USE PESTICIDES SAFELY

If you use pesticides, apply them only when needed and handle them with care. Follow the directions and heed all precautions on the container label. If pesticides are handled, applied, or disposed of improperly, they may be injurious to humans, domestic animals, desirable plants, honey bees and other pollinating insects, fish, and wildlife, and may contaminate water supplies.

CONTENTS

A Survey of Extent and Cost of Weed Control and Specific Weed Problems[1]

PURPOSE OF SURVEY AND PROCEDURE

Losses from weeds and costs of weed control in the United States are among the most important economical problems in agricultural production. The average annual losses due to reduced crop yield and quality and costs of weed control for the decade ending in 1960 (1) were estimated as follows:

Crop or situation	Losses in yield and quality	Cost of control	Total
Agronomic crops	$1,573,024,000	$1,876,000,000	$3,449,024,000
Horticultural crops.	254,281,000	307,000,000	561,281,000
Grazing lands	632,325,000	365,000,000	997,325,000
Aquatic sites and noncropland.	53,140,000	55,638,000	108,778,000
Totals	$2,512,770,000	$2,603,638,000	$5,116,408,000

The weed control problem presents a major challenge to the most efficient farm operator because of the increasing labor and other production costs that reduce his net income. Weeds hinder complete mechanized production of many crops. In addition to lowering crop quality and yield, weeds cause many other losses, such as poisoning of livestock, inducing off-flavors in milk, and reducing flow of irrigation and drainage waters.

New and powerful chemicals for weed control are replacing hoe hands, who have sought other jobs, and are replacing or supplementing inefficient cultural methods. The use of herbicides helps the farmer reduce production costs of many crops in spite of higher farming costs. Workers in research and education must speed up their programs to fill farmers' needs for information about improved methods of weed control. This means that additional sound weed control programs must be developed. To help perfect these programs a survey was made in 1959. The information obtained was published in a joint report by the Agricultural Research Service and the Federal Extension Service in ARS 34-23. In 1962 a similar survey was made, and this publication presents the new estimates. Information requested by the questionnaire used in both surveys included important weeds in each crop, acres treated, treatment costs per acre, effectiveness of available chemicals, the expected trend of chemical weed control by crops, and the need for better chemicals. An additional item included in the 1962 report is information on residue problems in the soil after use of herbicides on various crops. The information obtained on residues related to the residual persistence of herbicides in soils and their effect on the particular crop and on crops grown in rotation with that crop. Comparisons of the 1959 and 1962 estimates are given (tables 1 to 5).

[1] Cooperative investigation of the Agricultural Research Service, Federal Extension Service, Economic Research Service, Cooperative State Extension Service, and Cooperative State Research Service, United States Department of Agriculture. The information was compiled by L. L. Danielson, W. B. Ennis, Jr., D. L. Klingman, W. C. Shaw, and F. L. Timmons, Crops Research Division, Agricultural Research Service; J. E. Jernigan and J. R. Paulling, Federal Extension Service. P. E. Strickler, Farm Production Economics Division, Economic Research Service, U.S. Department of Agriculture, reviewed and summarized the data for this publication.

The questionnaires returned listed weeds causing problems in various crops in different regions by common, colloquial, and in some instances by their scientific name. Appendix A lists the common or colloquial name reported and, in the best judgment of the botanist, the correct scientific name. Because positive identification of some of the weed species was not possible from the local names reported, some errors may be present in the scientific names assigned. In some instances it was not possible to assign a scientific name to the common name reported in the survey. Appendix B lists the names of weeds reported by their scientific name.

From the returned questionnaires, weighted averages were computed by regions and nationally on estimated acreages and costs. The information obtained is given in the tables. It is hoped the data will be helpful in:

a. Planning research on specific weed problems in particular crops or sites in different regions.
b. Planning research and development programs on new herbicides.
c. Planning long-range basic research that will open new frontiers for practical weed control developments.
d. Predicting problems that may be encountered in recommending herbicides for use by farmers, and
e. Developing educational programs.

CHEMICAL WEED CONTROL ON A NATIONAL BASIS

Chemical weed control is being adopted increasingly on American farms. In 1962 over 70 million acres were treated with herbicides as compared with about 53 million acres in 1959 (table 1). This expanded usage of herbicides is a continuation of a trend that resulted in a doubling of acreages treated between 1949 and 1959. There has been a somewhat parallel trend in the number of herbicides available for weed control on farms. From 1949 to 1959 the number of new organic herbicides available to farmers increased from about 20 to nearly 60. In 1962, about 100 herbicides in 6,000 different formulations were available. These new chemicals possess various elective properties that make them useful for controlling weeds in many crops and under different soil and climatic conditions.

Increased mechanized crop production and a shortage of labor for hand-weeding have accentuated weed problems that cause tremendous losses in crop yields and quality. The use of herbicides alone, or combined with cultural, mechanical, biological, and other methods of weed control, offers unusual promise for revolutionizing crop production through increased mechanization, improved crop quality, higher yields, and reduced production, harvesting, and processing costs.

Chemical weed control is having a far-reaching impact on crop production. There is increasing evidence that new chemical methods of weed control affect the choice of crops and the variety of the crop to plant. New chemical methods of weed control have brought about changes in seedbed preparation, methods of seeding, seeding rates, row spacing, plant spacing in the row, and plant populations per acre. In addition, the use of herbicides is modifying fertilizer practices, including type, time of application, and placement of fertilizer. Chemical weed control is affecting cultivation practices, including the type and number of cultivations per season. The use of herbicides also facilitates irrigation practices, harvesting procedures, seed-cleaning operations, erosion control, and fallow practices for weed control. In addition, the extensive use

TABLE 1.--Comparison of estimated extent and cost of chemical weed control in the United States, 1959 and 1962

Crop or area	States reporting		Total acreage treated		Harvested acreage treated		Total cost, all herbicides and applications		Average cost per acre, all treatments		Increase or decrease in cost	Acreage treated by--			
												Farmers		Custom operators	
	1959	1962	1959	1962	1959	1962	1959	1962	1959	1962		1959	1962	1959	1962
	Number	Number	1,000 acres	1,000 acres	Percent	Percent	$1,000	$1,000	Dollars	Dollars	Percent	Percent	Percent	Percent	Percent
Corn	40	46	20,051	25,302	24.5	38.8	37,980	57,600	1.89	2.28	+20.6	82	83	18	17
Cotton	13	15	1,554	5,433	10.3	34.9	4,709	16,805	2.98	3.09	+3.7	92	91	8	9
Soybeans	15	28	556	2,827	2.4	10.2	2,315	10,835	4.16	3.83	-7.9	98	90	2	10
Small grains	38	45	20,723	18,931	21.6	23.5	37,095	29,579	1.79	1.56	-12.8	75	65	25	35
Rice	4	6	502	940	31.7	53.0	889	6,250	1.77	6.65	+275.7	13	66	87	34
Peanuts	5	8	35	310	2.4	22.0	116	2,565	3.33	8.27	+149.8	100	97	[1]	3
Sugarbeets	11	15	125	362	13.9	32.8	625	2,237	5.05	6.18	+23.6	94	65	6	35
Sorghum	14	25	2,093	2,665	13.6	23.1	6,512	5,258	3.11	1.97	-36.7	40	66	60	34
Forage seeds	14	20	282	439	7.8	16.1	1,868	2,416	6.62	5.50	-16.9	80	62	20	38
Vegetables	20	29	276	951	9.9	35.5	1,418	8,634	5.14	9.09	-76.7	84	75	16	25
Potatoes	-	4	-	171	-	12.4	-	1,017	-	5.95	-	-	100	-	0
Dry beans	-	2	-	16	-	1.1	-	114	-	7.12	-	-	95	-	5
Sweet corn	-	1	-	30	-	4.6	-	187	-	6.23	-	-	95	-	5
Onions	-	1	-	26	-	27.0	-	650	-	25.00	-	-	98	-	2
Tree fruits and nuts	9	21	5	267	.2	9.7	43	2,397	8.60	8.98	+4.4	99	86	1	14
Strawberries	3	-	5	-	5.2	-	55	-	11.20	-	-	97	-	3	-
Ornamentals	6	15	2	51	1.0	24.8	45	969	22.50	19.00	-15.6	70	34	30	66
Lawns	17	23	60	672	.7	8.4	1,489	15,368	24.82	22.86	-7.9	82	83	18	17
Hay	20	33	272	412	.4	.6	1,692	1,794	6.22	8.69	+39.7	81	78	19	22
Pastures	34	45	2,400	4,714	.8	1.5	5,789	13,340	2.41	2.83	+17.4	74	64	26	36
Rangeland	13	20	2,011	2,262	.3	.3	6,174	6,265	3.07	2.77	-9.8	37	37	63	63
Forest plantings	-	18	-	274	-	-	-	2,752	-	10.04	-	-	-	-	-
Noncropland	27	31	1,971	3,612	-	-	19,738	83,714	10.01	23.18	+131.6	30	26	70	74
Total	41	50	52,923	70,667	[2] 4.0	[2] 5.4	128,552	270,746	2.43	3.86	+58.8	-	-	-	-

[1] Less than 0.5 percent.
[2] Excludes forest plantings and noncropland.

of herbicides will improve disease and insect control practices and land and equipment utilization.

Specific data are not available on the benefits of using herbicides on crops in various geographical areas. However, between 1959 and 1962, expenditures for chemical weed control by farmers increased from $128 million to over $272 million, and the average cost per acre of all herbicides and applications increased from $2.43 to $3.86. These expenditures were offset by reduced labor needs, improved crop quality and yields, and improvements in other farming operations. Benefits derived from chemical weed control continue to attract interest in safe and efficient herbicides that will reduce weed losses and increase efficiency of crop production.

