOLL/BUDWORMS(1)	6.5	34.775	2.0865
CYPERMETHRIN	AR	0.06	FPR	1.	CUTWORMS(1)	0.5	2.675	0.1605
CYPERMETHRIN	AZ	0.07	FPO	5.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	12.	49.92	17.472
CYPERMETHRIN	CA36	0.07	FPO	4.	PINK BOLLWORM(1), TOBACCO BUDWORM(1), COTTON BOLLWORM(1)	30.	15.	4.2
CYPERMETHRIN	FL	0.06	FPO	1.5	BOLLWORMS(1)	20.	5.	0.45
CYPERMETHRIN	GA	0.05	FPO	5.	BOLL/BUDWORM(1)	30.	75.3	18.825
CYPERMETHRIN	LA	0.055	FPO	6.	HELIOTHIS(1)	15.	96.3	31.779
CYPERMETHRIN	MO	0.07	FPO	1.	BOLL/BUDWORM(1)	10.	18.5	1.295
CYPERMETHRIN	MS	0.06	FPO	2.	HELIOTHIS(1.5)	15.	160.95	19.314
CYPERMETHRIN	NC	0.06	FPO	2.8	HELIOTHIS(1), EUROPEAN CORN BORER(3), FALL ARMYWORM(5)	20.	19.6	3.2928
CYPERMETHRIN	NM	0.06	FPO	1.	HELIOTHIS(2)	10.	8.3	0.498
CYPERMETHRIN	OK	0.055	FPO	3.	BOLLWORM(1), WEEVIL(2)	8.	33.2	5.478
CYPERMETHRIN	SC	0.055	FPO	2.	BOLL/BUDWORM(1)	15.	18.3	2.013

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CYPERMETHRIN	TN	0.07	FPO	1.	BOLL/BUDWORM(1)	15.	59.85	4.1895
CYPERMETHRIN	TX19	0.07	FPO	3.	BOLLWORM(2), TOBACCO BUDWORM(2)	90.	270.	56.7
CYPERMETHRIN	TX20	0.05	FPO	1.5	BOLL/BUDWORM(2)	11.	37.565	2.8174
CYPERMETHRIN	TX20	0.04	FPR	1.	CUTWORM(2)	1.	3.415	0.1366
CYPERMETHRIN	TX21	0.055	FPO	2.	BOLL/BUDWORMS(1)	24.	15.6	1.716
CYPERMETHRIN	TX23	0.06	FPO	1.	BOLL/BUDWORM LARVAE(1)	1.	1.4	0.084
CYPERMETHRIN	TX24	0.06	FPO	1.	BOLLWORM(1), BUDWORM(1), BOLL WEEVIL(1)	5.	55.14	3.3084
CYPERMETHRIN	TX25	0.06	FPO	1.3	BOLL/BUDWORM(1)	10.	280.	21.
CYPERMETHRIN	TX26	0.06	FPO	1.	HELIOTHIS(2)	9.	35.55	2.133
						U.S. Totals >		212.39
DICOFOL	CA36	1.25	FPO	1.	CARMINE MITE(2)	45.	22.5	28.125
DICOFOL	CA36	1.25	FPR	1.	CARMINE MITE(2)	5.	2.5	3.125
DICOFOL	CA37	1.25	FPO	1.	SPIDER MITES(2)	30.	360.	450.
DICOFOL	CA37	1.25	FPR	1.	SPIDER MITES(2)	60.	720.	900.
DICOFOL	FL	1.5	FPO	1.8	SPIDER MITES(2)	10.	2.5	6.75
DICOFOL	GA	1.25	FPO	1.	SPIDER MITES(1)	0.5	1.255	1.5688
DICOFOL	LA	1.	FPO	2.5	MITES(1)	5.	32.1	80.25
DICOFOL	MS	1.	FPO	2.	SPIDER MITES(1.2)	3.	32.19	64.38
DICOFOL	NC	1.2	FPR	1.8	SPIDER MITES(2)	1.	0.98	2.1168
DICOFOL	OK	1.	FPO	2.	SPIDER MITES(2)	0.5	2.075	4.15
DICOFOL	SC	1.	FPO	1.5	SPIDER MITES(3)	1.	1.22	1.83
DICOFOL	TX23	1.	FPO	1.	SPIDER MITES(1)	1.	1.4	1.4

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
DICOFOL	TX25	1.5	FPO	1.5	SPIDER MITES(2)	1.	28.	63.
						U.S. Totals >		1606.7
DICROTOPHOS	AL	0.2	FPO	1.	APHIDS(2)	30.	100.8	20.16
DICROTOPHOS	AL	0.2	FPR	1.	THRIPS(2)	25.	84.	16.8
DICROTOPHOS	AR	0.2	FPO	1.	PLANT BUGS(1)	5.	26.75	5.35
DICROTOPHOS	AR	0.25	FPO	1.	APHIDS(3)	10.	53.5	13.375
DICROTOPHOS	AR	0.2	FPR	1.	THRIPS(1)	5.	26.75	5.35
DICROTOPHOS	CA37	0.4	FPO	1.5	APHIDS(3), WHITEFLIES(3)	1.	12.	7.2
DICROTOPHOS	FL	0.2	FPR	1.	PLANT BUGS(2)	5.	1.25	0.25
DICROTOPHOS	GA	0.15	FPO	2.	APHIDS(1)	20.	50.2	15.06
DICROTOPHOS	GA	0.15	FPR	1.5	THRIPS(1), PLANT BUGS(1)	15.	37.65	8.4713
DICROTOPHOS	LA	0.27	FPO	1.	APHIDS(3)	12.	77.04	20.801
DICROTOPHOS	LA	0.2	FPR	2.	THRIPS(1), PLANT BUGS(2)	14.	89.88	35.952
DICROTOPHOS	MO	0.37	FPO	1.	APHIDS(1)	30.	55.5	20.535
DICROTOPHOS	MO	0.15	FPR	1.	THRIPS(2), APHIDS(1)	50.	92.5	13.875
DICROTOPHOS	MS	0.32	FPO	3.	APHIDS(1)	20.	214.6	206.02
DICROTOPHOS	MS	0.25	FPR	2.	PLANT BUGS(1.5), THRIPS(1.5)	40.	429.2	214.6
DICROTOPHOS	NC	0.125	FPR	1.	THRIPS(2)	1.	0.98	0.1225
DICROTOPHOS	NM	0.25	FPO	1.5	APHIDS(2)	15.	12.45	4.6687
DICROTOPHOS	NM	0.125	FPR	1.	THRIPS(2), FLEAHOPPER(1)	18.	14.94	1.8675
DICROTOPHOS	OK	0.15	FPO	1.	COTTON FLEAHOPPER(1), APHID(1)	4.	16.6	2.49
DICROTOPHOS	OK	0.15	FPR	1.	COTTON FLEAHOPPER(1), APHID(1)	4.	16.6	2.49

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
DICROTOPHOS	SC	0.2	FPR	1.2	THRIPS(2), PLANT BUGS(2), STINK BUGS(2)	7.	8.54	2.0496
DICROTOPHOS	TN	0.37	FPO	1.	APHIDS(1)	40.	159.6	59.052
DICROTOPHOS	TN	0.15	FPR	1.	THRIPS(2), APHIDS(1)	55.	219.45	32.917
DICROTOPHOS	TX19	0.2	FPR	1.	FLEAHOPPER(1)	75.	225.	45.
DICROTOPHOS	TX20	0.1	FPO	1.	APHIDS(3)	8.	27.32	2.732
DICROTOPHOS	TX20	0.1	FPR	1.	THRIPS(3), APHIDS(3)	15.	51.225	5.1225
DICROTOPHOS	TX20	0.1	FPR	1.5	FLEAHOPPER(1)	28.	95.62	14.343
DICROTOPHOS	TX21	0.1	FPO	1.	APHID(3)	6.	3.9	0.39
DICROTOPHOS	TX23	0.5	FPO	1.	LYGUS BUGS(1)	3.	4.2	2.1
DICROTOPHOS	TX23	0.1	FPR	2.	THRIPS(2), FLEAHOPPERS(2), COTTON APHIDS(2)	80.	112.	22.4
DICROTOPHOS	TX24	0.125	FPO	1.	THRIPS(1), FLEAHOPPERS(1), APHIDS(1)	11.	121.31	15.164
DICROTOPHOS	TX25	0.25	FPO	1.3	APHIDS(1)	11.	308.	100.1
DICROTOPHOS	TX25	0.125	FPR	1.3	FLEAHOPPERS(1)	7.	196.	30.625
DICROTOPHOS	TX25	0.125	FPR	1.5	THRIPS(1)	3.	84.	15.75
DICROTOPHOS	TX26	0.25	FPO	1.5	APHIDS(2)	15.	59.25	22.219
DICROTOPHOS	TX26	0.125	FPR	1.	THRIPS(2), FLEAHOPPER(1)	12.	47.4	5.925
							U.S. Totals >	991.32
DIFLUBENZURON	AL	0.125	FPO	4.	BEET ARMYWORM(3) -- ACTS AS SYNERGIST	25.	84.	42.
DIFLUBENZURON	FL	0.034	FPO	3.	BEET ARMYWORM(3) -- ACTS AS SYNERGIST	85.	21.25	2.1675
DIFLUBENZURON	FL	0.034	FPR	2.	BEET ARMYWORM(3) -- ACTS AS SYNERGIST	85.	21.25	1.445
DIFLUBENZURON	GA	0.078	FPO	4.	BEET ARMYWORM(2) -- ACTS AS SYNERGIST	20.	50.2	15.662
DIFLUBENZURON	MS	0.063	FPR	4.	BOLL WEEVILS(2.5) -- ACTS AS SYNERGIST	5.	53.65	13.413

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
DIFLUBENZURON	SC	0.06	FPO	1.1	BEET ARMYWORMS(3) -- ACTS AS SYNERGIST	2.	2.44	0.161
						U.S. Totals >		74.848
DIMETHOATE	AL	0.25	FPR	1.	THRIPS(3)	15.	50.4	12.6
DIMETHOATE	AR	0.2	FPO	1.	PLANT BUGS(1), APHIDS(3)	15.	80.25	16.05
DIMETHOATE	AR	0.2	FPR	1.	THRIPS(1)	5.	26.75	5.35
DIMETHOATE	AZ	0.3	FPR	2.	LYGUS BUG(1), THRIPS(1)	7.	29.12	17.472
DIMETHOATE	CA37	0.35	FPO	1.	APHIDS(3.5), LYGUS BUGS(3.5)	11.	132.	46.2
DIMETHOATE	CA37	0.35	FPR	1.	APHIDS(3.5), LYGUS BUGS(3.5)	23.	276.	96.6
DIMETHOATE	FL	0.25	FPR	1.	PLANT BUGS(2)	2.	0.5	0.125
DIMETHOATE	GA	0.25	FPO	2.	APHIDS(2)	5.	12.55	6.275
DIMETHOATE	GA	0.184	FPR	1.5	APHIDS(2), THRIPS(1), PLANT BUGS(1), FLEAHOPPERS(1)	15.	37.65	10.391
DIMETHOATE	LA	0.27	FPO	1.	APHIDS(3)	12.	77.04	20.801
DIMETHOATE	LA	0.2	FPR	2.	THRIPS(1), PLANT BUGS(2)	12.	77.04	30.816
DIMETHOATE	MO	0.184	FPR	1.	THRIPS(2), PLANT BUGS(2)	33.	61.05	11.233
DIMETHOATE	MS	0.25	FPO	2.	APHIDS(2)	10.	107.3	53.65
DIMETHOATE	MS	0.25	FPR	2.	PLANT BUGS(1.5), THRIPS(1.5)	25.	268.25	134.13
DIMETHOATE	NC	0.1	FPR	1.	THRIPS(2)	1.	0.98	0.098
DIMETHOATE	NM	0.25	FPO	1.5	APHIDS(3)	10.	8.3	3.1125
DIMETHOATE	NM	0.125	FPR	1.	FLEAHOPPER(3)	6.	4.98	0.6225
DIMETHOATE	OK	0.15	FPO	1.	COTTON FLEAHOPPER(1), APHID(1)	4.	16.6	2.49
DIMETHOATE	OK	0.15	FPR	1.	COTTON FLEAHOPPER(1), APHID(1)	4.	16.6	2.49
DIMETHOATE	SC	0.15	FPO	1.	THRIPS(2), COTTON APHIDS(3)	2.5	3.05	0.4575

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
DIMETHOATE	SC	0.15	FPR	1.	THRIPS(2), COTTON APHIDS(3)	5.	6.1	0.915
DIMETHOATE	TN	0.184	FPR	1.	THRIPS(2), PLANT BUGS(2)	30.	119.7	22.025
DIMETHOATE	TX20	0.125	FPR	1.	APHIDS(3)	3.	10.245	1.2806
DIMETHOATE	TX20	0.18	FPR	1.	FLEAHOPPER(2)	13.	44.395	7.9911
DIMETHOATE	TX23	0.15	FPR	1.	THRIPS(2), FLEAHOPPERS(2), COTTON APHIDS(2)	5.	7.	1.05
DIMETHOATE	TX24	0.125	FPR	1.	FLEAHOPPERS(1), APHIDS(1)	5.	55.14	6.8925
DIMETHOATE	TX25	0.2	FPO	1.3	APHIDS(2)	3.	84.	21.84
DIMETHOATE	TX25	0.11	FPR	1.3	FLEAHOPPERS(1), THRIPS(1)	6.	168.	23.1
DIMETHOATE	TX26	0.25	FPO	1.5	APHIDS(3)	5.	19.75	7.4063
DIMETHOATE	TX26	0.125	FPR	1.	FLEAHOPPER(3)	4.	15.8	1.975
						U.S. Totals >		565.43
DISULFOTON	AL	0.75	AP	1.	THRIPS(3)	25.	84.	63.
DISULFOTON	CA36	1.	AP	1.	LYGUS BUG(1), LEAFHOPPERS(3)	2.5	1.25	1.25
DISULFOTON	CA36	1.	FPR	1.	LYGUS BUG(1), SOUTHERN GARDEN LEAFHOPPER(3)	2.5	1.25	1.25
DISULFOTON	CA37	0.65	FPO	1.	APHIDS(3), LYGUS BUGS(4), SPIDER MITES(3)	0.5	6.	3.9
DISULFOTON	CA37	0.65	FPR	1.	APHIDS(3), LYGUS BUGS(4), SPIDER MITES(3)	0.5	6.	3.9
DISULFOTON	FL	0.75	AP	1.	THRIPS(1)	30.	7.5	5.625
DISULFOTON	LA	1.	AP	1.	THRIPS(1)	3.	19.26	19.26
DISULFOTON	MO	0.8	AP	1.	THRIPS(1)	12.	22.2	17.76
DISULFOTON	MS	0.8	AP	1.	THRIPS(1)	10.	107.3	85.84
DISULFOTON	NM	0.1	FPR	1.	APHIDS(4)	1.	0.83	0.083
DISULFOTON	SC	0.6	AP	1.	THRIPS(2)	1.	1.22	0.732

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
DISULFOTON	TN	0.8	AP	1.	THRIPS(2)	15.	59.85	47.88
DISULFOTON	TX21	0.6	AP	1.	THRIPS(2), APHIDS(3)	13.	8.45	5.07
DISULFOTON	TX23	0.6	AP	1.	THRIPS(3)	1.	1.4	0.84
DISULFOTON	TX24	0.1	FPO	1.	APHIDS(1)	1.	11.028	1.1028
DISULFOTON	TX25	0.6	AP	1.	THRIPS(4)	1.	28.	16.8
DISULFOTON	TX25	0.1	FPO	1.	APHIDS(1)	6.	168.	16.8
DISULFOTON	TX26	0.1	FPR	1.	APHIDS(4)	1.	3.95	0.395
						U.S. Totals >		291.49
ENDOSULFAN	AZ	1.5	FPO	2.	TOBACCO BUDWORM(3), WHITEFLY(3)	2.	8.32	24.96
ENDOSULFAN	CA36	0.43	FPR	1.	LEAF PERFORATOR(2), SWEET POTATO WHITEFLY(2)	25.	12.5	5.375
ENDOSULFAN	CA37	1.25	FPO	1.5	LEAF PERFORATOR(2.5), BOLL/BUDWORM(2)	3.	36.	67.5
ENDOSULFAN	LA	0.44	FPR	1.	APHIDS(2)	5.	32.1	14.124
ENDOSULFAN	MS	0.5	FPO	2.	APHIDS(2)	15.	160.95	160.95
ENDOSULFAN	MS	0.5	FPR	1.	APHIDS(2)	20.	214.6	107.3
						U.S. Totals >		380.21
ESFENVALERATE	AL	0.03	FPO	4.	BOLL/BUDWORMS(1)	20.	67.2	8.064
ESFENVALERATE	AR	0.03	FPO	3.	BOLL/BUDWORMS(1)	13.	69.55	6.2595
ESFENVALERATE	AR	0.04	FPR	1.	CUTWORMS(1)	1.	5.35	0.214
ESFENVALERATE	AZ	0.04	FPO	5.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	12.	49.92	9.984
ESFENVALERATE	CA36	0.04	FPR	4.	TOBACCO & PINK BOLLWORMS (1)	30.	15.	2.4
ESFENVALERATE	CA37	0.04	FPO	2.	BOLL/BUDWORMS(1)	1.	12.	0.96

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ESFENVALERATE	FL	0.05	FPO	1.	BOLLWORMS(2), CUTWORMS(4)	10.	2.5	0.125
ESFENVALERATE	FL	0.05	FPR	1.	BOLLWORMS(2), CUTWORMS(4)	20.	5.	0.25
ESFENVALERATE	GA	0.028	FPO	5.	BOLL WEEVIL(2), BOLL/BUDWORMS(1)	15.	37.65	5.271
ESFENVALERATE	LA	0.035	FPO	6.	HELIOTHIS(1)	25.	160.5	33.705
ESFENVALERATE	MO	0.04	FPO	1.	BOLL/BUDWORM(1)	5.	9.25	0.37
ESFENVALERATE	MS	0.04	FPO	3.	HELIOTHIS(1.5)	18.	193.14	23.177
ESFENVALERATE	NC	0.038	FPO	2.8	HELIOTHIS(1), EUROPEAN CORN BORER(3.5), FALL ARMYWORM(5)	6.	5.88	0.6256
ESFENVALERATE	NM	0.035	FPO	1.	HELIOTHIS(2)	1.	0.83	0.0291
ESFENVALERATE	OK	0.03	FPO	3.	BOLLWORM(1), WEEVILS(2)	5.	20.75	1.8675
ESFENVALERATE	SC	0.03	FPO	2.	BOLL/BUDWORM(1)	30.	36.6	2.196
ESFENVALERATE	TN	0.04	FPO	1.	BOLL/BUDWORM(1)	15.	59.85	2.394
ESFENVALERATE	TX20	0.04	FPO	1.5	BOLL/BUDWORM(2)	8.8	30.052	1.8031
ESFENVALERATE	TX20	0.03	FPR	1.	CUTWORM(2)	0.3	1.0245	0.0307
ESFENVALERATE	TX21	0.04	FPO	2.	BOLL/BUDWORMS(1)	18.	11.7	0.936
ESFENVALERATE	TX23	0.036	FPO	1.	BOLL/BUDWORM LARVAE(1)	23.	32.2	1.1592
ESFENVALERATE	TX24	0.03	FPO	1.	BUDWORM(1), BOLLWORM(1), BOLL WEEVIL(1)	5.	55.14	1.6542
ESFENVALERATE	TX25	0.04	FPO	1.3	BOLL/BUDWORM(1)	12.	336.	16.8
ESFENVALERATE	TX26	0.035	FPO	1.	HELIOTHIS(2)	14.	55.3	1.9355
						U.S. Totals >		122.21
FENVALERATE	AZ	0.15	FPO	3.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	7.	29.12	13.104
FENVALERATE	CA37	0.1	FPO	2.	BOLL/BUDWORMS(2), LEAF PERFORATOR(2), WHITEFLY(3)	6.	72.	14.4
FENVALERATE	SC	0.1	FPO	1.	BOLL/BUDWORM(1)	2.	2.44	0.244

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
FENVALERATE	TX20	0.1	FPO	1.5	BOLL/BUDWORM(2)	7.9	26.979	4.0468
FENVALERATE	TX20	0.1	FPR	1.	CUTWORM(2)	0.8	2.732	0.2732
FENVALERATE	TX25	0.15	FPO	1.3	BOLL/BUDWORM(1)	2.	56.	10.5
						U.S. Totals >		42.568
FLUCYTHRINATE	AZ	0.06	FPO	2.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	5.	20.8	2.496
						U.S. Totals >		2.496
GOSSYPLURE	AZ	0.006	FPO	1.	PINK BOLLWORM(4)	10.	41.6	0.2496
GOSSYPLURE	AZ	0.006	FPR	1.	PINK BOLLWORM(4)	10.	41.6	0.2496
GOSSYPLURE	CA36	0.006	FPO	1.	PINK BOLLWORM(3)	2.	1.	0.006
GOSSYPLURE	CA36	0.006	FPR	1.	PINK BOLLWORM(3)	60.	30.	0.18
						U.S. Totals >		0.6852
LINDANE	CA37	0.1	AP	1.	WIREWORM(1), SEED CORN MAGGOT(1)	5.	60.	6.
						U.S. Totals >		6.
MALATHION	AL	1.2	FPO	10.	BOLL WEEVILS(1)	25.	84.	1008.
MALATHION	AR	0.8	FPR	1.	BOLLWEEVIL(2)	1.	5.35	4.28
MALATHION	AZ	1.	FPR	3.	BOLL WEEVIL(1)	0.5	2.08	6.24
MALATHION	CA37	1.5	FPO	1.	APHIDS(4)	1.	12.	18.
MALATHION	CA37	1.5	FPR	1.	APHIDS(4)	2.	24.	36.
MALATHION	FL	1.	FPO	3.	BOLLWORMS(1)	75.	18.75	56.25

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
MALATHION	FL	1.	FPR	2.	BOLLWORMS(1)	75.	18.75	37.5
MALATHION	GA	1.01	FPO	4.	BOLL WEEVIL(1)	1.	2.51	10.14
MALATHION	LA	1.	FPO	1.5	BOLL WEEVIL(1)	10.	64.2	96.3
MALATHION	LA	1.	FPR	1.5	BOLL WEEVIL(1)	10.	64.2	96.3
MALATHION	MS	0.922	FPO	4.	BOLL WEEVIL(2)	3.	32.19	118.72
MALATHION	MS	0.922	FPR	2.	BOLL WEEVIL(2)	5.	53.65	98.931
MALATHION	OK	1.	FPO	1.	WEEVILS(2), APHIDS(2)	0.5	2.075	2.075
MALATHION	OK	1.	FPR	1.	WEEVILS(2), APHIDS(2)	0.5	2.075	2.075
MALATHION	SC	0.9	FPO	1.5	BOLLWEEVIL(1)	10.	12.2	16.47
MALATHION	SC	0.9	FPR	1.5	BOLLWEEVIL(1)	10.	12.2	16.47
MALATHION	TX20	0.88	FPO	2.	BOLL WEEVIL(2)	10.	34.15	60.104
MALATHION	TX20	0.88	FPR	1.	BOLL WEEVIL(2)	10.	34.15	30.052
MALATHION	TX24	1.	FPO	2.5	BOLL WEEVIL(DIAPAUSE)(1)	5.	55.14	137.85
MALATHION	TX25	0.88	FPO	3.	BOLLWEEVIL(DIAPAUSE)(1)	4.	112.	295.68
MALATHION	TX26	1.	FPO	2.5	BOLL WEEVIL(DIAPAUSE)(1)	10.	39.5	98.75
						U.S. Totals >		2246.2
METHAMIDOPHOS	AL	0.5	FPO	1.	WHITEFLY(2), WESTERN FLOWER THRIPS(3)	5.	16.8	8.4
METHAMIDOPHOS	AZ	0.75	FPO	1.	LYGUS BUG(1)	2.5	10.4	7.8
METHAMIDOPHOS	AZ	0.75	FPR	1.	LYGUS BUG(1)	2.5	10.4	7.8
METHAMIDOPHOS	CA37	0.75	FPO	1.	LYGUS BUGS(1), CABBAGE LOOPER(3)	25.	300.	225.
METHAMIDOPHOS	CA37	0.75	FPR	1.	LYGUS BUGS(1), CABBAGE LOOPER(3)	25.	300.	225.
METHAMIDOPHOS	FL	0.5	FPO	1.5	WHITEFLIES(3)	15.	3.75	2.8125

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
METHAMIDOPHOS	GA	0.37	FPO	2.	WESTERN FLOWER THRIPS(1), WHITEFLY(1)	5.	12.55	9.287
METHAMIDOPHOS	LA	0.27	FPO	1.	APHIDS(2), WHITEFLIES(1)	14.	89.88	24.268
METHAMIDOPHOS	LA	0.5	FPO	1.	MITES(2)	2.5	16.05	8.025
METHAMIDOPHOS	LA	0.22	FPR	2.	THRIPS(1), PLANT BUGS(2)	10.	64.2	28.248
METHAMIDOPHOS	MS	0.5	FPO	1.	WHITEFLIES(3)	10.	107.3	53.65
METHAMIDOPHOS	MS	0.5	FPO	2.	WESTERN FLOWER THRIPS(3)	5.	53.65	53.65
METHAMIDOPHOS	MS	0.5	FPR	1.	THRIPS(2)	2.	21.46	10.73
METHAMIDOPHOS	SC	0.1	FPR	1.2	THRIPS(2)	1.	1.22	0.1464
						U.S. Totals >		664.82
METHIDATHION	CA37	0.75	FPO	2.5	SPIDER MITES(3), LYGUS BUGS(3.5)	12.	144.	270.
METHIDATHION	NC	1.	FPO	1.8	SPIDER MITES(2)	1.	0.98	1.764
						U.S. Totals >		271.76
METHOMYL	AL	0.125	FPO	2.	HELIOTHIS EGGS(2)	5.	16.8	4.2
METHOMYL	AR	0.125	FPO	1.	BOLLWORM EGGS(2)	0.5	2.675	0.3344
METHOMYL	AZ	0.3	FPO	2.	BEET ARMYWORM(1)	10.	41.6	24.96
METHOMYL	CA36	0.45	FPR	1.	BEET ARMYWORM(1)	2.	1.	0.45
METHOMYL	CA37	0.5	FPO	1.5	BEET ARMYWORM(4.5), CABBAGE LOOPER(4)	2.	24.	18.
METHOMYL	FL	0.4	FPO	2.	BOLLWORM EGGS(3), FALL ARMYWORMS(3), BEET ARMYWORMS(3.5)	70.	17.5	14.
METHOMYL	FL	0.5	FPR	2.	BOLLWORM EGGS(3), FALL ARMYWORMS(3), BEET ARMYWORMS(3.5)	70.	17.5	17.5
METHOMYL	LA	0.125	FPO	3.	HELIOTHIS EGGS(2)	5.	32.1	12.038
METHOMYL	MS	0.125	FPO	3.	HELIOTHIS EGGS(2)	20.	214.6	80.475

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
METHOMYL	MS	0.45	FPO	2.	HELIOTHIS(2.5)	5.	53.65	48.285
METHOMYL	MS	0.125	FPR	1.	HELIOTHIS EGGS(2)	25.	268.25	33.531
METHOMYL	OK	0.125	FPO	1.	BOLLWORM EGGS(2)	0.5	2.075	0.2594
METHOMYL	OK	0.125	FPR	1.	BOLLWORM EGGS(2)	0.5	2.075	0.2594
METHOMYL	SC	0.287	FPO	1.	BOLL/BUDWORM EGGS(3), ARMYWORMS(3)	3.	3.66	1.0504
METHOMYL	SC	0.287	FPR	1.	BOLL/BUDWORM EGGS(3), ARMYWORMS(3)	15.	18.3	5.2521
METHOMYL	TX20	0.125	FPO	1.	BOLL/BUDWORM EGGS(3)	10.	34.15	4.2688
METHOMYL	TX20	0.125	FPR	1.	BOLL/BUDWORM EGGS(3)	10.	34.15	4.2688
METHOMYL	TX21	0.2	FPR	1.	FLEAHOPPER(1)	6.	3.9	0.78
METHOMYL	TX25	0.675	FPO	2.	BEET ARMYWORMS(2)	1.	28.	37.8
METHOMYL	TX25	0.675	FPO	1.3	BOLL/BUDWORMS(3)	1.	28.	23.625
METHOMYL	TX25	0.113	FPR	1.3	FLEAHOPPERS(1)	1.	28.	3.955
METHOMYL	TX26	0.225	FPO	1.5	APHIDS(2)	10.	39.5	13.331
						U.S. Totals >		348.62
METHYL PARATHION	AL	0.33	FPO	5.	BOLL WEEVILS(1)	50.	168.	277.2
METHYL PARATHION	AR	0.5	FPO	1.	BOLLWEEVIL(2)	5.	26.75	13.375
METHYL PARATHION	AZ	1.	FPO	3.	PINK BOLLWORM(2), LYGUS BUG(2), TOBACCO BUDWORM(2)	25.	104.	312.
METHYL PARATHION	CA37	0.75	FPO	2.	LYGUS BUGS(3.5), BOLLWORMS(4)	1.	12.	18.
METHYL PARATHION	FL	0.5	FPO	2.	LOOPERS(4)	10.	2.5	2.5
METHYL PARATHION	LA	0.37	FPO	4.	BOLL WEEVIL(2)	55.	353.1	522.59
METHYL PARATHION	MS	0.37	FPO	4.	BOLL WEEVILS(1.5)	60.	643.8	952.82
METHYL PARATHION	MS	0.37	FPR	2.	BOLL WEEVILS(1.5)	60.	643.8	476.41

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
METHYL PARATHION	NC	0.5	FPO	1.2	GREEN STINK BUGS(1.5)	0.5	0.49	0.294
METHYL PARATHION	NM	0.25	FPR	1.	APHIDS(2), COTTON FLEAHOPPERS(1)	1.	0.83	0.2075
METHYL PARATHION	OK	0.16	FPO	2.	BOLL WEEVIL(1), APHID(2)	20.	83.	26.56
METHYL PARATHION	OK	0.16	FPR	1.	BOLL WEEVIL(1), APHID(2)	20.	83.	13.28
METHYL PARATHION	SC	0.4	FPR	1.3	COTTON APHIDS(3), STINKBUGS(2)	10.	12.2	6.344
METHYL PARATHION	TX19	0.87	FPO	3.	BOLL WEEVIL(2.5), BOLLWORM(4)	50.	150.	391.5
METHYL PARATHION	TX19	0.87	FPR	1.	BOLL WEEVIL(2.5), BOLLWORM(4)	25.	75.	65.25
METHYL PARATHION	TX20	0.375	FPO	2.	BOLL WEEVIL(3)	35.	119.53	89.644
METHYL PARATHION	TX20	0.125	FPR	1.	FLEAHOPPER(2)	9.	30.735	3.8419
METHYL PARATHION	TX20	0.375	FPR	2.	BOLL WEEVIL(3), FLEAHOPPER(2)	35.	119.53	89.644
METHYL PARATHION	TX21	0.4	FPO	3.	BOLL WEEVIL(1)	100.	65.	78.
METHYL PARATHION	TX21	0.4	FPR	2.	BOLL WEEVIL(2)	11.	7.15	5.72
METHYL PARATHION	TX23	0.5	FPO	2.	BOLL WEEVIL(3)	70.	98.	98.
METHYL PARATHION	TX23	0.25	FPR	1.	BOLLWEEVIL(3)	6.	8.4	2.1
METHYL PARATHION	TX25	0.2	FPO	1.3	APHIDS(2)	3.	84.	21.84
METHYL PARATHION	TX25	0.125	FPR	1.8	THRIPS(2)	1.	28.	6.125
METHYL PARATHION	TX25	0.1	FPR	1.3	FLEAHOPPERS(3)	1.	28.	3.5
METHYL PARATHION	TX26	0.25	FPR	1.	COTTON FLEAHOPPERS(1)	1.	3.95	0.9875
						U.S. Totals >		3477.7
NALED	CA37	0.5	FPO	2.	LYGUS BUGS(3.5), GRASSHOPPERS(1.5)	2.	24.	24.
NALED	CA37	0.5	FPR	1.	LYGUS BUGS(3.5), GRASSHOPPERS(1.5)	2.	24.	12.

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
							U.S. Totals >	36.
OXAMYL	AL	0.25	FPR	2.	WEEVILS(OVERWINTERED)(3)	2.	6.72	3.36
OXAMYL	AR	0.25	FPO	2.	BOLLWEEVIL(2)	20.	107.	53.5
OXAMYL	AR	0.25	FPR	2.	BOLLWEEVIL(2)	20.	107.	53.5
OXAMYL	AZ	0.75	FPO	2.	LEAF PERFORATOR(1)	1.	4.16	6.24
OXAMYL	LA	0.125	FPR	1.	PLANT BUGS(2)	7.	44.94	5.6175
OXAMYL	LA	0.25	FPR	3.	BOLL WEEVIL(1)	10.	64.2	48.15
OXAMYL	MO	0.184	FPR	1.	BOLL WEEVIL(2)	2.	3.7	0.6808
OXAMYL	MS	0.25	FPR	2.	BOLL WEEVIL(1.5), PLANT BUGS(1.25)	35.	375.55	187.77
OXAMYL	OK	0.25	FPO	1.	BOLL WEEVIL(1), FLEAHOPPER(1)	16.	66.4	16.6
OXAMYL	OK	0.25	FPR	1.	BOLL WEEVIL(1), FLEAHOPPER(1)	16.	66.4	16.6
OXAMYL	TN	0.184	FPR	1.	BOLL WEEVIL(2)	10.	39.9	7.3416
OXAMYL	TX20	0.188	FPR	2.	BOLL WEEVIL(2), FLEAHOPPER(1)	20.	68.3	25.681
OXAMYL	TX23	0.25	FPO	1.	LYGUS BUGS(2)	2.	2.8	0.7
OXAMYL	TX23	0.2	FPR	1.	BOLLWEEVIL(2)	1.	1.4	0.28
OXAMYL	TX24	0.25	FPO	1.	BOLL WEEVIL(2)	5.	55.14	13.785
OXAMYL	TX24	0.25	FPR	1.	BOLL WEEVIL(2)	5.	55.14	13.785
							U.S. Totals >	453.6
OXYDEMETON-METHYL	AL	0.25	FPO	2.	APHIDS(2)	25.	84.	42.
OXYDEMETON-METHYL	CA37	0.87	FPO	1.	LYGUS BUGS(3), APHIDS(2.5)	3.	36.	31.32
OXYDEMETON-METHYL	CA37	0.87	FPR	1.	LYGUS BUGS(3), APHIDS(2.5)	3.	36.	31.32

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
OXYDEMETON-METHYL	FL	0.5	FPO	1.3	APHIDS(3)	10.	2.5	1.625
OXYDEMETON-METHYL	GA	0.184	FPO	2.	APHIDS(1)	5.	12.55	4.6184
OXYDEMETON-METHYL	LA	0.27	FPO	1.	APHIDS(2)	6.	38.52	10.4
OXYDEMETON-METHYL	MS	0.25	FPO	2.	APHIDS(3.5)	1.	10.73	5.365
OXYDEMETON-METHYL	MS	0.25	FPR	1.	APHIDS(3.5)	1.	10.73	2.6825
OXYDEMETON-METHYL	NM	0.125	FPO	1.5	APHIDS(3)	5.	4.15	0.7781
OXYDEMETON-METHYL	NM	0.125	FPR	1.	FLEAHOPPERS(1)	1.	0.83	0.1037
OXYDEMETON-METHYL	OK	0.125	FPO	1.	THRIPS(1), APHID(1)	2.	8.3	1.0375
OXYDEMETON-METHYL	OK	0.125	FPR	1.	THRIPS(1), APHID(1)	2.	8.3	1.0375
OXYDEMETON-METHYL	SC	0.2	FPR	1.	THRIPS(2), COTTON APHIDS(2)	9.	10.98	2.196
OXYDEMETON-METHYL	TX20	0.17	FPR	1.	APHIDS(1)	3.	10.245	1.7416
OXYDEMETON-METHYL	TX26	0.125	FPO	1.	APHIDS(2)	2.	7.9	0.9875
						U.S. Totals >		137.21
PARATHION	AZ	1.	FPO	2.	PINK BOLLWORM(2), LYGUS BUG(2), TOBACCO BUDWORM(2)	3.	12.48	24.96
PARATHION	OK	0.37	FPO	2.	BOLL WEEVIL(1), APHID(2)	20.	83.	61.42
PARATHION	OK	0.37	FPR	1.	BOLL WEEVIL(1), APHID(2)	20.	83.	30.71
PARATHION	TX24	0.25	FPO	1.	BOLL WEEVIL(2), BOLLWORM(2)	4.	44.112	11.028
						U.S. Totals >		128.12
PERMETHRIN	AL	0.15	FPO	1.	SOYBEAN LOOPERS(3)	10.	33.6	5.04
PERMETHRIN	AZ	0.15	FPO	1.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	3.	12.48	1.872
PERMETHRIN	CA36	0.15	FPO	4.	TOBACCO & PINK BOLLWORM (1)	30.	15.	9.