Preemergence herbicides were used more extensively than postemergence herbicides on cotton, soybeans, and sugarbeets in both 1959 and 1962, while postemergence herbicides were widely used on small grains, corn, sorghum, pastures, rangeland, rice, and most other crops included in the surveys for both years. Preemergence herbicides were used more extensively than postemergence herbicides on potatoes and dry beans in 1962 (table 2). In States reporting in both 1959 and 1962, preemergence treatments increased 235 percent while postemergence treatments increased only 4 percent. Correspondingly, the cost of preemergence treatments greatly increased. The average cost per acre of preemergence herbicides and their application was about twice as much as those of postemergence treatments in both 1959 and 1962 (table 3). Although available herbicides were effective in controlling weeds in some crops (table 4) and the usage trend was upward on virtually all crops (table 5), many States indicated urgent need for better herbicides, particularly in soybeans, sugar beets, vegetables, fruit and nut crops, and ornamentals. Herbicides applied to corn, cotton, vegetables, and fruit and nut crops created the most critical residue problems for succeeding crops (table 4).

TABLE 2.--Comparison of estimated extent of chemical weed control in the United States, 1959 and 1962

Crop or area	Acres treated				Total harvested acreage		Harvested acreage treated			
	Preemergence		Postemergence				Preemergence		Postemergence	
	1959	1962	1959	1962	1959	1962	1959	1962	1959	1962
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	Percent	Percent	Percent	Percent
Corn	2,235	6,382	17,816	18,920	81,902	65,204	2.7	9.8	21.8	29.0
Cotton	1,001	3,365	553	2,068	15,117	15,569	6.6	21.6	3.7	13.3
Soybeans	546	2,402	10	425	22,631	27,604	2.4	8.7	(1)	1.5
Small grains	-	19	20,723	18,912	95,949	80,633	-	(1)	21.6	23.5
Rice	-	-	502	940	1,586	1,773	-	-	31.7	53.0
Peanuts	32	129	3	181	1,453	1,412	2.2	9.1	.2	12.8
Sugarbeets	82	331	43	31	905	1,103	9.1	30.0	4.8	2.8
Sorghum	8	241	2,085	2,424	15,402	11,536	.1	2.1	13.5	21.0
Forage seeds	-	62	282	377	3,627	2,739	-	2.3	7.8	13.8
Vegetables	72	474	204	477	2,787	2,679	2.6	17.7	7.3	17.8
Potatoes	-	156	-	15	1,336	1,385	-	11.3	-	1.1
Dry beans	-	16	-	-	1,460	1,467	-	1.1	-	-
Sweet corn	-	15	-	15	634	662	-	2.3	-	2.3
Onions	-	13	-	13	113	96	-	13.5	-	13.5
Tree fruits and nuts	-	107	5	160	2,735	2,758	-	3.9	.2	5.8
Strawberries	2	-	3	-	96	95	2.1	-	3.1	-
Ornamentals	-	7	2	44	193	206	-	3.4	1.0	21.4
Lawns	3	104	57	568	[2] 8,000	8,000	(1)	[3] 1.3	.7	[3] 7.1
Hay	-	25	272	387	66,274	67,646	-	(1)	.4	.6
Pastures	30	32	2,370	4,682	[2] 310,000	310,000	(1)	(1)	.8	[3] 1.5
Rangeland	-	-	2,011	2,262	[2] 630,000	630,000	-	-	.3	[3] .4
Forest plantings	-	30	-	244	-	-	-	-	-	-
Noncropland	27	1,492	1,944	2,120	-	-	-	-	-	-
Total	4,038	15,402	48,885	55,265	1,262,200	1,232,567	[4] 0.3	[4] 1.1	[4] 3.7	[4] 4.3

[1] Less than 0.05.
[2] Approximate estimates.
[3] Calculation based on estimated 1959 total acreage.
[4] Excludes forest plantings and noncropland.

TABLE 3.--Comparison of estimated cost of chemical weed control in the United States, 1959 and 1962

[Costs are for herbicides and application]

Crop or area	Totaled cost[1]				Average cost per acre[2]			
	Preemergence		Postemergence		Preemergence		Postemergence	
	1959	1962	1959	1962	1959	1962	1959	1962
	$1,000	$1,000	$1,000	$1,000	Dollars	Dollars	Dollars	Dollars
Corn	8,226	28,274	29,754	29,326	3.68	4.43	1.67	1.55
Cotton	3,222	10,228	1,487	6,577	3.22	3.04	2.69	3.18
Soybeans	2,297	9,993	18	842	4.21	4.16	1.75	1.98
Small grains	-	76	37,095	29,503	-	4.00	1.79	1.56
Rice	-	-	889	6,250	-	-	1.77	6.65
Peanuts	107	1,188	9	1,377	3.36	9.22	3.00	7.60
Sugarbeets	428	2,091	197	146	5.24	6.32	4.63	4.73
Sorghum	48	700	6,464	4,558	6.00	2.91	3.10	1.88
Forage seeds	-	668	1,868	1,748	-	10.72	6.63	4.64
Vegetables	582	5,422	836	3,212	8.10	11.45	4.08	6.72
Potatoes	-	924	-	93	-	5.93	-	6.20
Dry beans	-	114	-	-	-	7.39	-	-
Sweet corn	-	112	-	75	-	7.50	-	5.00
Onions	-	260	-	390	-	20.00	-	30.00
Tree fruits and nuts	-	923	43	1,474	-	8.61	7.89	9.21
Strawberries	35	-	20	-	17.60	-	6.18	-
Ornamentals	2	97	43	872	9.50	13.24	19.23	19.86
Lawns	680	5,163	809	10,205	266.67	49.55	14.12	17.96
Hay	-	199	1,692	1,595	-	7.91	6.22	4.12
Pastures	30	135	5,759	13,205	1.00	4.18	2.43	2.82
Rangeland	-	-	6,174	6,265	-	-	3.07	2.77
Forest plantings	-	336	-	2,416	-	11.24	-	9.89
Noncropland	2,596	33,915	17,142	49,799	95.45	22.73	8.82	23.49
Total	18,253	100,818	110,299	169,928	4.52	6.66	2.26	3.07

[1] Calculated from average costs incurred by farmers and other landowners in the States reporting.
[2] Total costs divided by acreage treated, table 2, does not always equal average costs, because acreages and costs are rounded in summary tables.

TABLE 4.--Comparison of effectiveness of herbicides, by number of States reporting, 1959 and 1962; and number of States reporting residue problems, 1962

Crop or area	Effectiveness of herbicides												Residue problem, 1962	
	Preemergence						Postemergence							
	Good		Fair		Poor		Good		Fair		Poor		Yes	No
	1959	1962	1959	1962	1959	1962	1959	1962	1959	1962	1959	1962		
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Corn	15	34	15	7	2	1	24	31	13	13	0	0	28	17
Cotton	4	6	7	5	0	2	5	6	3	6	0	0	9	5
Soybeans	1	5	12	19	2	3	-	2	-	7	-	6	2	25
Small grains	-	2	-	2	-	0	24	40	11	13	0	0	3	41
Rice	-	-	-	-	-	-	4	5	0	1	0	0	1	5
Peanuts	0	3	2	4	1	0	0	3	1	1	0	0	0	6
Sugarbeets	3	2	4	12	3	1	1	3	4	6	0	2	4	11
Sorghum	1	3	1	6	1	2	8	14	4	9	1	1	4	19
Forage seeds	0	3	1	4	0	1	3	7	6	9	3	2	3	17
Vegetables	5	9	9	12	1	3	5	13	11	8	0	1	15	13
Potatoes	-	4	-	0	-	0	-	2	-	1	-	0	1	3
Dry beans	-	1	-	1	-	0	-	-	-	-	-	-	0	2
Sweet corn	-	1	-	0	-	0	-	1	-	0	-	0	0	1
Onions	-	1	-	0	-	0	-	1	-	0	-	0	0	1
Tree fruits and nuts	0	3	2	5	0	0	2	10	7	10	0	0	12	8
Strawberries	0	-	3	-	0	-	0	-	I	-	0	-	-	-
Ornamentals	1	5	2	4	0	1	0	3	4	6	1	3	7	8
Lawns	2	7	2	6	1	0	8	13	7	9	2	1	7	16
Hay	1	2	0	2	0	0	10	9	6	17	2	6	6	27
Pastures	2	1	0	3	0	0	19	17	15	23	1	2	7	35
Rangeland	-	-	-	-	-	-	6	11	6	7	1	0	2	16
Forest plantings	-	4	-	2	-	0	-	3	-	12	-	0	3	14
Noncropland	1	5	1	4	0	0	8	12	17	15	0	2	7	24

TABLE 5.--Comparisons of herbicide usage trend and need for better herbicides, by number of States reporting, 1959 and 1962

Crop or area	Herbicide-usage trend						Need for better herbicides				
	Up		Stationary		Down		Urgent		Little		Some, 1959
	1959	1962	1959	1962	1959	1962	1959	1962	1959	1962	
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Corn	37	42	1	3	0	0	7	11	4	32	27
Cotton	11	14	2	0	0	0	2	5	0	8	11
Soybeans	14	27	1	0	0	0	11	24	0	3	4
Small grains	26	29	9	15	0	1	3	12	11	31	22
Rice	2	6	2	0	0	0	1	2	0	4	3
Peanuts	2	7	0	0	0	0	2	4	0	2	1
Sugarbeets	9	14	2	1	0	0	5	12	0	2	6
Sorghum	10	13	4	11	0	0	6	14	2	8	6
Forage seeds	8	15	2	6	0	0	8	15	0	6	4
Vegetables	16	24	4	5	0	0	8	23	0	5	12
Potatoes	-	3	-	1	-	0	-	1	-	3	-
Dry beans	-	2	-	0	-	0	-	1	-	1	-
Sweet corn	-	0	-	1	-	0	-	0	-	1	-
Onions	-	0	-	1	-	0	-	0	-	1	-
Tree fruits and nuts	7	20	2	1	0	0	5	15	0	4	4
Strawberries	3	-	0	-	0	0	1	-	0	-	2
Ornamentals	5	14	1	1	0	0	2	10	0	4	4
Lawns	18	22	1	1	0	0	7	10	3	12	10
Hay	14	24	4	8	0	0	8	19	1	14	9
Pastures	31	34	3	10	0	0	5	16	5	24	24
Rangeland	10	18	2	1	0	0	3	9	2	9	8
Forest plantings	-	18	-	0	-	0	-	11	-	6	-
Noncropland	22	27	2	4	0	0	7	12	2	17	15

AGRONOMIC CROPS

Agronomic crops, including forage and turf crops grown for seed but not including pastures and rangelands, were grown and harvested on approximately 207-1/2 million acres in 1962. From 1951 through 1960, annual losses from weeds due to reduced yield and quality and other causes averaged $1,573,000,000 in agronomic crops. In addition, the annual cost of cultural and chemical methods of controlling weeds in agronomic crops averaged $1,876,000,000. Thus, the losses caused by weeds and the cost of weed control in 12 major agronomic crops, plus 25 forage and turf crops grown for seed, amounted to approximately $3-1/2 billion annually. The tremendous losses and enormous cost of controlling weeds in agronomic crops are the motivating factors in the unprecedented farmer acceptance of improved chemical methods of weed control.