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PERMETHRIN	FL	0.2	FPO	1.3	BOLLWORMS(2), LOOPERS(3)	30.	7.5	1.95
PERMETHRIN	GA	0.2	FPO	1.	LOOPERS(1)	5.	12.55	2.51
PERMETHRIN	MS	0.15	FPO	1.	HELIOTHIS(2.5)	5.	53.65	8.0475
PERMETHRIN	SC	0.1	FPR	1.5	BOLL/BUDWORM(1)	3.	3.66	0.549
PERMETHRIN	TX20	0.1	FPR	1.	CUTWORM(2)	1.5	5.1225	0.5123
PERMETHRIN	TX25	0.15	FPO	1.3	BOLL/BUDWORM(1)	1.	28.	5.25
							U.S. Totals >	34.731
PHORATE	AZ	2.	AP	1.	LYGUS BUG(2), THRIPS(2)	3.	12.48	24.96
PHORATE	CA36	1.	SD	1.	LYGUS BUG(3), SOUTHERN GARDEN LEAFHOPPER(3)	5.	2.5	2.5
PHORATE	CA37	0.61	AP	1.	THRIPS(2), SPIDER MITES(3)	3.	36.	21.96
PHORATE	FL	0.75	AP	1.	THRIPS(1)	30.	7.5	5.625
PHORATE	GA	0.75	AP	1.	THRIPS(1)	10.	25.1	18.825
PHORATE	LA	0.87	AP	1.	THRIPS(2)	8.	51.36	44.683
PHORATE	MS	0.8	AP	1.	THRIPS(1.5)	1.	10.73	8.584
PHORATE	OK	0.75	AP	1.	THRIPS(1)	4.	16.6	12.45
PHORATE	SC	0.5	AP	1.	THRIPS(2)	5.	6.1	3.05
PHORATE	TX20	0.5	AP	1.	THRIPS(2), APHIDS(3)	2.	6.83	3.415
PHORATE	TX23	0.5	AP	1.	THRIPS(3)	1.	1.4	0.7
PHORATE	TX25	0.5	AP	1.	THRIPS(2)	2.	56.	28.
							U.S. Totals >	174.75
PROFENOFOS	AL	0.5	FPO	2.	SPIDERMITES(2), ARMYWORM(2)	30.	100.8	100.8

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PROFENOFOS	AR	0.75	FPO	1.	BOLLWORM(2), TOBACCO BUDWORM(2), SPIDERMITES(2)	6.	32.1	24.075
PROFENOFOS	AR	0.25	FPO	1.	BOLLWORM EGGS(2)	3.	16.05	4.0125
PROFENOFOS	AZ	0.75	FPO	2.	WHITEFLY(2), TOBACCO BUDWORM(2)	8.	33.28	49.92
PROFENOFOS	CA36	0.67	FPO	2.	COTTON BOLLWORM(1), SWEET POTATO WHITEFLY(3),TOBACCO BUD.(2)	5.	2.5	3.35
PROFENOFOS	CA37	0.65	FPO	1.	SPIDER MITES(4), APHIDS(3), LYGUS BUGS(3), BOLLWORMS(3)	20.	240.	156.
PROFENOFOS	CA37	0.65	FPR	1.	SPIDER MITES(4), APHIDS(3), LYGUS BUGS(3), BOLLWORMS(3)	20.	240.	156.
PROFENOFOS	FL	1.	FPO	1.5	BEET ARMYWORM(3.5), BOLLWORMS(2.5), FALL ARMYWORMS(3.5)	30.	7.5	11.25
PROFENOFOS	GA	0.62	FPO	2.	SPIDER MITES(2)	5.	12.55	15.562
PROFENOFOS	GA	0.87	FPO	3.	BEET & FALL ARMYWORM(2), BOLL/BUDWORM(2)	7.	17.57	45.858
PROFENOFOS	LA	0.87	FPO	1.	HELIOTHIS(2), MITES(2)	3.5	22.47	19.549
PROFENOFOS	LA	0.87	FPR	1.	HELIOTHIS(2), MITES(2)	7.	44.94	39.098
PROFENOFOS	MO	0.75	FPO	1.	BOLL/BUDWORM(2)	1.	1.85	1.3875
PROFENOFOS	MS	0.5	FPO	2.	APHIDS(2.5)	10.	107.3	107.3
PROFENOFOS	MS	0.125	FPO	4.	HELIOTHIS EGGS(2.5)	20.	214.6	107.3
PROFENOFOS	MS	1.	FPO	2.	SPIDER MITES(2)	22.	236.06	472.12
PROFENOFOS	MS	1.	FPO	3.	HELIOTHIS(2)	20.	214.6	643.8
PROFENOFOS	NC	0.25	FPO	1.	HELIOTHIS(2.5), FALL ARMYWORMS(4)	3.	2.94	0.735
PROFENOFOS	NM	1.	FPO	1.	APHIDS(2), HELIOTHIS(3)	1.	0.83	0.83
PROFENOFOS	OK	0.75	FPO	2.	BOLLWORM(2), SPIDER MITES(1)	8.	33.2	49.8
PROFENOFOS	SC	0.75	FPO	1.	BOLL/BUDWORM(3), ARMYWORMS(3)	4.5	5.49	4.1175
PROFENOFOS	SC	0.75	FPR	1.	BOLL/BUDWORM(3), ARMYWORMS(3)	12.	14.64	10.98
PROFENOFOS	TN	0.75	FPO	1.	BOLL/BUDWORM(2)	5.	19.95	14.962
PROFENOFOS	TX20	0.75	FPO	1.	BEET ARMYWORM(3)	0.6	2.049	1.5368

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PROFENOFOS	TX23	0.75	FPO	2.	SPIDER MITES(3)	9.	12.6	18.9
PROFENOFOS	TX24	0.75	FPO	2.	BOLL/BUDWORM(2), SPIDER MITES(2)	4.	44.112	66.168
PROFENOFOS	TX25	0.75	FPO	1.3	BOLL/BUDWORMS(3)	1.	28.	26.25
PROFENOFOS	TX25	1.	FPO	1.2	BEET ARMYWORMS(2)	1.	28.	33.6
PROFENOFOS	TX25	0.75	FPO	2.	SPIDER MITES(1)	1.	28.	42.
PROFENOFOS	TX26	1.	FPO	1.	APHIDS(2), HELIOTHIS(3)	1.	3.95	3.95
						U.S. Totals >		2231.2
PROPARGITE	CA37	1.42	FPO	1.	SPIDER MITES(2)	15.	180.	255.6
PROPARGITE	CA37	1.42	FPR	1.	SPIDER MITES(2)	29.	348.	494.16
PROPARGITE	FL	1.5	FPO	1.7	SPIDER MITES(3)	15.	3.75	9.5625
PROPARGITE	GA	1.2	FPO	1.	SPIDER MITES(1)	0.5	1.255	1.506
PROPARGITE	MS	1.4	FPO	1.	SPIDER MITES(1.5)	10.	107.3	150.22
PROPARGITE	SC	1.6	FPR	1.6	SPIDER MITES(2)	2.	2.44	6.2464
PROPARGITE	TX23	1.2	FPO	1.	SPIDER MITES(1)	15.	21.	25.2
						U.S. Totals >		942.49
SULFUR	CA37	30.	FPR	1.	MITES(3)	10.	120.	3600.
						U.S. Totals >		3600.
SULPROFOS	AL	1.	FPO	1.	BOLL/BUDWORM(2)	5.	16.8	16.8
SULPROFOS	AR	1.	FPO	1.	BOLLWORM(2), TOBACCO BUDWORM(2)	5.	26.75	26.75
SULPROFOS	AZ	1.25	FPO	2.	TOBACCO BUDWORM(2)	5.	20.8	52.

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
SULPROFOS	CA36	1.12	FPO	2.	TOBACCO BOLLWORMS(2), PINK BOLLWORMS (1)	10.	5.	11.2
SULPROFOS	CA37	1.25	FPO	1.5	BEET ARMYWORMS(3), BOLLWORMS(2)	3.	36.	67.5
SULPROFOS	FL	1.5	FPO	1.5	BEET ARMYWORM(3.5), BOLLWORMS(2.5), FALL ARMYWORMS(3.5)	35.	8.75	19.688
SULPROFOS	GA	1.12	FPO	2.	BEET & FALL ARMYWORMS(2), BOLL/BUDWORMS(2)	3.	7.53	16.867
SULPROFOS	LA	0.87	FPO	1.	HELIOTHIS(2)	3.5	22.47	19.549
SULPROFOS	LA	0.87	FPR	1.	HELIOTHIS(2)	7.	44.94	39.098
SULPROFOS	MS	1.	FPO	2.	HELIOTHIS(2)	25.	268.25	536.5
SULPROFOS	MS	0.5	FPR	1.	PLANT BUGS(2.5)	7.	75.11	37.555
SULPROFOS	NM	1.	FPO	1.	APHIDS(3), HELIOTHIS(3)	0.5	0.415	0.415
SULPROFOS	SC	1.	FPO	1.	BOLL/BUDWORM(3), ARMYWORMS(4)	1.	1.22	1.22
SULPROFOS	SC	1.	FPR	1.	BOLL/BUDWORM(3), ARMYWORMS(4)	6.	7.32	7.32
SULPROFOS	TX20	0.75	FPO	1.	BEET ARMYWORM(3)	0.6	2.049	1.5368
SULPROFOS	TX21	0.6	FPO	2.	BOLL/BUDWORMS(2)	15.	9.75	11.7
SULPROFOS	TX23	1.	FPO	1.	BOLL/BUDWORM LARVAE(2)	8.	11.2	11.2
SULPROFOS	TX24	1.	FPO	1.	BOLL/BUDWORM(2)	1.	11.028	11.028
SULPROFOS	TX25	1.5	FPO	1.5	BEET ARMYWORMS(2)	1.	28.	63.
SULPROFOS	TX25	1.	FPO	1.3	BOLL/BUDWORMS(3)	1.	28.	35.
SULPROFOS	TX26	1.	FPO	1.	APHIDS(3), HELIOTHIS(3)	0.5	1.975	1.975
						U.S. Totals >		987.9
THIODICARB	AL	0.6	FPO	2.	ARMYWORMS(2)	25.	84.	100.8
THIODICARB	AL	0.6	FPO	1.	SOYBEAN LOOPER	5.	16.8	10.08
THIODICARB	AL	0.125	FPR	3.	HELIOTHIS EGGS(1)	40.	134.4	50.4

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
THIODICARB	AR	0.25	FPO	2.	BOLLWORM EGGS(2)	10.	53.5	26.75
THIODICARB	AZ	0.75	FPO	2.	BEET ARMYWORM(1), TOBACCO BUDWORM(1)	3.	12.48	18.72
THIODICARB	CA37	0.6	FPO	1.5	BOLLWORMS(2)	1.	12.	10.8
THIODICARB	FL	0.512	FPO	2.5	BEET ARMYWORM(2.5), BOLLWORMS EGGS(3)	65.	16.25	20.8
THIODICARB	FL	0.512	FPR	2.	BEET ARMYWORM(2.5), BOLLWORMS EGGS(3)	65.	16.25	16.64
THIODICARB	GA	0.184	FPO	2.	BOLL/BUDWORM EGGS(1)	10.	25.1	9.2368
THIODICARB	GA	0.75	FPO	1.	BOLL/BUDWORM(2), SOYBEAN LOOPER(2)	2.	5.02	3.765
THIODICARB	GA	0.65	FPO	3.	BEET ARMYWORM(1)	7.	17.57	34.261
THIODICARB	LA	0.75	FPO	1.	HELIOTHIS(2), ARMYWORMS(2)	9.	57.78	43.335
THIODICARB	LA	0.125	FPO	3.	HELIOTHIS EGGS(1)	25.	160.5	60.188
THIODICARB	LA	0.75	FPR	1.	HELIOTHIS(2), ARMYWORMS(2)	9.	57.78	43.335
THIODICARB	MO	0.75	FPO	1.	BOLL/BUDWORM(2)	3.	5.55	4.1625
THIODICARB	MS	0.6	FPO	3.	HELIOTHIS(2)	30.	321.9	579.42
THIODICARB	MS	0.125	FPO	4.	HELIOTHIS EGGS(1.5)	50.	536.5	268.25
THIODICARB	MS	0.6	FPR	2.	HELIOTHIS(2)	25.	268.25	321.9
THIODICARB	NC	0.25	FPO	1.	HELIOTHIS(2.5), FALL ARMYWORMS(3)	1.	0.98	0.245
THIODICARB	NM	0.125	FPO	1.	HELIOTHIS EGGS(1)	2.5	2.075	0.2594
THIODICARB	NM	0.75	FPO	1.	ARMYWORMS(1), HELIOTHIS(3)	1.	0.83	0.6225
THIODICARB	OK	0.312	FPO	1.	BOLLWORM EGGS(2), BOLLWORM LARVAE(2)	5.	20.75	6.474
THIODICARB	OK	0.312	FPR	1.	BOLLWORM EGGS(2), BOLLWORM LARVAE(2)	5.	20.75	6.474
THIODICARB	SC	0.412	FPO	1.	BOLL/BUDWORM(2), ARMYWORMS(2)	15.	18.3	7.5396
THIODICARB	SC	0.412	FPR	1.	BOLL/BUDWORM(2), ARMYWORMS(2)	30.	36.6	15.079
THIODICARB	TN	0.75	FPO	1.	BOLL/BUDWORM(2)	5.	19.95	14.962

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
THIODICARB	TX19	0.9	FPR	1.	BOLLWORM(2), BEET ARMYWORM(1)	20.	60.	54.
THIODICARB	TX20	0.7	FPO	1.	BEET ARMYWORM(3)	0.7	2.3905	1.6733
THIODICARB	TX20	0.15	FPO	1.5	BOLL/BUDWORM(3)	2.2	7.513	1.6904
THIODICARB	TX21	0.7	FPO	2.	BOLL/BUDWORM(2)	12.	7.8	10.92
THIODICARB	TX23	0.125	FPO	2.	BOLL/BUDWORM EGGS(1)	40.	56.	14.
THIODICARB	TX23	0.125	FPR	1.	BOLL/BUDWORM EGGS(1)	10.	14.	1.75
THIODICARB	TX24	0.6	FPO	1.	BOLL/BUDWORM(1)	2.	22.056	13.234
THIODICARB	TX24	0.125	FPR	1.	BOLL/BUDWORM EGGS(1)	4.	44.112	5.514
THIODICARB	TX25	0.9	FPO	1.5	BEET ARMYWORMS(1)	2.	56.	75.6
THIODICARB	TX25	0.6	FPO	1.3	BOLL/BUDWORMS(3)	1.	28.	21.
THIODICARB	TX26	0.125	FPO	1.	HELIOTHIS EGGS(1)	2.5	9.875	1.2344
THIODICARB	TX26	0.75	FPO	1.	ARMYWORMS(1), HELIOTHIS(3)	1.	3.95	2.9625
						U.S. Totals >		1878.1
TRALOMETHRIN	AL	0.018	FPO	4.	BOLL/BUDWORMS(1)	5.	16.8	1.2096
TRALOMETHRIN	AR	0.018	FPO	3.	BOLL/BUDWORMS(1)	13.	69.55	3.7557
TRALOMETHRIN	AR	0.016	FPR	1.	CUTWORMS(1)	0.1	0.535	0.0086
TRALOMETHRIN	AZ	0.015	FPO	5.	PINK BOLLWORM/TOBACCO BUDWORM(1), COTTON LEAF PERFORATOR(2)	12.	49.92	3.744
TRALOMETHRIN	FL	0.015	FPO	1.7	BOLLWORMS(2)	5.	1.25	0.0319
TRALOMETHRIN	GA	0.018	FPO	6.	BOLL/BUDWORM(1), BOLL WEEVIL(2)	15.	37.65	3.9532
TRALOMETHRIN	LA	0.021	FPO	6.	HELIOTHIS(1)	5.	32.1	4.0446
TRALOMETHRIN	MS	0.024	FPO	3.	HELIOTHIS(1.5)	15.	160.95	11.588
TRALOMETHRIN	NC	0.019	FPO	2.8	HELIOTHIS(1), EUROPEAN CORN BORER(3)	8.	7.84	0.4171

TABLE 2. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
TRALOMETHRIN	OK	0.021	FPO	3.	BOLLWORM(1), BOLLWEEVIL(2)	4.	16.6	1.0458
TRALOMETHRIN	SC	0.022	FPR	2.	BOLL/BUDWORM(1)	35.	42.7	1.8788
TRALOMETHRIN	TX20	0.016	FPO	1.5	BOLL/BUDWORM(2)	1.8	6.147	0.1475
TRALOMETHRIN	TX21	0.015	FPO	2.	BOLL/BUDWORMS(1)	18.	11.7	0.351
TRALOMETHRIN	TX23	0.017	FPO	1.	BOLL/BUDWORM LARVAE(1)	15.	21.	0.357
TRALOMETHRIN	TX25	0.018	FPO	1.3	BOLL/BUDWORMS(1)	2.	56.	1.26
						U.S. Totals >		33.793
TRICHLORFON	FL	0.1	FPR	1.	PLANT BUGS(2.5)	1.5	0.375	0.0375
						U.S. Totals >		0.0375

* Pesticide timing: AP = at planting, FPO = foliar-postbloom, FPR = foliar-prebloom, and SD = sidedress.
** Pesticide efficacy is on a 1 to 5 scale; 1 is very good and 5 is very poor.

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ALACHLOR	LA	1.5	PRE	1.	GRASSES(2)	5.	32.1	48.15
							U.S. Totals >	48.15
CYANAZINE	AL	0.75	LB	1.	BROADLEAVES(1)	25.	84.	63.
CYANAZINE	AL	0.5	POE	1.	BROADLEAVES(1)	25.	84.	42.
CYANAZINE	AR	0.8	POE	1.5	BROADLEAVES(1)	45.	240.75	288.9
CYANAZINE	AR	0.8	PRE	1.	BROADLEAVES(3)	6.	32.1	25.68
CYANAZINE	AZ	1.5	LB	1.	ANNUAL GRASS(5), CYPERUS(5), BROADLEAF WEEDS(2)	10.	41.6	62.4
CYANAZINE	AZ	0.75	POE	1.	GRASS(3), CYPERUS(3), BROADLEAF WEEDS(2)	10.	41.6	31.2
CYANAZINE	AZ	1.5	PPI	1.	ANNUAL GRASS(5), CYPERUS(5), BROADLEAF WEEDS(2)	10.	41.6	62.4
CYANAZINE	CA37	1.2	LB	1.	IPOMOEA(2), PHYSALIS(1), AMARANTHUS(1)	15.	162.75	195.3
CYANAZINE	FL	0.5	POE	1.	BROADLEAVES(1)	25.	6.25	3.125
CYANAZINE	FL	0.8	PRE	1.	BROADLEAVES(2)	3.	0.75	0.6
CYANAZINE	GA	0.9	LB	1.	BROADLEAVES(1)	55.	138.05	124.24
CYANAZINE	GA	0.3	POE	1.	BROADLEAVES(1)	55.	138.05	41.415
CYANAZINE	LA	0.4	POE	1.	BROADLEAVES(1)	35.	224.7	89.88
CYANAZINE	MO	1.2	LB	1.	BROADLEAVES(1)	40.	74.	88.8
CYANAZINE	MO	0.8	POE	1.	BROADLEAVES(1)	30.	55.5	44.4
CYANAZINE	MO	0.8	PRE	1.	BROADLEAVES(2)	8.	14.8	11.84
CYANAZINE	MS	0.82	LB	1.	BROADLEAVES(1)	27.	289.71	237.56
CYANAZINE	MS	0.31	POE	2.	BROADLEAVES(2)	35.	375.55	232.84
CYANAZINE	MS	0.2	PRE	1.	BROADLEAVES(3)	5.2	55.796	11.159
CYANAZINE	NC	0.3	POE	1.	BROADLEAVES(1)	20.	19.6	5.88

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
CYANAZINE	SC	0.8	LB	1.	BROADLEAVES(1)	20.	24.4	19.52
CYANAZINE	SC	0.3	POE	1.5	BROADLEAVES(1)	55.	67.1	30.195
CYANAZINE	TN	0.5	POE	1.	BROADLEAVES(1)	20.	79.8	39.9
							U.S. Totals >	1752.2
DIURON	AL	0.5	POE	1.	BROADLEAVES(2)	15.	50.4	25.2
DIURON	AR	0.8	LB	1.	BROADLEAVES(2)	5.	26.75	21.4
DIURON	AZ	0.75	LB	1.	ANNUAL GRASS(3), CYPERUS(3), BROADLEAF WEEDS(2)	2.	8.32	6.24
DIURON	AZ	0.75	POE	1.	GRASS(3), CYPERUS(2), BROADLEAF WEEDS(1)	5.	20.8	15.6
DIURON	AZ	0.75	PRE	1.	ANNUAL GRASS(3), CYPERUS(3), BROADLEAF WEEDS(2)	2.	8.32	6.24
DIURON	GA	0.9	LB	1.	BROADLEAVES(1)	20.	50.2	45.18
DIURON	GA	0.7	POE	1.	BROADLEAVES(1)	10.	25.1	17.57
DIURON	GA	0.4	PRE	1.	BROADLEAVES(3)	10.	25.1	10.04
DIURON	LA	0.5	PRE	1.	BROADLEAVES(2)	20.	128.4	64.2
DIURON	MO	1.	PRE	1.	BROADLEAVES(3)	1.	1.85	1.85
DIURON	MS	0.56	LB	1.	BROADLEAVES AND GRASSES(2)	9.	96.57	54.079
DIURON	MS	0.14	POE	1.	BROADLEAVES AND GRASSES(2)	33.	354.09	49.573
DIURON	MS	0.53	PRE	1.	BROADLEAVES(3)	4.	42.92	22.748
DIURON	SC	0.8	LB	1.	BROADLEAVES(3)	5.	6.1	4.88
DIURON	SC	0.1	POE	1.	BROADLEAVES(3)	1.	1.22	0.122
DIURON	TX	0.85	PRE	1.	BROADLEAVES(3)	1.	51.28	43.588
							U.S. Totals >	388.51

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
DSMA	AL	1.5	POE	2.	GRASSES AND NUTSEDGE(3)	10.	33.6	100.8
DSMA	AR	2.	POE	3.	BROADLEAVES AND GRASSES(2)	10.	53.5	321.
DSMA	FL	1.	POE	1.	BROADLEAVES(3), GRASSES(2), CYPERUS(3.5)	20.	5.	5.
DSMA	GA	1.	POE	2.	BROADLEAVES(2), CYPERUS(2)	10.	25.1	50.2
DSMA	LA	1.6	POE	2.	GRASSES AND BROADLEAVES(2)	70.	449.4	1438.1
DSMA	MO	2.1	POE	2.	XANTHIUM(2), GRASSES(3)	5.	9.25	38.85
DSMA	MS	0.69	POE	2.	BROADLEAVES AND GRASSES(2)	15.	160.95	222.11
DSMA	NC	1.5	POE	1.	BROADLEAVES(3)	15.	14.7	22.05
DSMA	SC	1.9	POE	1.	BROADLEAVES(4), CYPERUS(2)	3.	3.66	6.954
DSMA	SC	0.9	POE	1.	BROADLEAVES(4), CYPERUS(4)	8.	9.76	8.784
DSMA	TN	1.5	POE	1.	GRASSES(2), XANTHIUM(2), IPOMOEA(2)	5.	19.95	29.925
DSMA	TX	2.	POE	1.	GRASSES(2), CYPERUS(4)	1.	51.28	102.56
						U.S. Totals >		2346.3
FENOXAPROP-ETHYL	FL	0.09	POE	1.	GRASSES(1)	1.	0.25	0.0225
FENOXAPROP-ETHYL	GA	0.15	POE	1.	GRASSES(1)	2.	5.02	0.753
						U.S. Totals >		0.7755
FLUAZIFOP-P-BUTYL	AL	0.2	SPT	1.	GRASSES(1)	15.	50.4	10.08
FLUAZIFOP-P-BUTYL	AR	0.141	POE	2.	GRASSES(1)	10.	53.5	15.087
FLUAZIFOP-P-BUTYL	AR	0.141	SPT	2.	GRASSES(1)	10.	53.5	15.087
FLUAZIFOP-P-BUTYL	AZ	0.31	SPT	2.	GRASS(1), CYPERUS(5), BROADLEAF WEEDS(5)	5.	20.8	12.896
FLUAZIFOP-P-BUTYL	CA37	0.14	SPT	2.	PERENNIAL GRASSES(1), SORGHUM(1), CYNODON(2)	4.	43.4	12.152

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
FLUAZIFOP-P-BUTYL	FL	0.22	POE	1.	GRASSES(1)	4.	1.	0.22
FLUAZIFOP-P-BUTYL	GA	0.13	POE	1.	GRASSES(1)	5.	12.55	1.6315
FLUAZIFOP-P-BUTYL	LA	0.14	POE	1.	GRASSES(1)	40.	256.8	35.952
FLUAZIFOP-P-BUTYL	MO	0.14	POE	1.	GRASSES(2)	7.	12.95	1.813
FLUAZIFOP-P-BUTYL	MS	0.15	SPT	1.	GRASSES(1)	38.	407.74	61.161
FLUAZIFOP-P-BUTYL	NC	0.16	POE	1.3	GRASSES(1)	20.	19.6	4.0768
FLUAZIFOP-P-BUTYL	OK	0.13	POE	1.	GRASSES(2)	1.7	7.055	0.9172
FLUAZIFOP-P-BUTYL	SC	0.05	POE	1.	GRASSES(1)	2.	2.44	0.122
FLUAZIFOP-P-BUTYL	TN	0.1	POE	1.	GRASSES(1)	50.	199.5	19.95
FLUAZIFOP-P-BUTYL	TX	0.187	POE	1.	GRASSES(1)	6.	307.68	57.536
FLUAZIFOP-P-BUTYL	TX	0.12	SPT	1.	GRASSES(1)	9.	461.52	55.382
						U.S. Totals >		304.06
FLUOMETURON	AL	0.8	PRE	1.	BROADLEAVES AND GRASSES(2)	80.	268.8	215.04
FLUOMETURON	AR	0.8	POE	2.	BROADLEAVES(2)	75.	401.25	642.
FLUOMETURON	AR	0.5	PRE	1.	BROADLEAVES(2)	70.	374.5	187.25
FLUOMETURON	CA37	1.5	POE	1.	SOLANUM(2)	1.	10.85	16.275
FLUOMETURON	FL	0.7	POE	1.	BROADLEAVES(2)	5.	1.25	0.875
FLUOMETURON	FL	1.2	PRE	1.	BROADLEAVES(2)	20.	5.	6.
FLUOMETURON	GA	0.4	POE	1.2	BROADLEAVES(2)	50.	125.5	60.24
FLUOMETURON	GA	0.6	PRE	1.	BROADLEAVES(2)	75.	188.25	112.95
FLUOMETURON	LA	0.56	POE	1.	BROADLEAVES(2.5)	60.	385.2	215.71
FLUOMETURON	LA	1.	PRE	1.	BROADLEAVES(2.5)	60.	385.2	385.2

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
FLUOMETURON	MO	1.5	POE	1.	BROADLEAVES(2)	40.	74.	111.
FLUOMETURON	MO	1.5	PRE	1.	BROADLEAVES(2)	75.	138.75	208.13
FLUOMETURON	MS	1.19	LB	1.	BROADLEAVES(2)	3.	32.19	38.306
FLUOMETURON	MS	0.44	POE	1.	BROADLEAVES AND GRASSES(2)	38.	407.74	179.41
FLUOMETURON	MS	0.69	PRE	1.	BROADLEAVES(2)	75.	804.75	555.28
FLUOMETURON	NC	0.33	POE	1.	BROADLEAVES(2)	10.	9.8	3.234
FLUOMETURON	NC	0.65	PRE	1.	BROADLEAVES(1)	100.	98.	63.7
FLUOMETURON	OK	0.71	POE	1.	MORNINGGLORY(2)	0.2	0.83	0.5893
FLUOMETURON	SC	0.7	POE	1.	BROADLEAVES(3)	40.	48.8	34.16
FLUOMETURON	SC	1.25	PRE	1.	GRASSES(3), BROADLEAVES(2)	80.	97.6	122.
FLUOMETURON	TN	1.	PRE	1.	BROADLEAVES(2)	90.	359.1	359.1
FLUOMETURON	TX	0.79	PRE	1.	BROADLEAVES(2)	1.5	76.92	60.767
						U.S. Totals >		3577.2
GLYPHOSATE	AL	1.	PPF	1.	BROADLEAVES AND GRASSES(2)	3.	10.08	10.08
GLYPHOSATE	AR	0.38	PPF	1.	BROADLEAVES AND GRASSES(2)	1.	5.35	2.033
GLYPHOSATE	AR	0.38	SPT	1.5	GRASSES(1)	4.	21.4	12.198
GLYPHOSATE	AZ	1.5	SPT	1.	GRASS(1), CYPERUS(2), BROADLEAF WEEDS(1)	10.	41.6	62.4
GLYPHOSATE	CA37	2.75	PH	1.	SORGHUM(1), CYNODON(1)	6.	65.1	179.02
GLYPHOSATE	CA37	0.75	PPF	1.	WINTER GRASSES(1), BROADLEAVES(2)	25.	271.25	203.44
GLYPHOSATE	CA37	1.	SPT	2.	PERENNIAL GRASSES(1), CONVOLVULUS(2)	6.	65.1	130.2
GLYPHOSATE	LA	1.25	PPF	1.	GRASSES AND BROADLEAVES(1)	20.	128.4	160.5
GLYPHOSATE	MO	0.94	PPF	1.	GRASSES(1), BROADLEAVES(2)	3.	5.55	5.217

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
GLYPHOSATE	MO	0.8	RW	1.	GRASSES(3)	2.	3.7	2.96
GLYPHOSATE	MO	1.	SPT	1.	GRASSES(1), BROADLEAVES(3)	4.	7.4	7.4
GLYPHOSATE	MS	0.84	PPF	1.	BROADLEAVES AND GRASSES(2)	0.5	5.365	4.5066
GLYPHOSATE	MS	0.04	SPT	1.	GRASSES(1)	1.	10.73	0.4292
GLYPHOSATE	OK	0.5	SPT	2.	SILVERLEAF NIGHTSHADE(3)	2.	8.3	8.3
GLYPHOSATE	TN	1.	PPF	1.	GRASSES(1), BROADLEAVES(1)	2.	7.98	7.98
GLYPHOSATE	TX	1.	PPF	1.	GRASSES AND BROADLEAVES(1)	1.5	76.92	76.92
GLYPHOSATE	TX	0.5	SPT	1.2	GRASSES AND BROADLEAVES(1)	25.	1282.	769.2
						U.S. Totals >		1642.8
LACTOFEN	MS	0.2	POE	1.	BROADLEAVES(2)	3.	32.19	6.438
LACTOFEN	TN	0.15	POE	1.	IPOMOEA(2), GRASSES(1)	5.	19.95	2.9925
						U.S. Totals >		9.4305
LINURON	AL	0.5	POE	1.	BROADLEAVES AND GRASSES(2)	3.	10.08	5.04
LINURON	AR	1.	LB	1.	BROADLEAVES AND GRASSES(2)	5.	26.75	26.75
LINURON	MO	0.62	POE	1.	BROADLEAVES(3)	2.	3.7	2.294
LINURON	MS	0.85	LB	1.	BROADLEAVES AND GRASSES(2)	11.	118.03	100.33
LINURON	SC	1.	LB	1.	BROADLEAVES(2)	5.	6.1	6.1
LINURON	TN	1.	LB	1.	BROADLEAVES(1), GRASSES(1)	1.	3.99	3.99
						U.S. Totals >		144.5
METHAZOLE	AL	0.4	POE	1.	BROADLEAVES(2)	20.	67.2	26.88

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
METHAZOLE	AR	0.75	POE	1.5	BROADLEAVES AND GRASSES(2)	45.	240.75	270.84
METHAZOLE	FL	0.4	POE	1.	BROADLEAVES(3)	5.	1.25	0.5
METHAZOLE	GA	0.3	POE	1.	BROADLEAVES(1)	20.	50.2	15.06
METHAZOLE	LA	0.4	POE	1.	BROADLEAVES(2)	10.	64.2	25.68
METHAZOLE	MO	1.	POE	2.	BROADLEAVES(2)	30.	55.5	111.
METHAZOLE	MS	0.25	POE	1.	BROADLEAVES(2)	3.	32.19	8.0475
METHAZOLE	NC	0.33	POE	1.	BROADLEAVES(1)	25.	24.5	8.085
METHAZOLE	SC	0.32	POE	1.	BROADLEAVES(2)	20.	24.4	7.808
						U.S. Totals >		473.9
METOLACHLOR	AR	1.62	PRE	1.	BROADLEAVES AND GRASSES(3)	5.	26.75	43.335
METOLACHLOR	AZ	2.	POE	1.	GRASS(1), Y.NUTSEDGE(1), BROADLEAF WEEDS(2), P.NUTSEDGE(4)	5.	20.8	41.6
METOLACHLOR	LA	1.5	PRE	1.	GRASSES(2)	5.	32.1	48.15
METOLACHLOR	MO	1.62	PRE	1.	GRASSES(1)	4.	7.4	11.988
METOLACHLOR	MS	0.88	PRE	1.	GRASSES(1)	6.	64.38	56.654
METOLACHLOR	TN	0.75	PRE	1.	GRASSES(1), CYPERUS(2)	10.	39.9	29.925
METOLACHLOR	TX	1.2	PRE	1.	GRASSES(2), CYPERUS(3)	1.	51.28	61.536
						U.S. Totals >		293.19
MSMA	AL	1.	POE	2.	GRASSES AND NUTSEDGE(2)	75.	252.	504.
MSMA	AR	2.	POE	3.	BROADLEAVES AND GRASSES(2)	90.	481.5	2889.
MSMA	AZ	2.	POE	1.	GRASS(3), CYPERUS(2), BROADLEAF WEEDS(2)	5.	20.8	41.6
MSMA	CA37	1.75	POE	2.	CYPERUS(2), SOLANUM(3)	3.	32.55	113.93

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
MSMA	FL	1.2	POE	1.	BROADLEAVES(3), GRASSES(2), CYPERUS(3.5)	70.	17.5	21.
MSMA	GA	1.1	POE	2.	BROADLEAVES(2), CYPERUS(2)	85.	213.35	469.37
MSMA	MO	2.1	POE	2.	XANTHIUM(2), GRASSES(3)	45.	83.25	349.65
MSMA	MS	0.67	POE	2.	BROADLEAVES AND GRASSES(2)	85.	912.05	1222.1
MSMA	MS	2.	PPF	1.	BROADLEAVES(3)	0.4	4.292	8.584
MSMA	MS	0.12	SPT	1.	BROADLEAVES AND GRASSES(2)	4.	42.92	5.1504
MSMA	NC	0.7	POE	1.5	BROADLEAVES(3)	40.	39.2	41.16
MSMA	OK	1.5	POE	1.	BROADLEAVES(4)	0.5	2.075	3.1125
MSMA	SC	1.4	POE	1.5	BROADLEAVES(4), CYPERUS(2)	40.	48.8	102.48
MSMA	SC	0.7	POE	1.	BROADLEAVES(4), CYPERUS(4)	7.	8.54	5.978
MSMA	SC	1.4	POE	1.	BROADLEAVES(4), CYPERUS(2)	58.	70.76	99.064
MSMA	TN	1.	POE	1.	GRASSES(2), BROADLEAVES(2)	55.	219.45	219.45
MSMA	TX	1.4	POE	1.	GRASSES(2), CYPERUS(4)	6.	307.68	430.75
						U.S. Totals >		6526.4
NORFLURAZON	AL	1.	PPI	1.	BROADLEAVES(3), GRASSES(2)	28.	94.08	94.08
NORFLURAZON	AL	0.5	PRE	1.	BROADLEAVES(3), GRASSES(2)	27.	90.72	45.36
NORFLURAZON	AR	1.5	PPI	1.	BROADLEAVES AND GRASSES(2)	30.	160.5	240.75
NORFLURAZON	AR	1.5	PRE	1.	BROADLEAVES AND GRASSES(2)	20.	107.	160.5
NORFLURAZON	FL	1.5	PPI	1.	GRASSES(1), BROADLEAVES(3)	10.	2.5	3.75
NORFLURAZON	FL	1.4	PRE	1.	GRASSES(1), BROADLEAVES(3)	20.	5.	7.
NORFLURAZON	GA	0.9	PPI	1.	BROADLEAVES(2), CYPERUS(3)	15.	37.65	33.885
NORFLURAZON	GA	0.5	PRE	1.	BROADLEAVES(2)	30.	75.3	37.65

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
NORFLURAZON	LA	1.1	PRE	1.	BROADLEAVES(2)	40.	256.8	282.48
NORFLURAZON	MO	1.5	PPI	1.	BROADLEAVES(3)	60.	111.	166.5
NORFLURAZON	MS	0.75	PPI	1.	BROADLEAVES AND GRASSES(1)	29.	311.17	233.38
NORFLURAZON	MS	0.38	PRE	1.	BROADLEAVES AND GRASSES(1)	49.	525.77	199.79
NORFLURAZON	NC	1.1	PPI	1.	GRASSES(2), CYPERUS(3), SIDA(1)	25.	24.5	26.95
NORFLURAZON	SC	1.	PPI	1.	GRASSES(3), CYPERUS(3)	7.	8.54	8.54
NORFLURAZON	SC	0.4	PRE	1.	BROADLEAVES(4), GRASSES(3)	10.	12.2	4.88
NORFLURAZON	TN	0.4	PPI	1.	BROADLEAVES(3), GRASSES(4), SIDA(1)	8.	31.92	12.768
NORFLURAZON	TN	0.75	PRE	1.	BROADLEAVES(3), GRASSES(4), SIDA(1)	7.	27.93	20.948
						U.S. Totals >		1579.2
OXYFLUORFEN	AL	0.25	POE	1.	BROADLEAVES(2)	1.	3.36	0.84
OXYFLUORFEN	AR	0.25	POE	1.	BROADLEAVES(2)	5.	26.75	6.6875
OXYFLUORFEN	AZ	0.25	POE	1.	BROADLEAVES(1)	2.	8.32	2.08
OXYFLUORFEN	CA37	0.5	LB	1.	IPOMOEA(1), PHYSALIS(1), AMARANTHUS(1)	10.	108.5	54.25
OXYFLUORFEN	CA37	0.35	PPF	1.	WINTER BROADLEAVES(2), MALVA(1)	6.	65.1	22.785
OXYFLUORFEN	FL	0.15	POE	1.	BROADLEAVES(2)	5.	1.25	0.1875
OXYFLUORFEN	MO	0.37	POE	1.	BROADLEAVES(1)	3.	5.55	2.0535
OXYFLUORFEN	MS	0.14	POE	1.	BROADLEAVES(2)	0.5	5.365	0.7511
OXYFLUORFEN	NC	0.12	POE	1.	BROADLEAVES(1)	1.	0.98	0.1176
						U.S. Totals >		89.752
PARAQUAT	AL	0.5	PPF	1.	BROADLEAVES AND GRASSES(3)	2.	6.72	3.36

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PARAQUAT	AR	0.7	PPF	1.	BROADLEAVES AND GRASSES(3)	3.	16.05	11.235
PARAQUAT	CA37	0.25	PPF	1.	WINTER GRASSES(1), BROADLEAVES(2)	3.	32.55	8.1375
PARAQUAT	LA	0.7	PPF	1.	GRASSES AND BROADLEAVES(2)	20.	128.4	89.88
PARAQUAT	MO	0.75	PPF	1.	BROADLEAVES(2), GRASSES(2)	1.	1.85	1.3875
PARAQUAT	MS	0.75	PPF	2.	BROADLEAVES AND GRASSES(3)	0.8	8.584	12.876
PARAQUAT	TN	0.4	PPF	1.	GRASSES(2), BROADLEAVES(2)	2.	7.98	3.192
						U.S. Totals >		130.07
PENDIMETHALIN	AL	0.75	PPI	1.	GRASSES(1)	38.	127.68	95.76
PENDIMETHALIN	AR	1.	PPI	1.	GRASSES(1), AMARANTHUS(1)	35.	187.25	187.25
PENDIMETHALIN	AZ	0.75	PPI	1.	ANNUAL GRASS(1), AMARANTHUS(4)	40.	166.4	124.8
PENDIMETHALIN	CA37	0.87	PPI	1.	ANNUAL GRASSES AND AMARANTHUS(2)	30.	325.5	283.18
PENDIMETHALIN	FL	0.75	PPI	1.	GRASSES(1), RICHARDIA(1), AMARANTHUS(1)	50.	12.5	9.375
PENDIMETHALIN	GA	0.95	PPI	1.	GRASSES AND SMALL-SEEDED BROADLEAVES(1)	40.	100.4	95.38
PENDIMETHALIN	GA	0.3	PRE	1.	GRASSES AND SMALL-SEEDED BROADLEAVES(2)	10.	25.1	7.53
PENDIMETHALIN	LA	1.	PPI	1.	GRASSES(1)	30.	192.6	192.6
PENDIMETHALIN	MO	1.	PPI	1.	GRASSES(1)	30.	55.5	55.5
PENDIMETHALIN	MS	1.	PPI	1.	GRASSES(1)	39.	418.47	418.47
PENDIMETHALIN	MS	0.94	PRE	1.	GRASSES(3)	0.5	5.365	5.0431
PENDIMETHALIN	NC	0.75	PPI	1.	GRASSES(1), AMARANTHUS(1)	45.	44.1	33.075
PENDIMETHALIN	OK	0.75	PPI	1.	ANNUAL GRASSES AND BROADLEAFS(2)	35.	145.25	108.94
PENDIMETHALIN	SC	0.75	PPI	1.	GRASSES(1), AMARANTHUS(2)	38.	46.36	34.77
PENDIMETHALIN	TN	0.6	PPI	1.	GRASSES(1), AMARANTHUS(1)	15.	59.85	35.91

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PENDIMETHALIN	TN	0.4	PRE	1.	GRASSES(1), AMARANTHUS(1)	15.	59.85	23.94
PENDIMETHALIN	TX	0.85	PPI	1.	GRASSES(1), AMARANTHUS(1)	19.	974.32	828.17
PENDIMETHALIN	TX	0.6	PRE	1.	GRASSES(2), AMARANTHUS(2)	3.	153.84	92.304
						U.S. Totals >		2632.
PROMETRYN	AL	0.5	POE	1.	GRASSES(2), BROADLEAVES(2)	6.	20.16	10.08
PROMETRYN	AR	0.5	POE	1.5	BROADLEAVES(2)	25.	133.75	100.31
PROMETRYN	AZ	1.6	LB	1.	AMARANTHUS(1),PHYSALIS(1),IPOMOEA(2)	75.	312.	499.2
PROMETRYN	AZ	1.6	PPI	1.	AMARANTHUS(1),PHYSALIS(1),IPOMOEA(2)	70.	291.2	465.92
PROMETRYN	AZ	1.6	PRE	1.	AMARANTHUS(1),PHYSALIS(1),IPOMOEA(2)	30.	124.8	199.68
PROMETRYN	CA37	1.6	LB	1.	IPOMOEA(2), PHYSALIS(1), AMARANTHUS(1)	5.	54.25	86.8
PROMETRYN	CA37	2.25	PPI	1.	SOLANUM(2)	15.	162.75	366.19
PROMETRYN	FL	0.3	POE	1.	BROADLEAVES(2)	10.	2.5	0.75
PROMETRYN	LA	0.24	POE	1.	BROADLEAVES(2)	20.	128.4	30.816
PROMETRYN	MO	1.4	LB	1.	BROADLEAVES(3)	1.	1.85	2.59
PROMETRYN	MO	0.57	POE	1.	BROADLEAVES(2)	1.	1.85	1.0545
PROMETRYN	MS	0.2	POE	1.	BROADLEAVES(2)	22.	236.06	47.212
PROMETRYN	OK	0.5	POE	1.	MORNINGGLORY(2)	0.5	2.075	1.0375
PROMETRYN	OK	0.65	PRE	1.	MORNINGGLORY(2)	1.5	6.225	4.0462
PROMETRYN	SC	0.2	POE	1.	BROADLEAVES(2)	3.	3.66	0.732
PROMETRYN	TN	0.5	POE	1.	GRASSES(1), BROADLEAVES(2)	5.	19.95	9.975
PROMETRYN	TX	0.23	POE	1.	BROADLEAVES(2)	2.	102.56	23.589
PROMETRYN	TX	0.7	PRE	1.	BROADLEAVES(2)	16.	820.48	574.34

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
						U.S. Totals >		2424.3
SETHOXYDIM	AL	0.25	SPT	1.	GRASSES(1)	15.	50.4	12.6
SETHOXYDIM	AR	0.25	POE	2.	GRASSES(1)	7.	37.45	18.725
SETHOXYDIM	AR	0.25	SPT	2.	GRASSES(1)	8.	42.8	21.4
SETHOXYDIM	AZ	0.5	SPT	2.	GRASS(1), CYPERUS(5), BROADLEAF WEEDS(5)	5.	20.8	20.8
SETHOXYDIM	CA37	0.5	POE	1.	ANNUAL GRASSES(2)	2.	21.7	10.85
SETHOXYDIM	FL	0.25	POE	1.	GRASSES(1)	4.	1.	0.25
SETHOXYDIM	GA	0.15	POE	1.	GRASSES(1)	10.	25.1	3.765
SETHOXYDIM	LA	0.15	POE	1.	GRASSES(1)	25.	160.5	24.075
SETHOXYDIM	MO	0.28	POE	1.	GRASSES(2)	2.	3.7	1.036
SETHOXYDIM	MS	0.2	SPT	1.	GRASSES(1)	20.	214.6	42.92
SETHOXYDIM	NC	0.23	POE	1.2	GRASSES(1)	20.	19.6	5.4096
SETHOXYDIM	OK	0.17	POE	1.	GRASSES(2)	2.	8.3	1.411
SETHOXYDIM	SC	0.12	POE	1.	GRASSES(1)	6.	7.32	0.8784
SETHOXYDIM	TN	0.1	POE	1.	GRASSES(1)	30.	119.7	11.97
SETHOXYDIM	TX	0.15	POE	1.	GRASSES(1)	2.	102.56	15.384
SETHOXYDIM	TX	0.18	SPT	1.	GRASSES(1)	4.	205.12	36.922
						U.S. Totals >		228.4
TRIFLURALIN	AL	0.5	PPI	1.	GRASSES(1)	60.	201.6	100.8
TRIFLURALIN	AR	0.75	PPI	1.	GRASSES(1)	35.	187.25	140.44
TRIFLURALIN	AZ	0.75	PPI	1.	ANNUAL GRASS(1), CYPERUS(5), BROADLEAF WEEDS(2)	40.	166.4	124.8

TABLE 3. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Target pests and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
TRIFLURALIN	CA37	0.75	PPI	1.	ANNUAL GRASSES(1), AMARANTHUS(1)	50.	542.5	406.88
TRIFLURALIN	FL	0.62	PPI	1.	GRASSES(1), RICHARDIA(1), AMARANTHUS(1)	40.	10.	6.2
TRIFLURALIN	GA	0.9	PPI	1.	GRASSES AND SMALL-SEEDED BROADLEAVES(1)	60.	150.6	135.54
TRIFLURALIN	LA	1.	PPI	1.	GRASSES(1)	40.	256.8	256.8
TRIFLURALIN	MO	0.75	PPI	1.	GRASSES(1), BROADLEAVES(2)	60.	111.	83.25
TRIFLURALIN	MS	0.87	PPI	1.	GRASSES(1)	44.	472.12	410.74
TRIFLURALIN	NC	0.75	PPI	1.	GRASSES(1), AMARANTHUS(1)	45.	44.1	33.075
TRIFLURALIN	OK	0.75	PPI	1.	ANNUAL GRASSES AND BROADLEAFS(1)	60.	249.	186.75
TRIFLURALIN	SC	1.	PPI	1.	GRASSES(3)	7.	8.54	8.54
TRIFLURALIN	SC	0.75	PPI	1.	GRASSES(1), AMARANTHUS(2)	55.	67.1	50.325
TRIFLURALIN	TN	0.6	PPI	1.	GRASSES(1), AMARANTHUS(1)	60.	239.4	143.64
TRIFLURALIN	TX	0.8	PPI	1.	GRASSES(1), AMARANTHUS(1)	75.	3846.	3076.8
						U.S. Totals >		5164.6

* Pesticide timing: LB = lay-by, PH = preharvest, POE = post-emergence, PPF = preplant-foliar, PPI = preplant-incorporated, PRE = preemergence, RW = ropewick, and SPT = spot treatment.
** Pesticide efficacy is on a 1 to 5 scale; 1 is very good and 5 is very poor.

TABLE 4. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Use categories and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ARSENIC ACID	GA	4.4	FL	1.	DESICCANT(2)	5.	12.55	55.22
ARSENIC ACID	LA	4.	FL	1.	DESICCANT(2)	1.	6.42	25.68
ARSENIC ACID	OK	3.7	FL	1.	DESICCANT(1)	30.	124.5	460.65
ARSENIC ACID	TX	4.4	FL	1.	DESICCANT(2)	25.	1282.	5640.8
						U.S. Totals >		6182.4
DIMETHIPIN	AL	0.25	FL	1.	DEFOLIANT(4)	5.	16.8	4.2
DIMETHIPIN	AR	0.27	FL	1.5	DEFOLIANT(3)	5.	26.75	10.834
DIMETHIPIN	CA	0.3	FL	1.	DESICCANT(4)	2.	24.98	7.494
DIMETHIPIN	FL	0.27	FL	1.	DEFOLIANT(4)	10.	2.5	0.675
DIMETHIPIN	GA	0.3	FL	1.	DEFOLIANT(3)	5.	12.55	3.765
DIMETHIPIN	LA	0.27	FL	1.	DEFOLIANT(3)	15.	96.3	26.001
DIMETHIPIN	MO	0.3	FL	1.	DESICCANT(?)	10.	18.5	5.55
DIMETHIPIN	MS	0.5	FL	1.	DEFOLIANT(2)	15.	160.95	80.475
DIMETHIPIN	NC	0.31	FL	1.	DEFOLIANT(3)	10.	9.8	3.038
DIMETHIPIN	SC	0.31	FL	1.	DEFOLIANT(2)	5.	6.1	1.891
DIMETHIPIN	TN	0.31	FL	1.	DEFOLIANT(2)	5.	19.95	6.1845
DIMETHIPIN	TX	0.3	FL	1.	DEFOLIANT(4)	1.	51.28	15.384
						U.S. Totals >		165.49
ENDOTHALL	AL	0.095	FL	1.	DESICCANT(4)	5.	16.8	1.596
ENDOTHALL	CA	0.08	FL	1.	DESICCANT(4)	10.	124.9	9.992
ENDOTHALL	FL	0.08	FL	1.	DEFOLIANT/DESSICANT(3)	20.	5.	0.4

TABLE 4. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Use categories and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
ENDOTHALL	GA	0.09	FL	1.	DESICCANT(4)	1.	2.51	0.2259
ENDOTHALL	LA	0.065	FL	1.	DEFOLIANT ADDITIVE(3)	5.	32.1	2.0865
ENDOTHALL	MS	0.1	FL	1.	DESICCANT(4)	1.	10.73	1.073
ENDOTHALL	TX	0.09	FL	1.	DEFOLIANT(3)	5.	256.4	23.076
						U.S. Totals >		38.449
ETHEPHON	AL	1.	FL	1.5	PLANT GROWTH REGULATOR - BOLL OPENING(2)	25.	84.	126.
ETHEPHON	AR	1.5	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(1)	25.	133.75	200.63
ETHEPHON	AR	0.37	FL	1.	PLANT GROWTH REGULATOR - DEFOLIATION AID(1)	40.	214.	79.18
ETHEPHON	AZ	1.	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(2)	20.	83.2	83.2
ETHEPHON	CA	1.12	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING OR PREP DEFOLIATION(1)	40.	499.6	559.55
ETHEPHON	FL	1.	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(3)	20.	5.	5.
ETHEPHON	GA	1.5	FL	1.	PLANT GROWTH REGULATOR(2.5)	60.	150.6	225.9
ETHEPHON	LA	1.5	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(2)	35.	224.7	337.05
ETHEPHON	MO	1.5	FL	1.	PLANT GROWTH REGULATOR(4)	40.	74.	111.
ETHEPHON	MS	1.	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(2)	60.	643.8	643.8
ETHEPHON	NC	1.5	FL	1.	PLANT GROWTH REGULATOR(2)	40.	39.2	58.8
ETHEPHON	OK	1.5	FL	1.	PLANT GROWTH REGULATOR(1)	20.	83.	124.5
ETHEPHON	SC	1.	FL	1.	PLANT GROWTH REGULATOR(2.5)	10.	12.2	12.2
ETHEPHON	TN	1.5	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(2)	10.	39.9	59.85
ETHEPHON	TX	1.	FL	1.	PLANT GROWTH REGULATOR - BOLL OPENING(3)	10.	512.8	512.8
						U.S. Totals >		3139.5

TABLE 4. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Use categories and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
MEPIQUAT CHLORIDE	AL	0.013	FE	2.5	PLANT GROWTH REGULATOR(2)	40.	134.4	4.368
MEPIQUAT CHLORIDE	AR	0.011	FE	2.5	PLANT GROWTH REGULATOR - STALK SIZE CONTROL(4)	75.	401.25	11.034
MEPIQUAT CHLORIDE	AZ	0.027	FL	1.5	PLANT GROWTH REGULATOR(3)	15.	62.4	2.5272
MEPIQUAT CHLORIDE	CA	0.02	FL	1.5	PLANT GROWTH REGULATOR(2)	50.	624.5	18.735
MEPIQUAT CHLORIDE	FL	0.009	FE	3.	PLANT GROWTH REGULATOR(3)	20.	5.	0.135
MEPIQUAT CHLORIDE	GA	0.013	FL	2.5	PLANT GROWTH REGULATOR(2.5)	40.	100.4	3.263
MEPIQUAT CHLORIDE	LA	0.008	FE	3.	PLANT GROWTH REGULATOR - SIZE MGT.(3)	20.	128.4	3.0816
MEPIQUAT CHLORIDE	MO	0.012	FE	3.	PLANT GROWTH REGULATOR(4)	60.	111.	3.996
MEPIQUAT CHLORIDE	MS	0.011	FEL	3.	PLANT GROWTH REGULATOR(1)	70.	751.1	24.786
MEPIQUAT CHLORIDE	NC	0.02	FE	1.5	PLANT GROWTH REGULATOR(1)	50.	49.	1.47
MEPIQUAT CHLORIDE	OK	0.009	FL	2.5	PLANT GROWTH REGULATOR(2)	20.	83.	1.8675
MEPIQUAT CHLORIDE	SC	0.015	FE	1.5	PLANT GROWTH REGULATOR(1.5)	20.	24.4	0.549
MEPIQUAT CHLORIDE	TN	0.017	FE	2.	PLANT GROWTH REGULATOR(2)	30.	119.7	4.0698
MEPIQUAT CHLORIDE	TX	0.011	FL	3.	PLANT GROWTH REGULATOR(3)	15.	769.2	25.384
						U.S. Totals >		105.27
PARAQUAT DICHLORIDE	AL	0.07	FL	1.	DESICCANT(4)	5.	16.8	1.176
PARAQUAT DICHLORIDE	AR	0.08	FL	1.	DEFOLIANT/DESICCANT(3)	10.	53.5	4.28
PARAQUAT DICHLORIDE	CA	0.12	FL	1.5	DESICCANT(3)	30.	374.7	67.446
PARAQUAT DICHLORIDE	FL	0.12	FL	1.	DESICCANT(4)	4.	1.	0.12
PARAQUAT DICHLORIDE	GA	0.27	FL	1.	DESICCANT(2)	10.	25.1	6.777
PARAQUAT DICHLORIDE	LA	0.16	FL	1.	DEFOLIANT ADDITIVE(3), DEFOLIANT-FL & WEED DESICCANT(3)	15.	96.3	15.408
PARAQUAT DICHLORIDE	MO	0.7	FL	1.	DESICCANT(?)	5.	9.25	6.475

TABLE 4. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Use categories and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
PARAQUAT DICHLORIDE	MS	0.27	FLS	1.	DESICCANT(2)	10.	107.3	28.971
PARAQUAT DICHLORIDE	OK	0.27	FL	1.	DESICCANT(2)	20.	83.	22.41
PARAQUAT DICHLORIDE	TN	0.05	FL	1.	DESICCANT(3)	10.	39.9	1.995
PARAQUAT DICHLORIDE	TX	0.27	FL	1.5	DESICCANT(4)	25.	1282.	519.21
						U.S. Totals >		674.27
PHOSPHOROTRITHIOATE	AL	1.25	FL	1.	DEFOLIANT(2)	50.	168.	210.
PHOSPHOROTRITHIOATE	AR	1.12	FL	1.5	DEFOLIANT(1)	85.	454.75	763.98
PHOSPHOROTRITHIOATE	CA	1.25	FL	1.5	DEFOLIANT(2)	50.	624.5	1170.9
PHOSPHOROTRITHIOATE	FL	1.2	FL	1.5	DEFOLIANT(2)	70.	17.5	31.5
PHOSPHOROTRITHIOATE	GA	1.25	FL	1.	DEFOLIANT(2)	85.	213.35	266.69
PHOSPHOROTRITHIOATE	LA	1.	FL	1.	DEFOLIANT(2)	50.	321.	321.
PHOSPHOROTRITHIOATE	MO	1.37	FL	1.	DEFOLIANT(?)	50.	92.5	126.72
PHOSPHOROTRITHIOATE	MS	1.25	FL	1.5	DEFOLIANT(1)	50.	536.5	1005.9
PHOSPHOROTRITHIOATE	NC	1.12	FL	1.	DEFOLIANT(2)	75.	73.5	82.32
PHOSPHOROTRITHIOATE	OK	1.12	FL	1.5	DEFOLIANT(2)	25.	103.75	174.3
PHOSPHOROTRITHIOATE	SC	1.12	FL	1.5	DEFOLIANT(1.5)	90.	109.8	184.46
PHOSPHOROTRITHIOATE	TN	1.5	FL	1.	DEFOLIANT(2)	20.	79.8	119.7
PHOSPHOROTRITHIOATE	TX	1.25	FL	1.	DEFOLIANT(2)	25.	1282.	1602.5
						U.S. Totals >		6060.1
SODIUM CHLORATE	AL	3.5	FL	1.	DEFOLIANT(3)	10.	33.6	117.6
SODIUM CHLORATE	AR	3.	FL	1.	DEFOLIANT(2)	4.	21.4	64.2

TABLE 4. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of appli-cations	Use categories and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
SODIUM CHLORATE	CA	5.	FL	1.5	DEFOLIANT(2)	75.	936.75	7025.6
SODIUM CHLORATE	FL	3.5	FL	1.	DEFOLIANT(2)	3.	0.75	2.625
SODIUM CHLORATE	GA	3.5	FL	1.	DEFOLIANT(3)	10.	25.1	87.85
SODIUM CHLORATE	LA	3.5	FL	1.	DEFOLIANT(3)	25.	160.5	561.75
SODIUM CHLORATE	MO	3.5	FL	1.	DEFOLIANT(?)	10.	18.5	64.75
SODIUM CHLORATE	MS	4.	FLS	1.	DESICCANT/DEFOLIANT(3)	5.	53.65	214.6
SODIUM CHLORATE	TX	3.5	FL	1.	DEFOLIANT(2)	10.	512.8	1794.8
						U.S. Totals >		9933.8
THIDIAZURON	AL	0.12	FL	1.	DEFOLIANT(2)	35.	117.6	14.112
THIDIAZURON	AR	0.17	FL	1.5	DEFOLIANT & REGROWTH SUPPRESSION(1)	40.	214.	54.57
THIDIAZURON	AZ	0.05	FL	1.	DEFOLIANT(2.5)	5.	20.8	1.04
THIDIAZURON	CA	0.15	FL	1.	DEFOLIANT(4)	2.	24.98	3.747
THIDIAZURON	FL	0.15	FL	1.	DEFOLIANT(2)	15.	3.75	0.5625
THIDIAZURON	GA	0.15	FL	1.	DEFOLIANT(2)	60.	150.6	22.59
THIDIAZURON	LA	0.09	FL	1.	DEFOLIANT(2)	25.	160.5	14.445
THIDIAZURON	MO	0.1	FL	1.	DEFOLIANT(?)	10.	18.5	1.85
THIDIAZURON	MS	0.07	FL	1.	DEFOLIANT(1)	60.	643.8	45.066
THIDIAZURON	NC	0.07	FL	1.	DEFOLIANT(2)	50.	49.	3.43
THIDIAZURON	SC	0.15	FL	1.	DEFOLIANT(2)	10.	12.2	1.83
THIDIAZURON	TN	0.2	FL	1.	DEFOLIANT(3)	3.	11.97	2.394
THIDIAZURON	TX	0.07	FL	1.5	DEFOLIANT(2)	20.	1025.6	107.69

TABLE 4. Pesticide Use Patterns, Target Pests, Acreage Treated, and Pounds Pesticides Used
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

Pesticide	State	Treatment rate (lb ai/A)	Timing* of treatment	Number of applications	Use categories and pesticide efficacy**	Percentage of acreage treated	Treated acres (thousands)	Pesticide use-lb ai (thousands)
						U.S. Totals >		273.32

* Pesticide timing: FE = foliar-early, FL = foliar-late, FEL = foliar-early & late, FLS = foliar-late & spot treatment, ST = spot treatment.
** Pesticide efficacy is on a 1 to 5 scale; 1 is very good and 5 is very poor.

TABLE 5. Non-pesticide Control Practices for Cotton Pests
Disease Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
COVER CROPS	LA	NEMATODES (ROOTKNOT & RENIFORM)	2.	13.
		U.S. TOTALS =>	0.12	13.
CROP ROTATION	AL	NEMATODES AND FUNGAL WILTS	10.	34.
CROP ROTATION	AR	NEMATODES	10.	54.
CROP ROTATION	AZ	PHYMATOTRICHUM ROOT ROT	25.	104.
CROP ROTATION	CA	VERTICILLIUM WILT, SEEDLING DISEASES	75.	937.
CROP ROTATION	FL	FUSARIUM WILT, ROOTKNOT NEMATODE	50.	13.
CROP ROTATION	GA	ROOTKNOT NEMATODE	40.	100.
CROP ROTATION	LA	WILTS(VERT.&FUS.),NEMATODES(RN&RENIFORM)	5.	32.
CROP ROTATION	MO	LEAF DISEASES (CERCOSPORA, ASCOCHYTA)	20.	37.
CROP ROTATION	MS	NEMATODES, WILTS	5.	54.
CROP ROTATION	NC	DISEASES AND NEMATODES	65.	64.
CROP ROTATION	NM	VERTICILLIUM WILT	70.	58.
CROP ROTATION	OK	SEEDLING DISEASES, WILTS, NEMATODES	3.	12.
CROP ROTATION	SC	WILTS, NEMATODES	10.	12.
CROP ROTATION	TN	NEMATODES, WILTS	20.	80.
CROP ROTATION	TX	NEMATODES, WILTS, COTTON ROOT ROT	35.	1795.
CROP ROTATION	VA	NEMATODES, SEEDLING DISEASES	90.	2.
		U.S. TOTALS =>	30.9	3386.
CULTIVATION - BURY RESIDUE	AL	SEEDLING DISEASES	20.	67.
CULTIVATION - BURY RESIDUE	AR	SEEDLING DISEASES & NEMATODES	60.	321.

TABLE 5. Non-pesticide Control Practices for Cotton Pests
Disease Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
CULTIVATION - BURY RESIDUE	AZ	CRUMPLE LEAF VIRUS	100.	416.
CULTIVATION - BURY RESIDUE	FL	SEEDLING DISEASES	90.	23.
CULTIVATION - BURY RESIDUE	GA	SEEDLING DISEASES	15.	38.
CULTIVATION - BURY RESIDUE	LA	SEEDLING DISEASES	90.	578.
CULTIVATION - BURY RESIDUE	MS	SEEDLING DISEASES, FOLIAR DISEASES	40.	429.
CULTIVATION - BURY RESIDUE	NC	DISEASES AND NEMATODES	79.	77.
CULTIVATION - BURY RESIDUE	NM	BACTERIAL BLIGHT	100.	83.
CULTIVATION - BURY RESIDUE	OK	SEEDLING DISEASES	20.	83.
CULTIVATION - BURY RESIDUE	TN	SEEDLING DISEASES, FOLIAR DISEASES	10.	40.
CULTIVATION - BURY RESIDUE	TX	SEEDLING/FOLIAR DISEASES,COTTON ROOT ROT	30.	1538.
CULTIVATION - BURY RESIDUE	VA	SEEDLING DISEASES	20.	0.
		U.S. TOTALS =>	33.7	3693.
DELAYED PLANTING	AL	SEEDLING DISEASES	5.	17.
DELAYED PLANTING	AR	SEEDLING DISEASES	10.	54.
DELAYED PLANTING	CA	SEEDLING DISEASES	80.	999.
DELAYED PLANTING	GA	SEEDLING DISEASES	80.	201.
DELAYED PLANTING	LA	SEEDLING DISEASES	15.	96.
DELAYED PLANTING	MS	SEEDLING DISEASES	10.	107.
DELAYED PLANTING	NC	DISEASES AND NEMATODES	19.	19.
DELAYED PLANTING	OK	SEEDLING DISEASES	20.	83.
DELAYED PLANTING	SC	SEEDLING DISEASES (PYTHIUM)	20.	24.
DELAYED PLANTING	TN	SEEDLING DISEASES	25.	100.

TABLE 5. Non-pesticide Control Practices for Cotton Pests
Disease Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
DELAYED PLANTING	TX	SEEDLING DISEASES	20.	1026.
		U.S. TOTALS =>	24.9	2725.
ERADICATION OF GRAMA GRASS	AZ	COTTON RUST	3.	12.
ERADICATION OF GRAMA GRASS	NM	COTTON RUST	5.	4.
		U.S. TOTALS =>	0.15	17.
FALLOW	AL	NEMATODES	5.	17.
FALLOW	AR	NEMATODES	2.	11.
FALLOW	FL	SEEDLING DISEASES, ROOTKNOT NEMATODE	5.	1.
FALLOW	LA	NEMATODES (ROOTKNOT & RENIFORM)	1.	6.
FALLOW	MS	NEMATODES	3.	32.
FALLOW	NC	DISEASES AND NEMATODES	4.	4.
FALLOW	SC	NEMATODES, SEEDLING DISEASES	1.	1.
		U.S. TOTALS =>	0.66	73.
IRRIGATION MANAGEMENT	AZ	ASPERGILLUS FLAVUS (AFLATOXIN)	40.	166.
IRRIGATION MANAGEMENT	CA	VERTICILLIUM WILT	10.	125.
		U.S. TOTALS =>	2.66	291.
LOWER PLANT POPULATION	MO	BOLL ROT	50.	93.
		U.S. TOTALS =>	0.84	93.

TABLE 5. Non-pesticide Control Practices for Cotton Pests
Disease Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
MONITOR N FERTILIZATION	MO	BOLL ROT	50.	93.
		U.S. TOTALS =>	0.84	93.
RESISTANT CULTIVARS	AL	FUSARIUM AND VERTICILLIUM WILTS	70.	235.
RESISTANT CULTIVARS	AR	FUSARIUM WILT	80.	428.
RESISTANT CULTIVARS	AZ	VERTICILLIUM WILT, COTTON RUST	75.	312.
RESISTANT CULTIVARS	CA	VERTICILLIUM WILT	50.	625.
RESISTANT CULTIVARS	FL	FUSARIUM WILT, ROOTKNOT NEMATODE	80.	20.
RESISTANT CULTIVARS	GA	FUSARIUM WILT, ROOTKNOT NEMATODE	60.	151.
RESISTANT CULTIVARS	LA	WILTS(VERT.&FUS.),NEMATODES,BACTERIAL BL	50.	321.
RESISTANT CULTIVARS	MO	ROOTKNOT, FUSARIUM, BACTERIAL BLIGHT	90.	167.
RESISTANT CULTIVARS	MS	VASCULAR WILTS, NEMATODES	50.	537.
RESISTANT CULTIVARS	NC	NEMATODES	15.	15.
RESISTANT CULTIVARS	NM	VERTICILLIUM WILT, BACTERIAL BLIGHT	70.	58.
RESISTANT CULTIVARS	OK	VERTICILLIUM WILT, BACTERIAL BLIGHT	80.	332.
RESISTANT CULTIVARS	SC	FUSARIUM WILT, ROOTKNOT NEMATODE	80.	98.
RESISTANT CULTIVARS	TN	VASCULAR WILTS, NEMATODES	75.	299.
RESISTANT CULTIVARS	TX	FUSARIUM WILT, NEMATODES, BACTERIAL BL.	60.	3077.
		U.S. TOTALS =>	60.9	6673.
SANITATION	AZ	ALTERNARIA LEAF SPOT, CRUMPLE LEAF VIRUS	100.	416.
SANITATION	CA	FUSARIUM WILT	5.	62.
SANITATION	GA	BACTERIAL BLIGHT	1.	3.

TABLE 5. Non-pesticide Control Practices for Cotton Pests
Disease Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
SANITATION	NC	DISEASES AND NEMATODES	40.	39.
SANITATION	NM	NEMATODES	10.	8.
		U.S. TOTALS =>	4.82	528.
SEEDBED DESIGN	AL	SEEDLING DISEASES AND VERTICILLIUM WILT	40.	134.
SEEDBED DESIGN	FL	SEEDLING DISEASES	70.	18.
SEEDBED DESIGN	GA	SEEDLING DISEASES	90.	226.
SEEDBED DESIGN	LA	SEEDLING DISEASES	85.	546.
SEEDBED DESIGN	MO	SEEDLING DISEASES (RHIZOCTONIA, PYTHIUM)	100.	185.
SEEDBED DESIGN	MS	SEEDLING DISEASES	90.	966.
SEEDBED DESIGN	OK	SEEDLING DISEASES	15.	62.
SEEDBED DESIGN	SC	SEEDLING DISEASES	60.	73.
SEEDBED DESIGN	TN	SEEDLING DISEASES	40.	160.
SEEDBED DESIGN	TX	SEEDLING DISEASES	70.	3590.
SEEDBED DESIGN	VA	SEEDLING DISEASES	80.	2.
		U.S. TOTALS =>	54.4	5960.

TABLE 6. Non-pesticide Control Practices for Cotton Pests
Insect Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s) (efficacy**)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
ALFALFA INTERPLANT	CA37	LYGUS BUG(1.5), LEPIDOPTERA(1.5)	3.	36.
		U.S. TOTALS =>	0.33	36.
CONSERVATION-NATURAL ENEMIES	AL	BOLL/BUDWORM(3), APHIDS(4), ARMYWORMS(3)	100.	336.
CONSERVATION-NATURAL ENEMIES	AR	SCOUTING(1)	100.	535.
CONSERVATION-NATURAL ENEMIES	AZ	TOBACCO BUDWORM(2), LYGUS BUG(2)	80.	333.
CONSERVATION-NATURAL ENEMIES	CA36	CARMINE MITE(2), BOLLWORM(2), LEAFPER(2)	50.	25.
CONSERVATION-NATURAL ENEMIES	CA37	ALL PESTS(1.5)	20.	240.
CONSERVATION-NATURAL ENEMIES	FL	BOLLWORMS(2),BEET ARMYWORMS(3),APHIDS(2)	70.	18.
CONSERVATION-NATURAL ENEMIES	GA	ALL PESTS(2)	20.	50.
CONSERVATION-NATURAL ENEMIES	LA	ALL PESTS(EXCEPT BOLL WEEVIL)(3)	60.	385.
CONSERVATION-NATURAL ENEMIES	MO	ALL PESTS(3)	90.	167.
CONSERVATION-NATURAL ENEMIES	MS	HELIOTHIS(3)	90.	966.
CONSERVATION-NATURAL ENEMIES	NC	ALL PESTS(EXCEPT THRIPS)(3)	95.	93.
CONSERVATION-NATURAL ENEMIES	NM	ALL PESTS(3)	80.	66.
CONSERVATION-NATURAL ENEMIES	OK	ALL PESTS(3)	90.	374.
CONSERVATION-NATURAL ENEMIES	SC	BOLL/BUDWORM(2)	75.	92.
CONSERVATION-NATURAL ENEMIES	TN	ALL PESTS(3)	85.	339.
CONSERVATION-NATURAL ENEMIES	TX19	BOLLWORM(4)	100.	300.
CONSERVATION-NATURAL ENEMIES	TX20	APHIDS(1), BOLL/BUDWORMS(2)	85.	290.
CONSERVATION-NATURAL ENEMIES	TX21	ALL PESTS(2.5)	95.	62.
CONSERVATION-NATURAL ENEMIES	TX23	BOLL/BUDWORM(3)	90.	126.
CONSERVATION-NATURAL ENEMIES	TX24	ALL PESTS(3)	95.	1048.

TABLE 6. Non-pesticide Control Practices for Cotton Pests
Insect Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s) (efficacy**)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
CONSERVATION-NATURAL ENEMIES	TX25	ALL PESTS(4)	75.	2100.
CONSERVATION-NATURAL ENEMIES	TX26	ALL PESTS(3)	80.	316.
		U.S. TOTALS =>	75.4	8259.
CROP RESIDUE DESTRUCTION	AL	BOLL WEEVIL(3)	50.	168.
CROP RESIDUE DESTRUCTION	AR	BOLL WEEVIL(3)	50.	268.
CROP RESIDUE DESTRUCTION	AZ	PINK BOLLWORM(2)	100.	416.
CROP RESIDUE DESTRUCTION	CA36	PINK BOLLWORM(1), S. POTATO WHITEFLY(2)	100.	50.
CROP RESIDUE DESTRUCTION	CA37	PINK BOLLWORM(1), BOLL WEEVIL(1)	100.	1200.
CROP RESIDUE DESTRUCTION	FL	BOLL WEEVIL(2)	100.	25.
CROP RESIDUE DESTRUCTION	GA	BOLL WEEVIL(3)	100.	251.
CROP RESIDUE DESTRUCTION	LA	BOLL WEEVIL(2)	85.	546.
CROP RESIDUE DESTRUCTION	MO	BOLL WEEVIL(2)	80.	148.
CROP RESIDUE DESTRUCTION	MS	BOLL WEEVEL(3)	85.	912.
CROP RESIDUE DESTRUCTION	NM	PINK BOLLWORM(1)	40.	33.
CROP RESIDUE DESTRUCTION	OK	BOLL WEEVIL(1)	40.	166.
CROP RESIDUE DESTRUCTION	SC	BOLL WEEVIL(1)	80.	98.
CROP RESIDUE DESTRUCTION	TN	BOLL WEEVIL(2)	40.	160.
CROP RESIDUE DESTRUCTION	TX19	BOLL WEEVIL(2)	100.	300.
CROP RESIDUE DESTRUCTION	TX20	PINK BOLLWORM(1), BOLL WEEVIL(1)	93.	318.
CROP RESIDUE DESTRUCTION	TX21	BOLL WEEVIL(3)	90.	59.
CROP RESIDUE DESTRUCTION	TX23	BOLL WEEVIL(1)	75.	105.
CROP RESIDUE DESTRUCTION	TX26	BOLL WEEVIL(1), PINK BOLLWORM(1)	40.	158.

TABLE 6. Non-pesticide Control Practices for Cotton Pests
Insect Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s) (efficacy**)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
		U.S. TOTALS =>	49.1	5379.
CROP ROTATION	AZ	ALL PESTS(3)	50.	208.
CROP ROTATION	CA36	PINK BOLLWORM(2)	80.	40.
CROP ROTATION	TX24	MITES(4)	5.	55.
		U.S. TOTALS =>	2.77	303.
DATE OF PLANTING	AL	BEET ARMYWORMS(3)	10.	34.
DATE OF PLANTING	AZ	PINK BOLLWORM(2)	5.	21.
DATE OF PLANTING	CA36	PINK BOLLWORM(3)	100.	50.
DATE OF PLANTING	CA37	PINK BOLLWORM(3), BOLL WEEVIL(3)	95.	1140.
DATE OF PLANTING	GA	THRIPS(3)	20.	50.
DATE OF PLANTING	LA	HELIOTHIS(2), ARMYWORMS(2)	75.	482.
DATE OF PLANTING	NC	HELIOTHIS(2), E. CORN BORER(2), APHID(3)	80.	78.
DATE OF PLANTING	OK	BOLL WEEVIL(1)	20.	83.
DATE OF PLANTING	TX23	BOLL/BUDWORM(4)	90.	126.
DATE OF PLANTING	TX24	BOLL WEEVIL(3)	90.	993.
DATE OF PLANTING	TX25	BOLL WEEVIL(2)	3.	84.
		U.S. TOTALS =>	28.7	3140.
EARLY HARVEST	CA37	BOLL WEEVIL(1.5), PINK BOLLWORM(1.5)	3.	36.
		U.S. TOTALS =>	0.33	36.

TABLE 6. Non-pesticide Control Practices for Cotton Pests
Insect Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s) (efficacy**)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
ERADICATION PROGRAMS	SC	BOLL WEEVIL(1)	100.	122.
		U.S. TOTALS =>	1.11	122.
FAST FRUITING CULTIVARS	TX20	BOLL WEEVIL(3), BOLL/BUDWORM(3)	70.	239.
		U.S. TOTALS =>	2.18	239.
MATURITY ENHANCEMENT	CA36	PINK BOLLWORM(1), S. POTATO WHITEFLY(1)	75.	38.
MATURITY ENHANCEMENT	NC	HELIOTHIS(2), EUROPEAN CORN BORER(2)	60.	59.
MATURITY ENHANCEMENT	TX20	BOLL WEEVIL(4), BOLL/BUDWORM(4)	90.	307.
		U.S. TOTALS =>	3.68	404.
PHEROMONE SYSTEMS	AL	BOLL WEEVILS(5), BOLL/BUDWORMS(5)	30.	101.
PHEROMONE SYSTEMS	AR	BOLL WEEVIL(1)	50.	268.
PHEROMONE SYSTEMS	CA36	PINK BOLLWORM(3)	80.	40.
PHEROMONE SYSTEMS	CA37	PINK BOLLWORM(3)	1.5	18.
PHEROMONE SYSTEMS	MS	HELIOTHIS(4), BOLL WEEVIL(4)	80.	858.
		U.S. TOTALS =>	11.7	1285.
RESISTANT CULTIVARS	CA37	SPIDER MITES(3), LYGUS BUGS(3)	97.	1164.
RESISTANT CULTIVARS	MS	PLANT BUGS(2)	35.	376.
RESISTANT CULTIVARS	TX20	FLEAHOPPERS(4), BOLL/BUDWORMS(4)	20.	68.
		U.S. TOTALS =>	14.7	1608.

TABLE 6. Non-pesticide Control Practices for Cotton Pests
Insect Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s) (efficacy**)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
SCOUTING	AL	ALL PESTS(2)	95.	319.
SCOUTING	AR	ALL PESTS(1)	90.	482.
SCOUTING	AZ	ALL PESTS(2)	100.	416.
SCOUTING	CA36	ALL PESTS(2)	99.	50.
SCOUTING	CA37	ALL PESTS(2)	80.	960.
SCOUTING	FL	BOLLWORMS(1),ARMYWORMS(3),PLANT BUGS(3)	80.	20.
SCOUTING	GA	ALL PESTS(5)	85.	213.
SCOUTING	LA	ALL PESTS(2)	85.	546.
SCOUTING	MO	ALL PESTS(2)	40.	74.
SCOUTING	MS	ALL PESTS(2)	97.	1041.
SCOUTING	NM	ALL PESTS(3)	45.	37.
SCOUTING	OK	ALL PESTS(2)	60.	249.
SCOUTING	SC	ALL PESTS(2)	95.	116.
SCOUTING	TN	ALL PESTS(2)	40.	160.
SCOUTING	TX19	ALL PESTS(3.5)	85.	255.
SCOUTING	TX20	ALL PESTS(2)	69.	236.
SCOUTING	TX23	ALL PESTS(2)	65.	91.
SCOUTING	TX24	ALL PESTS(1)	35.	386.
SCOUTING	TX25	ALL PESTS(2)	35.	980.
SCOUTING	TX26	ALL PESTS(3)	45.	178.
		U.S. TOTALS =>	62.1	6807.
TRICHOGRAMMA CONTROL	TX25	BOLL/BUDWORM(5)	2.	56.

TABLE 6. Non-pesticide Control Practices for Cotton Pests
Insect Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s) (efficacy**)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
		U.S. TOTALS =>	0.51	56.

* Numbers following state abbreviations indicate specific regions within the state; TX26 includes regions 26 and 27 in TX, TX20 includes regions 20 and 22 in TX.
** Control practice efficacy on a pest is on a 1 to 5 scale; 1 is very good and 5 is very poor.