The survey data reported in tables 1 through 5 show that farmers are rapidly accepting the use of herbicides for weed control in agronomic crops. The major agronomic crops included in the survey in 1962 were corn, cotton, soybeans, small grains (including wheat, oats, barley, and rye), rice, peanuts, sugar beets, sorghum, and forage and turf crops grown for seed.

In 1962, 57,209,000 acres, or 28 percent of the harvested acreage of agronomic crops, were treated with herbicides. The harvested acreage treated with herbicides varied from 10 percent of the soybean acreage to 53 percent of the rice acreage. Additional information on the use of herbicides, including the acreage treated, the per-acre cost, the effectiveness of herbicides, and the ratio of acreage treated by farmers and custom operators, is presented in tables 6 through 30. These data indicate important trends in herbicide usage in 1962.

In 1962, farmers invested $53,218,000 in preemergence herbicides for weed control in agronomic crops. They also invested $80,327,000 for postemergence herbicides. Total expenditures for herbicides for weed control in agronomic crops were $133,545,000. The average cost per acre for preemergence treatments was $4.12. The average per acre cost for postemergence treatments was $1.81. Farmers using their own equipment treated 77 percent of the total acreage, and custom operators treated 23 percent.

Although cultural, mechanical, crop competition, ecological, and other nonchemical methods of weed control were used on approximately 72 percent of the agronomic crops harvested in 1962, there was a striking increase in the use of herbicides. Regardless of the methods of weed control used in the past, the survey data show that infestations of 5 to 10 of the most seriously damaging weeds in agronomic crops increased in all areas.

An analysis of the 10 most damaging weeds in corn showed that 5 species--pigweed, foxtail, crabgrass, barnyardgrass, and nutsedge--were common to the northeastern, southeastern, and north-central production regions. In addition, four weed species--bermudagrass, johnsongrass, common morningglory, and quackgrass--were common to two or more of these regions. Thus, in the principal corn-producing regions three annual grassweeds, three perennial grassweeds, one perennial sedge, and two deep-germinating annual broadleaved weeds constituted major weed problems.

Similar trends are evident in weed populations in other agronomic crops. These data clearly indicate that, under intensive cultural, mechanical, crop competition, ecological, and chemical methods of controlling weeds, several rather distinctly

identifiable groups of weeds are becoming more and more serious in the production of crops. These may be classified as annual grassy weeds, annual and perennial sedges, perennial grassy weeds, annual deep-germinating broadleaved weeds, and perennial broadleaved weeds, in order of decreasing seriousness in agronomic crops.

Throughout the survey on weed control in agronomic crops, the reports on the degree of effectiveness of the herbicides and the reported need for better ones were closely correlated. When the majority of States rated the effectiveness of herbicides fair to poor, the need for better herbicides was usually rated urgent.

The ecological shifts in weed populations that are occurring in several agronomic crops undoubtedly reflect the lack of available hand-hoe labor, reduced cultivation, and increased reliance on selective herbicides for weed control.

Corn

In 1962 more than 25 million acres of corn were treated--over 6-1/4 million with preemergence herbicides and nearly 19 million with postemergence herbicides. This treated acreage was approximately 39 percent of the harvested acreage. Farmers invested $28,274,000 in preemergence treatments and $29,326,000 in postemergence treatments, or a total of $57,600,000. The average per-acre cost was $4.43 for preemergence treatments and $1.55 for postemergence treatments. Farmers treated 83 percent of the acreage with their own equipment, and custom operators treated the other 17 percent. (Tables 1, 2, 3, and 6.)

Of the reporting States, 34 rated the effectiveness of the preemergence herbicides good, 7 fair, and 1 poor. The effectiveness of postemergence was rated good by 31 States and fair by 13 States. Forty-two States reported the herbicide-usage trend was up, and three States reported the use as stationary. Eleven States indicated an urgent need for better herbicides. Twenty-eight States reported that the present herbicides caused residue problems in soils, but 17 States indicated that there were no residue problems associated with the use of herbicides. (Tables 4, 5, and 6.)

The degree of infestation, extent of damage, and infestation trend of the most important weed species in corn are given by geographical production regions in table 7. It is obvious that some highly significant trends are occurring in weed infestations in corn production. The similarity of species becoming the most serious weeds in corn production in the different major production regions is striking. For example, crabgrass, pigweed, foxtail, barnyardgrass, and nutsedge were among the 10 most serious weeds in all production regions. In addition, 4 weeds, bermudagrass, johnsongrass, common morningglory, and quackgrass, were among the 10 most serious weeds in at least two of the three major production regions--the northeastern, north-central, and southern regions. In decreasing order of importance, the most seriously damaging weeds in corn production are annual grassy weeds, perennial grassy weeds and sedges, annual deep-germinating broadleaved weeds, shallow-germinating annual broadleaved weeds with prolific seed-production capabilities, and perennial broadleaved species.

In developing chemical or cultural practices of weed control in corn, workers must utilize broad-spectrum herbicides that deal with the entire weed population. Since most herbicides do not possess the broad-spectrum properties necessary for controlling the total weed population in corn production, mixtures of herbicides and herbicide rotations supplemented by crop competition, cultural practices, and other methods will be required to give full-season control of the entire weed spectrum.

TABLE 6.--Corn: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmers	Custom operators	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Connecticut-----	20	10	7.50	7.50	40	60	G	G	Up	Little	No
Delaware--------	25	50	3.50	2.00	60	40	G	F	Up	Little	Yes
Maine-----------	3.5	.5	8.50	2.50	100	0	G	F	Sta.	Little	No
Maryland--------	90	200	3.50	2.00	85	15	G	G	Up	Little	No
Massachusetts---	15	12	7.00	6.00	20	80	G	F	Up	Little	No
New Hampshire---	6	3	8.00	8.00	40	60	G	G	Up	Little	No
New Jersey------	12	12	6.00	5.50	95	5	G	G	Up	Little	Yes
Pennsylvania----	500	400	7.00	3.50	80	20	G	G	Up	Urgent	Yes
Rhode Island----	1	2	-	-	83	17	G	G	Up	Little	No
Vermont---------	7	9.1	-	-	50	50	G	F	Up	Little	Yes
West Virginia---	15	5	6.00	6.00	95	5	G	G	Up	Little	Yes
Northeastern--	694.5	703.6	6.41	3.13	78	22	11-G	7-G 4-F	10-Up 1-Sta.	1-Urgent 10-Little	5-Yes 6-No
Illinois--------	1,240	4,000	4.00	1.25	85	15	G	G	Up	Little	Yes
Indiana---------	344	1,706	3.80	1.40	99	1	G	G	Up	Urgent	Yes
Iowa------------	1,000	3,000	3.00	1.00	90	10	G	G	Up	Urgent	No
Kansas----------	40	640	6.50	1.85	80	20	G	F	Up	Little	Yes
Michigan--------	500	800	3.50	1.50	70	30	G	F	Up	Little	Yes
Minnesota-------	300	2,400	4.50	2.00	75	25	G	G	Up	Little	Yes
Missouri--------	335	921	4.00	1.50	90	10	F	G	Up	Little	No
Nebraska--------	250	900	4.25	1.75	85	15	F	G	Up	Urgent	Yes
North Dakota----	2	108	4.50	1.50	99	1	P	G	Up	Urgent	No
Ohio------------	546	1,260	3.30	1.60	75	25	G	G	Up	Little	No
South Dakota----	200	800	4.00	1.35	60	40	G	G	Up	Urgent	Yes
Wisconsin-------	220	460	8.00	2.50	80	20	G	G	Up	Little	Yes
North Central-	4,977.0	1,699.5	3.90	1.47	83	17	9-G 2-F 1-P	10-G 2-F	12-Up	5-Urgent 7-Little	8-Yes 4-No
Alabama---------	20.4	37.8	7.00	.75	90	10	F	F	Up	Urgent	Yes
Arkansas--------	8	7.4	4.00	1.50	100	0	G	G	Sta.	Little	Yes
Florida---------	25	-	4.00	-	100	0	G	-	Up	Little	Yes
Georgia---------	45	55	8.00	3.00	98	2	G	G	Up	-	No
Kentucky--------	35	170	5.00	2.00	95	5	G	G	Up	Little	Yes
Louisiana-------	21	17	4.50	1.00	90	10	G	F	Up	Little	No
Mississippi-----	100	59	4.50	1.00	90	10	G	G	Up	Little	No
North Carolina--	150	300	10.00	1.50	80	20	G	G	Up	Little	No
Oklahoma--------	.5	-	-	-	100	0	-	-	-	-	-
South Carolina--	24.9	26.6	7.50	3.00	75	25	F	G	Up	Little	No
Tennessee-------	67.5	80	4.00	1.50	70	30	G	G	Up	Little	Yes
Texas-----------	3	14	3.75	2.00	50	40	F	G	Up	Urgent	Yes
Virginia--------	145	96	6.05	2.00	80	20	G	F	Up	Little	Yes
Southern------	645.3	862.4	6.51	1.73	84	16	9-G 3-F	8-G 3-F	11-Up 1-Sta.	2-Urgent 9-Little	7-Yes 5-No
California------	10	75	7.00	3.50	50	50	F	G	Up	Urgent	Yes
Colorado--------	40	175	1.00	.50	90	10	G	F	Up	Urgent	Yes
Idaho-----------	1	5	11.50	2.00	40	60	G	G	Up	Little	Yes
Montana---------	2	9	3.00	1.25	95	5	G	F	Sta.	Little	Yes
New Mexico------	-	9	-	3.50	90	10	-	G	Up	Little	No
Oregon----------	2	10	9.50	5.50	90	10	F	F	Up	Little	Yes
Utah------------	-	15	-	2.00	75	25	-	G	Up	Urgent	Yes
Washington------	10	60	7.00	3.00	75	25	G	F	Up	-	Yes
Wyoming---------	.5	.3	7.00	3.00	75	25	G	G	Up	Little	Yes
Hawaii----------	-	.1	-	15.00	100	0	-	G	Up	Little	No
Western-------	65.5	358.4	3.36	1.87	78	22	5-G 2-F	6-G 4-F	9-Up 1-Sta.	3-Urgent 6-Little	8-Yes 2-No
UNITED STATES-	6,382.3	18,819.8	4.43	1.58	83	17	34-G 7-F 1-P	31-G 13-F	42-Up 3-Sta.	4-Urgent 32-Little	28-Yes 17-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta, stationary.

TABLE 7.--Corn: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Common lambsquarters--	12	-	6	6	2	6	4	6	4	2
Pigweed----------	12	-	6	6	2	8	2	7	2	3
Quackgrass----------	11	2	6	3	-	7	4	8	3	-
Foxtail----------	11	2	7	2	3	7	1	4	6	1
Common morningglory---	7	3	2	2	3	3	1	5	2	-
Crabgrass----------	12	11	10	1	2	10	-	7	5	-
Barnyardgrass---------	8	3	4	1	2	5	1	3	5	-
Bermudagrass----------	1	-	-	1	-	1	-	1	-	-
Nutsedge----------	12	4	8	-	1	7	4	2	10	-
Ragweed----------	12	2	10	-	4	8	-	11	-	1
Smartweed----------	11	4	7	-	6	5	-	11	-	-
Wild mustard----------	7	1	6	-	4	3	-	2	2	3
Johnsongrass----------	4	1	3	-	-	2	2	-	3	1
Canada thistle--------	5	2	3	-	2	3	-	3	2	-
Curly dock----------	4	1	3	-	3	1	-	3	1	-
Common chickweed------	3	-	3	-	3	-	-	2	-	1
Purslane----------	5	4	1	-	4	1	-	4	1	-
Bindweed----------	6	6	-	-	6	-	-	5	1	-
Cocklebur----------	2	2	-	-	2	-	-	2	-	-
Goosegrass----------	2	2	-	-	2	-	-	2	-	-
Henbit----------	1	1	-	-	1	-	-	1	-	-
Purpletop----------	1	1	-	-	-	1	-	1	-	-

[1] The 12 States reporting were Connecticut, Delaware, Pennsylvania, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and West Virginia.

North Central:[2]										
Foxtail----------	11	-	4	7	-	4	7	1	10	-
Johnsongrass----------	7	3	2	2	2	-	5	1	6	-
Barnyardgrass---------	11	2	8	1	2	9	-	6	4	1
Crabgrass----------	9	1	7	1	4	5	-	5	4	-
Quackgrass----------	11	4	6	1	5	3	3	7	3	1
Wild mustard----------	7	4	2	1	4	3	-	1	-	6
Wirestem muhly--------	2	-	1	1	-	1	1	-	2	-
Wild oat----------	1	-	-	1	-	-	1	-	-	1
Small-pigweed---------	1	-	-	1	-	1	-	-	1	-
Pigweed----------	11	3	8	-	3	6	2	4	3	4
Velvetleaf----------	5	2	3	-	1	3	1	2	2	1
Nutsedge----------	7	5	2	-	4	2	1	2	5	-
Shattercane----------	3	1	2	-	-	1	2	-	3	-
Wild onion and wild garlic----------	2	1	1	-	1	-	1	2	-	-
Giant foxtail---------	1	-	1	-	-	-	1	-	1	-
Smartweed----------	11	3	8	-	3	8	-	7	3	1
Common lambsquarters--	11	4	7	-	4	7	-	5	1	5
Canada thistle--------	10	5	5	-	4	6	-	6	2	2
Bindweed----------	8	4	4	-	3	5	-	5	2	1
Ragweed----------	11	7	4	-	8	3	-	5	-	6
Cocklebur----------	9	6	3	-	4	5	-	3	1	5
Common morningglory---	8	5	3	-	4	4	-	4	1	3
Horsenettle----------	3	1	2	-	1	2	-	1	2	-
Milkweed----------	2	-	2	-	-	2	-	1	1	-
Sunflower----------	2	-	2	-	1	1	-	1	1	-
Sowthistle----------	3	2	1	-	2	1	-	1	1	1
Groundcherry----------	1	-	1	-	-	1	-	-	1	-
Kochia----------	1	-	1	-	-	1	-	-	1	-
Jimsonweed----------	2	1	1	-	1	1	-	1	-	1
Curly dock----------	4	4	-	-	4	-	-	4	-	-
Goosegrass----------	3	3	-	-	3	-	-	3	-	-
Fall panicum----------	2	2	-	-	1	1	-	2	-	-
Purslane----------	2	2	-	-	2	-	-	2	-	-
Stinkgrass----------	1	1	-	-	-	1	-	-	1	-
Dogbane----------	1	1	-	-	-	1	-	-	1	-
Marshelder----------	1	1	-	-	1	-	-	1	-	-
Russian thistle-------	1	1	-	-	1	-	-	1	-	-
Wild cucumber---------	1	1	-	-	-	1	-	-	-	1
Wild sweetpotato------	1	1	-	-	-	1	-	-	-	1
Muhly----------	1	1	-	-	1	-	-	-	1	-
Black nightshade------	1	1	-	-	1	-	-	-	1	-
Witchgrass----------	1	1	-	-	1	-	-	-	1	-

[2] The 11 States reporting were Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and Wisconsin.

TABLE 7.--Corn: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[3]										
Crabgrass	9	-	2	7	1	4	4	2	7	-
Cocklebur	10	2	3	5	1	5	4	4	6	-
Common morningglory	10	1	5	4	2	5	3	5	5	-
Pigweed	10	2	4	4	2	5	3	5	5	-
Nutsedge	10	5	2	3	4	4	2	2	8	-
Johnsongrass	10	-	8	2	-	7	3	2	8	-
Foxtail	4	1	2	1	1	2	1	-	4	-
Coffeeweed	3	-	2	1	-	2	1	1	2	-
Barnyardgrass	8	2	6	-	4	4	-	6	2	-
Bermudagrass	8	4	4	-	4	4	-	4	4	-
Ragweed	8	5	3	-	5	3	-	6	-	2
Goosegrass	8	5	3	-	6	2	-	6	1	1
Common lambsquarters	4	2	2	-	2	2	-	4	-	-
Brachiaria	2	-	2	-	1	1	-	1	1	-
Rattlebox	4	3	1	-	3	1	-	1	1	2
Southern sandbur	2	1	1	-	1	1	-	1	-	1
Bindweed	1	-	1	-	-	1	-	-	1	-
Annual panicum	1	-	1	-	-	1	-	-	1	-
Sicklepod	1	-	1	-	-	1	-	-	1	-
Florida beggarweed	1	-	1	-	-	1	-	-	1	-
Redvine	1	-	1	-	1	-	-	-	1	-
Trumpetvine	2	1	1	-	2	-	-	1	1	-
Wild sweetpotato	1	-	1	-	1	-	-	-	1	-
Sandbur	1	-	1	-	1	-	-	-	1	-
Smartweed	6	6	-	-	6	-	-	4	2	-
Quackgrass	3	3	-	-	1	1	1	2	1	-
Florida pusley	2	1	1	-	1	1	-	1	1	-
Texas millet	1	1	-	-	1	-	-	-	1	-
Nightshade	1	1	-	-	1	-	-	-	1	-
Purslane	1	1	-	-	1	-	-	1	-	-
Wild onion and garlic	1	1	-	-	1	-	-	1	-	-
Weed bromegrasses	1	1	-	-	1	-	-	1	-	-
Wild mustard	1	1	-	-	1	-	-	1	-	-
Jimsonweed	1	1	-	-	1	-	-	1	-	-
Horsenettle	1	1	-	-	1	-	-	-	-	1
Western:[4]										
Pigweed	7	1	4	2	3	2	2	5	1	1
Barnyardgrass	6	-	5	1	3	2	1	4	2	-
Purslane	1	-	-	1	1	-	-	-	-	1
Spiny amaranth	1	-	-	1	1	-	-	-	-	1
Green amaranth	1	-	-	1	1	-	-	-	-	1
Apple-of-Peru	1	-	-	1	1	-	-	-	-	1
Bindweed	6	1	5	-	3	2	1	3	3	-
Wild oat	4	1	3	-	2	1	1	2	2	-
Quackgrass	2	-	2	-	-	2	-	-	2	-
Canada thistle	2	-	2	-	-	1	1	-	2	-
Common lambsquarters	6	4	2	-	4	2	-	5	-	1
Wild mustard	3	1	2	-	2	1	-	1	2	-
Foxtail	3	1	2	-	2	1	-	2	1	-
Common morningglory	3	1	2	-	2	1	-	1	-	2
Sunflower	2	-	2	-	2	-	-	2	-	-
Johnsongrass	2	-	2	-	1	1	-	2	-	-
Green foxtail	2	1	1	-	1	1	-	1	1	-
Yellow foxtail	1	-	1	-	-	1	-	-	1	-
Punctureviné	1	-	1	-	1	-	-	-	1	-
Crabgrass	1	-	1	-	-	1	-	1	-	-
Southern sandbur	1	-	1	-	-	1	-	1	-	-
Marshelder	1	-	1	-	-	1	-	1	-	-
Sandbur	1	-	1	-	1	-	-	-	1	-
Nutsedge	1	-	1	-	1	-	-	-	1	-
Nightshade	1	-	1	-	1	-	-	1	-	-
Bermudagrass	2	2	-	-	1	1	-	2	-	-
Smartweed	1	1	-	-	1	-	-	-	1	-
Curly dock	1	1	-	-	1	-	-	1	-	-
Russian knapweed	1	1	-	-	1	-	-	1	-	-
Common chickweed	1	1	-	-	1	-	-	-	-	1
Kochia	1	1	-	-	1	-	-	-	1	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Whitetop	1	1	-	-	1	-	-	1	-	-
Povertyweed	1	1	-	-	1	-	-	1	-	-