TABLE 7. Non-pesticide Control Practices for Cotton Pests
Weed Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
BIOLOGICAL CONTROL	AZ	BROADLEAVES -- PUNCTUREVINE	2.	8.
		U.S. TOTALS =>	0.08	8.
CROP ROTATION	AL	CYPERUS	15.	50.
CROP ROTATION	AR	ALL WEEDS	10.	54.
CROP ROTATION	AZ	GRASSES, BROADLEAVES	30.	125.
CROP ROTATION	CA37	SOLANUM, CYPERUS	50.	543.
CROP ROTATION	FL	CYPERUS	25.	6.
CROP ROTATION	GA	WILD POINSETTIA	5.	13.
CROP ROTATION	MO	IPOMOEA, SORGHUM	30.	56.
CROP ROTATION	MS	ALL WEEDS	5.	54.
CROP ROTATION	NC	BROADLEAVES, CYPERUS	70.	69.
CROP ROTATION	OK	SOLANUM, IPOMOEA, SORGHUM	15.	62.
CROP ROTATION	SC	ELEUSINE, AMARANTHUS, CYPERUS	10.	12.
CROP ROTATION	TN	SORGHUM, CYNODON, ABUTILON	25.	100.
CROP ROTATION	TX	SOLANUM, CYPERUS, IPOMOEA	30.	1538.
		U.S. TOTALS =>	24.5	2680.
CULTIVATION (MECHANICAL)	AL	ALL WEEDS	95.	319.
CULTIVATION (MECHANICAL)	AR	ALL WEEDS	100.	535.
CULTIVATION (MECHANICAL)	AZ	SEDGES, GRASSES, BROADLEAVES	100.	416.
CULTIVATION (MECHANICAL)	CA37	ALL	100.	1085.
CULTIVATION (MECHANICAL)	FL	XANTHIUM,CASSIA,IPOMOEA,AMRANTHUS,CYPERU	95.	24.

TABLE 7. Non-pesticide Control Practices for Cotton Pests
Weed Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
CULTIVATION (MECHANICAL)	GA	ALL WEEDS	99.	248.
CULTIVATION (MECHANICAL)	LA	GRASSES AND BROADLEAVES	95.	610.
CULTIVATION (MECHANICAL)	MO	BROADLEAVES AND GRASSES	98.	181.
CULTIVATION (MECHANICAL)	MS	BROADLEAVES AND GRASSES	96.	1030.
CULTIVATION (MECHANICAL)	NC	GRASSES, BROADLEAVES, CYPERUS	100.	98.
CULTIVATION (MECHANICAL)	OK	AMARANTHUS, SOLANUM, IPOMOEA, SORGHUM	97.	403.
CULTIVATION (MECHANICAL)	SC	SORGHUM, CYPERUS, BROADLEAVES	100.	122.
CULTIVATION (MECHANICAL)	TN	XANTHIUM,IPOMOEA,SORGHUM,SIDA,AMARANTHUS	98.	391.
CULTIVATION (MECHANICAL)	TX	SORGHUM, IPOMOEA, CYPERUS, AMARANTHUS	95.	4872.
		U.S. TOTALS =>	94.3	10334.
CULTURAL MANAGEMENT	AR	ALL WEEDS	75.	401.
		U.S. TOTALS =>	3.66	401.
FALLOWING, DRY	CA37	CYNODON, CYPERUS, SORGHUM	2.	22.
		U.S. TOTALS =>	0.2	22.
HAND HOEING	AL	ABUTILON, XANTHIUM	7.	24.
HAND HOEING	AR	IPOMOEA, AMARANTHUS, XANTHIUM, EUPHORBIA	40.	214.
HAND HOEING	AZ	BROADLEAVES, GRASSES	20.	83.
HAND HOEING	CA37	ABUTILON,DATURA,HELIANTHUS,SORGHUM,ETC.	75.	814.
HAND HOEING	GA	OCCASIONAL WEEDS	5.	13.
HAND HOEING	LA	BROADLEAVES	15.	96.

TABLE 7. Non-pesticide Control Practices for Cotton Pests
Weed Control Practices Sorted by Practice
1990 Cotton Commodity Assessment

Control Practice	State*	Target pest(s)	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
HAND HOEING	MO	CAMPSIS, IPOMOEA, AMPELAMUS, BROADLEAVES	20.	37.
HAND HOEING	MS	BROADLEAVES	10.	107.
HAND HOEING	NC	BROADLEAVES	1.	1.
HAND HOEING	OK	SOLANUM, SORGHUM, AMARANTHUS	25.	104.
HAND HOEING	SC	AMARANTHUS, ABUTILON	2.	2.
HAND HOEING	TN	ABUTILON, ERIGERON, PERENNIAL VINES	10.	40.
HAND HOEING	TX	SOLANUM, PROBOSCIDEA, SORGHUM, FRANSERIA	15.	769.
		U.S. TOTALS =>	21.	2304.
SCOUTING	AL	ABUTILON, CYNODON	10.	34.
SCOUTING	AR	ALL WEEDS	30.	161.
SCOUTING	AZ	BROADLEAVES	50.	208.
SCOUTING	FL	ALL WEEDS	75.	19.
SCOUTING	GA	ALL WEEDS	10.	25.
SCOUTING	MO	BROADLEAVES AND GRASSES	70.	130.
SCOUTING	MS	BROADLEAVES AND GRASSES	93.	998.
SCOUTING	NC	GRASSES, BROADLEAVES, CYPERUS	98.	96.
SCOUTING	OK	ALL	80.	332.
SCOUTING	TN	ALL WEEDS	80.	319.
SCOUTING	TX	ALL WEEDS	50.	2564.
		U.S. TOTALS =>	44.6	4885.

* Numbers following state abbreviations indicate specific regions within the state.

TABLE 8. Non-pesticide Control Practices for Cotton Pests
Management Practices to Replace Desiccants, Defoliants, and Plant Growth Regulators Sorted by Practice
1990 Cotton Commodity Assessment

Management Practice	State	Use category	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
EARLY INSECT CONTROL	LA	PLANT GROWTH REGULATOR-PROMOTE FRUIT SET	90.	578.
		U.S. TOTALS =>	5.273	578.
EARLY PLANTING	SC	PGR - EARLY MATURITY	40.	49.
		U.S. TOTALS =>	0.445	49.
FROST OR FREEZE	AZ	DESICCATION/DEFOLIATION	40.	166.
FROST OR FREEZE	GA	DEFOLIANT(4.5)	5.	13.
FROST OR FREEZE	LA	DEFOLIATION/DESICCATION	15.	96.
FROST OR FREEZE	MO	DEFOLIANT/DESICCANT	15.	28.
FROST OR FREEZE	MS	DEFOLIATION/DESICCATION	0.5	5.
FROST OR FREEZE	OK	DEFOLIATION/DESICCATION	80.	332.
FROST OR FREEZE	SC	DEFOLIATION	1.	1.
FROST OR FREEZE	TN	DEFOLIATION	70.	279.
FROST OR FREEZE	TX	DESICCATION	50.	2564.
		U.S. TOTALS =>	31.8	3485.
HAND HARVEST	MS	ALL CATAGORIES	0.1	1.
		U.S. TOTALS =>	0.01	1.
INSECT CONTROL	SC	PGR - EARLY MATURITY & SMALLER PLANTS	100.	122.
		U.S. TOTALS =>	1.113	122.

TABLE 8. Non-pesticide Control Practices for Cotton Pests
Management Practices to Replace Desiccants, Defoliants, and Plant Growth Regulators Sorted by Practice
1990 Cotton Commodity Assessment

Management Practice	State	Use category	Percentage of State Cotton Acreage Where Practiced	Acreage Where Practiced (thousands)
NITROGEN FERTILIZATION	NC	DEFOLIATION IMPROVED WITH N DEFICIENCY	70.	69.
		U.S. TOTALS =>	0.626	69.
NITROGEN MANAGEMENT	GA	DEFOLIANT(3) - IN COMB. W/ DEFOLIANT	60.	151.
		U.S. TOTALS =>	1.374	151.
PICK WITH GREEN LEAVES	AZ	DESICCATION/DEFOLIATION	20.	83.
		U.S. TOTALS =>	0.759	83.
VARIETAL SELECTION	AR	ALL - EARLY VARITIES W/ EARLY MATURATION	5.	27.
VARIETAL SELECTION	LA	ALL - DETERMINATE VARIETIES	70.	449.
VARIETAL SELECTION	NC	DEFOLIATION IMPROVED WITH EARLY HYBRIDS	50.	49.
VARIETAL SELECTION	SC	PGR - EARLY BOLL OPENING	25.	31.
VARIETAL SELECTION	SC	PGR - PLANT SELECTION	25.	31.
VARIETAL SELECTION	TN	DEFOLIATION - EARLY MATURING VARIETIES	90.	359.
VARIETAL SELECTION	TX	DEFOLIATION - EARLY MATURING VARIETIES	40.	2051.
		U.S. TOTALS =>	27.34	2996.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
1,3-DICHLOROPROPENE	AL	ALDICARB(1)	1.	3.36	0.	-30.	0.	-612.
1,3-DICHLOROPROPENE	AZ	NONE	5.	20.8	-5.	-5.	-1254.	-1254.
1,3-DICHLOROPROPENE	CA	METAM(10),ALDICARB(20)	30.	374.7	-2.	-5.	-8191.	-20477.
1,3-DICHLOROPROPENE	FL	ALDICARB(1),FENAMIPHOS(1)	2.	0.5	0.	-1.	0.	-3.
1,3-DICHLOROPROPENE	GA	FENAMIPHOS(2),ALDICARB(12)	15.	37.65	-2.	-4.	-472.	-944.
1,3-DICHLOROPROPENE	NC	ALDICARB(0.09),FENAMIPHOS(0.01)	0.1	0.098	-1.	-3.4	-1.	-2.
1,3-DICHLOROPROPENE	SC	ALDICARB(4)	5.	6.1	0.	-10.	0.	-332.
		U.S. Totals >	4.044	443.21	-0.145	-0.347	-9918.	-23625.
ALDICARB	AL	1,3-DICHLOROPROPENE(0.5)	5.	16.8	0.	-30.	0.	-3059.
ALDICARB	AR	FENAMIPHOS(10)	60.	321.	0.	-10.	0.	-22823.
ALDICARB	CA	FENAMIPHOS(10)	20.	249.8	0.	-2.	0.	-5461.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ALDICARB	FL	1,3-DICHLOROPROPENE(40),FENAMIPHOS(20)	60.	15.	0.	-15.	0.	-1514.
ALDICARB	GA	1,3-DICHLOROPROPENE(50),FENAMIPHOS(17)	85.	213.35	0.	-4.	0.	-5351.
ALDICARB	LA	FENAMIPHOS(10)	45.	288.9	0.	-7.	0.	-13812.
ALDICARB	MO	ROTATION	20.	37.	-5.	-5.	-1217.	-1217.
ALDICARB	MS	FENAMIPHOS(10)	10.	107.3	0.	-4.	0.	-3030.
ALDICARB	NC	FENAMIPHOS(1.4),1,3-DICHLOROPROPENE(0.1)	2.8	2.744	0.	-3.4	0.	-53.
ALDICARB	NM	FENAMIPHOS(5),1,3-DICHLOROPROPENE(5)	10.	8.3	0.	-10.	0.	-538.
ALDICARB	SC	FENAMIPHOS(27),1,3-DICHLOROPROPENE(18)	90.	109.8	-7.	-10.	-4189.	-5984.
ALDICARB	TN	FENAMIPHOS(50)	50.	199.5	-15.	-20.	-17357.	-23142.
ALDICARB	TX	FENAMIPHOS(8)	10.	512.8	-1.	-10.	-2174.	-21743.
ALDICARB	VA	FENAMIPHOS(1)	10.	0.2	-5.	-10.	-5.	-10.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals >	19.	2082.5	-0.366	-1.581	-24942.	-107737.
CAPTAN	AL	PCNB(26),CARBOXIN(2),CHLORONEB(2)	30.	100.8	0.	-10.	0.	-6119.
CAPTAN	AR	THIRAM(40)	50.	267.5	-5.	-10.	-9510.	-19019.
CAPTAN	AZ	THIRAM(?),PCNB(?),CARBOXIN(?)	70.	291.2	-1.	-4.	-3512.	-14047.
CAPTAN	CA	THIRAM(50),PCNB(7),METALAXYL(7), CARBOXIN(7)	70.	874.3	0.	-2.	0.	-19112.
CAPTAN	NM	THIRAM (70)	70.	58.1	0.	-3.	0.	-1129.
CAPTAN	OK	CARBOXIN,CHLORONEB	30.	124.5	0.	-3.	0.	-1229.
CAPTAN	TX	CARBOXIN(4),PCNB+ETRIDIAZOLE(2)	10.	512.8	0.	-4.	0.	-8697.
		U.S. Totals >	20.34	2229.2	-0.191	-1.017	-13021.	-69353.
CARBOXIN	AL	PCNB(11),CAPTAN(2)	15.	50.4	0.	-12.	0.	-3671.
CARBOXIN	AR	THIRAM(60)	99.	529.65	-5.	-10.	-18829.	-37658.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CARBOXIN	AZ	THIRAM(?),PCNB(?),CAPTAN(?)	30.	124.8	-1.	-4.	-1505.	-6020.
CARBOXIN	CA	PCNB(15),CAPTAN(5)	20.	249.8	0.	-1.	0.	-2730.
CARBOXIN	FL	PCNB(15),METALAXYL(50),CHLORONEB (5)	70.	17.5	0.	-5.	0.	-589.
CARBOXIN	GA	PCNB(40),ETRIDIAZOLE(5),CHLORONE B(5)	50.	125.5	0.	-5.	0.	-3934.
CARBOXIN	LA	PCNB(47),THIRAM(24),CAPTAN(19)	95.	609.9	0.	-5.	0.	-20828.
CARBOXIN	MO	THIRAM(100)	100.	185.	-4.	-8.	-4869.	-9738.
CARBOXIN	MS	ETRIDIAZOLE(5),METALAXYL(15)	20.	214.6	0.	-5.	0.	-7575.
CARBOXIN	NM	PCNB(25)	30.	24.9	-1.	-10.	-161.	-1614.
CARBOXIN	OK	TCMTB,CHLORONEB	34.	141.1	0.	-3.	0.	-1393.
CARBOXIN	SC	PCNB+ETRIDIAZOLE(20)	50.	61.	0.	-5.	0.	-1662.
CARBOXIN	TN	ETRIDIAZOLE(7.5),METALAXYL(22.5)	30.	119.7	0.	-5.	0.	-3471.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CARBOXIN	TX	CAPTAN(16),PCNB+ETRIDIAZOLE(40)	80.	4102.4	-1.	-4.	-17394.	-69577.
CARBOXIN	VA	PCNB+ETRIDIAZOLE(5),PCNB(85)	90.	1.8	-1.	-10.	-9.	-86.
		U.S. Totals >	59.84	6558.	-0.627	-2.502	-42767.	-170547.
CHLORONEB	AL	PCNB(1.7)	2.	6.72	0.	-5.	0.	-204.
CHLORONEB	CA	PCNB(5)	5.	62.45	0.	-2.	0.	-1365.
CHLORONEB	MS	METALAXYL-AND-PCNB(1)	1.	10.73	0.	-5.	0.	-379.
CHLORONEB	OK	METALAXYL,PCNB	20.	83.	0.	-4.	0.	-1092.
CHLORONEB	SC	METALAXYL(4)	5.	6.1	0.	-5.	0.	-166.
CHLORONEB	TX	CARBOXIN(2),PCNB+ETRIDIAZOLE(1)	5.	256.4	0.	-4.	0.	-4349.
		U.S. Totals >	3.882	425.4	0.	-0.111	0.	-7555.
ETRIDIAZOLE	AL	METALAXYL(15)	15.	50.4	0.	-4.	0.	-1224.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ETRIDIAZOLE	AR	METALAXYL(20)	20.	107.	0.	-5.	0.	-3804.
ETRIDIAZOLE	LA	METALAXYL(45)	45.	288.9	0.	-7.	0.	-13812.
ETRIDIAZOLE	MO	METALAXYL(10)	10.	18.5	1.	-2.	122.	-243.
ETRIDIAZOLE	MS	METALAXYL(25)	25.	268.25	0.	-8.	0.	-15151.
ETRIDIAZOLE	SC	PCNB+METALAXYL(2)	10.	12.2	0.	-7.	0.	-465.
ETRIDIAZOLE	TN	METALAXYL(22)	22.	87.78	0.	-22.	0.	-11201.
ETRIDIAZOLE	TX	METALAXYL(0.3)	1.5	76.92	-2.	-4.	-652.	-1305.
ETRIDIAZOLE	TX	METALAXYL(0.1)	0.5	25.64	-1.	-3.	-109.	-326.
ETRIDIAZOLE	VA	PCNB(2),METALAXYL(2),CARBOXIN(2)	10.	0.2	-5.	-10.	-5.	-10.
		U.S. Totals >	8.539	935.79	-0.009	-0.697	-644.	-47540.
FENAMIPHOS	AL	1,3-DICHLOROPROPENE(0.1),ALDICARB(0.8)	1.	3.36	0.	-3.	0.	-61.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
FENAMIPHOS	CA	ALDICARB(0.01)	0.01	0.1249	0.	-2.	0.	-3.
FENAMIPHOS	FL	1,3-DICHLOROPROPENE(2),ALDICARB(6)	8.	2.	0.	-10.	0.	-135.
FENAMIPHOS	GA	1,3-DICHLOROPROPENE-AND-ALDICARB (1)	1.	2.51	0.	-5.	0.	-79.
FENAMIPHOS	LA	ALDICARB(1)	1.	6.42	0.	-10.	0.	-438.
FENAMIPHOS	MS	ALDICARB(1)	1.	10.73	0.	-2.	0.	-152.
FENAMIPHOS	NC	ALDICARB(1.2)	1.2	1.176	0.	-3.4	0.	-23.
FENAMIPHOS	SC	ALDICARB(4)	5.	6.1	0.	-10.	0.	-332.
FENAMIPHOS	TX	ALDICARB(1)	1.	51.28	0.	0.	0.	0.
		U.S. Totals >	0.764	83.701	0.	-0.018	0.	-1223.
MANCOZEB	AR	PCNB(5),METALAXYL(5)	10.	53.5	0.	-1.	0.	-380.
MANCOZEB	AZ	COPPER-SULFATE(?),GRAMA-GRASS-CO NTROL(?)	5.	20.8	-15.	-20.	-3763.	-5017.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
MANCOZEB	LA	PCNB(1)	1.	6.42	0.	-1.	0.	-44.
MANCOZEB	MS	ETRIDIAZOLE+PCNB(1)	1.	10.73	0.	-5.	0.	-379.
MANCOZEB	NM	NONE	3.	2.49	-25.	-25.	-403.	-403.
		U.S. Totals >	0.857	93.94	-0.061	-0.091	-4166.	-6223.
METALAXYL	AL	ETRIDIAZOLE(10)	10.	33.6	-5.	-15.	-1020.	-3059.
METALAXYL	AL	CARBOXIN(50)	60.	201.6	0.	-10.	0.	-12237.
METALAXYL	AR	PCNB+ETRIDIAZOLE(24)	40.	214.	-3.	-5.	-4565.	-7608.
METALAXYL	CA	CARBOXIN(20),ETRIDIAZOLE(20)	40.	499.6	-1.	-2.	-5461.	-10921.
METALAXYL	FL	CARBOXIN(39),PCNB(18)	60.	15.	0.	-5.	0.	-505.
METALAXYL	GA	PCNB(12),ETRIDIAZOLE(6),CARBOXIN (12)	30.	75.3	0.	-5.	0.	-2361.
METALAXYL	LA	FENAMINOSULF(25)	97.	622.74	0.	-2.	0.	-8507.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METALAXYL	LA	ETRIDIAZOLE(4),FENAMIOSULF(1)	6.	38.52	0.	-7.	0.	-1842.
METALAXYL	MO	ETRIDIAZOLE(100)	100.	185.	0.	-1.	0.	-1217.
METALAXYL	MO	ETRIDIAZOLE(10)	10.	18.5	-1.	-4.	-122.	-487.
METALAXYL	MS	PCNB+CARBOXIN(90)	90.	965.7	-2.	-4.	-13636.	-27271.
METALAXYL	MS	PCNB+ETRIDIAZOLE(10)	10.	107.3	0.	-10.	0.	-7575.
METALAXYL	NC	PCNB+ETRIDIAZOLE	70.	68.6	-0.5	-4.5	-197.	-1769.
METALAXYL	SC	CHLORONEB(18)	90.	109.8	0.	-3.	0.	-1795.
METALAXYL	TN	PCNB+CARBOXIN(95)	95.	379.05	-5.	-10.	-10992.	-21985.
METALAXYL	TN	PCNB+ETRIDIAZOLE(2)	2.	7.98	0.	-10.	0.	-463.
METALAXYL	TX	CARBOXIN(24),PCNB+ETRIDIAZOLE(30)	60.	3076.8	-1.	-5.	-13046.	-65228.
METALAXYL	TX	PCNB+ETRIDIAZOLE(1.6)	2.	102.56	0.	-2.	0.	-870.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METALAXYL	VA	ETRIDIAZOLE(10),PCNB(80)	90.	1.8	-5.	-10.	-43.	-86.
		U.S. Totals >	61.35	6723.5	-0.72	-2.579	-49080.	-175785.
PCNB	AL	CAPTAN(22),CARBOXIN(1),THIRAM(1)	37.5	126.	0.	-15.	0.	-11472.
PCNB	AR	METALAXYL(50),MANCOZEB(10),CARBOXIN(?)	60.	321.	-10.	-20.	-22823.	-45646.
PCNB	AZ	CAPTAN(?),CARBOXIN(?)	5.	20.8	-1.	-4.	-251.	-1003.
PCNB	CA	CAPTAN,CARBOXIN	25.	312.25	0.	-5.	0.	-17064.
PCNB	CA	CARBOXIN(0.008),CHLORONEB(0.002)	0.01	0.1249	-1.	-4.	-1.	-5.
PCNB	FL	METALAXYL(5)	5.	1.25	0.	-2.	0.	-17.
PCNB	GA	CARBOXIN(30),ETRIDIAZOLE(10),CHLORONEB(10)	50.	125.5	0.	-5.	0.	-3934.
PCNB	LA	MANCOZEB(5)	51.	327.42	-5.	-15.	-11181.	-33544.
PCNB	LA	CARBOXIN(60),IMAZALIL(10),THIRAM(10)	96.	616.32	0.	-5.	0.	-21047.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PCNB	MO	CHLORONEB(50)	100.	185.	0.	-1.	0.	-1217.
PCNB	MO	CHLORONEB(10)	20.	37.	-1.	-4.	-243.	-974.
PCNB	MS	METALAXYL(25)	25.	268.25	0.	-8.	0.	-15151.
PCNB	NC	METALAXYL	18.	17.64	-3.5	-4.5	-354.	-455.
PCNB	NM	NONE	5.	4.15	-5.	-5.	-134.	-134.
PCNB	OK	TCMTB,CHLORONEB	11.	45.65	0.	-3.	0.	-451.
PCNB	SC	PCNB+METALAXYL(2)	10.	12.2	0.	-7.	0.	-465.
PCNB	TN	METALAXYL(23)	23.	91.77	0.	-21.	0.	-11178.
PCNB	TX	CARBOXIN(0.4)	2.	102.56	-2.	-7.	-870.	-3044.
PCNB	TX	CARBOXIN(0.1),CAPTAN(0.1)	0.2	10.256	0.	-10.	0.	-435.
PCNB	VA	ETRIDIAZOLE(14),METALAXYL(14),CA RBOXIN(14)	95.	1.9	-1.	-10.	-9.	-90.

TABLE 9. Impact of the Loss of Individual Pesticides on Cotton Production
Fungicides/Nematicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals >	23.97	2627.	-0.526	-2.455	-35867.	-167328.
TCMTB	AL	PCNB(0.8),CARBOXIN(0.15)	1.	3.36	0.	-6.	0.	-122.
		U.S. Totals >	0.031	3.36	0.	-0.002	0.	-122.
THIRAM	AL	PCNB(0.8),CARBOXIN(0.05)	1.	3.36	0.	-4.	0.	-82.
THIRAM	AR	CAPTAN-AND-CARBOXIN(50)	50.	267.5	-5.	-10.	-9510.	-19019.
THIRAM	LA	CAPTAN(15),DICHLORAN(2),CAPTAFOL (2)	20.	128.4	0.	-2.	0.	-1754.
		U.S. Totals >	3.643	399.26	-0.14	-0.306	-9510.	-20855.