[3] The 11 States reporting were Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

[4] The 7 States reporting were Arizona, California, Hawaii, Montana, New Mexico, Utah, and Wyoming.

Although there is much evidence of similarity in the weed populations in corn regardless of geographical regions, there are also many weeds that are more serious in some geographical regions than others. While one species that dominates the weed population in corn in the Northeastern States may not occur in corn in the Southern States, there are enough weeds common to all production regions to necessitate the development of herbicides and herbicide mixtures with broad spectrum weed-control capabilities.

Cotton

In 1962, 3,365,000 acres of cotton were treated with preemergence herbicides and 2,068,000 acres with postemergence herbicides--a total of 5,433,000 acres. This treated acreage was approximately 35 percent of the harvested acreage. Cotton producers invested $10,228,000 in preemergence treatments and $6,577,000 in postemergence treatments, or a total of $16,805,000. The average per-acre cost was $3.04 for preemergence treatments and $3.18 for postemergence treatments. Farmers treated 91 percent of the total with their own equipment, and custom operators treated the other 9 percent. (Tables 1, 2, 3, and 8.)

Six of the reporting States rated the effectiveness of preemergence herbicides good, five fair, and two poor; and six States reported the effectiveness of postemergence herbicides good and six fair. Fourteen of the reporting States reported that the herbicide-usage trend was up, and no State indicated that the herbicide-usage trend was either stationary or down. (Tables 4, 5, and 8.)

TABLE 8.--Cotton: Estimated extent and cost of chemical weed control and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmers	Custom operators	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Missouri---------	1,664	434	3.25	1.50	90	10	F	F	Up	Little	No
North Central--	1,664	434	3.25	1.50	90	10	1-F	1-F	1-Up	1-Little	1-No
Alabama----------	253.2	25.6	2.50	2.25	95	5	G	G	Up	Little	Yes
Arkansas---------	700	600	3.00	3.00	98	2	F	F	Up	Little	Yes
Florida----------	1	-	6.00	-	100	0	F	-	Up	Little	Yes
Georgia----------	240	10	3.50	3.00	98	2	G	G	Up	-	Yes
Louisiana--------	400	365	-	2.00	90	10	G	F	Up	Little	No
Mississippi------	1,010.3	466	-	-	85	15	-	-	-	-	-
North Carolina---	75	1	4.50	2.00	90	10	G	-	Up	Urgent	No
Oklahoma---------	26	.5	-	-	100	0	-	G	-	-	-
South Carolina---	137.6	23.6	3.50	5.00	90	10	P	F	Up	Urgent	No
Tennessee--------	300	30	2.25	4.00	90	10	G	F	Up	Little	No
Texas------------	46.4	283.4	4.00	2.25	95	5	F	G	Up	Urgent	No
Virginia---------	.1	-	10.50	-	100	0	F	-	Up	Urgent	Yes
Southern-------	3,189.6	1,805.1	3.00	2.61	92	8	5-G 4-F 1-P	4-G 4-F	10-Up	4-Urgent 5-Little	5-Yes 4-No
Arizona----------	6	120	8.00	7.00	75	25	G	G	Up	Little	Yes
California-------	3	60	4.50	8.00	80	20	P	F	Up	Urgent	Yes
New Mexico-------	-	40	-	5.50	50	50	-	G	Up	Little	Yes
Western--------	9	2,201	6.83	7.00	72	28	1-G 1-P	2-G 1-F	3-Up	1-Urgent 2-Little	3-Yes
UNITED STATES--	3,364.6	2,068.1	3.04	3.18	91	9	6-G 5-F 2-P	6-G 6-F	14-Up	5-Urgent 8-Little	9-Yes 5-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

Five States indicated an urgent need for better herbicides. Nine States reported residue problems associated with the use of the present herbicides, but five States indicated no residue problems associated with herbicide usage. The residue problems reported were associated with the residual toxicity of herbicides in soils as they affect cotton and crops grown in rotation with cotton. (Tables 4 and 8.)

The degree of infestation, extent of damage, and infestation trend of the important weeds in cotton are given in table 9. Some of the most damaging weeds in cotton production were crabgrass, johnsongrass, pigweed, common morningglory, cocklebur, goosegrass, nutsedge, redvine, ragweed, and trumpetvine in the southern region; and some of the most damaging weeds in cotton in the western irrigated region included johnsongrass, pigweed, common morningglory, barnyardgrass, jungle-rice, groundcherry, Texas blueweed, nutsedge, puncturevine, silverleaf nightshade, and bindweed. The similarity of some of the weed infestations in cotton and corn is very striking. At least 5 of the top 10 weed species in all corn-producing regions were also among the most serious weeds in the production of cotton. These included pigweed, crabgrass, barnyardgrass, nutsedge, bermudagrass, johnsongrass, and common morningglory. Again, the significant trend in weed populations in cotton production seemed to be very similar to those in corn production--namely, annual grassy weeds, perennial sedges, perennial grassy weeds, deep-germinating annual broadleaved weeds, perennial broadleaved weeds, and perennial vines in decreasing order of damage. The most serious weeds in cotton production cause heavy to moderate damage, and the infestation trend for many of the 10 most serious weeds is up in several of the cotton-producing States.

Soybeans

In 1962 about 2,402,000 acres of soybeans were treated with preemergence herbicides and 425,000 acres with postemergence herbicides--a total of 2,827,000 acres. This acreage was approximately 10.2 percent of the harvested acreage. Farmers invested $9,993,000 in preemergence treatments and $842,000 in postemergence treatments--a total of $10,835,000. The average per-acre cost was $4.16 for preemergence treatments and $1.98 for postemergence treatments. Farmers used their own equipment to apply herbicides on 90 percent of the acreage, and custom operators treated the other 10 percent. (Tables 1, 2, 3, and 10.)

The survey showed a striking and urgent need for better herbicides. Five States reported the effectiveness of preemergence herbicides good, 19 fair, and 3 poor. Two States reported the effectiveness of postemergence herbicides good, seven fair, and six poor. In spite of this rather average effectiveness rating, 27 States reported that the herbicide-usage trend was up. No State reported the usage trend as stationary or down. Twenty-four States reported an urgent need for better herbicides but three States reported little need for improved herbicides. Also in striking contrast to the residual problems reported for the use of herbicides in corn and cotton, only two States reported residual problems associated with the use of current herbicides in soybeans. (Tables 4, 5, and 10.)

The degree of infestation, extent of damage, and infestation trend of important weeds in soybeans in the various production regions are given in table 11. Of the 10 most damaging weeds in the north-central, southeastern, and northeastern regions of soybean production, at least 5 were common to all three production regions. The weed populations in soybeans provide further evidence of the necessity for broad-spectrum herbicides, mixtures of herbicides, or combinations of herbicides, cultural practices, and other techniques that will give full-season control of all weeds in the population. Again, the problem weeds may be classified as annual grassy weeds, perennial sedges, perennial grasses, deep-germinating annual broadleaved weeds, perennial broadleaved weeds, and perennial vines.

TABLE 9.--Cotton: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
North-Central:[1]										
Johnsongrass	1	-	1	-	-	-	1	-	-	1
Foxtail	1	-	1	-	-	1	-	-	1	-
Redvine	1	-	1	-	-	1	-	-	1	-
Common morningglory	1	-	1	-	-	1	-	1	-	-
Crabgrass	1	-	1	-	-	1	-	1	-	-
Cocklebur	1	-	1	-	-	1	-	1	-	-
Nutsedge	1	-	1	-	-	1	-	1	-	-
Pigweed	1	-	1	-	-	1	-	1	-	-
Ragweed	1	-	1	-	-	1	-	1	-	-
Smartweed	1	-	1	-	-	1	-	1	-	-
Trumpetvine	1	-	1	-	1	-	-	-	1	-
Goosegrass	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	1	-	-
Southern:[2]										
Crabgrass	10	1	3	6	1	1	8	5	4	1
Johnsongrass	9	2	3	4	1	4	4	4	4	1
Pigweed	8	2	3	3	2	3	3	5	3	-
Common morningglory	9	3	3	3	3	4	2	7	1	1
Cocklebur	10	3	5	2	2	5	3	7	3	-
Goosegrass	7	3	3	1	3	2	2	5	1	1
Nutsedge	9	3	5	1	2	6	1	4	5	-
Redvine	2	-	1	1	-	1	1	-	2	-
Ragweed	5	3	1	1	4	-	1	4	-	1
Trumpetvine	4	2	1	1	2	1	1	3	1	-
Purslane	5	2	2	1	3	2	-	4	1	-
Bermudagrass	7	3	4	-	3	4	-	5	1	1
Common lambsquarters	6	3	3	-	2	3	1	5	-	1
Florida pusley	3	1	2	-	1	1	1	2	1	-
Southern sandbur	1	-	1	-	-	-	1	-	1	-
Crowfootgrass	1	-	1	-	-	-	1	1	-	-
Coffeeweed	3	2	1	-	1	2	-	2	1	-
Horsenettle	2	1	1	-	1	1	-	2	-	-
Curly dock	1	-	1	-	-	1	-	-	1	-
Foxtail	1	-	1	-	-	1	-	-	1	-
Annual panicum	1	-	1	-	-	1	-	1	-	-
Sicklepod	1	-	1	-	-	1	-	1	-	-
Brachiaria	1	-	1	-	-	1	-	1	-	-
Quackgrass	1	-	1	-	-	1	-	1	-	-
Barnyardgrass	5	3	2	-	2	3	-	2	3	-
Smartweed	5	5	-	-	4	-	1	5	-	-
Greenbrier	1	1	-	-	-	1	-	1	-	-
Tick-trefoil	1	1	-	-	-	1	-	1	-	-
Wild sweetpotato	1	1	-	-	1	-	-	-	1	-
Florida beggarweed	1	1	-	-	1	-	-	-	1	-
Sandbur	1	1	-	-	1	-	-	-	1	-
Common chickweed	1	1	-	-	1	-	-	1	-	-
Henbit	1	1	-	-	1	-	-	1	-	-
Weed bromegrasses	1	1	-	-	1	-	-	1	-	-
Jimson weed	1	1	-	-	1	-	-	1	-	-
Nightshade	1	1	-	-	1	-	-	1	-	-
Western:[2]										
Johnsongrass	3	-	3	-	-	3	-	3	-	-
Pigweed	3	-	3	-	1	2	-	2	-	1
Common morningglory	3	1	2	-	-	1	2	-	1	2
Barnyardgrass	3	1	2	-	1	2	-	2	-	1
Jungle-rice	1	-	1	-	-	1	-	1	-	-
Groundcherry	1	-	1	-	-	1	-	1	-	-
Texas blueweed	1	-	1	-	-	1	-	1	-	-
Nutsedge	3	2	1	-	3	-	-	1	2	-
Punctureweed	1	-	1	-	1	-	-	-	1	-
Silverleaf nightshade	1	-	1	-	1	-	-	1	-	-
Bindweed	3	3	-	-	1	2	-	3	-	-
Foxtail	2	2	-	-	1	-	1	1	1	2
Bermudagrass	3	3	-	-	1	2	-	2	-	1
Sprangletop	1	1	-	-	1	-	-	-	1	-
Stinkgrass	1	1	-	-	1	-	-	-	1	-
Crabgrass	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	1	-	-
Horse purslane	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	-	-	1

[1] The 1 State reporting was Missouri.

[2] The 10 States reporting were Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

[2] The 3 States reporting were Arizona, California, and New Mexico.

TABLE 10.--Soybeans: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage, trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Delaware	25	-	4.00	-	80	20	F	-	Up	Urgent	No
Maryland	10	-	4.00	-	90	10	F	-	Up	Urgent	No
New Jersey	9	-	6.00	-	95	5	F	F	Up	Urgent	No
Pennsylvania	2	-	6.00	-	100	0	F	-	Up	Urgent	No
Northeastern	46	-	4.48	-	86	14	4-F	1-F	4-Up	4-Urgent	4-No
Illinois	750	5	4.00	2.00	95	5	G	P	Up	Urgent	No
Indiana	180	110	4.10	-	99	1	F	-	Up	Urgent	No
Iowa	500	-	3.00	-	90	10	G	-	Up	Urgent	No
Kansas	5	-	11.00	-	90	10	F	-	Up	Urgent	Yes
Michigan	4	-	5.50	-	80	20	F	-	Up	Little	No
Minnesota	60	5	5.00	2.00	95	5	G	P	Up	Little	No
Missouri	100	5	4.50	1.50	90	10	F	P	Up	Urgent	No
Nebraska	12	3	4.25	2.50	95	5	F	F	Up	Urgent	No
North Dakota	-	-	4.00	-	100	0	P	-	Up	Urgent	No
Ohio	198.4	18.2	6.15	4.80	85	15	F	P	Up	Little	Yes
South Dakota	1	-	6.00	-	100	-	G	-	Up	Urgent	No
Wisconsin	1	-	6.00	-	80	20	F	-	Up	Urgent	No
North Central	1,811.4	146.2	4.06	3.38	93	7	4-G 7-F 1-P	1-F 4-P	12-Up	9-Urgent 3-Little	2-Yes 10-No
Alabama	1.2	.1	5.00	1.50	100	0	G	F	Up	Urgent	No
Arkansas	225	135	4.00	2.00	75	25	F	F	Up	Urgent	No
Florida	.5	-	6.00	-	100	0	F	-	Up	Urgent	No
Kentucky	12	10	5.50	1.75	96	4	F	P	Up	Urgent	No
Louisiana	25	10	2.75	1.25	95	5	F	G	Up	Urgent	No
Mississippi	185	9	5.50	2.50	90	10	F	F	Up	Urgent	No
North Carolina	10	1	5.00	3.00	95	5	F	F	Up	Urgent	No
Oklahoma	10	-	-	-	100	0	-	-	-	-	-
South Carolina	10	100	3.00	1.50	75	25	P	F	Up	Urgent	No
Tennessee	50	5	3.75	1.00	90	10	P	P	Up	Urgent	No
Texas	11	-	4.50	-	100	-	F	-	Up	Urgent	No
Virginia	5	9	4.00	2.50	90	10	F	G	Up	Urgent	No
Southern	594.7	279.1	4.49	1.80	82	18	1-G 8-F 2-P	2-G 5-F 2-P	11-Up	11-Urgent	11-No
UNITED STATES	2,402.1	425.3	4.16	1.99	90	10	5-G 19-F 3-P	2-G 7-F 6-P	27-Up	24-Urgent 3-Little	2-Yes 25-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair; P, poor.

Small Grains (wheat, oats, barley, and rye)

In 1962 only 19,000 acres of small grain crops were treated with preemergence herbicides, but 18,912,000 acres received postemergence treatments. This treated acreage was 23.5 percent of the harvested acreage. Farmers invested $29,579,000 in chemical methods of controlling weeds in small grains. The average per-acre cost was $4.00 for preemergence treatments and $1.56 for postemergence treatments. Farmers treated 65 percent of the acreage, and custom operators treated the other 35 percent. (Tables 1, 2, 3, and 12.)

Twenty-nine States reported good effectiveness with postemergence herbicides but 13 States rated the herbicides only fair. Twenty-nine States reported that the herbicide-usage trend was up, five indicated the trend was stationary, and one State reported the trend was down. Twelve States reported an urgent need for more effective herbicides, but 31 States indicated little need for better herbicides. Only 3 States

TABLE 11.--Soybeans: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Pigweed	4	-	1	3	-	2	2	2	2	-
Common lambsquarters	4	1	1	2	1	1	2	2	2	-
Foxtail	3	-	1	2	-	2	1	-	3	-
Common morningglory	2	-	1	1	-	-	2	1	1	-
Nutsedge	1	-	-	1	-	-	1	-	1	-
Johnsongrass	2	-	2	-	-	1	1	1	1	-
Ragweed	4	2	2	-	2	2	-	4	-	-
Jimsonweed	1	-	1	-	-	-	1	1	-	-
Barnyardgrass	3	2	1	-	2	1	-	2	1	-
Smartweed	2	1	1	-	1	1	-	2	-	-
Crabgrass	3	2	1	-	3	-	-	3	-	-
Horsenettle	1	-	1	-	-	1	-	1	-	-
Goosegrass	1	-	1	-	1	-	-	1	-	-
Wild mustard	1	1	-	-	-	1	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Bindweed	1	1	-	-	1	-	-	1	-	-
Bermudagrass	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Foxtail	11	1	3	7	1	3	7	2	9	-
Johnsongrass	5	-	3	2	-	2	3	1	4	-
Smartweed	10	2	7	1	3	6	1	6	3	1
Wild oat	1	-	-	1	-	-	1	-	1	-
Wild mustard	6	2	4	-	2	3	1	4	-	2
Giant foxtail	1	-	1	-	-	-	1	-	1	-
Pigweed	11	2	9	-	2	8	1	9	1	1
Barnyardgrass	11	3	8	-	2	9	-	7	3	1
Common lambsquarters	11	3	8	-	2	8	1	8	2	1
Canada thistle	9	3	6	-	3	6	-	5	2	2
Ragweed	10	5	5	-	4	5	1	8	-	2
Velvetleaf	6	1	5	-	2	4	-	3	2	1
Common morningglory	6	2	4	-	1	5	-	3	2	1
Cocklebur	9	5	4	-	5	4	-	5	1	3
Bindweed	5	1	4	-	1	4	-	5	-	-
Crabgrass	6	2	4	-	2	4	-	3	3	-
Sowthistle	4	1	3	-	1	3	-	3	1	-
Quackgrass	7	4	3	-	4	2	1	5	2	-
Kochia	2	-	2	-	-	2	-	1	1	-
Jimsonweed	2	-	2	-	1	1	-	-	1	1
Curly dock	3	2	1	-	2	1	-	2	1	-
Milkweed	2	1	1	-	1	1	-	-	1	1
Shattercane	2	-	2	-	-	2	-	-	2	-
Western waterhemp	1	-	1	-	-	1	-	-	1	-
Goosegrass	3	2	1	-	3	-	-	3	-	-
Nutsedge	3	3	-	-	2	1	-	2	1	-
Purslane	2	2	-	-	2	-	-	2	-	-
Dodder	2	2	-	-	2	-	-	1	-	1
Muhly	1	1	-	-	1	-	-	-	1	-
Dogbane	1	1	-	-	1	-	-	-	1	-
Wild buckwheat	1	1	-	-	1	-	-	1	-	-
Marshelder	1	1	-	-	1	-	-	1	-	-
Southern:[3]										
Cocklebur	11	2	3	6	2	2	7	2	8	1
Pigweed	10	1	4	5	-	5	5	4	6	-
Johnsongrass	10	1	5	4	-	5	5	4	6	-
Crabgrass	10	3	3	4	2	5	3	7	3	-
Common morningglory	10	3	5	2	2	5	3	5	5	-
Coffeeweed	6	1	3	2	1	3	2	1	5	-
Nutsedge	8	4	3	1	4	3	1	2	6	-
Barnyardgrass	4	1	2	1	1	2	1	2	2	-
Brachiaria	2	-	1	1	-	1	1	1	1	-
Foxtail	3	2	-	1	2	-	1	2	1	-
Bermudagrass	5	2	3	-	1	4	-	4	1	-
Goosegrass	7	4	3	-	4	3	-	6	1	-
Ragweed	5	3	2	-	2	3	-	4	1	-
Smartweed	6	4	2	-	4	2	-	6	-	-
Common lambsquarters	5	3	2	-	3	2	-	5	-	-
Trumpetvine	2	1	1	-	1	1	-	1	1	-
Giant foxtail	1	-	1	-	-	1	-	-	1	-
Sandbur	1	-	1	-	-	1	-	-	1	-
Florida pusley	2	-	2	-	-	2	-	1	1	-