* Alternatives are other pesticides or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide.
** Yield impacts are plus (+) or minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; totals for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ACEPHATE	AL	DICROTOPHOS(32),DIMETHOATE(8)	40.	134.4	0.	-2.	0.	-1632.
ACEPHATE	AR	ALDICARB(10.5),DICROTOPHOS(2.25),DIMETHOATE(2.25)	15.	80.25	0.	-15.	0.	-8559.
ACEPHATE	AZ	METHYL-PARATHION(26),MONITOR(7),CYGON(7)	40.	166.4	-10.	-15.	-20068.	-30102.
ACEPHATE	CA36	ALDICARB(3),PERMETHRIN(1.5),CYPERMETHRIN(1.5)	6.	2.94	0.	-10.	0.	-321.
ACEPHATE	CA37	METHAMIDOPHOS(25),DIMETHOATE(8),PROFENOFOS(3)	35.	420.	-5.	-7.	-22953.	-32134.
ACEPHATE	FL	PHOSPHAMIDON(68)	95.	23.75	0.	-2.	0.	-320.
ACEPHATE	GA	DICROTOPHOS(0.5),DIMETHOATE(0.2),METHAMIDOPHOS(5.3)	6.	15.06	0.	-10.	0.	-944.
ACEPHATE	LA	ALDICARB(5),DIMETHOATE(5),DICROTOPHOS(5),METHAMIDOPHOS(3),OXAMYL(1),CHLORPYRIFOS(1)	20.	128.4	0.	-3.	0.	-2631.
ACEPHATE	MO	DIMETHOATE(0.24),FENVALERATE(0.06)	0.3	0.555	0.	-8.	0.	-29.
ACEPHATE	MO	DISULFOTON(0.7),PHORATE(0.1),ALDICARB(0.1),CARBOFURAN(0.1)	1.	1.85	0.	-10.	0.	-122.
ACEPHATE	MS	ALDICARB(9.4),DIMETHOATE(4.7),PROFENOFOS(3.3),DICROTOPHOS(23.5),OTHERS(6.1)	50.	536.5	0.	-15.	0.	-56815.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ACEPHATE	NC	ALDICARB(19),DICROTOPHOS(0.7),DIMETHOATE(0.3)	20.	19.6	0.	0.	0.	0.
ACEPHATE	NM	DICROTOPHOS(0.7),DIMETHOATE(0.2),DISULFOTON(0.02),M-PARATHION(0.02),OTHERS(0.06)	1.	0.83	0.	-8.	0.	-43.
ACEPHATE	OK	ALDICARB(1),DIMETHOATE(4),DICROTOPHOS(4),PHORATE(0.5)	10.	41.5	0.	-10.	0.	-1365.
ACEPHATE	SC	DICROTOPHOS(4),DIMETHOATE(4),OXYDEMETON-METHYL(2)	10.	12.2	0.	-12.	0.	-798.
ACEPHATE	TN	DISULFOTON(1.4),ALDICARB(0.2),PHORATE(0.2),CARBOFURAN(0.2)	2.	7.98	0.	-4.	0.	-185.
ACEPHATE	TN	DIMETHOATE(0.4),PYRETHROIDS(0.2),BYDRIN(0.4)	1.	3.99	0.	-6.	0.	-139.
ACEPHATE	TX19	DICROTOPHOS(25)	25.	75.	0.	-5.	0.	-1590.
ACEPHATE	TX20	DICROTOPHOS(4.5),OXYDEMETON-METHYL(2.7),DIMETHOATE(1.3),PHOSPHAMIDON(0.5)	9.	30.735	0.	-2.	0.	-261.
ACEPHATE	TX20	ALDICARB(2.4),DICROTOPHOS(3)	6.	20.49	2.	-4.3	174.	-374.
ACEPHATE	TX20	DICROTOPHOS(25.5),DIMETHOATE(3),METHYL-PARATHION(1.5)	30.	102.45	-1.	-12.	-434.	-5213.
ACEPHATE	TX21	DICROTOPHOS(5.6),DIMETHOATE(1.6),DISULFOTON(0.16),PARATHION(0.16),OTHERS(0.48)	8.	5.2	0.	-8.	0.	-176.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ACEPHATE	TX23	DIMETHOATE(3.6),DICROTOPHOS(8.4)	12.	16.8	0.	-25.	0.	-1781.
ACEPHATE	TX24	DICROTOPHOS(0.7),DIMETHOATE(0.15),PHOSPHAMIDON(0.15)	1.	11.03	0.	-3.	0.	-140.
ACEPHATE	TX25	DICROTOPHOS(3),DIMETHOATE(1.5),ALDICARB(0.6),PHORATE(0.3),METHYL-PARATHION(0.3)	6.	168.	0.	-8.	0.	-5699.
ACEPHATE	TX26	DICROTOPHOS(0.7),DIMETHOATE(0.2),DISULFOTON(0.02),M-PARATHION(0.02),OTHERS(0.06)	1.	3.95	0.	-8.	0.	-134.
		U.S. Totals >	18.52	2029.9	-0.635	-2.2226	-43281.	-151506.
ALDICARB	AL	DISULFOTON(32),DICROTOPHOS(39),ACEPHATE(45)	65.	218.4	-15.	-35.	-19885.	-46399.
ALDICARB	AR	ACEPHATE(65),PHORATE(2.5),DISULFOTON(2.5)	70.	374.5	-5.	-25.	-13313.	-66567.
ALDICARB	AZ	PHORATE(15)	25.	104.	-10.	-15.	-12542.	-18814.
ALDICARB	CA36	ACEPHATE(5),PROFENOFOS(5),DISULFOTON(5),PHORATE(5)	75.	36.75	-10.	-20.	-4017.	-8034.
ALDICARB	CA37	METHAMIDOPHOS(17),DIMETHOATE(5),PROFENOFOS(3)	25.	300.	0.	-7.	0.	-22953.
ALDICARB	FL	DISULFOTON(10),PHORATE(11)	25.	6.25	0.	-3.	0.	-126.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ALDICARB	GA	DICROTOPHOS(13),DIMETHOATE(5),PHORATE(32),DISULFOTON(8),ACEPHATE(12)	70.	175.7	-5.	-15.	-5508.	-16525.
ALDICARB	LA	ACEPHATE(10),DISULFOTON(20),PHORATE(20)	50.	321.	-2.	-10.	-4385.	-21924.
ALDICARB	MO	DISULFOTON(3.5),DICROTOPHOS(1.4),ACEPHATE(0.7),PHORATE(0.7),CARBOFURAN(0.7)	7.	12.95	-5.	-12.	-426.	-1023.
ALDICARB	MS	ACEPHATE(10.5),DISULFOTON(10.5),PHORATE(7),DICROTOPHOS(3.5)	35.	375.55	-3.	-10.	-7954.	-26514.
ALDICARB	NC	DICROTOPHOS(10),ACEPHATE(41),DISULFOTON(42),PHORATE(1)	94.	92.12	-6.	-20.	-3167.	-10557.
ALDICARB	NM	ACEPHATE(2.4),DICROTOPHOS(1.6),PHORATE(3.2)	8.	6.64	-2.	-8.	-86.	-344.
ALDICARB	OK	DICROTOPHOS(1),PHORATE(0.5),ACEPHATE(1.5),DIMETHOATE(0.5)	5.	20.75	0.	-8.	0.	-546.
ALDICARB	SC	DICROTOPHOS(12),ACEPHATE(23),PHORATE(12)	80.	97.6	-5.	-15.	-2660.	-7979.
ALDICARB	TN	DISULFOTON(5),DICROTOPHOS(2),ACEPHATE(1),PHORATE(1),CARBOFURAN(1)	10.	39.9	-5.	-4.	-1157.	-926.
ALDICARB	TX20	ACEPHATE(4.2),DICROTOPHOS(2.4),PHORATE(0.5)	9.4	32.101	-2.	-4.3	-272.	-585.
ALDICARB	TX21	ACEPHATE(3.6),DICROTOPHOS(2.4),PHORATE(4.8)	12.	7.8	-2.	-8.	-66.	-265.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ALDICARB	TX23	PHORATE(3),DISULFOTON(0.75),FOLIAR-SPRAYS-USED-LATER(11.25)	15.	21.	0.	-5.	0.	-445.
ALDICARB	TX24	DICROTOPHOS(0.15),ACEPHATE(0.15)	1.	11.03	-2.	-3.	-94.	-140.
ALDICARB	TX25	DICROTOPHOS(3),DIMETHOATE(3),PHORATE(15),ACEPHATE(6),CARBOFURAN(1.5)	30.	840.	-12.	-22.	-42739.	-78355.
ALDICARB	TX26	ACEPHATE(2.4),DICROTOPHOS(1.6),PHORATE(3.2)	8.	31.6	-2.	-8.	-268.	-1072.
		U.S. Totals >	28.52	3125.6	-1.739	-4.8425	-118540.	-330092.
AVERMECTIN	TX21	BIFENTHRIN(5)	5.	3.25	-5.	-20.	-69.	-276.
		U.S. Totals >	0.03	3.25	-0.001	-0.004	-69.	-276.
AZINPHOSMETHYL	AL	METHYL-PARATHION(35)	35.	117.6	0.	-30.	0.	-21415.
AZINPHOSMETHYL	AR	OXAMYL(26),MALATHION(5),METHYL-PARATHION(4)	35.	187.25	0.	-10.	0.	-13313.
AZINPHOSMETHYL	AZ	ESFENVALERATE(3.5),CYFLUTHRIN(3.5),BIFENTHRIN(4),CYHALOTHRIN(4)	15.	62.4	-5.	-5.	-3763.	-3763.
AZINPHOSMETHYL	CA36	CYPERMETHRIN(15),PERMETHRIN(15),ESFENVALERATE(15)	50.	24.5	0.	-10.	0.	-2678.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
AZINPHOSMETHYL	LA	MALATHION(4),OXAMYL(4),METHYL-PARATHION(4)	12.	77.04	0.	-20.	0.	-10524.
AZINPHOSMETHYL	MO	METHYL-PARATHION(2),OXAMYL(1.5),MALATHION(1.5)	5.	9.25	-3.	-5.	-183.	-304.
AZINPHOSMETHYL	MS	METHYL-PARATHION(15),OXAMYL(7.5),MALATHION(2.5)	25.	268.25	0.	-20.	0.	-37877.
AZINPHOSMETHYL	OK	PARATHION(1.8),OXAMYL(1.2),MALATHION(0.8),CARBARYL(0.4)	4.	16.6	-2.	-12.	-109.	-655.
AZINPHOSMETHYL	TN	METHYL-PARATHION(16),MALATHION(12),OXAMYL(12)	40.	159.6	0.	-25.	0.	-23142.
AZINPHOSMETHYL	TX19	METHYL-PARATHION(90)	90.	270.	0.	-75.	0.	-85860.
AZINPHOSMETHYL	TX20	OXAMYL(26.4),MALATHION(6.6),METHYL-PARATHION(6.6)	33.	112.69	-3.	-28.	-1433.	-13379.
AZINPHOSMETHYL	TX21	METHYL-PARATHION(100)	100.	65.	-1.	-65.	-276.	-17914.
AZINPHOSMETHYL	TX23	METHYL-PARATHION(44),PHOSMET(20),OXAMYL(11)	75.	105.	-3.	-15.	-1336.	-6678.
AZINPHOSMETHYL	TX24	OXAMYL(4),METHYL-PARATHION(10)	14.	154.42	0.	-10.	0.	-6547.
AZINPHOSMETHYL	TX25	MALATHION(1.5)	2.	56.	0.	-10.	0.	-2374.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals >	15.38	1685.6	-0.1041	-3.6151	-7099.	-246424.
BACILLUS THURINGIENSIS	AL	THIODICARB(7)	7.	23.52	-2.	-5.	-286.	-714.
BACILLUS THURINGIENSIS	AZ	CYHALOTHRIN(0.5),CYFLUTHRIN(0.5)	1.	4.16	0.	-20.	0.	-1003.
BACILLUS THURINGIENSIS	CA37	NO-REPLACEMENT	7.	84.	-5.	-5.	-4591.	-4591.
BACILLUS THURINGIENSIS	FL	THIODICARB(3),PERMETHRIN(1.5)	5.	1.25	0.	-2.	0.	-17.
BACILLUS THURINGIENSIS	GA	THIODICARB(2.5),PERMETHRIN(2.5)	5.	12.55	-5.	-10.	-393.	-787.
BACILLUS THURINGIENSIS	OK	PROFENOFOS(0.05),PYRETHROIDS(0.35),THIODICARB(0.1)	0.5	2.075	15.	-3.	102.	-20.
BACILLUS THURINGIENSIS	SC	CYHALOTHRIN(1),CYPERMETHRIN(1.5),PROFENOPHOS(0.7),CYFLUTHRIN(0.5),OTHER(1.3)	5.	6.1	2.	-20.	66.	-665.
BACILLUS THURINGIENSIS	TX20	PYRETHROIDS(1.22),PHOSPHATES(1.4)	3.5	11.953	0.	-6.	0.	-304.
BACILLUS THURINGIENSIS	TX23	THIODICARB(0.5)	1.	1.4	0.	-1.	0.	-6.
BACILLUS THURINGIENSIS	TX24	THIODICARB(1)	4.	44.12	0.	-3.	0.	-561.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are used	not used	Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are used	not used
BACILLUS THURINGIENSIS	TX25	OTHER PYRETHROIDS(0.75),THIODICARB(0.5),SULPROFOS(0.5)	5.	140.	0.	-5.	0.	-2968.
		U.S. Totals >	3.022	331.13	-0.0748	-0.1707	-5101.	-11636.
BIFENTHRIN	AL	PROFENOFOS(5),DICROTOPHOS(2)	7.	23.52	-18.	-25.	-2570.	-3569.
BIFENTHRIN	AR	DICROTOPHOS(.15),DIMETHOATE(.25),PROFENOFOS(.1),CHLORPYRIFOS(.1)	0.6	3.21	0.	-5.	0.	-114.
BIFENTHRIN	AZ	CYFLUTHRIN(1),CYHALOTHRIN(1),CYPERMETHRIN(1),TRALOMETHRIN(1),ESFENVALERATE(1)	5.	20.8	-0.5	-20.	-125.	-5017.
BIFENTHRIN	CA36	DICOFOL(9),PERMETHRIN(6),AZINPHOSMETHL(10),ALDICARB(15)	20.	9.8	0.	-15.	0.	-1607.
BIFENTHRIN	FL	OXYDEMETON-METHYL(2.5),CHLORPYRIFOS(1)	5.	1.25	0.	-1.	0.	-8.
BIFENTHRIN	LA	PYRETHROIDS(2),MITICIDES(1.6),APHICIDES(1.4)	2.	12.84	0.	-20.	0.	-1754.
BIFENTHRIN	MO	DICROTOPHOS(5.6)	8.	14.8	-4.	-8.	-390.	-779.
BIFENTHRIN	MS	DICROTOPHOS(6),DIMETHOATE(4.5),CYHALOTHRIN(1.5),CYFLUTHRIN(1.5)	15.	160.95	0.	-5.	0.	-5682.
BIFENTHRIN	OK	PROFENOFOS(0.2),CYHALOTHRIN(0.1),CYFLUTHRIN(0.2),CYPERMETHRIN(0.3)	1.	4.15	0.	-5.	0.	-68.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
BIFENTHRIN	SC	CYHALOTHRIN(0.2),CYFLUTHRIN(0.2),TRALOMETHRIN(0.2),CYPERMETHRIN(0.2),OTHERS(0.2)	1.	1.22	0.	-20.	0.	-133.
BIFENTHRIN	TN	DICROTOPHOS(4.9)	7.	27.93	-4.	-4.	-648.	-648.
BIFENTHRIN	TX21	AVERMECTIN(6)	6.	3.9	0.	-50.	0.	-827.
BIFENTHRIN	TX23	PROFENOFOS(0.6),PROPARGITE(0.4)	1.	1.4	0.	-8.	0.	-47.
BIFENTHRIN	TX25	OTHER-PYRETHROIDS(0.98),PROFENOFOS(0.02)	1.	28.	0.	-35.	0.	-4155.
		U.S. Totals >	2.863	313.77	-0.0548	-0.3581	-3733.	-24409.
CARBARYL	CA37	LORSBAN(1.5),CURACRON(0.5)	2.	24.	0.	-4.	0.	-1049.
CARBARYL	OK	OXAMYL(0.2),PARATHION(0.2),MALATHION(0.1)	0.5	2.075	-2.	-8.	-14.	-55.
CARBARYL	TX25	DICROTOPHOS(0.6),DIMETHOATE(0.2),ACEPHATE(0.15),OTHERS(0.05)	1.	28.	0.	-5.	0.	-594.
		U.S. Totals >	0.493	54.075	-0.0002	-0.0249	-14.	-1697.
CARBOFURAN	TX25	ALDICARB(0.7),PHORATE(0.3)	1.	28.	8.	-22.	950.	-2612.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are: used	not used	Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are: used	not used
		U.S. Totals >	0.255	28.	0.01393	-0.0383	950.	-2612.
CHLORPYRIFOS	AL	PROFENOFOS(4),BIFENTHRIN(2)	6.	20.16	0.	-5.	0.	-612.
CHLORPYRIFOS	AR	PROFENOFOS(2.5),DIMETHOATE(1.4), DICROTOPHOS(1.4),BIFENTHRIN(0.1)	5.	26.75	0.	-10.	0.	-1902.
CHLORPYRIFOS	AZ	METHOMYL(14),THIODICARB(7),BT(1)	22.	91.52	-3.	-5.	-3311.	-5519.
CHLORPYRIFOS	CA36	PROPARGITE(3),PERMETHRIN(3),CYPERMETHRIN(3),ESFENVALERATE(3)	10.	4.9	-1.	-12.	-54.	-643.
CHLORPYRIFOS	CA37	METHAMIDOPHOS(27),DIMETHOATE(8), PROFENOFOS(5)	40.	480.	0.	-8.	0.	-41971.
CHLORPYRIFOS	FL	THIODICARB(6),SULPROFOS(1),PROFENOFOS(1),ESFENVALERATE(1)	10.	2.5	0.	-10.	0.	-168.
CHLORPYRIFOS	GA	PROFENOFOS(3.5),PROPARGITE(0.7), DICOFOL(0.7),OTHERS(2.1)	7.	17.57	0.	-10.	0.	-1102.
CHLORPYRIFOS	LA	DIMETHOATE(1.5),DICROTOPHOS(1.5),METHAMIDOPHOS(1),OXYDEMETON-METHYL(1)	5.	32.1	0.	-5.	0.	-1096.
CHLORPYRIFOS	LA	ACEPHATE(2),DIMETHOATE(2),DICROTOPHOS(1),METHAMIDOPHOS(1),OXAMYL(1)	7.	44.94	0.	-3.	0.	-921.
CHLORPYRIFOS	MS	PROFENOFOS(19),DIMETHOATE(8),DICROTOPHOS(9),SULPROFOS(6),OTHERS(8)	50.	536.5	0.	-15.	0.	-56815.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CHLORPYRIFOS	OK	PARATHION(0.75),DICROTOPHOS(1),DIMETHOATE(0.75)	2.5	10.375	-1.	-3.	-34.	-102.
CHLORPYRIFOS	SC	PROFENOFOS(1.2),SULPROFOS(1.2),DICROTOPHOS(1.2),DIMETHOATE(1.2),OTHERS(1.2)	6.	7.32	0.	-12.	0.	-479.
CHLORPYRIFOS	TX20	CYPERMETHRIN(0.24),ESFENVALERATE(0.08),CHLORPYRIFOS(0.08)	0.4	1.366	0.	0.	0.	0.
CHLORPYRIFOS	TX21	DICROTOPHOS(11)	11.	7.15	0.	-3.	0.	-91.
		U.S. Totals >	11.71	1283.2	-0.0499	-1.6346	-3399.	-111421.
CYFLUTHRIN	AL	CYHALOTHRIN(30)	30.	100.8	0.	-40.	0.	-24474.
CYFLUTHRIN	AR	CYHALOTHRIN(16),TRALOMETHRIN(6.4),OTHERS(9.6)	32.	171.2	0.	-50.	0.	-60862.
CYFLUTHRIN	AZ	CYHALOTHRIN(2),CYPERMETHRIN(2),TRALOMETHRIN(2),ESFENVALERATE(2),OTHERS(2)	12.	49.92	-0.5	-20.	-301.	-12041.
CYFLUTHRIN	FL	CYHALOTHRIN(55),CYPERMETHRIN(10)	65.	16.25	0.	-40.	0.	-4375.
CYFLUTHRIN	GA	CYHALOTHRIN(10),CYPERMETHRIN(2),ESFENVALERATE(4),OTHERS(4)	20.	50.2	0.	-90.	0.	-28328.
CYFLUTHRIN	LA	CYHALOTHRIN(10.4),ESFENVALERATE(7.8),CYPERMETHRIN(5.2),TRALOMETHRIN(2.6)	26.	166.92	0.	-10.	0.	-11401.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYFLUTHRIN	MO	CYHALOTHRIN(5),CYPERMETHRIN(2),ESFENVALERATE(2),THIODICARB(0.5),PROFENOFOS(5)	10.	18.5	0.	-10.	0.	-1217.
CYFLUTHRIN	MS	CYHALOTHRIN(5.1),ESFENVALERATE(5.1),TRALOMETHRIN(3.4),CYPERMETHRIN(3.4)	17.	182.41	0.	-30.	0.	-38634.
CYFLUTHRIN	NC	CYHALOTHRIN(6),CYPERMETHRIN(3),ESFENVALERATE(0.5),TRALOMETHRIN(2.5)	12.	11.76	0.	-15.	0.	-1011.
CYFLUTHRIN	NM	CYHALOTHRIN(5.5),CYPERMETHRIN(1.5),ESFENVALERATE(3)	10.	8.3	0.	-17.	0.	-914.
CYFLUTHRIN	OK	CYHALOTHRIN(1.2),CYPERMETHRIN(1.2),ESFENVALERATE(0.8),TRALOMETHRIN(0.4)	4.	16.6	0.	-15.	0.	-819.
CYFLUTHRIN	SC	CYHALOTHRIN(4.5),TRALOMETHRIN(3),CYPERMETHRIN(3.7),ESFENVALERATE(3.8)	15.	18.3	0.	-20.	0.	-1995.
CYFLUTHRIN	TN	CYHALOTHRIN(4),CYPERMETHRIN(2),ESFENVALERATE(4)	10.	39.9	0.	-8.	0.	-1851.
CYFLUTHRIN	TX19	CYHALOTHRIN(2.5),CYPERMETHRIN(2.5)	5.	15.	0.	-20.	0.	-1272.
CYFLUTHRIN	TX20	PYRETHROIDS(4.4)	4.4	15.026	0.	-12.	0.	-765.
CYFLUTHRIN	TX21	CYHALOTHRIN(5.5),CYPERMETHRIN(5.5),ESFENVALERATE(5.5),TRALOMETHRIN(5.5)	22.	14.3	0.	-17.	0.	-1031.
CYFLUTHRIN	TX23	ESFENVALERATE(0.6),CYHALOTHRIN(0.2),CYPERMETHRIN(0.1),TRALOMETHRIN(0.1)	1.	1.4	0.	-15.	0.	-89.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYFLUTHRIN	TX24	CYHALOTHRIN(1.25),CYPERMETHRIN(1.25),ESFENVALERATE(1.25),AZINPHOSMETHYL(1.25)	5.	55.15	0.	-5.	0.	-1169.
CYFLUTHRIN	TX25	CYHALOTHRIN(1.7),CYPERMETHRIN(1.9),ESFENVALERATE(2.4)	6.	168.	0.	-35.	0.	-24931.
CYFLUTHRIN	TX26	CYHALOTHRIN(7.7),CYPERMETHRIN(2.1),ESFENVALERATE(4.2)	14.	55.3	0.	-17.	0.	-3986.
		U.S. Totals »	10.72	1175.2	-0.0044	-3.2445	-301.	-221164.
CYHALOTHRIN	AL	CYFLUTHRIN(30)	30.	100.8	0.	-40.	0.	-24474.
CYHALOTHRIN	AR	CYFLUTHRIN(11.7),TRALOMETHRIN(5.2),CYPERMETHRIN(3.9),OTHERS(5.2)	26.	139.1	0.	-50.	0.	-49450.
CYHALOTHRIN	AZ	CYFLUTHRIN(2),CYPERMETHRIN(2),TRALOMETHRIN(2),ESFENVALERATE(2),OTHERS(4)	12.	49.92	-0.5	-20.	-301.	-12041.
CYHALOTHRIN	FL	CYFLUTHRIN(17),CYPERMETHRIN(3)	20.	5.	0.	-40.	0.	-1346.
CYHALOTHRIN	GA	CYFLUTHRIN(10),TRALOMETHRIN(4),ESFENVALERATE(4),OTHERS(2)	20.	50.2	0.	-90.	0.	-28328.
CYHALOTHRIN	LA	CYFLUTHRIN(10.8),ESFENVALERATE(8.1),CYPERMETHRIN(5.4),TRALOMETHRIN(2.7)	27.	173.34	0.	-10.	0.	-11839.
CYHALOTHRIN	MO	CYFLUTHRIN(5),CYPERMETHRIN(6),ESFENVALERATE(6),THIODICARB(2),PROFENOFOS(1)	20.	37.	0.	-10.	0.	-2435.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYHALOTHRIN	MS	CYPERMETHRIN(2.5),ESFENVALERATE(5),TRALOMETHRIN(7.5),CYFLUTHRIN(10)	25.	268.25	0.	-30.	0.	-56815.
CYHALOTHRIN	NC	CYFLUTHRIN(20.5),CYPERMETHRIN(20),ESFENVALERATE(2.2),TRALOMETHRIN(11.3)	54.	52.92	-4.	-15.	-1213.	-4548.
CYHALOTHRIN	NM	CYFLUTHRIN(8.25),CYPERMETHRIN(2.25),ESFENVALERATE(4.5)	15.	12.45	0.	-17.	0.	-1371.
CYHALOTHRIN	OK	CYPERMETHRIN(2.4),ESFENVALERATE(1.6),TRALOMETHRIN(0.8),CYFLUTHRIN(2.4)	8.	33.2	0.	-15.	0.	-1638.
CYHALOTHRIN	SC	CYFLUTHRIN(10),TRALOMETHRIN(10),CYPERMETHRIN(10),ESFENVALERATE(10)	40.	48.8	0.	-20.	0.	-5319.
CYHALOTHRIN	TN	CYFLUTHRIN(6.25),CYPERMETHRIN(7.5),ESFENVALERATE(7.5),OTHERS(3.75)	25.	99.75	0.	-8.	0.	-4628.
CYHALOTHRIN	TX19	CYFLUTHRIN(2.5),CYPERMETHRIN(2.5)	5.	15.	0.	-20.	0.	-1272.
CYHALOTHRIN	TX20	PYRETHROIDS(4.4)	4.4	15.026	0.	-12.	0.	-765.
CYHALOTHRIN	TX21	CYFLUTHRIN(5.5),CYPERMETHRIN(5.5),ESFENVALERATE(5.5),TRALOMETHRIN(5.5)	22.	14.3	0.	-17.	0.	-1031.
CYHALOTHRIN	TX23	ESFENVALERATE(6),CYFLUTHRIN(2),CYPERMETHRIN(1),TRALOMETHRIN(1)	10.	14.	0.	-15.	0.	-890.
CYHALOTHRIN	TX24	CYFLUTHRIN(2.5),CYPERMETHRIN(0.5),ESFENVALERATE(0.75),AZINPHOSMETHYL(1.25)	5.	55.15	0.	-5.	0.	-1169.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYHALOTHRIN	TX25	CYPERMETHRIN(3.2),CYFLUTHRIN(1.9),ESFENVALERATE(3.9)	9.	252.	0.	-35.	0.	-37397.
CYHALOTHRIN	TX26	CYFLUTHRIN(10.5),CYPERMETHRIN(2.8),ESFENVALERATE(5.7)	19.	75.05	0.	-17.	0.	-5410.
		U.S. Totals >	13.79	1511.3	-0.0222	-3.6994	-1514.	-252167.
CYPERMETHRIN	AL	CYHALOTHRIN(10),CYFLUTHRIN(10)	20.	67.2	0.	-40.	0.	-16316.
CYPERMETHRIN	AR	CYFLUTHRIN(1.8),CYHALOTHRIN(1.5),OTHERS(1.4)	5.	26.75	0.	-50.	0.	-9510.
CYPERMETHRIN	AZ	CYFLUTHRIN(3),CYHALOTHRIN(3),TRALOMETHRIN(3),ESFENVALERATE(3)	12.	49.92	-0.5	-20.	-301.	-12041.
CYPERMETHRIN	CA36	BIFENTHRIN(6),PERMETHRIN(9),CYPERMETHRIN(9),ESFENVALERATE(9)	30.	14.7	0.	-10.	0.	-1607.
CYPERMETHRIN	FL	CYFLUTHRIN(10),CYHALOTHRIN(10)	20.	5.	0.	-40.	0.	-1346.
CYPERMETHRIN	GA	CYFLUTHRIN(10),TRALOMETHRIN(6),CYHALOTHRIN(10),OTHERS(3)	30.	75.3	0.	-90.	0.	-42492.
CYPERMETHRIN	LA	CYFLUTHRIN(4.5),ESFENVALERATE(3),CYHALOTHRIN(6),TRALOMETHRIN(1.5)	15.	96.3	0.	-10.	0.	-6577.
CYPERMETHRIN	MO	CYFLUTHRIN(2.5),CYHALOTHRIN(5),ESFENVALERATE(2.5)	10.	18.5	0.	-10.	0.	-1217.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYPERMETHRIN	MS	CYHALOTHRIN(4),ESFENVALERATE(4),TRALOMETHRIN(3.5),CYFLUTHRIN(3.5)	15.	160.95	0.	-30.	0.	-34089.
CYPERMETHRIN	NC	CYHALOTHRIN(10),CYFLUTHRIN(5),ESFENVALERATE(0.8),TRALOMETHRIN(4.2)	20.	19.6	0.	-15.	0.	-1685.
CYPERMETHRIN	NM	CYFLUTHRIN(4),CYHALOTHRIN(4),ESFENVALERATE(2)	10.	8.3	0.	-17.	0.	-914.
CYPERMETHRIN	OK	CYFLUTHRIN(1.5),CYHALOTHRIN(3),ESFENVALERATE(2),TRALOMETHRIN(1.5)	8.	33.2	0.	-15.	0.	-1638.
CYPERMETHRIN	SC	CYFLUTHRIN(3.75),TRALOMETHRIN(3.75),CYHALOTHRIN(3.75),ESFENVALERATE(3.75)	15.	18.3	0.	-20.	0.	-1995.
CYPERMETHRIN	TN	CYHALOTHRIN(7.5),ESFENVALERATE(3.75),CYFLUTHRIN(3.75)	15.	59.85	0.	-8.	0.	-2777.
CYPERMETHRIN	TX19	CYFLUTHRIN(45),CYHALOTHRIN(45)	90.	270.	0.	-20.	0.	-22896.
CYPERMETHRIN	TX20	ESFENVALERATE(0.6),PERMETHRIN(0.2),CHLORPYRIFOS(0.2),PYRETHROIDS(11)	12.	40.98	0.	-12.	0.	-2085.
CYPERMETHRIN	TX21	CYFLUTHRIN(6),CYHALOTHRIN(6),ESFENVALERATE(6),TRALOMETHRIN(6)	24.	15.6	0.	-17.	0.	-1124.
CYPERMETHRIN	TX23	ESFENVALERATE(0.7),CYFLUTHRIN(0.1),CYHALOTHRIN(0.2)	1.	1.4	0.	-15.	0.	-89.
CYPERMETHRIN	TX24	CYHALOTHRIN(1.5),CYFLUTHRIN(1.25),ESFENVALERATE(1),TRALOMETHRIN(1),OTHERS(0.75)	5.	55.15	0.	-5.	0.	-1169.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYPERMETHRIN	TX25	CYFLUTHRIN(2.2),CYHALOTHRIN(3.3),ESFENVALERATE(4.5)	10.	280.	0.	-35.	0.	-41552.
CYPERMETHRIN	TX26	CYFLUTHRIN(3.6),CYHALOTHRIN(3.6),ESFENVALERATE(1.8)	9.	35.55	0.	-17.	0.	-2562.
		U.S. Totals >	12.34	1352.5	-0.0044	-3.0174	-301.	-205682.
DICOFOL	CA36	BIFENTHRIN(22.5),AVERMECTRIN(22.5)	45.	22.05	-10.	-15.	-2410.	-3615.
DICOFOL	CA37	PROPARGITE(30),SULFUR(4),AVERMECTIN(16)	50.	600.	0.	-5.	0.	-32790.
DICOFOL	FL	CHLORPYRIFOS(1),PROPARGITE(8.5)	10.	2.5	0.	-7.	0.	-118.
DICOFOL	GA	PROPARGITE(0.1),CHLORPYRIFOS(0.1),PROFENOFOS(0.25)	0.5	1.255	0.	-5.	0.	-39.
DICOFOL	LA	PROFENOFOS(1.5),METHAMIDOPHOS(2.5),PROPARGITE(0.5),BIFENTHRIN(0.5)	5.	32.1	0.	-3.	0.	-658.
DICOFOL	MS	CHLORPYRIFOS(1.2),PROFENOFOS(1.2),PROPARGITE(0.6)	3.	32.19	0.	-2.	0.	-455.
DICOFOL	NC	METHIDATHION(1)	1.	0.98	0.	-0.5	0.	-3.
DICOFOL	OK	BIFENTHRIN(0.1),PROPARGITE(0.05),PROFENOFOS(0.05)	0.5	2.075	0.	-5.	0.	-34.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DICOFOL	SC	BIFENTHRIN(0.3),PROFENOFOS(0.7)	1.	1.22	0.	-2.	0.	-13.
DICOFOL	TX23	PROFENOFOS(0.6),PROPARGITE(0.4)	1.	1.4	0.	-8.	0.	-47.
DICOFOL	TX25	PROFENOFOS(0.6),BIFENTHRIN(0.2)	1.	28.	0.	-8.	0.	-950.
		U.S. Totals >	6.604	723.77	-0.0354	-0.5681	-2410.	-38722.
DICROTOPHOS	AL	ACEPHATE(49)	55.	184.8	0.	-2.	0.	-2243.
DICROTOPHOS	AR	DIMETHOATE(7),SULPROFOS(3),CHLOR PYRIFOS(1)	11.	58.85	0.	-10.	0.	-4184.
DICROTOPHOS	CA37	LORSBAN(1)	1.	12.	0.	-5.	0.	-656.
DICROTOPHOS	FL	DIMETHOATE(1.5),TRICHLORFON(1.5)	5.	1.25	0.	-2.	0.	-17.
DICROTOPHOS	GA	DIMETHOATE(7.3),CHLORPYRIFOS(2.5),OXYDEMETON-METHYL(6.5),OTHERS (8.7)	25.	62.75	0.	-10.	0.	-3934.
DICROTOPHOS	LA	ACEPHATE(3),DIMETHOATE(4),METHAM IDOPHOS(4),CHLORPYRIFOS(3),OXAM YL(1)	15.	96.3	0.	-5.	0.	-3289.
DICROTOPHOS	MO	BIFENTHRIN(21)	30.	55.5	0.	-8.	0.	-2922.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DICROTOPHOS	MO	DIMETHOATE(50)	50.	92.5	-2.	-12.	-1217.	-7304.
DICROTOPHOS	MS	DIMETHOATE(8),CHLORPYRIFOS(3.7), ACEPHATE(3.7),METHOMYL(3.7),BIFENTHIN(3.7),ENDOSULFAN+METHYL-P	45.	482.85	-3.	-15.	-10227.	-51134.
DICROTOPHOS	NC	ALDICARB(0.75),ACEPHATE(0.2),OTHERS(0.05)	1.	0.98	0.	-20.	0.	-112.
DICROTOPHOS	NM	ACEPHATE(15),DIMETHOATE(7),PARATHION(4),OTHERS(7)	33.	27.39	-2.	-12.	-355.	-2130.
DICROTOPHOS	OK	DIMETHOATE(1.6),ACEPHATE(0.8),CHLORPYRIFOS(0.8),PARATHION(0.4)	4.	16.6	-1.	-3.	-55.	-164.
DICROTOPHOS	SC	METHYL-PARATHION(0.7),DIMETHOATE(2.5),ACEPHATE(1.9),OTHERS(1.8)	7.	8.54	-1.	-12.	-47.	-559.
DICROTOPHOS	TN	DIMETHOATE(55), BIFENTHRIN(28)	95.	379.05	0.	-4.	0.	-8794.
DICROTOPHOS	TX19	ACEPHATE(56),DIMETHOATE(19)	75.	225.	0.	-10.	0.	-9540.
DICROTOPHOS	TX20	ACEPHATE(35),METHYL-PARATHION(2),ALDICARB(2)	39.	133.18	0.6	-8.	339.	-4518.
DICROTOPHOS	TX21	ACEPHATE(2.7),DIMETHOATE(1.3),PARATHION(0.7),OTHERS(1.3)	6.	3.9	-2.	-12.	-33.	-198.
DICROTOPHOS	TX23	ACEPHATE(32),DIMETHOATE(48)	80.	112.	0.	-25.	0.	-11872.