[1] The 4 States reporting were Delaware, Maryland, New Jersey, and Pennsylvania.

[2] The 11 States reporting were Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and Wisconsin.

TABLE 11.--Soybeans: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[3]--Con.										
Annual panicum--------	1	-	1	-	-	1	-	-	1	-
Wild sweetpotato------	1	-	1	-	-	1	-	-	1	-
Redvine---------------	1	-	1	-	-	1	-	-	1	-
Velvetleaf------------	1	-	1	-	-	1	-	1	-	-
Southern sandbur------	1	-	1	-	-	1	-	1	-	-
Florida beggarweed----	1	-	1	-	-	1	-	1	-	-
Sicklepod-------------	1	1	-	-	-	1	-	-	1	-
Rattlebox-------------	1	1	-	-	1	-	-	1	-	-
Horseweed-------------	1	1	-	-	1	-	-	1	-	-
Carpetweed------------	1	1	-	-	1	-	-	1	-	-
Jimsonweed------------	1	1	-	-	1	-	-	1	-	-
Horsenettle-----------	1	1	-	-	1	-	-	1	-	-
Purslane--------------	1	1	-	-	1	-	-	1	-	-

[3] The 11 States reporting were Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

reported any residual problems associated with the use of herbicides, but 40 States reported there were no residual problems associated with the use of herbicides in small grains (Table 4, 5, and 12.)

The degree of infestation, extent of damage, and infestation trend of important weeds in small grains in the various production regions are given in table 13. The effectiveness of chemical and cultural methods of controlling weeds in small grains is clearly reflected in the weed-population data submitted by the reporting States. For example, most States reported slight to moderate damage and that the infestation trend for many weed species in small grains was stationary or down. Several States reported that the wild onion and wild garlic infestations were heavy, the extent of damage was heavy, and the infestation trend was up. Infestation trend was also up for cheat, curly dock, foxtail, wild oat, and Canada thistle.

In general, the use of herbicides, especially the phenoxy compounds, has greatly reduced the overall seriousness of the weed problems in small grains. However, a significant trend in the weed populations in small grains is occurring. The infestation trend seems to be toward annual grasses and difficult-to-control broadleaved annual and perennial weed species. Some of the most serious weeds in small grains in the North Central States included ragweed, wild mustard, foxtail, wild oat, johnsongrass, Canada thistle, smartweed, pigweed, common lambsquarters, and quackgrass. In the southern production region, wild onion, wild garlic, wild mustard, cheat, knawel, curly dock, common chickweed, henbit, corncockle, ragweed, and common lambsquarters were among the most serious weeds. In the western region, wild oat, wild mustard, common lambsquarters, bindweed, whitetop, weed bromegrasses, common chickweed, speedwell, Russian knapweed, and gromwell appeared to be among the most serious weeds in small-grain production. In the western-producing region, heavy infestations of wild oat cause moderate to heavy damage. The infestation trend of this weed appeared to be up in several States.

Rice

In 1962, 940,000 acres of rice, 53 percent of the harvested acreage, were treated with herbicides. Farmers invested $6 1/4 million for weed control in rice. The average per-acre cost was $6.65 for postemergence treatments. The high cost of postemergence treatements was caused by their use for the control of annual grassy

TABLE 12.--Small Grains: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post emergence	Pre-emergence	Post emergence	Farmer	Custom operator	Pre-emergence	Post emergence			
	1000 acres	1000 acres	Dollar	Dollar	Percent	Percent					
Maine	-	60	-	1.00	100	0	-	G	Sta.	Little	No
Maryland	-	20	-	1.75	70	30	-	G	Sta.	Little	No
Massachusetts	-	.5	-	3.00	50	50	-	F	Up	Little	Yes
New Hampshire	-	.5	-	3.00	50	50	-	G	Up	Urgent	Yes
New Jersey	-	8.4	-	3.00	95	5	-	G	Up	Little	No
Pennsylvania	-	350	-	3.50	80	20	-	G	Up	Little	No
Vermont	-	4.5	-		50	50	-	F	Up	Little	No
West Virginia	-	2	-	2.00	100	0	-	F	Up	Urgent	No
Northeastern	-	445.9	-	3.06	82	18	-	5-G 3-F	6-Up 2-Sta.	2-Urgent 6-Little	2-Yes 6-No
Illinois	-	135	-	1.25	90	10	-	G	Sta.	Little	No
Indiana	-	34	-	1.20	99	1	-	F	Down	Little	No
Iowa	-	1,000	-	1.00	90	10	-	G	Sta.	Little	No
Kansas	-	600	-	1.85	60	40	-	-	Sta.	-	-
Michigan	-	300	-	1.50	65	35	-	G	Up	Little	No
Minnesota	5	1,800	4.00	2.00	75	25	G	G	Up	Little	No
Missouri	-	14	-	2.00	50	50	-	G	Sta.	Little	No
Nebraska	-	800	-	2.25	50	50	-	G	Up	Little	No
North Dakota	-	3,700	-	1.00	65	35	-	G	Up	Little	No
Ohio	-	280	-	1.70	65	35	-	F	Up	Little	Yes
South Dakota	-	2,500	-	1.35	67	33	-	G	Sta.	Little	No
Wisconsin	-	600	-	1.50	80	20	-	G	Up	Little	No
North Central	5	11,763	4.00	1.42	69	31	1-G	9-G 2-F	6-Up 5-Sta. 1-Down	11-Little	1-Yes 10-No
Alabama	-	10	-	1.00	95	5	-	F	Up	Urgent	No
Arkansas	-	3	-	2.00	100	0	-	G	Sta.	Little	No
Florida	-	10	-	3.00	50	50	-	G	Up	Little	No
Georgia	-	35	-	3.00	98	2	-	G	Up	Urgent	No
Kentucky	-	25	-	2.75	85	15	-	F	Sta.	Urgent	No
Louisiana	-	5	-	1.25	95	5	-	F	Up	Urgent	No
Mississippi	-	15	-	1.50	90	10	-	G	Up	Urgent	No
North Carolina	-	60	-	1.50	90	10	-	G	Sta.	Little	No
Oklahoma	-	10	-	2.00	20	80	-	-	Up	Urgent	No
South Carolina	-	205	-	1.00	75	25	-	G	Up	Little	No
Tennessee	-	10	-	1.50	70	30	-	F	Up	Little	No
Texas	-	500	-	1.60	30	70	G	-	Up	Urgent	No
Virginia	-	23	-	2.00	90	10	-	F	Sta.	Urgent	No
Southern	-	911	-	1.56	53	47	1-G	6-G 5-F	10-Up 3-Sta.	8-Urgent 5-Little	13-No
Arizona	-	5	-	2.00	80	20	-	G	Sta.	Little	No
California	-	500	-	3.00	25	75	-	G	Sta.	Little	No
Colorado	-	25	-	1.25	50	50	-	F	Up	Urgent	No
Idaho	2	700	4.50	2.00	-	-	F	G	Up	Little	No
Montana	10	3,400	4.00	1.25	60	40	G	G	Up	Little	No
Nevada	-	15	-	3.00	20	80	-	G	Up	Little	No
New Mexico	-	5	-	2.50	100	0	-	G	Sta.	Little	No
Oregon	-	900	-	2.50	50	50	-	G	Sta.	Little	No
Utah	-	100	-	2.00	50	50	-	G	Sta.	Little	No
Washington	-	100	-	2.00	65	35	-	F	Up	-	No
Wyoming	2	40	3.50	1.50	50	50	F	G	Up	Little	No
Alaska	-	2	-	10.00	90	10	-	F	Up	Urgent	No
Western	14	5,792	4.00	1.72	55	45	1-G 2-F	9-G 3-F	7-Up 5-Sta.	2-Urgent 9-Little	12-No
UNITED STATES	19	18,911.9	4.00	1.56	65	35	3-G 2-F	29-G 13-F	29-Up 15-Sta. 1-Down	12-Urgent 21-Little	3-Yes 41-No

[1] Represents cost of herbicides custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair.