APPENDIX B

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DICROTOPHOS	TX24	ACEPHATE(2.7),DIMETHOATE(2.7),DISULFOTON(1.6),METHYL-PARATHION(1)	8.	88.24	0.	-3.	0.	-1122.
DICROTOPHOS	TX25	DIMETHOATE(12.6),DISULFOTON(4.2),ACEPHATE(2.1),ALDICARB(1.1),METHYL-PARATHION(1)	21.	588.	-1.	-15.	-2493.	-37397.
DICROTOPHOS	TX26	ACEPHATE(7),DIMETHOATE(6),METHOMYL(12)	25.	98.75	-2.	-12.	-837.	-5024.
		U.S. Totals >	24.9	2728.4	-0.219	-2.3049	-14925.	-157113.
DIFLUBENZURON	AL	NONE(NO-OTHER-SYNERGIST-EXISTS)	25.	84.	-4.	-4.	-2040.	-2040.
DIFLUBENZURON	FL	THIODICARB(60),SULPROFOS(8.5),PROFENOFOS(8.5),METHOMYL(4)	85.	21.25	-2.	-18.	-286.	-2574.
DIFLUBENZURON	GA	PROFENOFOS(6),THIODICARB(6),SULPROFOS(4),OTHERS(4)	20.	50.2	-5.	-20.	-1574.	-6295.
DIFLUBENZURON	MS	METHYL-PARATHION(3.5),AZINPHOSMETHYL(1.5)	5.	53.65	0.	-20.	0.	-7575.
DIFLUBENZURON	SC	THIODICARB(1),CHLORPYRIFOS(0.4),PROFENOFOS(0.6)	2.	2.44	0.	-2.	0.	-27.
		U.S. Totals >	1.93	211.54	-0.0572	-0.2716	-3899.	-18511.
DIMETHOATE	AL	DICROTOPHOS(7),ACEPHATE(8)	15.	50.4	0.	-1.	0.	-306.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DIMETHOATE	AR	DICROTOPHOS(8),ENDOSULFAN(3)	11.	58.85	0.	-35.	0.	-14645.
DIMETHOATE	AZ	ACEPHATE(5.8),ALDICARB(1.2)	7.	29.12	-5.	-7.	-1756.	-2458.
DIMETHOATE	CA37	METHAMIDOPHOS(15),ACEPHATE(13)	28.	336.	-3.	-5.	-11017.	-18362.
DIMETHOATE	FL	DICROTOPHOS(0.6),TRICHLORFON(0.4)	2.	0.5	0.	-2.	0.	-7.
DIMETHOATE	GA	DICROTOPHOS(13.5),ACEPHATE(0.75),CHLORPYRIFOS(0.75)	15.	37.65	0.	-10.	0.	-2361.
DIMETHOATE	LA	ACEPHATE(3),DICROTOPHOS(4),METHAMIDOPHOS(4),CHLORPYRIFOS(3),OXAMYL(1)	15.	96.3	0.	-5.	0.	-3289.
DIMETHOATE	MO	DICROTOPHOS(30),ACEPHATE(3)	33.	61.05	0.	-4.	0.	-1607.
DIMETHOATE	MS	DICROTOPHOS(24.5),PROFENOFOS(5.2),ACEPHATE(5.3)	35.	375.55	0.	-10.	0.	-26514.
DIMETHOATE	NC	ALDICARB(0.75),ACEPHATE(0.2),OTHERS(0.05)	1.	0.98	0.	-20.	0.	-112.
DIMETHOATE	NM	ACEPHATE(0.7),DICROTOPHOS(4.4),PHOSPHAMIDON(0.3),OTHERS(0.6)	6.	4.98	0.	-12.	0.	-387.
DIMETHOATE	OK	DICROTOPHOS(1.6),ACEPHATE(0.8),CHLORPYRIFOS(0.8),PARATHION(0.4)	4.	16.6	1.	-3.	55.	-164.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DIMETHOATE	SC	METHYL-PARATHION(0.5),ACEPHATE(2),DICROTOPHOS(1.5),OXYDEMETON-METHYL(1)	5.	6.1	0.	-12.	0.	-399.
DIMETHOATE	TN	DICROTOPHOS(27),ACEPHATE(3)	30.	119.7	0.	-4.	0.	-2777.
DIMETHOATE	TX20	ACEPHATE(8),DICROTOPHOS(5),OXYDEMETON-METHYL(0.41),PHOSPHAMIDON(0.09)	13.5	46.103	0.9	-11.	176.	-2150.
DIMETHOATE	TX23	DICROTOPHOS(3.5),DIMETHOATE(1.5)	5.	7.	0.	-25.	0.	-742.
DIMETHOATE	TX24	ACEPHATE(1.1),DICROTOPHOS(3.2),METHYL-PARATHION(0.6)	5.	55.15	0.	-3.	0.	-702.
DIMETHOATE	TX25	DICROTOPHOS(6.3),ACEPHATE(1.3),DISULFOTON(0.9),ALDICARB(0.5)	9.	252.	0.	-15.	0.	-16027.
DIMETHOATE	TX26	ACEPHATE(1),DICROTOPHOS(4),METHOMYL(4)	9.	35.55	0.	-12.	0.	-1809.
		U.S. Totals >	14.5	1589.6	-0.184	-1.391	-12543.	-94817.
DISULFOTON	AL	ALDICARB(15),DICROTOPHOS(17),ACEPHATE(20)	25.	84.	0.	-20.	0.	-10198.
DISULFOTON	CA36	ALDICARB(3.75),ACEPHATE(0.25),PHORATE(0.25)	5.	2.45	0.	-5.	0.	-134.
DISULFOTON	CA37	ALDICARB(0.5),PHORATE(0.5)	1.	12.	0.	-4.	0.	-525.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DISULFOTON	FL	ALDICARB(4.5),PHORATE(21)	30.	7.5	0.	-3.	0.	-151.
DISULFOTON	LA	ALDICARB(2.4),ACEPHATE(0.3),PHORATE(0.3)	3.	19.26	0.	-10.	0.	-1315.
DISULFOTON	MO	DICROTOPHOS(5.4),ACEPHATE(1.8),ALDICARB(4.8)	12.	22.2	0.	-12.	0.	-1753.
DISULFOTON	MS	ALDICARB(6),ACEPHATE(2.5),PHORATE(1)	10.	107.3	0.	-10.	0.	-7575.
DISULFOTON	NM	ACEPHATE(0.1),DICROTOPHOS(0.65),DIMETHOATE(0.15),OTHERS(0.1)	1.	0.83	0.	-12.	0.	-65.
DISULFOTON	SC	ALDICARB(0.5),ACEPHATE(0.2),PHORATE(0.1)	1.	1.22	0.	-12.	0.	-80.
DISULFOTON	TN	DICROTOPHOS(6.75),ACEPHATE(2.25),ALDICARB(6)	15.	59.85	0.	-4.	0.	-1389.
DISULFOTON	TX21	ACEPHATE(1.4),DICROTOPHOS(8.5),DIMETHOATE(2),OTHERS(1.1)	13.	8.45	0.	-12.	0.	-430.
DISULFOTON	TX23	ALDICARB(1)	1.	1.4	0.	-1.	0.	-6.
DISULFOTON	TX24	ACEPHATE(0.1),DICROTOPHOS(0.6),METHYL-PARATHION(0.3)	1.	11.03	0.	-3.	0.	-140.
DISULFOTON	TX25	DICROTOPHOS(4.9),ACEPHATE(0.7),DIMETHOATE(0.7),ALDICARB(0.4),METHYL-PARATHION(0.3)	7.	196.	0.	-15.	0.	-12466.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DISULFOTON	TX26	ACEPHATE(0.1),DICROTOPHOS(0.65), DIMETHOATE(0.15),PHOSPHAMIDON(0.05),OTHERS(0.05)	1.	3.95	0.	-12.	0.	-201.
		U.S. Totals >	4.904	537.44	0.	-0.5344	0.	-36427.
ENDOSULFAN	AZ	CYHALOTHRIN(1),CYFLUTHRIN(1)	2.	8.32	0.	-5.	0.	-502.
ENDOSULFAN	CA36	ALDICARB(19),PROFENOFOS(2)	25.	12.25	0.	-5.	0.	-669.
ENDOSULFAN	CA37	B.t.(1.5),SULPROFOS(1.5)	3.	36.	-2.	-10.	-787.	-3935.
ENDOSULFAN	LA	METHAMIDOPHOS(1),CHLORPYRIPHOS(1.2),DICROTOPHOS(1),DIMETHOATE(1),OTHERS(0.8)	5.	32.1	0.	-5.	0.	-1096.
ENDOSULFAN	MS	DICROTOPHOS(11),DIMETHOATE(10),CHLORPYRIFOS(10),BIFENTHRIN(4)	35.	375.55	0.	-5.	0.	-13257.
		U.S. Totals >	4.236	464.22	-0.0115	-0.2855	-787.	-19459.
ESFENVALERATE	AL	CYHALOTHRIN(10),CYFLUTHRIN(10)	20.	67.2	0.	-40.	0.	-16316.
ESFENVALERATE	AR	CYFLUTHRIN(4),CYHALOTHRIN(3),OTHERS(3)	10.	53.5	0.	-50.	0.	-19019.
ESFENVALERATE	AZ	CYFLUTHRIN(3),CYHALOTHRIN(3),CYPERMETHRIN(3),TRALOMETHRIN(3)	12.	49.92	-0.5	-20.	-301.	-12041.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ESFENVALERATE	CA36	AZINPHOSMETHYL(15),PERMETHRIN(9),CYPERMETHRIN(9)	30.	14.7	0.	-10.	0.	-1607.
ESFENVALERATE	FL	CYFLUTHRIN(10),CYHALOTHRIN(5),CYPERMETHRIN(5)	20.	5.	0.	-40.	0.	-1346.
ESFENVALERATE	GA	CYFLUTHRIN(4.5),CYHALOTHRIN(4.5),TRALOMETHRIN(4.5),CYPERMETHRIN(1.5)	15.	37.65	0.	-90.	0.	-21246.
ESFENVALERATE	LA	CYFLUTHRIN(10),CYHALOTHRIN(8.7),CYPERMETHRIN(3.7),TRALOMETHRIN(2.5)	25.	160.5	0.	-10.	0.	-10962.
ESFENVALERATE	MO	CYHALOTHRIN(2.3),CYPERMETHRIN(1.2),CYFLUTHRIN(.5),THIODICARB(.5),PROFENOFOS(.5)	5.	9.25	0.	-10.	0.	-609.
ESFENVALERATE	MS	CYHALOTHRIN(7.2),CYFLUTHRIN(5.4),TRALOMETHRIN(3.6),CYPERMETHRIN(1.8)	18.	193.14	0.	-30.	0.	-40907.
ESFENVALERATE	NC	CYHALOTHRIN(3),CYFLUTHRIN(1.1),CYPERMETHRIN(1.1),TRALOMETHRIN(0.8)	6.	5.88	0.	-15.	0.	-505.
ESFENVALERATE	NM	CYHALOTHRIN(0.4),CYFLUTHRIN(0.4),CYPERMETHRIN(0.2)	1.	0.83	0.	-17.	0.	-91.
ESFENVALERATE	OK	CYFLUTHRIN(1.5),CYPERMETHRIN(1.5),CYHALOTHRIN(1.5),TRALOMETHRIN(0.5)	5.	20.75	0.	-15.	0.	-1024.
ESFENVALERATE	SC	CYFLUTHRIN(7.5),TRALOMETHRIN(7.5),CYPERMETHRIN(6),CYHALOTHRIN(9)	30.	36.6	0.	-20.	0.	-3989.
ESFENVALERATE	TN	CYHALOTHRIN(6.75),CYPERMETHRIN(3.75),CYFLUTHRIN(1.5),THIODICARB(1.5),OTHERS(1.5)	15.	59.85	0.	-8.	0.	-2777.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ESFENVALERATE	TX20	CYPERMETHRIN(0.18),PERMETHRIN(0.06),CHLORPYRIFOS(0.06),PYRETHROIDS(8.7)	9.	30.735	0.	-12.	0.	-1564.
ESFENVALERATE	TX21	CYHALOTHRIN(7),CYFLUTHRIN(7),CYPERMETHRIN(4)	18.	11.7	0.	-17.	0.	-843.
ESFENVALERATE	TX23	CYPERMETHRIN(0.2),CYFLUTHRIN(0.4),CYHALOTHRIN(0.2),TRALOMETHRIN(0.2)	23.	32.2	0.	-15.	0.	-2048.
ESFENVALERATE	TX24	CYHALOTHRIN(1.5),CYFLUTHRIN(1.25),CYPERMETHRIN(1),TRALOMETHRIN(0.75),OTHERS(0.5)	5.	55.15	0.	-5.	0.	-1169.
ESFENVALERATE	TX25	CYFLUTHRIN(2.8),CYHALOTHRIN(4.3),CYPERMETHRIN(4.8)	12.	336.	0.	-35.	0.	-49862.
ESFENVALERATE	TX26	CYHALOTHRIN(5.6),CYFLUTHRIN(5.6),CYPERMETHRIN(2.8)	14.	55.3	0.	-17.	0.	-3986.
		U.S. Totals >	11.28	1235.9	-0.0044	-2.8154	-301.	-191912.
FENVALERATE	AZ	CYFLUTHRIN(1),CYHALOTHRIN(1),TRALOMETHRIN(1),ESFENVALERATE(1),OTHERS(1)	7.	29.12	-0.5	-20.	-176.	-7024.
FENVALERATE	SC	ESFENVALERATE(0.6),TRALOMETHRIN(0.4),CYPERMETHRIN(0.4),CYHALOTHRIN(0.4),OTHERS(0.2)	2.	2.44	0.	-20.	0.	-266.
FENVALERATE	TX20	PYRETHROIDS(8.6)	8.6	29.369	0.	-12.	0.	-1494.
		U.S. Totals >	0.556	60.929	-0.0026	-0.1289	-176.	-8784.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
FLUCYTHRINATE	AZ	CYFLUTHRIN(1),CYHALOTHRIN(1),TRALOMETHRIN(1),ESFENVALERATE(1),OTHERS(1)	5.	20.8	-0.5	-20.	-125.	-5017.
		U.S. Totals >	0.19	20.8	-0.0018	-0.0736	-125.	-5017.
GOSSYPLURE	AZ	CYHALOTHRIN(4),CYFLUTHRIN(4),BIFENTHRIN(1),ESFENVALERATE(2),CYPERMETHRIN(1)	12.	49.92	0.	-20.	0.	-12041.
GOSSYPLURE	CA36	AZINPHOSMETHYL(25),PERMETHRIN(25),CYPERMETHRIN(10)	60.	29.4	0.	-10.	0.	-3213.
		U.S. Totals >	0.724	79.32	0.	-0.2238	0.	-15254.
LINDANE	CA37	ACEPHATE(2),CHLORPYRIFOS(3)	5.	60.	0.	-2.	0.	-1312.
		U.S. Totals >	0.547	60.	0.	-0.0192	0.	-1312.
MALATHION	AL	AZINPHOSMETHYL(25)	25.	84.	0.	-70.	0.	-35692.
MALATHION	AR	OXAMYL(0.4),AZINPHOSMETHYL(0.4),METHYL PARATHION(0.2)	1.	5.35	0.	-10.	0.	-380.
MALATHION	AZ	AZINPHOSMETHYL(0.5)	0.5	2.08	-7.	-3.	-176.	-75.
MALATHION	CA37	OXYDEMETON-METHYL(1.5),PROFENOFOS(0.9),DIMETHOATE(0.6)	3.	36.	0.	-3.	0.	-1180.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
MALATHION	FL	AZINPHOSMETHYL(75)	75.	18.75	0.	-20.	0.	-2524.
MALATHION	GA	AZINPHOSMETHYL(1)	1.	2.51	0.	-90.	0.	-1416.
MALATHION	LA	AZINPHOSMETHYL(6),OXAMYL(4.5),METHYL-PARATHION(4.5)	15.	96.3	0.	-20.	0.	-13155.
MALATHION	MS	METHYL-PARATHION(4),AZINPHOSMETHYL(2.4),OXAMYL(1.6)	8.	85.84	0.	-20.	0.	-12121.
MALATHION	OK	AZINPHOSMETHYL(0.1),PARATHION(0.15),OXAMYL(0.2),CARBARYL(0.05)	0.5	2.075	0.	-5.	0.	-34.
MALATHION	SC	AZINPHOSMETHYL(6),METHYL-PARATHION(4)	10.	12.2	0.	0.	0.	0.
MALATHION	TX20	OXAMYL(5),METHYL-PARATHION(2),AZINPHOSMETHYL(4)	11.	37.565	-3.	-28.	-478.	-4460.
MALATHION	TX24	AZINPHOSMETHYL(4.25),METHYL-PARATHION(0.75)	5.	55.15	0.	-7.	0.	-1637.
MALATHION	TX25	AZINPHOSMETHYL(3.6)	4.	112.	0.	-10.	0.	-4749.
MALATHION	TX26	AZINPHOSMETHYL(8)	10.	39.5	-2.	-15.	-335.	-2512.
		U.S. Totals >	5.377	589.32	-0.0145	-1.1727	-988.	-79935.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METHAMIDOPHOS	AL	ACEPHATE(5)	5.	16.8	-3.	-12.	-306.	-1224.
METHAMIDOPHOS	AZ	DIMETHOATE(3),PHORATE(2)	5.	20.8	-5.	-7.	-1254.	-1756.
METHAMIDOPHOS	CA37	B.t.(8),DIMETHOATE(20),ACEPHATE(10)	38.	456.	-5.	-7.	-24920.	-34889.
METHAMIDOPHOS	FL	ACEPHATE(10.5)	15.	3.75	0.	-2.	0.	-50.
METHAMIDOPHOS	GA	ACEPHATE(4.5),PROFENOFOS(0.5)	5.	12.55	0.	-10.	0.	-787.
METHAMIDOPHOS	LA	ACEPHATE(2),DIMETHOATE(4),DICROTOPHOS(4),CHLORPYRIFOS(3),OXAMYL(1),DICOFOL(1)	15.	96.3	0.	-5.	0.	-3289.
METHAMIDOPHOS	MS	DICROTOPHOS(1.8),ACEPHATE(11.7),DIMETHOATE(3.5)	17.	182.41	0.	-5.	0.	-6439.
METHAMIDOPHOS	SC	ACEPHATE(0.5),DICROTOPHOS(0.3),DIMETHOATE(0.2)	1.	1.22	0.	-12.	0.	-80.
		U.S. Totals >	7.207	789.83	-0.3885	-0.7117	-26481.	-48513.
METHIDATHION	CA37	DICOFOL(5),PROPARGITE(5),AVERMECTIN(2)	12.	144.	3.	-9.	4722.	-14165.
METHIDATHION	NC	DICOFOL(1)	1.	0.98	0.	-0.5	0.	-3.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals >	1.323	144.98	0.06927	-0.2078	4722.	-14168.
METHOMYL	AL	THIODICARB(5)	5.	16.8	0.	-5.	0.	-510.
METHOMYL	AR	PROFENOFOS(0.3),THIODICARB(0.2)	0.5	2.675	0.	0.	0.	0.
METHOMYL	AZ	CHLORPYRIFOS(10)	10.	41.6	-5.	-15.	-2508.	-7525.
METHOMYL	CA36	CHLORPYRIFOS(0.2)	2.	0.98	0.	-10.	0.	-107.
METHOMYL	CA37	B.t.(0.4),METHAMIDOPHOS(0.8),PERMETHRIN(0.4),OTHERS(0.4)	2.	24.	0.	-5.	0.	-1312.
METHOMYL	FL	THIODICARB(56),SULPROFOS(7),PROFONOFOS(7)	70.	17.5	0.	-18.	0.	-2120.
METHOMYL	LA	THIODICARB(5)	5.	32.1	0.	-3.	0.	-658.
METHOMYL	MS	THIODICARB(32),PROFENOFOS(13)	45.	482.85	0.	-6.	0.	-20454.
METHOMYL	OK	LARVIN(1)	1.	4.15	0.	-2.	0.	-27.
METHOMYL	SC	THIODICARB(9),PROFENOFOS(4.5),CHLORPYRIFOS(1.5)	15.	18.3	0.	-1.	0.	-100.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METHOMYL	TX20	THIODICARB(6),PROFENOFOS(6)	12.	40.98	0.	-1.	0.	-174.
METHOMYL	TX21	DICROTOPHOS(3),DIMETHOATE(3)	6.	3.9	0.	-7.	0.	-116.
METHOMYL	TX25	DICROTOPHOS(1.5),DIMETHOATE(0.8),THIODICARB(0.5),PROFENOPHOS(0.2)	3.	84.	0.	-15.	0.	-5342.
METHOMYL	TX26	DICROTOPHOS(8),OXYDEMETON-METHYL(2)	10.	39.5	0.	-8.	0.	-1340.
		U.S. Totals >	7.385	809.34	-0.0368	-0.5836	-2508.	-39784.
METHYL PARATHION	AL	AZINPHOSMETHYL(50)	50.	168.	0.	-30.	0.	-30593.
METHYL PARATHION	AR	OXAMYL(2.25),MALATHION(0.5),AZINPHOSMETHYL(2.25)	5.	26.75	0.	-10.	0.	-1902.
METHYL PARATHION	AZ	ESFENVALERATE(5),CYHALOTHRIN(5),CYFLUTHRIN(5),CYPERMETHRIN(5),OTHERS(5)	25.	104.	-10.	-5.	-12542.	-6271.
METHYL PARATHION	CA37	METHAMIDOPHOS(0.4),ACEPHATE(0.2),PROFENOFOS(0.4)	1.	12.	5.	-4.	656.	-525.
METHYL PARATHION	FL	B.t.(1.5),PERMETHRIN(8)	10.	2.5	0.	-2.	0.	-34.
METHYL PARATHION	LA	MALATHION(18.7),AZINPHOSMETHYL(18.15),OXAMYL(18.15)	55.	353.1	0.	-20.	0.	-48233.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METHYL PARATHION	MS	AZINPHOSMETHYL(60),OXAMYL(30),MALATHION(10)	100.	1073.	0.	-20.	0.	-151508.
METHYL PARATHION	NC	CYHALOTHRIN(0.25),CYPERMETHRIN(0.09),CYFLUTHRIN(0.09),OTHERS(0.07)	0.5	0.49	0.	-1.	0.	-3.
METHYL PARATHION	NM	DICROTOPHOS(0.6),DIMETHOATE(0.2),DISULFOTON(0.05),ACEPHATE(0.05),OTHERS(0.1)	1.	0.83	0.	-12.	0.	-65.
METHYL PARATHION	OK	AZINPHOSMETHYL(8),OXAMYL(8),MALATHION(4)	20.	83.	0.	-5.	0.	-1365.
METHYL PARATHION	SC	ACEPHATE(5),DICROTOPHOS(2),DIMETHOATE(3)	10.	12.2	0.	-5.	0.	-332.
METHYL PARATHION	TX19	AZINPHOSMETHYL(36),PYRETHROIDS(20),SULPROFOS(2),THIODICARB(2)	60.	180.	0.	-75.	0.	-57240.
METHYL PARATHION	TX20	OXAMYL(8),AZINPHOSMETHYL(8),MALATHION(22),ACEPHATE(7),DICROTOPHOS(5)	50.	170.75	1.	-22.	724.	-15928.
METHYL PARATHION	TX21	AZINPHOSMETHYL(100)	100.	65.	0.	-65.	0.	-17914.
METHYL PARATHION	TX23	OXAMYL(2.4),AZINPHOSMETHYL(67.6)	70.	98.	0.	-15.	0.	-6233.
METHYL PARATHION	TX25	DICROTOPHOS(3.2),DIMETHOATE(0.5),ACEPHATE(1.3)	5.	140.	1.	-15.	594.	-8904.
METHYL PARATHION	TX26	DICROTOPHOS(0.6),DIMETHOATE(0.2),DISULFOTON(0.05),ACEPHATE(0.05),OTHERS(0.1)	1.	3.95	0.	-12.	0.	-201.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals >	22.75	2493.6	-0.1551	-5.0943	-10569.	-347250.
NALED	CA37	METHAMIDOPHOS(0.8),ACEPHATE(1.2),DIMETHOATE(2)	4.	48.	0.	-3.	0.	-1574.
		U.S. Totals >	0.438	48.	0.	-0.0231	0.	-1574.
OXAMYL	AL	AZINPHOSMETHYL(0.5),METHYL-PARATHION(1.5)	2.	6.72	0.	0.	0.	0.
OXAMYL	AR	AZINPHOSMETHYL(18.75),MALATHION(3.75),METHYL-PARATHION(2.5)	25.	133.75	0.	-10.	0.	-9510.
OXAMYL	AZ	CYHALOTHRIN(0.5),CYFLUTHRIN(0.5)	1.	4.16	-1.	-5.	-50.	-251.
OXAMYL	LA	MALATHION(2),AZINPHOSMETHYL(3),METHYL-PARATHION(3),ACEPHATE(2),DIMETHOATE(2)	12.	77.04	0.	-20.	0.	-10524.
OXAMYL	MO	AZINPHOSMETHYL(1.4),MALATHION(0.6)	2.	3.7	0.	-5.	0.	-122.
OXAMYL	MS	METHYL-PARATHION(21),AZINPHOSMETHYL(10.5),ACEPHATE(3.5)	35.	375.55	0.	-20.	0.	-53028.
OXAMYL	OK	PARATHION(8),DIMETHOATE(1.6),MALATHION(4.8),DICROTOPHOS(1.6)	16.	66.4	0.	-15.	0.	-3277.
OXAMYL	TN	AZINPHOSMETHYL(5),METHYL-PARATHION(5)	10.	39.9	0.	-25.	0.	-5786.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
OXAMYL	TX20	AZINPHOSMETHYL(17.6),MALATHION(0.8),METHYL-PARATHION(1.6)	20.	68.3	0.8	-28.	232.	-8109.
OXAMYL	TX23	AZINPHOSMETHYL(1.8),METHYL-PARATHION(1.2)	3.	4.2	0.	-15.	0.	-267.
OXAMYL	TX24	AZINPHOSMETHYL(7),METHYL-PARATHION(3)	10.	110.3	0.	-10.	0.	-4677.
		U.S. Totals >	8.121	890.02	0.00266	-1.4017	182.	-95548.
OXYDEMETON-METHYL	AL	DICROTOPHOS(20),BIFENTHRIN(5)	25.	84.	0.	-8.	0.	-4079.
OXYDEMETON-METHYL	CA37	DICOFOL(1.5),PROPARGITE(1.5),MALATHION(1.5),CHLORPYRIPHOS(1.5)	6.	72.	0.	0.	0.	0.
OXYDEMETON-METHYL	FL	BIFENTHRIN(5)	10.	2.5	-1.	-3.	-17.	-50.
OXYDEMETON-METHYL	GA	DICROTOPHOS(4),DIMETHOATE(1),CHLORPYRIFOS(1),METHAMIDOPHOS(1)	5.	12.55	0.	-10.	0.	-787.
OXYDEMETON-METHYL	LA	METHAMIDOPHOS(1.8),DIMETHOATE(1.5),DICROTOPHOS(1.5),CHLORPYRIFOS(1.2)	6.	38.52	0.	-5.	0.	-1315.
OXYDEMETON-METHYL	MS	DICROTOPPHOS(1.0),DIMETHOATE(0.5)	1.5	16.095	0.	-3.	0.	-341.
OXYDEMETON-METHYL	NM	DICROTOPHOS(3),DIMETHOATE(1),DISULFOTON(0.3),ACEPHATE(0.3),OTHERS(0.5)	6.	4.98	0.	-12.	0.	-387.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
OXYDEMETON-METHYL	OK	PARATHION(0.3),DIMETHOATE(0.5),PROFENOFOS(0.4),DICROTOPHOS(0.5)	2.	8.3	0.	-3.	0.	-82.
OXYDEMETON-METHYL	SC	ACEPHATE(4),DICROTOPHOS(1.6),DIMETHOATE(1.6),METHYL-PARATHION(0.8)	8.	9.76	0.	-12.	0.	-638.
OXYDEMETON-METHYL	TX20	ACEPHATE(1.2),DICROTOPHOS(1.2),DIMETHOATE(0.54),PHOSPHAMIDON(0.06)	3.	10.245	-0.3	-2.	-13.	-87.
OXYDEMETON-METHYL	TX26	DICROTOPHOS(1.2),DIMETHOATE(0.4),DISULFOTON(0.1),ACEPHATE(0.1),OTHERS(0.2)	2.	7.9	0.	-12.	0.	-402.
		U.S. Totals >	2.435	266.85	-0.0004	-0.1198	-30.	-8169.
PARATHION	AZ	ESFENVALERATE(1),CYHALOTHRIN(1),CYFLUTHRIN(1)	3.	12.48	0.	-5.	0.	-753.
PARATHION	OK	AZINPHOSMETHYL(8),OXAMYL(8),MALATHION(4)	20.	83.	0.	-5.	0.	-1365.
PARATHION	TX24	AZINPHOSMETHYL(2),METHYL-PARATHION(1),OXAMYL(1)	4.	44.12	0.	-7.	0.	-1309.
		U.S. Totals >	1.274	139.6	0.	-0.0503	0.	-3427.
PERMETHRIN	AL	THIODICARB(10)	10.	33.6	-10.	-30.	-2040.	-6119.
PERMETHRIN	AZ	CYFLUTHRIN(.6),CYHALOTHRIN(.6),TRALOMETHRIN(.6),ESFENVALERATE(.6),OTHERS(.6)	3.	12.48	-0.5	-20.	-75.	-3010.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PERMETHRIN	CA36	AZINPHOSMETHYL(15),CYPERMETHRIN(9),ESFENVALERATE(9)	30.	14.7	0.	-10.	0.	-1607.
PERMETHRIN	FL	B.t.(10),THIODICARB(10),CYFLUTHRIN(10)	30.	7.5	0.	-20.	0.	-1010.
PERMETHRIN	GA	CYFLUTHRIN(1.5),TRALOMETHRIN(1.5),CYHALTHRIN(1),CYPERMETHRIN(0.5),OTHERS(0.5)	5.	12.55	0.	-90.	0.	-7082.
PERMETHRIN	MS	CYHALOTHRIN(3),CYFLUTHRIN(1),TRALOMETHRIN(0.5),CYPERMETHRIN(0.5)	5.	53.65	0.	-30.	0.	-11363.
PERMETHRIN	SC	CYHALOTHRIN(0.9),CYPERMETHRIN(0.6),ESFENVALERATE(0.6),TRALOMETHRIN(0.6)	3.	3.66	0.	-20.	0.	-399.
PERMETHRIN	TX20	CYPERMETHRIN(0.9),ESFENVALERATE(0.3),CHLORPYRIFOS(0.3)	1.5	5.1225	0.	-13.	0.	-282.
		U.S. Totals »	1.307	143.26	-0.031	-0.4529	-2115.	-30871.
PHORATE	AZ	ALDICARB(3)	3.	12.48	0.	-7.	0.	-1054.
PHORATE	CA36	ALDICARB(3.75),DISULFOTON(0.25),ACEPHATE(0.25)	5.	2.45	0.	-5.	0.	-134.
PHORATE	FL	DISULFOTON(21),ALDICARB(4.5)	30.	7.5	0.	-3.	0.	-151.
PHORATE	GA	ALDICARB(10)	10.	25.1	0.	-10.	0.	-1574.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PHORATE	LA	ALDICARB(6),DISULFOTON(1.2),ACEPHATE(0.8)	8.	51.36	0.	-7.	0.	-2456.
PHORATE	MS	ALDICARB(0.6),ACEPHATE(0.15),DISULFOTON(0.15),DICROTOPHOS(0.05)	1.	10.73	0.	-10.	0.	-758.
PHORATE	OK	ALDICARB(2),ACEPHATE(2)	4.	16.6	0.	-0.5	0.	-27.
PHORATE	SC	ALDICARB(2.5),DISULFOTON(1),ACEPHATE(1)	5.	6.1	0.	-12.	0.	-399.
PHORATE	TX20	ALDICARB(1.8),ACEPHATE(0.2)	2.	6.83	3.	-4.3	87.	-125.
PHORATE	TX23	ALDICARB(1)	1.	1.4	0.	-1.	0.	-6.
PHORATE	TX25	ALDICARB(1.5),ACEPHATE(0.4),DICROTOPHOS(0.1)	2.	56.	5.	-22.	1187.	-5224.
		U.S. Totals >	1.794	196.55	0.01869	-0.1747	1274.	-11906.
PROFENOFOS	AL	CHLORPYRIFOS(30)	30.	100.8	-5.	-8.	-3059.	-4895.
PROFENOFOS	AR	THIODICARB(2.2),BIFENTHRIN(2),SULPROFOS(1.3),CHLORPYRIFOS(0.3)	6.	32.1	0.	-10.	0.	-2282.
PROFENOFOS	AZ	ESFENVALERATE(2),CYHALOTHRIN(2),CYFLUTHRIN(2),CYPERMETHRIN(2)	8.	33.28	5.	-10.	2007.	-4014.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PROFENOFOS	CA36	ESFENVALERATE(1.5),CYPERMETHRIN(1.5),PERMETHRIN(1.5)	5.	2.45	0.	-10.	0.	-268.
PROFENOFOS	CA37	DIMETHOATE(9),DICOFOL(6),METHAMIDOPHOS(8),ACEPHATE(7)	30.	360.	0.	-3.	0.	-11804.
PROFENOFOS	FL	SULPROFOS(7.5),THIODICARB(21),METHOMYL(1.5)	30.	7.5	0.	-15.	0.	-757.
PROFENOFOS	GA	SULPROPHOS(2.7),CHLORPYRIFOS(2.7),THIODICARB(1.8),METHOMYL(0.9),OTHERS(0.9)	9.	22.59	0.	-20.	0.	-2833.
PROFENOFOS	LA	ACEPHATE(2.5),SULPROFOS(4),THIODICARB(4)	10.5	67.41	0.	-5.	0.	-2302.
PROFENOFOS	MO	CYHALOTHRIN(0.45),CYPERMETHRIN(0.25),ESFENVALERATE(0.15),OTHERS(0.15)	1.	1.85	0.	-10.	0.	-122.
PROFENOFOS	MS	CHLORPYRIFOS(36),THIODICARB(6),SULPROFOS(18)	60.	643.8	0.	-4.	0.	-18181.
PROFENOFOS	NC	CYHALOTHRIN(1.5),CYPERMETHRIN(0.5),CYFLUTHRIN(0.7),OTHERS(0.3)	3.	2.94	0.	-15.	0.	-253.
PROFENOFOS	NM	SULPROFOS(0.7),THIODICARB(0.3)	1.	0.83	0.	-2.	0.	-11.
PROFENOFOS	OK	BIFENTHRIN(3.2),DICOFOL(3.2),PROPARGITE(1.6)	8.	33.2	0.	-6.	0.	-655.
PROFENOFOS	SC	PYRETHROIDS(6),SULPROFOS(2.4),CHLORPYRIFOS(1.2),THIODICARB(1.2),OTHERS(1.2)	12.	14.64	0.	-20.	0.	-1596.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PROFENOFOS	TN	CYHALOTHRIN(2.25),CYPERMETHRIN(1.25),ESFENVALERATE(0.75),OTHERS(0.75)	5.	19.95	0.	-8.5	0.	-984.
PROFENOFOS	TX20	THIODICARB(0.6)	0.6	2.049	0.5	-7.	4.	-61.
PROFENOFOS	TX23	PROPARGITE(6.3),DICOFOL(2.7)	9.	12.6	0.	-8.	0.	-427.
PROFENOFOS	TX24	PROPARGITE(1.2),DICOFOL(1),SULPROFOS(1.2),BIFENTHRIN(0.6)	4.	44.12	-2.	-3.	-374.	-561.
PROFENOFOS	TX25	BIFENTHRIN(0.5),THIODICARB(0.5),DICOFOL(0.5)	1.5	42.	0.	-8.	0.	-1425.
PROFENOFOS	TX26	SULPROFOS(0.7),THIODICARB(0.3)	1.	3.95	0.	-2.	0.	-33.
		U.S. Totals >	13.21	1448.1	-0.0209	-0.7843	-1422.	-53463.
PROPARGITE	CA37	DICOFOL(11),SULFUR(4)	34.	408.	0.	-12.	0.	-53513.
PROPARGITE	FL	CHLORPYRIFOS(1.5),DICOFOL(12.75)	15.	3.75	0.	-7.	0.	-177.
PROPARGITE	GA	DICOFOL(0.1),PROFENOFOS(0.3),CHLORPYRIFOS(0.1)	0.5	1.255	0.	-5.	0.	-39.
PROPARGITE	MS	DICOFOL(1),PROFENOFOS(4),CHLORPYRIFOS(4)	10.	107.3	0.	-2.	0.	-1515.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PROPARGITE	SC	BIFENTHRIN(0.2),PROFENOFOS(1.2), DICOFOL(0.6)	2.	2.44	0.	-2.	0.	-27.
PROPARGITE	TX23	PROFENOFOS(10.5),DICOFOL(4.5)	15.	21.	0.	-8.	0.	-712.
		U.S. Totals >	4.962	543.74	0.	-0.8213	0.	-55983.
SULFUR	CA37	DICOFOL(6),PROPARGITE(4)	10.	120.	0.	-12.	0.	-15739.
		U.S. Totals >	1.095	120.	0.	-0.2309	0.	-15739.
SULPROFOS	AL	PROFENOFOS(4),CYHALOTHRIN(1)	5.	16.8	-2.	-12.	-204.	-1224.
SULPROFOS	AZ	ESFENVALERATE(1),CYHALOTHRIN(1), CYFLUTHRIN(1.5),CYPERMETHRIN(1.5)	5.	20.8	-2.	-6.	-502.	-1505.
SULPROFOS	CA36	AZINPHOSMETHYL(5),CYPERMETHRIN(3),PERMETHRIN(3)	10.	4.9	0.	-10.	0.	-536.
SULPROFOS	CA37	CHLORPYRIFOS(1.2),METHAMIDOPHOS(1.2),B.t.(0.6)	3.	36.	0.	-1.	0.	-393.
SULPROFOS	FL	PROFENOFOS(5.25),THIODICARB(28), METHOMYL(1.75)	35.	8.75	0.	-15.	0.	-883.
SULPROFOS	GA	CHLORPYRIFOS(0.3),THIODICARB(1.2),PROFENOFOS(1.2),DIFLUBENZURON(0.3)	3.	7.53	0.	-20.	0.	-944.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
SULPROFOS	LA	ACEPHATE(2),PROFENOFOS(3.5),THIODICARB(3.5)	9.	57.78	0.	-5.	0.	-1973.
SULPROFOS	MS	CHLORPYRIFOS(4.8),THIODICARB(11.2),PROFENOFOS(16)	32.	343.36	0.	-12.	0.	-29089.
SULPROFOS	NM	PROFENOFOS(0.35),THIODICARB(0.15)	0.5	0.415	0.	-2.	0.	-5.
SULPROFOS	SC	PYRETHROIDS(3),PROFENOFOS(1.2),CHLORPYRIFOS(0.6),THIODICARB(0.6),OTHERS(0.6)	6.	7.32	0.	-20.	0.	-798.
SULPROFOS	TX20	THIODICARB(0.6)	0.6	2.049	0.5	-7.	4.	-61.
SULPROFOS	TX21	PROFENOFOS(10.5),THIODICARB(4.5)	15.	9.75	0.	-2.	0.	-83.
SULPROFOS	TX23	CYPERMETHRIN(0.8),CYFLUTHRIN(0.8),ESFENVALERATE(4.8),TRALOMETHRIN(1.6)	8.	11.2	0.	-15.	0.	-712.
SULPROFOS	TX24	PROFENOFOS(0.65),THIODICARB(0.35)	1.	11.03	0.	-2.	0.	-94.
SULPROFOS	TX25	THIODICARB(0.7),PROFENOFOS(0.3)	1.	28.	0.	-4.	0.	-475.
SULPROFOS	TX26	PROFENOFOS(0.35),THIODICARB(0.15)	0.5	1.975	0.	-2.	0.	-17.
		U.S. Totals >	5.18	567.66	-0.0103	-0.5691	-701.	-38792.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
THIODICARB	AL	PROFENOFOS(70)	70.	235.2	0.	-2.	0.	-2855.
THIODICARB	AR	PROFENOFOS(4),SULPROFOS(3),METHOMYL(2)	10.	53.5	0.	-5.	0.	-1902.
THIODICARB	AZ	CYHALOTHRIN(1.5),CYFLUTHRIN(1.5)	3.	12.48	0.	-15.	0.	-2258.
THIODICARB	CA37	CHLORPYRIFOS(0.4),METHAMIDOPHOS(0.2),B.t.(0.4)	1.	12.	0.	-1.	0.	-131.
THIODICARB	FL	PROFENOFOS(9.75),SULPROFOS(9.75),METHOMYL(45.5)	65.	16.25	-5.	-15.	-547.	-1640.
THIODICARB	GA	PROFENOFOS(8.5),SULPROFOS(6.8),DIFLUBENZURON(1.7)	17.	42.67	0.	-20.	0.	-5351.
THIODICARB	LA	ACEPHATE(4),PROFENOFOS(13),SULPROFOS(13)	30.	192.6	0.	-5.	0.	-6577.
THIODICARB	MO	CYHALOTHRIN(1.35),CYPERMETHRIN(0.75),ESFENVALERATE(0.45),OTHERS(0.45)	3.	5.55	0.	-10.	0.	-365.
THIODICARB	MS	METHOMYL(57),SULPROFOS(19),PROFENOFOS(19)	95.	1019.3	0.	-8.	0.	-57573.
THIODICARB	NC	CYHALOTHRIN(0.5),CYPERMETHRIN(0.17),CYFLUTHRIN(0.18),OTHERS(0.15)	1.	0.98	0.	-15.	0.	-84.
THIODICARB	NM	PROFENOFOS(1),SULPROFOS(1),METHOMYL(0.5)	3.5	2.905	-1.	-3.	-19.	-56.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
THIODICARB	OK	PROFENOFOS(2),ACEPHATE(1.5),METHOMYL(1),TRICHLORFON(0.5)	5.	20.75	-2.	-5.	-137.	-341.
THIODICARB	SC	PYRETHROIDS(12),PROFENOFOS(3),CHLORPYRIFOS(3),SULPROFOS(3),METHOMYL(9)	30.	36.6	0.	-20.	0.	-3989.
THIODICARB	TN	CYHALOTHRIN(1.5),CYPERMETHRIN(1),ESFENVALERATE(0.75),OTHERS(0.75),CYFLUTHRIN(1)	5.	19.95	0.	-8.	0.	-926.
THIODICARB	TX19	PYRETHROIDS(16),METHYL-PARATHION(2),SULPROFOS(2)	20.	60.	0.	-20.	0.	-5088.
THIODICARB	TX20	CHLORPYRIFOS(0.42),DIFLUBENZURON(0.28),PYRETHROIDS(2.2)	2.9	9.9035	0.6	-8.	25.	-336.
THIODICARB	TX21	PROFENOFOS(6),SULPROFOS(6)	12.	7.8	-1.	-3.	-33.	-99.
THIODICARB	TX23	METHOMYL(10)	45.	63.	-1.	-5.	-267.	-1336.
THIODICARB	TX24	PROFENOFOS(1.4),SULPROFOS(1.3),B.t.(1.3),CYHALOTHRIN(0.5),CYFLUTHRIN(0.5)	5.	55.15	0.	-5.	0.	-1169.
THIODICARB	TX25	SULPROFOS(0.6),PROFENOFOS(0.4)	2.	56.	-1.	-4.	-237.	-950.
THIODICARB	TX26	PROFENOFOS(0.5),SULPROFOS(0.5),METHOMYL(0.5)	2.5	9.875	-1.	-3.	-42.	-126.
THIODICARB	TX26	PROFENOFOS(0.5),SULPROFOS(0.5)	1.	3.95	0.	-2.	0.	-33.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals >	17.67	1936.5	-0.0184	-1.3671	-1256.	-93187.
TRALOMETHRIN	AL	CYHALOTHRIN(2.5),CYFLUTHRIN(2.5)	5.	16.8	0.	-40.	0.	-4079.
TRALOMETHRIN	AR	CYFLUTHRIN(5),CYHALOTHRIN(4),CYPERMETHRIN(1),ESFENVALERATE(1),OTHERS(1)	13.	69.55	0.	-50.	0.	-24725.
TRALOMETHRIN	AZ	CYFLUTHRIN(3),CYHALOTHRIN(3),CYPERMETHRIN(2),ESFENVALERATE(3),OTHERS(1)	12.	49.92	-0.5	-20.	-301.	-12041.
TRALOMETHRIN	FL	CYFLUTHRIN(2),CYHALOTHRIN(2),CYPERMETHRIN(1)	5.	1.25	0.	-25.	0.	-210.
TRALOMETHRIN	GA	CYFLUTHRIN(6),CYHALOTHRIN(4.5),ESFENVALERATE(3),CYPERMETHRIN(1.5)	15.	37.65	0.	-90.	0.	-21246.
TRALOMETHRIN	LA	CYFLUTHRIN(1.5),CYHALOTHRIN(1.5),ESFENVALERATE(1.2),CYPERMETHRIN(0.8)	5.	32.1	0.	-10.	0.	-2192.
TRALOMETHRIN	MS	CYHALOTHRIN(6),CYFLUTHRIN(4.5),TRALOMETHRIN(3),CYPERMETHRIN(1.5)	15.	160.95	0.	-30.	0.	-34089.
TRALOMETHRIN	NC	CYHALOTHRIN(4),CYPERMETHRIN(1.8),CYFLUTHRIN(1.9),ESFENVALERATE(0.3)	8.	7.84	0.	-15.	0.	-674.
TRALOMETHRIN	OK	CYHALOTHRIN(1.2),CYPERMETHRIN(1.2),ESFENVALERATE(0.8),CYFLUTHRIN(0.8)	4.	16.6	0.	-15.	0.	-819.
TRALOMETHRIN	SC	CYHALOTHRIN(14),CYFLUTHRIN(7),CYPERMETHRIN(7),ESFENVALERATE(7)	35.	42.7	0.	-20.	0.	-4654.

TABLE 10. Impact of the Loss of Individual Pesticides on Cotton Production
Insecticides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
TRALOMETHRIN	TX20	PYRETHROIDS(1.8)	1.8	6.147	0.	-12.	0.	-313.
TRALOMETHRIN	TX21	CYHALOTHRIN(4.6),CYFLUTHRIN(4.6),CYPERMETHRIN(4.4),ESFENVALERATE(4.4)	18.	11.7	0.	-17.	0.	-843.
TRALOMETHRIN	TX23	CYPERMETHRIN(1.5),CYFLUTHRIN(4.5),ESFENVALERATE(9)	15.	21.	0.	-15.	0.	-1336.
TRALOMETHRIN	TX25	OTHER-PYRETHROIDS(2)	2.	56.	0.	-35.	0.	-8310.
		U.S. Totals >	4.838	530.21	-0.0044	-1.69489	-301.	-115532.
TRICHLORFON	FL	DICROTOPHOS(1),DIMETHOATE(0.3)	1.5	0.375	0.	-2.	0.	-5.
		U.S. Totals >	0.003	0.375	0.	-0.00007	0.	-5.

* Alternatives are other pesticides or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide.
** Yield impacts are plus (+) or minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; totals for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ALACHLOR	LA	METOLOCHLOR(5)	5.	32.1	0.	-30.	0.	-6577.
		U.S. Totals >	0.293	32.1	0.	-0.096	0.	-6577.
CYANAZINE	AL	DIURON(20),PROMETRYN(30)	50.	168.	0.	-15.	0.	-15296.
CYANAZINE	AR	FLUOMETURON(10),METHAZOLE(20),PROMETRYN(5),OXYFLUORFEN(10)	45.	240.75	0.	-25.	0.	-42793.
CYANAZINE	AR	METOLACHLOR(2),FLUOMETURON(2),NORFLURAZON(2)	6.	32.1	0.	-30.	0.	-6847.
CYANAZINE	AZ	PROMETRYN(15),OXYFLUORFEN(5)	20.	83.2	0.	-30.	0.	-30102.
CYANAZINE	CA37	PROMETRYN(8),OXYFLUORFEN(7)	15.	180.	0.	-35.	0.	-68859.
CYANAZINE	FL	FLUOMETURON(10),PROMETRYN(10),METHAZOLE(3),OXYFLUORFEN(2)	25.	6.25	-5.	-25.	-210.	-1052.
CYANAZINE	GA	DIURON(20),PROMETRYN(15),FLUOMETURON(10),METHAZOLE(10)	55.	138.05	0.	-20.	0.	-17311.
CYANAZINE	LA	METHAZOLE(5),PROMETRYN(10),FLUOMETURON(10),DIURON(10)	35.	224.7	0.	-20.	0.	-30694.
CYANAZINE	MO	METHAZOLE(63),OXYFLUORFEN(15)	78.	144.3	-1.	-20.	-949.	-18990.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
CYANAZINE	MS	FLUOMETURON(10.2),DIURON(18),LINURON(4)	32.2	345.51	0.	-33.	0.	-80496.
CYANAZINE	MS	FLUOMETURON(1),METHAZOLE(6),PROMETRYN(15),LACTOFEN(8)	35.	375.55	0.	-33.	0.	-87496.
CYANAZINE	NC	METHAZOLE(15),OXYFLUORFEN(5)	20.	19.6	-2.	-10.	-225.	-1123.
CYANAZINE	SC	PROMETRYN(35),LINURON(15),FLUOMETURON(15),METHAZOLE(10)	75.	91.5	-5.	-20.	-2493.	-9974.
CYANAZINE	TN	PROMETRYN(9),LACTOFEN(5),METHAZOLE(5),OXYFLUORFEN(1)	20.	79.8	0.	-15.	0.	-6943.
		U.S. Totals >	19.43	2129.3	-0.057	-6.132	-3878.	-417975.
DIURON	AL	CYANAZINE(4),PROMETYN(4)	15.	50.4	0.	-15.	0.	-4589.
DIURON	AR	CYANAZINE(5)	5.	26.75	0.	-25.	0.	-4755.
DIURON	AZ	PROMETRYN(4),CYANAZINE(3)	7.	29.12	0.	-10.	0.	-3512.
DIURON	GA	CYANAZINE(20)	20.	50.2	0.	-20.	0.	-6295.
DIURON	GA	FLUOMETURON(9),NORFLURAZON(1)	10.	25.1	0.	-45.	0.	-7082.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DIURON	LA	FLUOMETURON(20)	20.	128.4	-10.	-50.	-8770.	-43849.
DIURON	MO	METHAZOLE(1)	1.	1.85	0.	-10.	0.	-122.
DIURON	MS	FLUOMETURON(15),CYANAZINE(19),METHAZOLE(5),LINURON(3)	42.	450.66	0.	-33.	0.	-104995.
DIURON	MS	FLUOMETURON(4)	4.	42.92	0.	-33.	0.	-10000.
DIURON	SC	CYANAZINE(6)	6.	7.32	0.	-20.	0.	-798.
DIURON	TX	PROMETRYN(0.8),FLUOMETURON(0.2)	1.	51.28	0.	-11.	0.	-2392.
		U.S. Totals >	7.884	864.	-0.129	-2.764	-8770.	-188387.
DSMA	AL	MSMA(10)	10.	33.6	0.	-25.	0.	-5099.
DSMA	AR	MSMA(10)	10.	53.5	0.	-25.	0.	-9510.
DSMA	FL	MSMA(20)	20.	5.	0.	-25.	0.	-841.
DSMA	GA	MSMA(10)	10.	25.1	-20.	-35.	-3148.	-5508.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DSMA	LA	MSMA(70)	70.	449.4	0.	-35.	0.	-107429.
DSMA	MO	MSMA(5)	5.	9.25	0.	-10.	0.	-609.
DSMA	MS	MSMA(15)	15.	160.95	0.	-15.	0.	-17045.
DSMA	NC	MSMA(15)	15.	14.7	0.	-20.	0.	-1685.
DSMA	SC	MSMA(11)	11.	13.42	0.	-50.	0.	-3657.
DSMA	TN	MSMA(5)	5.	19.95	0.	-20.	0.	-2314.
DSMA	TX	MSMA(1)	1.	51.28	0.	-8.	0.	-1739.
		U.S. Totals >	7.63	836.15	-0.046	-2.28	-3148.	-155435.
FENOXAPROP-ETHYL	FL	SETHOXYDIM(0.5),FLUAZIFOP-P-BUTYL(0.5)	1.	0.25	0.	-15.	0.	-25.
FENOXAPROP-ETHYL	GA	SETHOXYDIM(1),FLUAZIFOP-P-BUTYL(1)	2.	5.02	0.	-10.	0.	-315.
		U.S. Totals >	0.048	5.27	0.	-0.005	0.	-340.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
FLUAZIFOP-P-BUTYL	AL	SETHOXYDIM(15)	15.	50.4	-10.	-25.	-3059.	-7648.
FLUAZIFOP-P-BUTYL	AR	SETHOXYDIM(20)	20.	107.	0.	-13.	0.	-9890.
FLUAZIFOP-P-BUTYL	AZ	SETHOXYDIM(5)	5.	20.8	0.	-25.	0.	-6271.
FLUAZIFOP-P-BUTYL	CA37	SETHOXYDIM(4)	4.	48.	0.	-50.	0.	-26232.
FLUAZIFOP-P-BUTYL	FL	SETHOXYDIM(4)	4.	1.	0.	-15.	0.	-101.
FLUAZIFOP-P-BUTYL	GA	SETHOXYDIM(4),FENOXAPROP(1)	5.	12.55	0.	-10.	0.	-787.
FLUAZIFOP-P-BUTYL	LA	SETHOXYDIM(35)	40.	256.8	-10.	-25.	-17539.	-43849.
FLUAZIFOP-P-BUTYL	MO	SETHOXYDIM(7)	7.	12.95	-1.	-10.	-85.	-852.
FLUAZIFOP-P-BUTYL	MS	SETHOXYDIM(33),GYLPHOSATE(3),DSMA/MSMA(2)	38.	407.74	0.	-6.	0.	-17272.
FLUAZIFOP-P-BUTYL	NC	SETHOXYDIM(20)	20.	19.6	0.	-10.	0.	-1123.
FLUAZIFOP-P-BUTYL	OK	SETHOXYDIM(1.7)	1.7	7.055	0.	-7.	0.	-162.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
FLUAZIFOP-P-BUTYL	SC	SETHOXYDIM(2)	2.	2.44	0.	-10.	0.	-133.
FLUAZIFOP-P-BUTYL	TN	SETHOXYDIM(50),GLYPHOSATE-ROPEWICK(20)	50.	199.5	-2.	-12.	-2314.	-13885.
FLUAZIFOP-P-BUTYL	TX	SETHOXYDIM(13),GLYPHOSATE(2)	15.	769.2	-2.	-9.	-6523.	-29353.
		U.S. Totals >	17.47	1915.	-0.433	-2.311	-29521.	-157558.
FLUOMETURON	AL	METHAZOLE(25),PROMETRYN(25),DSMA/MSMA(25)	80.	268.8	0.	-25.	0.	-40790.
FLUOMETURON	AR	NORFLURAZON(25),DIURON(35),METOLACHLOR(10)	70.	374.5	-10.	-30.	-26627.	-79881.
FLUOMETURON	AR	DIURON(15),METHAZOLE(45),PROMETRYN(15)	75.	401.25	-2.	-25.	-5706.	-71322.
FLUOMETURON	CA37	MSMA(1)	1.	12.	-5.	-5.	-656.	-656.
FLUOMETURON	FL	MSMA/DSMA(5),NORFLURAZON(10),DIURON(10)	25.	6.25	-5.	-30.	-210.	-1262.
FLUOMETURON	GA	METHAZOLE(40)	50.	125.5	0.	-35.	0.	-27541.
FLUOMETURON	GA	DIURON(40),NORFLURAZON(35)	75.	188.25	-15.	-55.	-17705.	-64918.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
FLUOMETURON	LA	NORFLURAZON(30),DIURON(30)	60.	385.2	-30.	-80.	-78927.	-210473.
FLUOMETURON	MO	CYANAZINE(60),METHAZOLE(30),PROMETRYN(10)	100.	185.	-5.	-25.	-6087.	-30433.
FLUOMETURON	MS	PROMETRYN(13),HAND-HOE(?),METHAZOLE(25)	38.	407.74	-8.	-25.	-23029.	-71966.
FLUOMETURON	MS	DIURON(73),CYANAZINE(5)	78.	836.94	-8.	-25.	-47270.	-147720.
FLUOMETURON	NC	DIURON(50),METHAZOLE(10),NORFLURAZON(30),MSMA(10)	100.	98.	-50.	-80.	-28077.	-44923.
FLUOMETURON	NC	METHAZOLE(10)	10.	9.8	0.	-25.	0.	-1404.
FLUOMETURON	OK	PROMETRYN(0.1),HOEING(0.1)	0.2	0.83	-2.	-10.	-5.	-27.
FLUOMETURON	SC	NORFLURAZON(60),METHAZOLE(40)	100.	122.	0.	-25.	0.	-16623.
FLUOMETURON	TN	DIURON(75),PROMETRYN(15)	90.	359.1	-20.	-35.	-41656.	-72897.
FLUOMETURON	TX	PROMETRYN(1),DIURON(0.5)	1.5	76.92	0.	-11.	0.	-3588.
		U.S. Totals >	35.2	3858.1	-4.048	-13.	-275955.	-886424.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
GLYPHOSATE	AL	PARAQUAT(3)	3.	10.08	0.	-30.	0.	-1836.
GLYPHOSATE	AR	SETHOXYDIM(2),FLUAZIFOP-P-BUTYL(2)	4.	21.4	0.	-3.	0.	-456.
GLYPHOSATE	AZ	FLUAZIFOP-P-BUTYL(3),SETHOXYDIM(2),HAND-HOEING(4)	10.	41.6	-5.	-25.	-2508.	-12542.
GLYPHOSATE	CA37	PARAQUAT(25)	25.	300.	0.	-2.	0.	-6558.
GLYPHOSATE	CA37	FLUAZIFOP-P-BUTYL(4)	6.	72.	-12.	-50.	-9444.	-39348.
GLYPHOSATE	CA37	NONE	6.	72.	-1.	-1.	-787.	-787.
GLYPHOSATE	LA	PARAQUAT(20),TILLAGE(20)	20.	128.4	0.	-15.	0.	-13155.
GLYPHOSATE	MO	MSMA(2),PARAQUAT(1),FLUAZIFOP-P-BUTYL(6)	9.	16.65	-2.	-5.	-219.	-548.
GLYPHOSATE	MS	TILLAGE(0.5),FLUAZIFOP-P-BUTYL(1)	1.5	16.095	0.	0.	0.	0.
GLYPHOSATE	OK	MSMA(2),HOEING(1)	2.	8.3	-5.	-15.	-137.	-410.
GLYPHOSATE	TN	PARAQUAT(2)	2.	7.98	-5.		-231.	

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
GLYPHOSATE	TX	FLUAZIFOP-P-BUTYL(10),MSMA(2),DSMA(2),HAND-HOEING(12.5)	26.5	1358.9	-2.	-7.	-11524.	-40333.
		U.S. Totals >	18.74	2053.4	-0.365	-1.701	-24850.	-115972.
LACTOFEN	MS	PROMETRYN(1),CYANAZINE(2)	3.	32.19	0.	-33.	0.	-7500.
LACTOFEN	TN	CYANAZINE(5)	5.	19.95	0.	-1.	0.	-116.
		U.S. Totals >	0.476	52.14	0.	-0.112	0.	-7615.
LINURON	AR	DIURON(2),CYANAZINE(3)	5.	26.75	0.	-2.	0.	-380.
LINURON	MO	DIURON(1),FLUOMETURON(1)	2.	3.7	0.	-5.	0.	-122.
LINURON	MS	CYANAZINE(4),DIURON(7)	11.	118.03	0.	-8.	0.	-6666.
LINURON	SC	CYANAZINE(5)	5.	6.1	0.	-3.	0.	-100.
LINURON	TN	CYANAZINE(0.5),PROMETRYN(0.5)	1.	3.99	0.	-1.	0.	-23.
		U.S. Totals >	1.447	158.57	0.	-0.107	0.	-7291.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METHAZOLE	AR	DIURON(10),FLUOMETURON(25),PROME TRYN(10)	45.	240.75	0.	-25.	0.	-42793.
METHAZOLE	FL	FLUOMETURON(1),CYANAZINE(4)	5.	1.25	0.	-15.	0.	-126.
METHAZOLE	GA	FLUOMETURON(20)	20.	50.2	0.	-35.	0.	-11016.
METHAZOLE	LA	PROMETRYN(10)	10.	64.2	0.	-15.	0.	-6577.
METHAZOLE	MO	FLUOMETURON(20),PROMETRYN(10)	30.	55.5	-2.	-15.	-730.	-5478.
METHAZOLE	MS	FLUOMETURON(3)	3.	32.19	0.	-5.	0.	-1136.
METHAZOLE	NC	FLUOMETURON(10),CYANAZINE(15)	25.	24.5	-5.	-25.	-702.	-3510.
METHAZOLE	SC	FLUOMETURON(20)	20.	24.4	-5.	-15.	-665.	-1995.
		U.S. Totals >	4.498	492.99	-0.031	-1.066	-2097.	-72632.
METOLACHLOR	AR	FLUOMETURON(2),CYANAZINE(3)	5.	26.75	0.	-30.	0.	-5706.
METOLACHLOR	AZ	MSMA(5)	5.	20.8	-2.	-10.	-502.	-2508.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
METOLACHLOR	LA	ALACHLOR(5)	5.	32.1	0.	-30.	0.	-6577.
METOLACHLOR	MO	TRIFLURALIN(3),PENDAMETHALIN(1)	4.	7.4	-1.	-10.	-49.	-487.
METOLACHLOR	MS	NORFLURAZON(6)	6.	64.38	0.	-8.	0.	-3636.
METOLACHLOR	TN	TRIFLURALIN(10)	10.	39.9	-2.	-10.	-463.	-2314.
METOLACHLOR	TX	MSMA(1)	1.	51.28	-1.	-6.	-217.	-1305.
		U.S. Totals >	2.214	242.61	-0.018	-0.331	-1231.	-22533.
MSMA	AL	DSMA(75)	75.	252.	0.	-25.	0.	-38241.
MSMA	AR	DSMA(90)	90.	481.5	0.	-25.	0.	-85587.
MSMA	AZ	CYANAZINE-AND-HAND-WEEDING(5)	5.	20.8	-2.	-10.	-502.	-2508.
MSMA	CA37	CULTIVATION-AND-HAND-WEEDING(3)	3.	36.	-15.	-40.	-5902.	-15739.
MSMA	FL	DSMA(70)	70.	17.5	0.	-15.	0.	-1767.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
MSMA	GA	DSMA(85)	85.	213.35	0.	-55.	0.	-73574.
MSMA	MO	DSMA(45)	45.	83.25	0.	-10.	0.	-5478.
MSMA	MS	DSMA(85)	85.	912.05	0.	-15.	0.	-96586.
MSMA	NC	DSMA(40)	40.	39.2	0.	-20.	0.	-4492.
MSMA	OK	DSMA(0.5)	0.5	2.075	-2.	-10.	-14.	-68.
MSMA	SC	DSMA(60)	89.	108.58	0.	-50.	0.	-29588.
MSMA	TN	DSMA(55)	55.	219.45	0.	-20.	0.	-25456.
MSMA	TX	DSMA(6)	6.	307.68	0.	-8.	0.	-10437.
		U.S. Totals >	24.58	2693.4	-0.094	-5.714	-6418.	-389521.
NORFLURAZON	AL	MSMA(20),METHAZOLE(15)	55.	184.8	-5.	-15.	-5609.	-16826.
NORFLURAZON	AR	TRIFLURALIN(10),PENDIMETHALIN(20)	30.	160.5	0.	-10.	0.	-11412.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
NORFLURAZON	AR	FLUOMETURON(10),CYANAZINE(5),METOLACHLOR(5)	20.	107.	0.	-30.	0.	-22823.
NORFLURAZON	FL	FLUOMETURON(20),DIURON(5)	25.	6.25	0.	-15.	0.	-631.
NORFLURAZON	GA	MSMA(13),DSMA(2)	15.	37.65	-7.	-10.	-1652.	-2361.
NORFLURAZON	GA	FLUOMETURON(25),DIURON(5)	30.	75.3	-5.	-35.	-2361.	-16525.
NORFLURAZON	LA	FLUOMETURON(30),DSMA(10)	40.	256.8	0.	-80.	0.	-140316.
NORFLURAZON	MO	CULTIVATION(60)	60.	111.	-5.	-10.	-3652.	-7304.
NORFLURAZON	MS	TRIFLURALIN(33),METOLACHLOR(4),PENDIMETHALIN(27)	64.	686.72	0.	-8.	0.	-38786.
NORFLURAZON	NC	TRIFLURALIN(2.5),PENDIMETHALIN(2.5),MSMA(20)	25.	24.5	-10.	-15.	-1404.	-2106.
NORFLURAZON	SC	FLUOMETURON(9),DSMA(4),MSMA(4)	17.	20.74	-2.	-30.	-226.	-3391.
NORFLURAZON	TN	FLUOMETURON(10),DSMA(3),MSMA(2)	15.	59.85	-5.	-10.	-1736.	-3471.
		U.S. Totals >	15.8	1731.1	-0.244	-3.902	-16639.	-265950.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
OXYFLUORFEN	AR	CYANAZINE(2),PROMETRYN(3)	5.	26.75	0.	-25.	0.	-4755.
OXYFLUORFEN	CA37	CYANAZINE(10)	10.	120.	-2.	-35.	-2623.	-45906.
OXYFLUORFEN	CA37	CYANAZINE(4),PROMETRYN(2)	6.	72.	0.	-2.	0.	-1574.
OXYFLUORFEN	FL	FLUOMETURON(1),CYANAZINE(4)	5.	1.25	0.	-15.	0.	-126.
OXYFLUORFEN	MO	CYANAZINE(3)	3.	5.55	-1.	-15.	-37.	-548.
OXYFLUORFEN	MS	LACTOFEN(0.5)	0.5	5.365	0.	-33.	0.	-1250.
OXYFLUORFEN	NC	CYANAZINE(1)	1.	0.98	0.	-15.	0.	-84.
		U.S. Totals >	2.116	231.9	-0.039	-0.796	-2660.	-54243.
PARAQUAT	AL	GLYPHOSATE(2)	2.	6.72	0.	-75.	0.	-3059.
PARAQUAT	AR	CULTIVATION(2),GLYPHOSATE(1)	3.	16.05	0.	-5.	0.	-571.
PARAQUAT	CA37	GLYPHOSATE(3)	3.	36.	0.	-2.	0.	-787.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PARAQUAT	LA	GLYPHOSATE(20),TILLAGE(20)	20.	128.4	0.	-15.	0.	-13155.
PARAQUAT	MO	GLYPHOSATE(1)	1.	1.85	0.	-10.	0.	-122.
PARAQUAT	MS	GLYPHOSATE(0.3),TILLAGE(0.5)	0.8	8.584	0.	-0.2	0.	-12.
PARAQUAT	TN	GLYPHOSATE(2)	2.	7.98	0.	-15.	0.	-694.
		U.S. Totals >	1.876	205.58	0.	-0.27	0.	-18400.
PENDIMETHALIN	AL	TRIFLURALIN(30)	38.	127.68	0.	-20.	0.	-15500.
PENDIMETHALIN	AR	NORFLURAZON(15),TRIFLURALIN(20)	35.	187.25	0.	-15.	0.	-19970.
PENDIMETHALIN	AZ	TRIFLURALIN(40)	40.	166.4	0.	-15.	0.	-30102.
PENDIMETHALIN	CA37	TRIFLURALIN(30)	30.	360.	0.	-10.	0.	-39348.
PENDIMETHALIN	FL	TRIFLURALIN(50)	50.	12.5	0.	-25.	0.	-2103.
PENDIMETHALIN	GA	TRIFLURALIN-PPI(10)-OR-SETHOXYDIM(10)	10.	25.1	-3.	-5.	-472.	-787.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PENDIMETHALIN	GA	TRIFLURALIN(40)	40.	100.4	0.	-60.	0.	-37770.
PENDIMETHALIN	LA	TRIFLURALIN(30)	30.	192.6	0.	-40.	0.	-52618.
PENDIMETHALIN	MO	TRIFLURALIN(25),NORFLURAZON(5)	30.	55.5	0.	-15.	0.	-5478.
PENDIMETHALIN	MS	TRIFLURALIN(25),NORFLURAZON(9.5) ,METOLACHLOR(5)	39.5	423.83	0.	-8.	0.	-23938.
PENDIMETHALIN	NC	TRIFLURALIN(45)	45.	44.1	0.	-20.	0.	-5054.
PENDIMETHALIN	OK	TRIFLURALIN(35)	35.	145.25	0.	-20.	0.	-9557.
PENDIMETHALIN	SC	TRIFLURALIN(38)	38.	46.36	0.	-80.	0.	-20213.
PENDIMETHALIN	TN	TRIFLURALIN(30)	30.	119.7	0.	-10.	0.	-6943.
PENDIMETHALIN	TX	TRIFLURALIN(19)	19.	974.32	0.	-15.	0.	-61967.
		U.S. Totals >	27.2	2981.	-0.007	-4.861	-472.	-331349.
PROMETRYN	AL	FLUOMETURON(2),METHAZOLE(2)	6.	20.16	0.	-20.	0.	-2447.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PROMETRYN	AR	FLUOMETURON(5),METHAZOLE(5),CYANAZINE(15)	25.	133.75	0.	-25.	0.	-23774.
PROMETRYN	AZ	CYANAZINE(65),OXYFLUORFEN(15),DIURON(10),HAND-HOEING(10)	70.	291.2	-2.	-20.	-7024.	-70237.
PROMETRYN	CA37	CYANAZINE(5)	5.	60.	0.	-35.	0.	-22953.
PROMETRYN	CA37	PENDIMETHALIN(8),TRIFLURALIN(7)	15.	180.	-20.	-25.	-39348.	-49185.
PROMETRYN	FL	CYANAZINE(5),FLUOMETURON(3),METHAZOLE(2)	10.	2.5	0.	-20.	0.	-337.
PROMETRYN	LA	METHAZOLE(20)	20.	128.4	0.	-15.	0.	-13155.
PROMETRYN	MO	FLUOMETURON(0.5),METHAZOLE(0.5)	1.	1.85	0.	-10.	0.	-122.
PROMETRYN	MS	FLUOMETURON(12),METHAZOLE(10)	22.	236.06	0.	-5.	0.	-8333.
PROMETRYN	OK	FLUOMETURON(1),HOEING(0.5)	1.5	6.225	-2.	-10.	-41.	-205.
PROMETRYN	OK	FLUOMETURON(0.5)	0.5	2.075	-1.	-10.	-7.	-68.
PROMETRYN	SC	CYANAZINE(3)	3.	3.66	0.	-20.	0.	-399.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PROMETRYN	TN	CYANAZINE(5)	5.	19.95	0.	-1.	0.	-116.
PROMETRYN	TX	FLUOMETURON(11),DIURON(4),METOLACHLOR(3)	18.	923.04	-6.	-11.	-23482.	-43051.
		U.S. Totals >	18.33	2008.9	-1.025	-3.438	-69902.	-234381.
SETHOXYDIM	AL	FLUAZIFOP-P-BUTYL(10)	15.	50.4	0.	-25.	0.	-7648.
SETHOXYDIM	AR	FLUAZIFOP-P-BUTYL(15)	15.	80.25	0.	-15.	0.	-8559.
SETHOXYDIM	AZ	FLUAZIFOP-P-BUTYL(5)	5.	20.8	0.	-15.	0.	-3763.
SETHOXYDIM	CA37	FLUAZIFOP-P-BUTYL(2)	2.	24.	0.	-35.	0.	-9181.
SETHOXYDIM	FL	FLUAZIFOP-P-BUTYL(4)	4.	1.	0.	-15.	0.	-101.
SETHOXYDIM	GA	FLUAZIFOP-P-BUTYL(8),FENOXAPROP(2)	10.	25.1	0.	-10.	0.	-1574.
SETHOXYDIM	LA	FLUAZIFOP-P-BUTYL(25)	25.	160.5	-5.	-25.	-5481.	-27405.
SETHOXYDIM	MO	FLUAZIFOP-P-BUTYL(2)	2.	3.7	-2.	-10.	-49.	-243.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
SETHOXYDIM	MS	FLUAZIFOP-P-BUTYL(17),GYLPHOSATE (2),DSMA/MSMA(1)	20.	214.6	0.	-6.	0.	-9090.
SETHOXYDIM	NC	FLUAZIFOP-P-BUTYL(20)	20.	19.6	0.	-10.	0.	-1123.
SETHOXYDIM	OK	FLUAZIFOP-P-BUTYL(2)	2.	8.3	0.	-7.	0.	-191.
SETHOXYDIM	SC	FLUAZIFOP-P-BUTYL(6)	6.	7.32	0.	-10.	0.	-399.
SETHOXYDIM	TN	FLUAZIFOP-P-BUTYL(30),GYLPHOSATE -ROPEWICK(?)	30.	119.7	0.	-10.	0.	-6943.
SETHOXYDIM	TX	FLUAZIFOP-P-BUTYL(5),GLYPHOSATE(1)	6.	307.68	0.	-9.	0.	-11741.
		U.S. Totals >	9.517	1042.9	-0.081	-1.29	-5530.	-87962.
TRIFLURALIN	AL	PENDIMETHALIN(60)	60.	201.6	0.	-70.	0.	-85660.
TRIFLURALIN	AR	NORFLURAZON(15),PENDIMETHALIN(20)	35.	187.25	0.	-15.	0.	-19970.
TRIFLURALIN	AZ	PENDIMETHALIN(40)	40.	166.4	0.	-15.	0.	-30102.
TRIFLURALIN	CA37	PENDIMETHALIN(50)	50.	600.	0.	-10.	0.	-65580.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
TRIFLURALIN	FL	PENDIMETHALIN(40)	40.	10.	0.	-25.	0.	-1683.
TRIFLURALIN	GA	PENDIMETHALIN(60)	60.	150.6	-3.	-60.	-2833.	-56656.
TRIFLURALIN	LA	PENDIMETHALIN(40)	40.	256.8	-5.	-40.	-8770.	-70158.
TRIFLURALIN	MO	PENDIMETHALIN(50),NORFLURAZON(10)	60.	111.	-1.	-25.	-730.	-18260.
TRIFLURALIN	MS	PENDIMETHALIN(25),NORFLURAZON(10),METOLACHLOR(5)	44.	472.12	0.	-8.	0.	-26665.
TRIFLURALIN	NC	PENDIMETHALIN(45)	45.	44.1	0.	-20.	0.	-5054.
TRIFLURALIN	OK	PENDIMETHALIN(58),METOLACHLOR(2)	60.	249.	-5.	-20.	-4096.	-16384.
TRIFLURALIN	SC	PENDIMETHALIN(60)	60.	73.2	0.	-80.	0.	-31915.
TRIFLURALIN	TN	PENDIMETHALIN(55),METOLACHLOR(5)	60.	239.4	-1.	-25.	-1389.	-34713.
TRIFLURALIN	TX	PENDIMETHALIN(73),METOLACHLOR(2)	75.	3846.	-1.	-15.	-16307.	-244606.
		U.S. Totals >	60.29	6607.5	-0.501	-10.38	-34124.	-707404.

TABLE 11. Impact of the Loss of Individual Pesticides on Cotton Production
Herbicides Sorted by Pesticide
1990 Cotton Commodity Assessment

* Alternatives are other pesticides or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide.
** Yield impacts are plus (+) or minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; totals for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ARSENIC ACID	GA	PARAQUAT-DICHLORIDE(3),SODIUM-CHLORATE(2)	5.	12.55	0.	0.	0.	0.
ARSENIC ACID	LA	PARAQUAT-DICHLORIDE(0.5),SODIUM-CHLORATE(0.5)	1.	6.42	0.	-20.	0.	-877.
ARSENIC ACID	OK	PARAQUAT-DICHLORIDE(15),WAIT-FOR-FREEZE(15)	30.	124.5	-5.	-15.	-2048.	-6144.
ARSENIC ACID	TX	PARAQUAT-DICHLORIDE(18),THIADIAZURON&PROSPHOROTRITHIOATE(17)	25.	1282.	-15.	-25.	-81535.	-135892.
		U.S. Totals >	13.01	1425.5	-1.226	-2.097	-83583.	-142913.
DIMETHIPIN	AL	PHOSPHOROTRITHIOATE(5)	5.	16.8	-2.	-10.	-204.	-1020.
DIMETHIPIN	AR	PHOSPHOROTRITHIOATE(3),THIDIAZURON(2)	5.	26.75	0.	-5.	0.	-951.
DIMETHIPIN	CA	PARAQUAT-DICHLORIDE(2)	2.	24.98	0.	0.	0.	0.
DIMETHIPIN	FL	PHOSPHOROTRITHIOATE(10)	10.	2.5	-4.	-15.	-67.	-252.
DIMETHIPIN	GA	SODIUM-CHLORATE(2),PHOSPHOROTRITHIOATE(3)	5.	12.55	0.	0.	0.	0.
DIMETHIPIN	LA	PHOSPHOROTRITHIOATE(15)	15.	96.3	0.	-20.	0.	-13155.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
DIMETHIPIN	MO	FROST	10.	18.5	-15.	-15.	-1826.	-1826.
DIMETHIPIN	MS	PHOSPHOROTRITHIOATE(8),SODIUM-CH LORATE(7)	15.	160.95	-1.	0.	-1136.	0.
DIMETHIPIN	NC	PHOSPHOROTRITHIOATE(7),THIDIAZUR ON(3)	10.	9.8	0.	-10.	0.	-562.
DIMETHIPIN	SC	PHOSPHOROTRITHIOATE(2.5),THIDIAZ URON(2.5)	5.	6.1	0.	-15.	0.	-499.
DIMETHIPIN	TN	PHOSPHOROTRITHIOATE(5)	5.	19.95	0.	-5.	0.	-579.
DIMETHIPIN	TX	PHOSPHOROTRITHIOATE(1)	1.	51.28	10.	-15.	2174.	-3261.
		U.S. Totals >	4.074	446.46	-0.016	-0.324	-1059.	-22104.
ENDOTHALL	AL	PARAQUAT-DICHLORIDE(5)	5.	16.8	-2.	-5.	-204.	-510.
ENDOTHALL	CA	PARAQUAT-DICHLORIDE(10)	10.	124.9	0.	0.	0.	0.
ENDOTHALL	FL	PHOSPHOROTRITHIOATE(15),THIDIAZU RON(5)	20.	5.	0.	0.	0.	0.
ENDOTHALL	GA	PARAQUAT-DICHLORIDE(1)	1.	2.51	0.	0.	0.	0.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ENDOTHALL	LA	ETHEPHON(5)	5.	32.1	0.	-5.	0.	-1096.
ENDOTHALL	MS	PARAQUAT-DICHLORIDE(0.01),SODIUM-CHLORATE(0.01)	1.	10.73	0.	0.	0.	0.
ENDOTHALL	TX	PHOSPHOROTRITHIOATE(4),THIDIAZURON(1)	5.	256.4	0.	0.	0.	0.
		U.S. Totals >	4.092	448.44	-0.003	-0.024	-204.	-1606.
ETHEPHON	AL	PARAQUAT-DICHLORIDE(5),THIDIAZURON(10),PHOSPHOROTRITHIOATE(10)	25.	84.	-8.	-10.	-4079.	-5099.
ETHEPHON	AR	PHOSPHOROTRITHIOATE(15),THIDIAZURON(7),DIMETHIPIN(3)	25.	133.75	0.	-3.	0.	-2853.
ETHEPHON	AR	PARAQUAT-DICHLORIDE(20)	40.	214.	3.	-3.	4565.	-4565.
ETHEPHON	AZ	NONE	20.	83.2	-7.	-7.	-7024.	-7024.
ETHEPHON	CA	PARAQUAT-DICHLORIDE(5)	40.	499.6	-3.	-4.	-16382.	-21843.
ETHEPHON	FL	PHOSPHOROTRITHIOATE(15),PARAQUAT-DICHLORIDE(5)	20.	5.	-3.	-10.	-101.	-337.
ETHEPHON	GA	PARAQUAT-DICHLORIDE(20)	60.	150.6	2.	-10.	1889.	-9443.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
ETHEPHON	LA	NONE	35.	224.7	-20.	-20.	-30694.	-30694.
ETHEPHON	MO	PARAQUAT(13)	40.	74.	-10.	-10.	-4869.	-4869.
ETHEPHON	MS	PARAQUAT-DICHLORIDE(11),SODIUM-C HLORATE(10)	60.	643.8	-10.	-15.	-45452.	-68178.
ETHEPHON	NC	THIDIAZURON(25)	40.	39.2	-10.	-20.	-2246.	-4492.
ETHEPHON	OK	WAIT FOR FREEZE(20)	20.	83.	-15.	-15.	-4096.	-4096.
ETHEPHON	SC	NONE	10.	12.2	-5.	-5.	-332.	-332.
ETHEPHON	TN	PHOSPHOROTRITHIOATE(2)	10.	39.9	0.	-5.	0.	-1157.
ETHEPHON	TX	PHOSPHOROTRITHIOATE(8),PARAQUAT-DICHLORIDE(2)	10.	512.8	-3.	-10.	-6523.	-21743.
		U.S. Totals >	25.55	2799.7	-1.692	-2.739	-115345.	-186724.
MEPIQUAT CHLORIDE	AL	NONE	40.	134.4	-10.	-10.	-8158.	-8158.
MEPIQUAT CHLORIDE	AR	VARIETY SELECTION AND OTHER CULTURAL MANAGEMENT(75)	75.	401.25	0.	0.	0.	0.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
MEPIQUAT CHLORIDE	AZ	WATER MANAGEMENT	15.	62.4	-5.	-10.	-3763.	-7525.
MEPIQUAT CHLORIDE	CA	PARAQUAT-DICHLORIDE(5)	50.	624.5	-5.	-5.	-34129.	-34129.
MEPIQUAT CHLORIDE	FL	NONE	20.	5.	-5.	-5.	-168.	-168.
MEPIQUAT CHLORIDE	GA	NONE	40.	100.4	-5.	-5.	-3148.	-3148.
MEPIQUAT CHLORIDE	LA	NONE	20.	128.4	-5.	-5.	-4385.	-4385.
MEPIQUAT CHLORIDE	MO	NONE-AVAILABLE	60.	111.	-20.	-20.	-14608.	-14608.
MEPIQUAT CHLORIDE	MS	NONE	70.	751.1	-5.	-5.	-26514.	-26514.
MEPIQUAT CHLORIDE	NC	NONE	50.	49.	-10.	-10.	-2808.	-2808.
MEPIQUAT CHLORIDE	OK	NONE	20.	83.	-10.	-10.	-2731.	-2731.
MEPIQUAT CHLORIDE	SC	NONE	20.	24.4	-5.	-5.	-665.	-665.
MEPIQUAT CHLORIDE	TN	NONE	30.	119.7	0.	-2.	0.	-1389.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
MEPIQUAT CHLORIDE	TX	NONE	15.	769.2	-5.	-5.	-16307.	-16307.
		U.S. Totals >	30.69	3363.8	-1.722	-1.798	-117382.	-122533.
PARAQUAT DICHLORIDE	AL	ETHEPHON(5)	5.	16.8	-2.	-4.	-204.	-408.
PARAQUAT DICHLORIDE	AR	PHOSPHOROTRITHIOATE(6),THIDIAZURON(3),DIMETHIPIN(1)	10.	53.5	0.	-5.	0.	-1902.
PARAQUAT DICHLORIDE	CA	DIMETHIPIN(2),ENDOTHALL(5)	30.	374.7	0.	0.	0.	0.
PARAQUAT DICHLORIDE	FL	ETHEPHON(4)	4.	1.	2.	-5.	13.	-34.
PARAQUAT DICHLORIDE	GA	ARSENIC-ACID(8),SODIUM-CHLORATE(2)	10.	25.1	-2.	-10.	-315.	-1574.
PARAQUAT DICHLORIDE	LA	THIDIAZURON(5),SODIUM-CHLORATE(10)	15.	96.3	-10.	-30.	-6577.	-19732.
PARAQUAT DICHLORIDE	MO	FROST	5.	9.25	-5.	-5.	-304.	-304.
PARAQUAT DICHLORIDE	MS	SODIUM-CHLORATE(10)	10.	107.3	-2.	-3.	-1515.	-2273.
PARAQUAT DICHLORIDE	OK	ARSENIC-ACID(15),WAIT-FOR-FREEZE(5)	20.	83.	-5.	-15.	-1365.	-4096.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PARAQUAT DICHLORIDE	TN	NONE	10.	39.9	0.	0.	0.	0.
PARAQUAT DICHLORIDE	TX	ARSENIC-ACID(25)	25.	1282.	0.	-25.	0.	-135892.
		U.S. Totals >	19.06	2088.9	-0.151	-2.438	-10267.	-166214.
PHOSPHOROTRITHIOATE	AL	THIDIAZURON(15),SODIUM-CHLORATE(15),DIMETHIPIN(20)	50.	168.	-5.	-15.	-5099.	-15296.
PHOSPHOROTRITHIOATE	AR	THIDIAZURON+ETHEPHON(75),DIMETHIPIN(10)	85.	454.75	0.	-5.	0.	-16166.
PHOSPHOROTRITHIOATE	CA	SODIUM-CHLORATE(50)	50.	624.5	0.	-10.	0.	-68258.
PHOSPHOROTRITHIOATE	FL	THIDIAZURON(40),SODIUM-CHLORATE(20),DIMETHIPIN(10)	70.	17.5	0.	-25.	0.	-2944.
PHOSPHOROTRITHIOATE	GA	THIDIAZURON(40),SODIUM-CHLORATE(20)	85.	213.35	-5.	-10.	-6689.	-13377.
PHOSPHOROTRITHIOATE	LA	DIMETHIPIN(50)	50.	321.	10.	-30.	21924.	-65773.
PHOSPHOROTRITHIOATE	MO	FROST	50.	92.5	-15.	-15.	-9130.	-9130.
PHOSPHOROTRITHIOATE	MS	DIMETHIPIN(25),THIDIAZURON(25)	50.	536.5	0.	-10.	0.	-37877.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, [redacted] Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
PHOSPHOROTRITHIOATE	NC	DIMETHIPIN(30),ETHEPHON(10),THIDIAZURON(30)	75.	73.5	0.	-10.	0.	-4212.
PHOSPHOROTRITHIOATE	OK	DIMETHIPIN(15),THIDIAZURON(10)	25.	103.75	-10.	-12.	-3413.	-4096.
PHOSPHOROTRITHIOATE	SC	DIMETHIPIN+ETHEPHON(40),THIDIAZURON+ETHEPHON(50)	90.	109.8	0.	-15.	0.	-8976.
PHOSPHOROTRITHIOATE	TN	DIMETHIPIN(10),THIDIAZURON(10)	20.	79.8	0.	-5.	0.	-2314.
PHOSPHOROTRITHIOATE	TX	PARAQUAT-DICHLORIDE(8),SODIUM-CHLORATE(8),THIDIAZURON(9)	25.	1282.	0.	-15.	0.	-81535.
		U.S. Totals >	37.2	4077.	-0.035	-4.841	-2406.	-329955.
SODIUM CHLORATE	AL	PHOSPHOROTRITHIOATE(10)	10.	33.6	0.	-5.	0.	-1020.
SODIUM CHLORATE	AR	PHOSPHOROTRITHIOATE(3),THIDIAZURON(1)	4.	21.4	0.	-5.	0.	-761.
SODIUM CHLORATE	CA	PHOSPHOROTRITHIOATE(75)	75.	936.75	0.	-3.	0.	-30716.
SODIUM CHLORATE	FL	PHOSPHOROTRITHIOATE(2),THIDIAZURON(1)	3.	0.75	0.	-25.	0.	-126.
SODIUM CHLORATE	GA	DIMETHIPIN(2),PHOSPHOROTRITHIOATE(8)	10.	25.1	0.	-5.	0.	-787.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
SODIUM CHLORATE	LA	PHOSPHOROTRITHIOATE(15),DIMETHIPIN(10)	25.	160.5	0.	-30.	0.	-32886.
SODIUM CHLORATE	MO	FROST	10.	18.5	-15.	-15.	-1826.	-1826.
SODIUM CHLORATE	MS	PHOSPHOROTRITHIOATE(2.5),PARAQUAT-DICHLORIDE(2.5)	5.	53.65	0.	-10.	0.	-3788.
SODIUM CHLORATE	TX	PHOSPHOROTRITHIOATE(7),THIDIAZURON(3)	10.	512.8	0.	-5.	0.	-10871.
		U.S. Totals >	16.09	1763.1	-0.027	-1.214	-1826.	-82781.
THIDIAZURON	AL	PHOSPHOROTRITHIOATE(25),SODIUM-CHLORATE(5),DIMETHIPIN(5)	35.	117.6	-5.	-10.	-3569.	-7138.
THIDIAZURON	AR	PHOSPHOROTRITHIOATE(30),DIMETHIPIN(10)	40.	214.	0.	-5.	0.	-7608.
THIDIAZURON	CA	PHOSPHOROTRITHIOATE(1),SODIUM-CHLORATE(1)	2.	24.98	0.	0.	0.	0.
THIDIAZURON	FL	PHOSPHOROTRITHIOATE(15)	15.	3.75	0.	-25.	0.	-631.
THIDIAZURON	GA	PHOSPHOROTRITHIOATE(40),SODIUM-CHLORATE(20)	60.	150.6	-3.	-5.	-2833.	-4721.
THIDIAZURON	LA	PHOSPHOROTRITHIOATE(15),DIMETHIPIN(10)	25.	160.5	5.	-30.	5481.	-32886.

TABLE 12. Impact of the Loss of Individual Pesticides on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulators Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide	State	Alternatives that would be used if the pesticide in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide is lost and alternatives are	
					used	not used	used	not used
THIDIAZURON	MO	FROST	10.	18.5	-15.	-15.	-1826.	-1826.
THIDIAZURON	MS	DIMETHIPIN(30),PHOSPHOROTRITHIOATE(30)	60.	643.8	-10.	-25.	-45452.	-113631.
THIDIAZURON	NC	DIMETHIPIN(10),ETHEPHON(20),PHOSPHOROTRITHIOATE(20)	50.	49.	-5.	-10.	-1404.	-2808.
THIDIAZURON	SC	PHOSPHOROTRITHIOATE(5),DIMETHIPIN(5)	10.	12.2	0.	-15.	0.	-997.
THIDIAZURON	TN	PHOSPHOROTRITHIOATE(3)	3.	11.97	0.	-5.	0.	-347.
THIDIAZURON	TX	PHOSPHOROTRITHIOATE(20)	20.	1025.6	0.	-5.	0.	-21743.
		U.S. Totals >	22.2	2432.5	-0.728	-2.851	-49603.	-194336.

* Alternatives are other pesticides or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide.

** Yield impacts are plus (+) or minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; totals for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 13. Impact of the Loss of Pesticide Groups on Cotton Production
Fungicide/Nematicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL FUNGICIDES	AL	NONE	99.	332.64	-20.	-20.	-40382.	-40382.
ALL FUNGICIDES	AR	NONE	100.	535.	-20.	-20.	-76077.	-76077.
ALL FUNGICIDES	AZ	CONTROL-OF-GRAMA-GRASSES(5)	99.	411.84	-6.	-20.	-29801.	-99336.
ALL FUNGICIDES	CA	LATER-PLANTING(5),CROP-ROTATION(40),HIGHER-SEEDING-RATE(30)	90.	1124.1	-2.	-4.	-24573.	-49146.
ALL FUNGICIDES	FL	NONE	99.	24.75	-20.	-20.	-3331.	-3331.
ALL FUNGICIDES	GA	NONE	99.	248.49	-2.	-2.	-3116.	-3116.
ALL FUNGICIDES	LA	DELAYED-PLANTING,RAISED-SEED-BEDS-&-CULTIVATION(20)	99.	635.58	-17.	-25.	-73797.	-108525.
ALL FUNGICIDES	MO	DELAYED-PLANTING-AND-ROTATION(50)	100.	185.	-5.	-10.	-6087.	-12173.
ALL FUNGICIDES	MS	NONE	100.	1073.	-22.	-22.	-166658.	-166658.
ALL FUNGICIDES	NC	ROTATION	22.	21.56	-3.5	-4.5	-432.	-556.
ALL FUNGICIDES	NM	NONE	99.	82.17	-4.	-4.	-2130.	-2130.
ALL FUNGICIDES	OK	NONE	94.	390.1	-15.	-15.	-19251.	-19251.
ALL FUNGICIDES	SC	LATE-PLANTING-AND-BEDDING(50)	99.	120.78	-5.	-10.	-3291.	-6583.
ALL FUNGICIDES	TN	NONE	100.	399.	-22.	-22.	-50912.	-50912.

TABLE 13. Impact of the Loss of Pesticide Groups on Cotton Production
Fungicide/Nematicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL FUNGICIDES	TX	NONE	100.	5128.	-35.	-35.	-760995.	-760995.
ALL FUNGICIDES	VA	NONE	95.	1.9	-15.	-15.	-135.	-135.
		U.S. Totals =>	97.8	10714.	-18.5	-20.53	-1260970.	-1399308.
ALL NEMATICIDES	AL	RESISTANT-VARIETIES,CROP-ROTATIO N(NOT-FEASIBLE)	7.	23.52	-10.	-20.	-1428.	-2855.
ALL NEMATICIDES	AR	ROTATION(7)	60.	321.	-10.	-15.	-22823.	-34235.
ALL NEMATICIDES	AZ	NONE	5.	20.8	-3.	-3.	-753.	-753.
ALL NEMATICIDES	CA	ROTATION(25),FALLOW(10)	50.	624.5	-7.	-10.	-47780.	-68258.
ALL NEMATICIDES	FL	RESISTANT-CULTIVARS(?)	80.	20.	-6.	-33.	-808.	-4442.
ALL NEMATICIDES	GA	RESISTANT-VARIETIES(?)	99.	248.49	-4.	-6.	-6232.	-9348.
ALL NEMATICIDES	LA	ROTATION,COVER-CROPS-&-RESISTANT -VARIETIES(20)	46.	295.32	-4.	-7.	-8068.	-14119.
ALL NEMATICIDES	MO	NONE	20.	37.	-4.	-5.	-974.	-1217.
ALL NEMATICIDES	MS	NONE,RESISTANT-CULTIVARS-ALREADY -USED	11.	118.03	-4.	-4.	-3333.	-3333.
ALL NEMATICIDES	NC	ROTATION	3.	2.94	-2.5	-3.4	-42.	-57.

TABLE 13. Impact of the Loss of Pesticide Groups on Cotton Production
Fungicide/Nematicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL NEMATICIDES	NM	NONE	10.	8.3	-1.	-15.	-54.	-807.
ALL NEMATICIDES	SC	SUBSOILING,EARLY-MATURING-VARIETIES(already-90+)	99.	120.78	-10.	-15.	-6583.	-9874.
ALL NEMATICIDES	TN	NONE,RESISTANT-CULTIVARS-ALREADY-USED	50.	199.5	-4.	-4.	-4628.	-4628.
ALL NEMATICIDES	TX	ROTATION-AND-RESISTANCE(50)	11.	564.08	-1.	-5.	-2392.	-11958.
ALL NEMATICIDES	VA	NONE	10.	0.2	-10.	-10.	-10.	-10.
		U.S. Totals =>	23.8	2604.5	-1.554	-2.434	-105907.	-165894.
FOLIAR FUNGICIDES	AZ	CONTROL-OF-GRAMA-GRASS(5),COPPER-SULFATE(?)	5.	20.8	-15.	-20.	-3763.	-5017.
FOLIAR FUNGICIDES	NM	NONE	3.	2.49	-25.	-25.	-403.	-403.
		U.S. Totals =>	0.21	23.29	-0.061	-0.08	-4166.	-5420.
FUNGICIDE SEED TREATMENTS	AL	NONE	99.	332.64	-20.	-20.	-40382.	-40382.
FUNGICIDE SEED TREATMENTS	AR	BIOLOGICAL(?)	100.	535.	-8.	-12.	-30431.	-45646.
FUNGICIDE SEED TREATMENTS	AZ	NONE	99.	411.84	-1.	-1.	-4967.	-4967.
FUNGICIDE SEED TREATMENTS	CA	LATER-PLANTING(5),CROP-ROTATION(40),HIGHER-SEEDING-RATE(30)	90.	1124.1	-2.	-4.	-24573.	-49146.

TABLE 13. Impact of the Loss of Pesticide Groups on Cotton Production
Fungicide/Nematicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
FUNGICIDE SEED TREATMENTS	FL	NONE	99.	24.75	-10.	-10.	-1666.	-1666.
FUNGICIDE SEED TREATMENTS	GA	NONE	99.	248.49	-2.	-2.	-3116.	-3116.
FUNGICIDE SEED TREATMENTS	LA	DELAYED-PLANTING,RAISED-SEED-BEDS-&-CULTIVATION(20)	97.	622.74	-17.	-25.	-72306.	-106333.
FUNGICIDE SEED TREATMENTS	MO	DELAYED-PLANTING-AND-ROTATION(50)	100.	185.	-5.	-10.	-6087.	-12173.
FUNGICIDE SEED TREATMENTS	MS	NONE	100.	1073.	-22.	-22.	-166658.	-166658.
FUNGICIDE SEED TREATMENTS	NC	ROTATION	22.	21.56	-3.5	-4.5	-432.	-556.
FUNGICIDE SEED TREATMENTS	NM	NONE	99.	82.17	-3.	-3.	-1597.	-1597.
FUNGICIDE SEED TREATMENTS	OK	NONE	94.	390.1	-15.	-15.	-19251.	-19251.
FUNGICIDE SEED TREATMENTS	SC	LATE-PLANTING-AND-BEDDING(50)	99.	120.78	-5.	-10.	-3291.	-6583.
FUNGICIDE SEED TREATMENTS	TN	NONE	100.	399.	-22.	-22.	-50912.	-50912.
FUNGICIDE SEED TREATMENTS	TX	NONE	100.	5128.	-35.	-35.	-760995.	-760995.
FUNGICIDE SEED TREATMENTS	VA	NONE	95.	1.9	-15.	-15.	-135.	-135.
		U.S. Totals =>	97.7	10701.	-17.41	-18.63	-1186801.	-1270117.

TABLE 13. Impact of the Loss of Pesticide Groups on Cotton Production
Fungicide/Nematicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

* Alternatives are other pesticides, pesticide groups, or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide group that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide group.

** Yield impacts are plus (+) and minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide group. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; total averages for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL INSECTICIDES	AL	BENEFICIALS(100),CULTURAL-EARLIER-PLANTING(90)	100.	336.	-70.	-90.	-142766.	-183557.
ALL INSECTICIDES	AR	NONE	100.	535.	-60.	-60.	-228231.	-228231.
ALL INSECTICIDES	AZ	MOVE-TO-OTHER-CROPS	100.	416.	-30.	-30.	-150509.	-150509.
ALL INSECTICIDES	CA36	RESISTANT-VARIETIES(?),CROP-CHANGES(?)	100.	50.	-50.	-50.	-27325.	-27325.
ALL INSECTICIDES	CA37	ALFALFA-MANAGEMENT-INTERPLANT(50),BIOLOGICAL-CONTROLS(20)	75.	900.	-12.	-12.	-118044.	-118044.
ALL INSECTICIDES	FL	NONE	100.	25.	-42.	-42.	-7067.	-7067.
ALL INSECTICIDES	GA	NONE	100.	251.	-90.	-100.	-141639.	-157377.
ALL INSECTICIDES	LA	BIOLOGICAL-CONTROL(100),EARLY-PLANTING(75),DESTROY-RESIDUE(85)	100.	642.	-25.	-35.	-109622.	-153470.
ALL INSECTICIDES	MO	RESISTANT-VARIETIES(?),CHANGE-CROPS(?)	99.	183.15	-20.	-20.	-24103.	-24103.
ALL INSECTICIDES	MS	CULTURAL-PRACTICES(100)	100.	1073.	-50.	-65.	-378769.	-492400.
ALL INSECTICIDES	NC	ALTERNATIVE-CROPS(99),MATURITY-ENHANCING-PRACTICES(1)	100.	98.	-40.	-50.	-22462.	-28077.
ALL INSECTICIDES	NM	RESISTANT-VARIETIES(?),OTHER-CROPS(?)	100.	83.	-20.	-20.	-10757.	-10757.
ALL INSECTICIDES	OK	CULTURAL-PRACTICES(40),SWITCH-CROPS(40),RESISTANT-VARIETIES(20)	50.	207.5	-30.	-40.	-20480.	-27307.
ALL INSECTICIDES	SC	ALTERNATE-CROPS(50),RESISTANT-VARIETIES(10)	99.	120.78	-25.	-40.	-16456.	-26330.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL INSECTICIDES	TN	RESISTANT-VARIETIES(20),INTERCROPPING(10),OTHER-CROPS(80)	99.	395.01	-17.	-25.	-38948.	-57276.
ALL INSECTICIDES	TX19	NONE-VIABLE	98.	294.	-85.	-85.	-105958.	-105958.
ALL INSECTICIDES	TX20	SHORT-SEASON-VARIETIES(?),NATURAL-ENEMIES(?)	99.	338.08	-29.	-29.	-41571.	-41571.
ALL INSECTICIDES	TX21	OTHER-CROPS(100)	100.	65.	-60.	-60.	-16536.	-16536.
ALL INSECTICIDES	TX23	OTHER-CROPS	100.	140.	-50.	-50.	-29680.	-29680.
ALL INSECTICIDES	TX24	RESISTANT-VARIETIES(?),NATURAL-ENEMIES(?)	40.	441.12	-5.	-10.	-9352.	-18703.
ALL INSECTICIDES	TX25	RESISTANT-VARIETIES(25)	75.	2100.	-30.	-45.	-267120.	-400680.
ALL INSECTICIDES	TX26	RESISTANT-VARIETIES(?),OTHER-CROPS(?)	75.	296.25	-20.	-20.	-25122.	-25122.
		U.S. Totals =>	82.	8989.9	-28.35	-34.19	-1932515.	-2330079.
BIOLOGICALS	AL	PYRETHROIDS(3.5),OVICIDES(3.5),BENEFICIALS(7)	7.	23.52	-2.	-10.	-286.	-1428.
BIOLOGICALS	AZ	PYRETHROIDS(3.5),ORGANOPHOSPHATES(1.7),CARBAMATES(1.4)	7.	29.12	-0.5	-1.	-176.	-351.
BIOLOGICALS	CA36	PYRETHROIDS(40),ORGANOPHOSPHATES(36),CARBAMATES(4)	60.	30.	-5.	-15.	-1640.	-4919.
BIOLOGICALS	CA37	PYRETHROIDS(2),SHORTER-SEASON(4),STRIP-PLANTING-ALFALFA(3)	7.	84.	-3.	-11.	-2754.	-10099.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
BIOLOGICALS	FL	CARBAMATES(3),PYRETHROIDS(2)	3.5	0.875	-1.	-2.	-6.	-12.
BIOLOGICALS	GA	PYRETHROIDS(4.5),ORGANOPHOSPHATES(0.25),CARBAMATES(0.25)	5.	12.55	0.	-1.	0.	-79.
BIOLOGICALS	MS	PYRETHROIDS(1),CARBAMATES(1),ORGANOPHOSPHATES(1)	15.	160.95	0.	-65.	0.	-73860.
BIOLOGICALS	OK	PYRETHROIDS(0.35),CARBAMATES(0.1),ORGANOPHOSPHATES(0.05)	0.5	2.075	15.	-3.	102.	-20.
BIOLOGICALS	SC	PYRETHROIDS(3),ORGANOPHOSPHATES(1),CARBAMATES(0.5)	5.	6.1	0.	-40.	0.	-1330.
BIOLOGICALS	TX20	PYRETHROIDS(1.75),ORGANOPHOSPHATES(1.2)	3.5	11.953	-3.	-10.	-152.	-507.
BIOLOGICALS	TX23	THIODICARB(0.4),PYRETHROID(0.1)	1.	1.4	0.	-5.	0.	-30.
BIOLOGICALS	TX24	CARBAMATES(1.2),PYRETHROIDS(0.8),ORGANOPHOSPHATES(0.2)	4.	44.112	0.	-5.	0.	-935.
BIOLOGICALS	TX25	PYRETHROIDS(1.2),ORGANOPHOSPHATES(0.5)	5.	140.	-1.	-5.	-594.	-2968.
		U.S. Totals =>	4.99	546.65	-0.081	-1.416	-5504.	-96537.
CARBAMATES	AL	ORGANOPHOSPHATES(75),PYRETHROIDS(25)	80.	268.8	-15.	-30.	-24474.	-48948.
CARBAMATES	AR	PYRETHROIDS(10),ORGANOPHOSPHATES(70)	80.	428.	0.	-60.	0.	-182585.
CARBAMATES	AZ	PYRETHROIDS(16.9),ORGANOPHOSPHATES(7.8)	26.	108.16	-2.	-10.	-2609.	-13044.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
CARBAMATES	CA36	PYRETHROIDS(37),ORGANOPHOSPHATES (19),SULFITES(4)	75.	37.5	-5.	-10.	-2049.	-4099.
CARBAMATES	CA37	ORGANOPHOSPHATES(20),PYRETHROIDS (2.8),SHORTER-SEASON(5)	28.	336.	0.	-4.	0.	-14690.
CARBAMATES	FL	PYRETHROIDS(7.5),ORGANPHOSPHATES (17.5)	25.	6.25	-5.	-15.	-210.	-631.
CARBAMATES	GA	ORGANOPHOSPHATES(65)	80.	200.8	-5.	-60.	-6295.	-75541.
CARBAMATES	LA	ORGANOPHOSPHATES(67)	55.	353.1	-2.	-10.	-4823.	-24117.
CARBAMATES	MO	ORGANOPHOSPHATES(5.8),PYRETHROID S(3.2)	9.	16.65	-2.	-20.	-219.	-2191.
CARBAMATES	MS	PYRETHROIDS(75),ORGANOPHOSPHATES (25)	100.	1073.	-25.	-65.	-189385.	-492400.
CARBAMATES	NC	PYRETHROIDS(79),ORGANOPHOSPHATES (14)	93.	91.14	-6.	-40.	-3133.	-20889.
CARBAMATES	NM	PYRETHROIDS(5.2),ORGANOPHOSPHATE S(2),BIOLOGICALS(0.4)	8.	6.64	-2.5	-17.	-108.	-731.
CARBAMATES	OK	PYRETHROIDS(15),ORGANOPHOSPHATES (4),CHLORINATED-HYDROCARBONS(2)	17.	70.55	-2.	-15.	-464.	-3482.
CARBAMATES	SC	PYRETHROIDS(52),ORGANOPHOSPHATES (37),ENDOSULFAN(4)	80.	97.6	-5.	-25.	-2660.	-13298.
CARBAMATES	TN	ORGANOPHOSPHATES(13),PYRETHROIDS (7)	20.	79.8	-3.	-25.	-1389.	-11571.
CARBAMATES	TX19	PYRETHROIDS(14),ORGANOPHOSPHATES (6)	20.	60.	0.	-20.	0.	-5088.
CARBAMATES	TX20	PYRETHROIDS(16.5),ORGANOPHOSPHAT ES(10),BIOLOGICALS(3)	30.	102.45	-2.	-7.	-869.	-3041.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
CARBAMATES	TX21	PYRETHROIDS(7.8),ORGANOPHOSPHATES(3),BIOLOGICALS(0.6)	15.	9.75	-2.5	-17.	-103.	-703.
CARBAMATES	TX23	PYRETHROIDS(12),ORGANOPHOSPHATES(4.5)	50.	70.	3.	-15.	890.	-4452.
CARBAMATES	TX24	PYRETHROIDS(6),ORGANOPHOSPHATES(3),B.t.(2)	7.	77.196	-3.	-5.	-982.	-1637.
CARBAMATES	TX25	ORGANOPHOSPHATES(22),PYRETHROIDS(5)	32.	896.	-10.	-18.	-37990.	-68383.
CARBAMATES	TX26	PYRETHROIDS(5.2),ORGANOPHOSPHATES(2),BIOLOGICALS(0.4)	5.	19.75	-2.5	-17.	-209.	-1424.
		U.S. Totals =>	40.2	4409.1	-4.065	-14.57	-277081.	-992943.
ORGANOPHOSPHATES	AL	PYRETHROIDS(95),CARBAMATES(5)	100.	336.	-20.	-30.	-40790.	-61186.
ORGANOPHOSPHATES	AR	PYRETHROIDS(70),CARBAMATES(10)	80.	428.	-5.	-60.	-15215.	-182585.
ORGANOPHOSPHATES	AZ	PYRETHROIDS(60),CARBAMATES(16)	80.	332.8	-5.	-15.	-20068.	-60204.
ORGANOPHOSPHATES	CA36	PYRETHROIDS(45),CARBAMATES(22)	90.	45.	-5.	-15.	-2459.	-7378.
ORGANOPHOSPHATES	CA37	PYRETHROIDS(2.5),SHORT-SEASON(12),ALFALFA-INTERPLANT(40)	55.	660.	0.	-18.	0.	-129848.
ORGANOPHOSPHATES	FL	PYRETHROIDS(50),CARBAMATES(50)	85.	21.25	-5.	-10.	-715.	-1430.
ORGANOPHOSPHATES	GA	CARBAMATES(90),PYRETHROIDS(10)	70.	175.7	-15.	-25.	-16525.	-27541.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ORGANOPHOSPHATES	LA	CARBAMATES(60),PYRETHROIDS(30),ENDOSULFAN(10)	98.	629.16	-3.	-30.	-12891.	-128915.
ORGANOPHOSPHATES	MO	CARBAMATES(15),PYRETHROIDS(85)	95.	175.75	-4.	-20.	-4626.	-23129.
ORGANOPHOSPHATES	MS	PYRETHROIDS(40),CARBAMATES(60)	100.	1073.	-45.	-65.	-340892.	-492400.
ORGANOPHOSPHATES	NC	PYRETHROIDS(18),CARBAMATES(6)	24.	23.52	-8.	-40.	-1078.	-5391.
ORGANOPHOSPHATES	NM	PYRETHROIDS(56),CARBAMATES(22),BIOLOGICALS(4),ENDOSULFAN(4)	86.	71.38	-3.	-20.	-1388.	-9251.
ORGANOPHOSPHATES	OK	PYRETHROIDS(39),CARBAMATES(10),CHLORINATED-HYDROCARBONS(3)	30.	124.5	-5.	-14.	-2048.	-5734.
ORGANOPHOSPHATES	SC	PYRETHROIDS(50),CARBAMATES(17),ENDOSULFAN(4),BIOLOGICALS(12)	83.	101.26	-4.	-25.	-2207.	-13797.
ORGANOPHOSPHATES	TN	CARBAMATES(15),PYRETHROIDS(75),ENDOSULFAN(5)	95.	379.05	-3.	-25.	-6595.	-54962.
ORGANOPHOSPHATES	TX19	PYRETHROIDS(89),CARBAMATES(9)	98.	294.	0.	-85.	0.	-105958.
ORGANOPHOSPHATES	TX20	PYRETHROIDS(40),CARBAMATES(40),BIOLOGICALS(20)	83.	283.45	-3.	-30.	-3605.	-36054.
ORGANOPHOSPHATES	TX21	PYRETHROIDS(60),CARBAMATES(23),BIOLOGICALS(5),ENDOSULFAN(5)	100.	65.	-3.	-75.	-827.	-20670.
ORGANOPHOSPHATES	TX23	PYRETHROIDS(20),CARBAMATES(70)	99.	138.6	-15.	-18.	-8815.	-10578.
ORGANOPHOSPHATES	TX24	PYRETHROIDS(23.8),CARBAMATES(6.8),BIOLOGICALS(3.4)	34.	374.95	-3.	-5.	-4769.	-7949.
ORGANOPHOSPHATES	TX25	PYRETHROIDS(47),CARBAMATES(6),BIOLOGICALS(1)	62.	1736.	-8.	-15.	-58885.	-110410.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ORGANOPHOSPHATES	TX26	PYRETHROIDS(56),CARBAMATES(22),BIOLOGICALS(4),ENDOSULFAN(4)	65.	256.75	-3.	-20.	-3266.	-21772.
		U.S. Totals =>	70.5	7725.1	-8.035	-22.26	-547666.	-1517140.
PYRETHROIDS	AL	ORGANOPHOSPHATES(70),CARBAMATES(30)	100.	336.	-40.	-60.	-81581.	-122371.
PYRETHROIDS	AR	ORGANOPHOSPHATES(70),CARBAMATES(20),BIOLOGICALS(20)	90.	481.5	-25.	-60.	-85587.	-205408.
PYRETHROIDS	AZ	CARBAMATES(36),ORGANOPHOSPHATES(44),BIOLOGICALS(4)	80.	332.8	-15.	-20.	-60204.	-80271.
PYRETHROIDS	CA36	CARBAMATES(25),ORGANOPHOSPHATES(50)	100.	50.	-5.	-15.	-2733.	-8198.
PYRETHROIDS	CA37	ORGANOPHOSPHATES(0.75),BIOLOGICALS(0.25)	1.	12.	0.	-4.	0.	-525.
PYRETHROIDS	FL	CARBAMATES(80),ORGANOPHOSPHATES(15),BIOLOGICALS(5)	100.	25.	-6.	-42.	-1010.	-7067.
PYRETHROIDS	GA	CARBAMATES(10),ORGANOPHOSPHATES(90)	100.	251.	-15.	-90.	-23607.	-141639.
PYRETHROIDS	LA	CARBAMATES(34),ORGANOPHOSPHATES(66)	99.	635.58	-10.	-25.	-43410.	-108525.
PYRETHROIDS	MO	CARBAMATES(19),ORGANOPHOSPHATES(34)	53.	98.05	-10.	-20.	-6452.	-12903.
PYRETHROIDS	MS	CARBAMATES(39),ORGANOPHOSPHATES(59)	98.	1051.5	-45.	-65.	-334074.	-482552.
PYRETHROIDS	NC	CARBAMATES(40),ORGANOPHOSPHATES(60)	98.	96.04	-15.	-45.	-8255.	-24764.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
PYRETHROIDS	NM	ORGANOPHOSPHATES(11),CARBAMATES(11),BIOLOGICALS(7),ENDOSULFAN(7)	36.	29.88	-17.	-20.	-3292.	-3872.
PYRETHROIDS	OK	CARBAMATES(20),CHLORINATED-HYDROCARBONS(2),PHOSPHATES(2)	30.	124.5	-5.	-22.	-2048.	-9011.
PYRETHROIDS	SC	CARBAMATES(10),BIOLOGICALS(40),ORGANOPHOSPHATES(50)	95.	115.9	-10.	-40.	-6317.	-25266.
PYRETHROIDS	TN	CARBAMATES(14),ORGANOPHOSPHATES(50),ENDOSULFAN(1)	65.	259.35	-2.	-25.	-3008.	-37606.
PYRETHROIDS	TX19	CARBAMATES(11),ORGANOPHOSPHATES(64)	75.	225.	-4.	-85.	-3816.	-81090.
PYRETHROIDS	TX20	ORGANOPHOSPHATES(18),CARBAMATES(18),BIOLOGICALS(9)	28.	95.62	-8.	-13.	-3243.	-5271.
PYRETHROIDS	TX21	ORGANOPHOSPHATES(14),CARBAMATES(14),BIOLOGICALS(9),ENDOSULFAN(9)	90.	58.5	-17.	-20.	-4217.	-4961.
PYRETHROIDS	TX23	ORGANOPHOSPHATES(25),CARBAMATES(22),BIOLOGICALS(3)	50.	70.	-5.	-15.	-1484.	-4452.
PYRETHROIDS	TX24	ORGANOPHOSPHATES(8),CARBAMATES(8),B.t.(4)	25.	275.7	-6.	-10.	-7014.	-11690.
PYRETHROIDS	TX25	ORGANOPHOSPHATES(16),CARBAMATES(16),BIOLOGICALS(9)	41.	1148.	-18.	-35.	-87615.	-170363.
PYRETHROIDS	TX26	ORGANOPHOSPHATES(11),CARBAMATES(11),BIOLOGICALS(7),ENDOSULFAN(7)	46.	181.7	-17.	-20.	-13097.	-15408.
		U.S. Totals =>	54.3	5953.7	-11.47	-22.93	-782061.	-1563213.

TABLE 14. Impact of the Loss of Pesticide Groups on Cotton Production
Insecticide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

* Alternatives are other pesticides, pesticide groups, or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide group that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide group.

** Yield impacts are plus (+) and minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide group. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; total averages for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ACETANILIDS	AR	FLUOMETURON(2),CYANAZINE(3)	5.	26.75	0.	-30.	0.	-5706.
ACETANILIDS	AZ	ARSENICALS(5)	5.	20.8	-2.	-20.	-502.	-5017.
ACETANILIDS	LA	DINITROANILINES(10)	10.	64.2	-2.	-35.	-877.	-15347.
ACETANILIDS	MO	ORGANIC-ARSENICALS(3),DINITROANILINES(1)	4.	7.4	-1.	-5.	-49.	-243.
ACETANILIDS	MS	NORFLURAZON(6)	6.	64.38	0.	-8.	0.	-3636.
ACETANILIDS	TN	ORGANIC-ARSENICALS(1),DINITROANILINES(9)	10.	39.9	-2.	-3.	-463.	-694.
ACETANILIDS	TX	ORGANIC-ARSENICALS(1)	1.	51.28	-1.	-6.	-217.	-1305.
		U.S. Totals =>	2.51	274.71	-0.031	-0.469	-2108.	-31948.
ALL HERBICIDES	AL	CULTIVATION(100),HOEING(100),CROP-ROTATION(30)	100.	336.	-25.	-95.	-50988.	-193754.
ALL HERBICIDES	AR	FLAME-CULTIVATION(100),HOE(100),CUTIVATION(100)	100.	535.	-40.	-75.	-152154.	-285289.
ALL HERBICIDES	AZ	EXTRA-CULTIVATION(90),HAND-HOEING(10)	100.	416.	-30.	-70.	-150509.	-351187.
ALL HERBICIDES	CA37	CULTIVATION(100),HAND-HOEING(90),CROP-ROTATIONS(50)	100.	1085.	-17.	-75.	-201604.	-889429.
ALL HERBICIDES	FL	HAND-WEEDING(?),CULTIVATION(?),CROP-ROTATION(?)	100.	25.	-50.	-90.	-8413.	-15143.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL HERBICIDES	GA	MECHANICAL-CULTIVATION(100)	100.	251.	-65.	-85.	-102295.	-133770.
ALL HERBICIDES	LA	TILLAGE(90),HAND-HOEING(10)	100.	642.	-10.	-80.	-43849.	-350789.
ALL HERBICIDES	MO	INCREASED-TILLAGE(100),HAND-HOEING(100),MORE-CROP-ROTATION(30)	100.	185.	-40.	-90.	-48692.	-109557.
ALL HERBICIDES	MS	FLAME-CULTIVATION(100),CULTIVATION(3x100),HAND-HOE(100)	100.	1073.	-40.	-100.	-303015.	-757538.
ALL HERBICIDES	NC	MORE-CULTIVATION(100)	100.	98.	-70.	-98.	-39308.	-55031.
ALL HERBICIDES	OK	HAND-HOEING(100),CULTIVATION(100),ROTATION(30)	100.	415.	-25.	-80.	-34134.	-109228.
ALL HERBICIDES	SC	HOEING(100),CULTIVATION(100)	100.	122.	-30.	-85.	-19947.	-56517.
ALL HERBICIDES	TN	CULTIVATION(100),HAND-HOEING(100)	100.	399.	-25.	-75.	-57855.	-173565.
ALL HERBICIDES	TX	HOEING(95),CULTIVATION(3X100),CROP-ROTATION(60)	100.	5128.	-30.	-80.	-652282.	-1739418.
		U.S. Totals =>	97.7	10710.	-27.36	-76.59	-1865043.	-5220214.
BIOLOGICALS FOR PUNCTUREVINE	AZ	HERBICIDES	2.	8.32	1.	-1.	100.	-100.
		U.S. Totals =>	0.08	8.32	0.0015	-0.001	100.	-100.
DINITROANILINES	AL	DIURON(30),NORFLURAZON(40),FLUAZIFOP(15),SETHOXYDIM(15)	100.	336.	-10.	-70.	-20395.	-142766.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
DINITROANILINES	AR	NORFLURAZON(40),CYANAZINE(5),METOLACHLOR(30)	75.	401.25	-5.	-15.	-14264.	-42793.
DINITROANILINES	AZ	DCPA(50),POE-GRASS-HERBICIDES(20),EXTRA-CULTIVATIONS(100),HOE(10)	80.	332.8	-10.	-30.	-40136.	-120407.
DINITROANILINES	CA37	PROMETRYN(25),HAND-WEEDING(75),EXTRA-CULTIVATIONS(75)	80.	868.	-9.	-25.	-85385.	-237181.
DINITROANILINES	FL	TRIAZINES(5),UREAS(35),ARSENICAL(25),SETHOXY-FLUAZOP(25)	90.	22.5	-10.	-25.	-1514.	-3786.
DINITROANILINES	GA	SETHOXYDIM(60),FLUAZIFOP(20),FENOXAPROP(5),FLUOMETURON(95)	100.	251.	-15.	-75.	-23607.	-118033.
DINITROANILINES	LA	ACETANILIDS(40),DIPHENYL-ETHERS(30)	70.	449.4	0.	-40.	0.	-122776.
DINITROANILINES	MO	ACETANILIDS(40),TRIAZINES(20),SETHOXYDIM(15),FLUAZIFOP(10)	90.	166.5	-15.	-25.	-16434.	-27389.
DINITROANILINES	MS	ACETANILIDS(13),NORFLURAZON(70)	83.	890.59	0.	-8.	0.	-50301.
DINITROANILINES	NC	SETHOXYDIM(40),FLUAZIFOP-P-BUTYL(40),METHAZOLE(10)	90.	88.2	-5.	-25.	-2527.	-12635.
DINITROANILINES	OK	ACETANILIDS(49),TRIAZINES(20),HAND-HOEING(15)	95.	394.25	-15.	-25.	-19456.	-32427.
DINITROANILINES	SC	SETHOXYDIM(45),FLUAZIFOP-P-BUTYL(20),NORFLURAZON(75)	100.	122.	-30.	-85.	-19947.	-56517.
DINITROANILINES	TN	ACETANILIDS(50),ORGANIC-ARSENICALS(1),FLUAZIFOP-OR-SETHOXDIM(9)	90.	359.1	-10.	-25.	-20828.	-52070.
DINITROANILINES	TX	ACETANILIDS(20),TRIAZINES(42),FLUAZIFOP(15),SETHOXYDIM(10),ORGANIC-ACIDS(10)	97.	4974.2	-10.	-21.	-210904.	-442899.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals =>	88.1	9655.8	-6.975	-21.45	-475397.	-1461979.
ORGANIC ARSENICALS	AL	NORFLURAZON(10),METHAZOLE(20),FLUOMETURON(55)	85.	285.6	-10.	-25.	-17336.	-43340.
ORGANIC ARSENICALS	AR	POE-MATERIALS(100),POAST-AND-FUSILADE-FOR-GRASSES(30)	100.	535.	-3.	-25.	-11412.	-95096.
ORGANIC ARSENICALS	AZ	CULTIVATIONS(1),SPOT-GLYPHOSATE(1),HOEING(1),OXYFLUORFEN(2)	5.	20.8	-5.	-30.	-1254.	-7525.
ORGANIC ARSENICALS	CA37	CULTIVATION(3),HANDWEEDING(3)	3.	32.55	-15.	-40.	-5337.	-14231.
ORGANIC ARSENICALS	FL	FLUOMETURON(30),SETHOXYDIM-AND-FLUAZIFOP-P-BUTYL(20)	80.	20.	-8.	-15.	-1077.	-2019.
ORGANIC ARSENICALS	GA	MECHANICAL-CULTIVATION(95),NORFLURAZON(30)	95.	238.45	-20.	-55.	-29902.	-82229.
ORGANIC ARSENICALS	LA	ACETANILIDS(40),DIPHENYL-ETHERS(30)	70.	449.4	-10.	-40.	-30694.	-122776.
ORGANIC ARSENICALS	MO	ACETANILIDS(10),TRIAZINES(15),METHAZOLE(10),SUBSTITUTED-UREAS(10)	50.	92.5	-1.	-5.	-609.	-3043.
ORGANIC ARSENICALS	MS	FLUOMETURON(100)	100.	1073.	-6.	-15.	-45452.	-113631.
ORGANIC ARSENICALS	NC	NORFLURAZON(40),METHAZOLE(15)	55.	53.9	-3.	-20.	-927.	-6177.
ORGANIC ARSENICALS	OK	HAND-HOEING(0.2),OVER-THE-TOP-GRASS-HERBICIDES(0.3)	0.5	2.075	-1.	-5.	-7.	-34.
ORGANIC ARSENICALS	SC	NORFLURAZON(40),CULTIVATION(100)	100.	122.	-30.	-85.	-19947.	-56517.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ORGANIC ARSENICALS	TN	FLUAZIFOP-OR-SETHOXYDIM(10),CYANAZINE(50),FLUOMETURON(40)	91.	363.09	-10.	-20.	-21059.	-42118.
ORGANIC ARSENICALS	TX	HOEING(1),NORFLURAZON(3),ACETANILIDS(2),GLYPHOSATE(1)	7.	358.96	-1.	-8.	-1522.	-12176.
		U.S. Totals =>	33.3	3647.3	-2.737	-8.816	-186533.	-600913.
SUBSTITUTED UREAS	AL	NORFLURAZON-&-TRIAZINES(90)	98.	329.28	-20.	-80.	-39975.	-159898.
SUBSTITUTED UREAS	AR	METOLACHLOR(20),NORFLURAZON(26),CYANAZINE(20),METHAZOLE(26)	100.	535.	-5.	-55.	-19019.	-209212.
SUBSTITUTED UREAS	AZ	TRIAZINES(30),CULTIVATION(10)	40.	166.4	0.	-20.	0.	-40136.
SUBSTITUTED UREAS	FL	TRIAZINES(15),NORFLURAZON(10)	25.	6.25	-5.	-25.	-210.	-1052.
SUBSTITUTED UREAS	GA	MECHANICAL-CULTIVATION(99),MSMA(95),TRIAZINES(95),METHAZOLE(70)	100.	251.	-40.	-60.	-62951.	-94426.
SUBSTITUTED UREAS	LA	TRIAZINES(80)	80.	513.6	-10.	-50.	-35079.	-175394.
SUBSTITUTED UREAS	MO	TRIAZINES(90),METHAZOLE(28)	100.	185.	-10.	-30.	-12173.	-36519.
SUBSTITUTED UREAS	MS	TRIAZINES(50),METHAZOLE(100),DIPHENYL-ETHERS(30)	100.	1073.	-8.	-33.	-60603.	-249988.
SUBSTITUTED UREAS	NC	NORFLURAZON(50),TRIAZINES(25),MSMA/DSMA(25)	100.	98.	-45.	-75.	-25269.	-42116.
SUBSTITUTED UREAS	OK	TRIAZINES(1.2),HOEING(1.0)	2.2	9.13	-0.5	-10.	-15.	-300.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
SUBSTITUTED UREAS	SC	NORFLURAZON(50),METHAZOLE(40),TRIAZINES(75)	100.	122.	-20.	-50.	-13298.	-33245.
SUBSTITUTED UREAS	TN	TRIAZINES(40),NORFLURAZON(30),MSMA(21)	91.	363.09	-20.	-30.	-42118.	-63178.
SUBSTITUTED UREAS	TX	TRIAZINES(2.5)	2.5	128.2	0.	-18.	0.	-9784.
		U.S. Totals =>	34.5	3779.9	-4.559	-16.36	-310711.	-1115247.
TRIAZINES	AL	SUBTITUTED-UREAS(40)	56.	188.16	-10.	-25.	-11421.	-28553.
TRIAZINES	AR	METHAZOLE(20),OXYFLUORFEN(20),DIURON(30),NORFLURAZON(6)	76.	406.6	0.	-26.	0.	-75164.
TRIAZINES	AZ	DIURON(40),HAND-HOEING(20),EXTRA-CULTIVATION(20)	80.	332.8	-2.	-40.	-8027.	-160543.
TRIAZINES	CA37	OXYFLUORFEN(24),CULTIVATION(25),HANDWEEDING(15)	30.	325.5	-9.	-35.	-32019.	-124520.
TRIAZINES	FL	UREAS(30),METHAZOLE(5)	35.	8.75	-2.	-30.	-118.	-1767.
TRIAZINES	GA	SUBSTITUTED-UREAS(55)	55.	138.05	0.	-20.	0.	-17311.
TRIAZINES	LA	UREAS(55)	55.	353.1	-10.	-40.	-24117.	-96467.
TRIAZINES	MO	SUBSTITUTED-UREAS(22),METHAZOLE(50)	72.	133.2	-1.	-20.	-876.	-17529.
TRIAZINES	MS	SUBSTITUTED-UREAS(51),METHAZOLE(30),DIPHENYL-ETHERS(20)	100.	1073.	0.	-33.	0.	-249988.

TABLE 15. Impact of the Loss of Pesticide Groups on Cotton Production
Herbicide Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
TRIAZINES	NC	METHAZOLE(10),OXYFLUORFEN(10)	20.	19.6	-2.	-10.	-225.	-1123.
TRIAZINES	OK	ACETANILIDS(2)	2.	8.3	-1.	-10.	-27.	-273.
TRIAZINES	SC	SUBSTITUTED-UREAS(55),METHAZOLE(20)	75.	91.5	-10.	-25.	-4987.	-12467.
TRIAZINES	TN	SUBSTITUTED-UREAS-OR-DIPHENYLETHERS(25)	25.	99.75	-1.	-15.	-579.	-8678.
TRIAZINES	TX	FLUOMETURON(11),DIURON(4),METOLACHLOR(3)	18.	923.04	-6.	-11.	-23482.	-43051.
		U.S. Totals =>	37.4	4101.4	-1.553	-12.29	-105878.	-837434.

* Alternatives are other pesticides, pesticide groups, or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide group that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide group.

** Yield impacts are plus (+) and minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide group. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; total averages for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.

TABLE 16. Impact of the Loss of Pesticide Groups on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulator Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL DESICCANTS AND DEFOLIANTS	AL	WAIT-FOR-FREEZE-BEFORE-HARVEST	95.	319.2	-30.	-40.	-58126.	-77502.
ALL DESICCANTS AND DEFOLIANTS	AR	CULTURAL-MANAGEMENT,NATURAL-DEFOLIATION(FROST,FREEZE)	95.	508.25	-5.	-10.	-18068.	-36137.
ALL DESICCANTS AND DEFOLIANTS	AZ	NATURAL-DEFOLIATION	5.	20.8	-3.	-3.	-753.	-753.
ALL DESICCANTS AND DEFOLIANTS	CA	NONE	100.	1249.	-15.	-15.	-204774.	-204774.
ALL DESICCANTS AND DEFOLIANTS	FL	WAIT-FOR-FROST	100.	25.	-50.	-60.	-8413.	-10095.
ALL DESICCANTS AND DEFOLIANTS	GA	ETHEPHON(75)	94.	235.94	-5.	-10.	-7397.	-14793.
ALL DESICCANTS AND DEFOLIANTS	LA	USE-SUB-OPTIMAL-FERTILITY,DETERMINATE-VARIETIES	99.	635.58	-30.	-35.	-130230.	-151935.
ALL DESICCANTS AND DEFOLIANTS	MO	NONE	75.	138.75	-15.	-15.	-13695.	-13695.
ALL DESICCANTS AND DEFOLIANTS	MS	USE-OF-HERBICIDES-SUCH-AS-GLYPHOSATE-POSSIBLE	98.	1051.5	-20.	-30.	-148477.	-222716.
ALL DESICCANTS AND DEFOLIANTS	NC	ARSENICS(30),PLANT-GROWTH-REGULATORS(20),FROST(50)	100.	98.	-10.	-25.	-5615.	-14039.
ALL DESICCANTS AND DEFOLIANTS	OK	WAIT-FOR-FREEZE	60.	249.	-20.	-20.	-16384.	-16384.
ALL DESICCANTS AND DEFOLIANTS	SC	EARLY-CULTIVARS,EARLY-PLANTING,LOWER-N-RATES	95.	115.9	-15.	-25.	-9475.	-15791.
ALL DESICCANTS AND DEFOLIANTS	TN	NITROGEN-RATES-LOWER,MANAGE-PLANTS-FOR-EARLY-CUT-OUT	28.	111.72	0.	-5.	0.	-3240.
ALL DESICCANTS AND DEFOLIANTS	TX	WAIT-FOR-FREEZE	80.	4102.4	-30.	-60.	-521825.	-1043651.

TABLE 16. Impact of the Loss of Pesticide Groups on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulator Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
		U.S. Totals =>	80.9	8861.1	-16.77	-26.78	-1143232.	-1825504.
ALL PLANT GROWTH REGULATORS	AL	SHORT-SEASON-VARIETIES	65.	218.4	-10.	-15.	-13257.	-19885.
ALL PLANT GROWTH REGULATORS	AR	CULTURAL-&-NITROGEN-MANAGEMENT,V ARIETY-SELECTION	80.	428.	-5.	-10.	-15215.	-30431.
ALL PLANT GROWTH REGULATORS	AZ	WATER-MANAGEMENT	35.	145.6	-5.	-15.	-8780.	-26339.
ALL PLANT GROWTH REGULATORS	CA	INCREASE-WATER-STRESS-TO-PROMOTE -EARLINESS,VARIETY-SELECTION	75.	936.75	-15.	-15.	-153580.	-153580.
ALL PLANT GROWTH REGULATORS	FL	USE-SHORT-SEASON-PRODUCTION-SYST EM	40.	10.	-8.	-10.	-538.	-673.
ALL PLANT GROWTH REGULATORS	GA	PARAQUAT-DICHLORIDE(20)	70.	175.7	2.	-10.	2203.	-11016.
ALL PLANT GROWTH REGULATORS	LA	USE-SUB-OPTIMAL-FERTILITY,DETERM INATE-VARIETIES	55.	353.1	-10.	-15.	-24117.	-36175.
ALL PLANT GROWTH REGULATORS	MO	NONE	70.	129.5	-30.	-30.	-25563.	-25563.
ALL PLANT GROWTH REGULATORS	MS	VARIETAL-SELECTION-FOR-SHORT-STA TURE-&-EARLY,REDUCE-N-RATES	75.	804.75	-5.	-10.	-28408.	-56815.
ALL PLANT GROWTH REGULATORS	NC	SHORT-STEM-VARIETIES(50),DETERMI NANT-VARIETIES(50)	75.	73.5	-5.	-10.	-2106.	-4212.
ALL PLANT GROWTH REGULATORS	OK	NONE	40.	166.	-15.	-15.	-8192.	-8192.
ALL PLANT GROWTH REGULATORS	SC	EARLY-CULTIVARS,EARLY-PLANTING	30.	36.6	-5.	-10.	-997.	-1995.

TABLE 16. Impact of the Loss of Pesticide Groups on Cotton Production
Desiccants, Defoliants, and Plant Growth Regulator Groups Sorted by Pesticide
1990 Cotton Commodity Assessment

"Lost" pesticide group	State	Alternatives that would be used if the pesticide group in column 1 were lost (% use)*	Percent of acreage currently treated	Acreage currently treated (x1000)	% Yield impact** if pesticide group is lost and alternatives are		Yield impact (thousands of lb cotton) if the pesticide group is lost and alternatives are	
					used	not used	used	not used
ALL PLANT GROWTH REGULATORS	TN	NITROGEN-RATES-LOWER,MANAGE-PLANTS-FOR-EARLY-CUT-OUT	40.	159.6	0.	-5.	0.	-4628.
ALL PLANT GROWTH REGULATORS	TX	DETERMINATE-STORM-PROOF-VARIETIES,SHORTER-SEASON-SYSTEM	25.	1282.	-10.	-15.	-54357.	-81535.
		U.S. Totals =>	44.9	4919.5	-4.884	-6.764	-332907.	-461040.
.		.				.		

* Alternatives are other pesticides, pesticide groups, or non-pesticide controls. Percent use is the best estimate of the portion of the acreage currently treated by the "lost" pesticide group that would be treated with each alternative. The alternatives collective percent use should not usually total more than that for the "lost" pesticide group.
** Yield impacts are plus (+) and minus (-) and represent the percent yield change on the acreage presently treated with the "lost" pesticide group. U.S. totals are based on a 5-year average (1984-88) that is weighted on acreage planted in each year/state; total averages for the U.S. were 10,958,000 planted acres/year and 622 lb cotton/acre.