[3] Sta.; stationary.

TABLE 13.--Small Grains: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Wild mustard	5	1	3	1	-	5	-	-	3	2
Common lambsquarters	5	1	3	1	1	3	1	4	-	1
Wild onion and wild garlic	4	1	2	1	-	3	1	3	1	-
Nutsedge	3	1	1	1	1	1	1	1	2	-
Quackgrass	2	-	1	1	-	1	1	-	2	-
Ragweed	2	-	1	1	-	1	1	2	-	-
Yellow rocket	1	-	-	1	-	1	-	1	-	-
Pigweed	4	-	4	-	1	3	-	3	-	1
Canada thistle	5	2	3	-	2	3	-	4	1	-
Smartweed	4	1	3	-	2	2	-	4	-	-
Curly dock	5	2	3	-	3	2	-	4	-	1
Barnyardgrass	2	-	2	-	-	2	-	2	-	-
Crabgrass	1	-	1	-	-	1	-	-	1	-
Weed bromegrasses	1	-	1	-	-	1	-	1	-	-
Milkweed	1	-	1	-	-	1	-	-	1	-
Bedstraw	1	-	1	-	-	1	-	-	1	-
Common morningglory	1	-	1	-	-	1	-	1	-	-
Goosegrass	1	-	1	-	-	1	-	-	-	1
Common chickweed	3	3	-	-	3	-	-	3	-	-
Henbit	2	2	-	-	2	-	-	2	-	-
Purslane	2	2	-	-	2	-	-	2	-	-
Knawel	1	1	-	-	1	-	-	-	1	-
Bindweed	1	1	-	-	1	-	-	1	-	-
Johnsongrass	1	1	-	-	1	-	-	-	-	1
Dodder	1	1	-	-	-	1	-	1	-	-
Foxtail	1	1	-	-	1	-	-	-	-	1
North-Central:[2]										
Ragweed	9	3	5	1	1	7	1	6	-	3
Wild mustard	9	3	5	1	3	6	-	4	1	4
Foxtail	5	1	3	1	1	4	-	2	3	-
Wild oat	2	-	1	1	-	1	1	1	1	-
Johnsongrass	5	4	-	1	4	1	-	2	3	-
Canada thistle	8	1	7	-	1	4	1	2	3	1
Smartweed	9	3	6	-	2	7	-	9	-	-
Pigweed	9	4	5	-	4	5	-	8	-	-
Common lambsquarters	9	4	5	-	4	5	-	7	-	2
Quackgrass	7	2	5	-	1	6	-	5	2	-
Bindweed	8	4	4	-	4	4	-	6	1	1
Curly dock	10	6	4	-	7	3	-	7	2	1
Sowthistle	4	-	4	-	1	3	-	2	1	1
Wild buckwheat	4	-	4	-	1	3	-	2	2	-
Wild onion and wild garlic	5	2	3	-	3	2	-	4	1	-
Weed bromegrasses	2	-	2	-	-	2	-	1	1	1
Milkweed	2	1	1	-	1	1	-	2	-	-
Cocklebur	3	2	1	-	2	1	-	2	1	-
Purslane	1	-	1	-	-	1	-	-	1	-
Giant foxtail	1	-	1	-	-	1	-	-	1	-
Yellow rocket	1	-	1	-	-	1	-	-	1	-
Horsenettle	1	-	1	-	-	1	-	1	-	-
Wild radish	1	-	1	-	-	1	-	1	-	-
Wintercress	1	-	1	-	-	1	-	-	1	-
Sunflower	3	3	-	-	3	-	-	2	1	-
Barnyardgrass	3	3	-	-	3	-	-	3	-	-
Muhly species	1	1	-	-	1	-	-	-	1	-
Russian thistle	1	1	-	-	1	-	-	-	1	-
Fumitory	1	1	-	-	1	-	-	-	1	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
Henbit	1	1	-	-	1	-	-	1	-	-
Field pennycress	1	1	-	-	1	-	-	1	-	-
Corncockle	1	1	-	-	1	-	-	-	-	1
Crabgrass	1	1	-	-	1	-	-	1	-	-
Sagewort	1	1	-	-	1	-	-	1	-	-
Dodder	1	1	-	-	1	-	-	1	-	-

[1] The 6 States reporting were Maryland, New Hampshire, New Jersey, Pennsylvania, Vermont, and West Virginia.

[2] The 10 States reporting were Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, North Dakota, Ohio and Wisconsin.

TABLE 13.--Small Grains: Number of States reporting degree of infestation, extent of damage, and infestation trend of weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[3]										
Wild onion and wild garlic	5	1	-	4	1	1	3	-	5	-
Wild mustard	5	2	2	1	2	2	1	2	2	1
Cheat	3	1	1	1	2	-	1	1	2	-
Knawel	8	4	3	1	4	3	1	5	3	-
Curly dock	7	3	4	-	3	4	-	4	2	1
Common chickweed	6	2	4	-	2	4	-	5	1	-
Henbit	7	4	3	-	4	3	-	5	2	-
Corncockle	4	3	1	-	2	2	-	2	2	-
Ragweed	3	2	1	-	1	2	-	3	-	-
Common lambsquarters	2	1	1	-	1	1	-	2	-	-
Smartweed	2	1	1	-	1	1	-	2	-	-
Darnel	1	-	1	-	-	1	-	-	1	-
Pigweed	1	-	1	-	-	1	-	1	-	-
Little wild barley	1	-	1	-	-	1	-	-	1	-
Mustard	1	-	1	-	-	1	-	1	-	-
Eveningprimrose	1	-	1	-	-	1	-	1	-	-
Canada thistle	1	-	1	-	-	1	-	1	-	-
Johnsongrass	1	-	1	-	1	-	-	1	-	-
Mayweed	2	2	-	-	1	1	-	1	1	-
Blessed thistle	2	2	-	-	2	-	-	-	1	1
Chicory	1	1	-	-	-	1	-	1	-	-
Corn spurrey	1	1	-	-	1	-	-	-	1	-
Bullthistle	1	1	-	-	1	-	-	-	1	-
Shepherdspurse	1	1	-	-	1	-	-	-	1	-
Plantain	1	1	-	-	1	-	-	-	1	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
Ragged-robin	1	1	-	-	1	-	-	1	-	-
Fleabane	1	1	-	-	1	-	-	1	-	-
Wild oat	1	1	-	-	1	-	-	1	-	-
Vetch	3	2	1	-	2	1	-	3	-	-
Western:[4]										
Wild oat	8	2	2	4	1	3	4	2	3	3
Wild mustard	8	2	3	3	2	4	2	2	3	3
Common lambsquarters	8	2	5	1	2	6	-	6	1	1
Bindweed	8	3	4	1	2	4	2	5	3	-
Whitetop	3	1	1	1	1	1	1	1	1	1
Weed bromegrasses	3	1	1	1	1	1	1	1	2	-
Common chickweed	1	-	-	1	-	1	-	-	1	-
Speedwell	1	-	-	1	1	-	-	-	1	-
Russian knapweed	1	-	-	1	-	-	1	-	1	-
Gromwell	1	-	-	1	-	-	1	-	1	-
Pigweed	5	-	5	-	-	5	-	4	-	1
Sunflower	5	2	3	-	4	1	-	3	1	1
Quackgrass	4	2	2	-	2	1	1	1	3	-
Kochia	3	1	2	-	1	1	1	2	1	-
Russian thistle	3	1	2	-	2	1	-	2	1	-
Wild buckwheat	2	1	1	-	1	-	1	-	2	-
Cowcockle	2	1	1	-	1	1	-	1	1	-
Sandbur	2	1	1	-	1	1	-	-	1	1
Cocklebur	4	3	1	-	3	1	-	3	-	1
Curly dock	4	3	1	-	4	-	-	2	-	2
Field pennycress	3	2	1	-	2	1	-	1	2	-
Shepherdspurse	2	1	1	-	2	-	-	1	1	-
Green foxtail	2	1	1	-	2	-	-	1	1	-
Johnsongrass	2	1	1	-	2	-	-	2	-	-
Dogfennel	1	-	1	-	-	1	-	-	1	-
Bluemustard	1	-	1	-	-	1	-	1	-	-
Field horsetail	1	-	1	-	-	1	-	1	-	-
Smartweed	1	-	1	-	1	-	-	1	-	-
Prickly lettuce	2	1	1	-	2	-	-	2	-	-
Douglas fiddleneck	1	-	1	-	-	1	-	-	1	-
Green tansy-mustard	1	-	1	-	-	1	-	-	1	-
Tumblmustard	1	-	1	-	-	1	-	1	-	-
Marshelder	1	-	1	-	1	-	-	1	-	-
Yellow flower pepper weed	1	-	1	-	1	-	-	1	-	-
Falseflax	1	-	1	-	1	-	-	1	-	-
Crabgrass	1	-	1	-	-	-	1	-	1	-
Ragweed	3	3	-	-	2	1	-	3	-	-
Hempnettle	1	1	-	-	1	-	-	-	1	-
Spurry	1	1	-	-	1	-	-	-	1	-
Knapweed	1	1	-	-	1	-	-	-	1	-
Coast fiddleneck	1	1	-	-	1	-	-	-	1	-

[3] The 8 States reporting were Alabama, Arkansas, Florida, Georgia, Kentucky, North Carolina, South Carolina, and Virginia.

TABLE 13.--Small Grains: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Western:[4]--Con.										
Bermudagrass	1	1	-	-	1	-	-	1	-	-
Groundcherry	1	1	-	-	1	-	-	1	-	-
Dodder	1	1	-	-	1	-	-	1	-	-
Foxtail	1	1	-	-	1	-	-	1	-	-
Wild onion and wild garlic	1	1	-	-	1	-	-	1	-	-
Povertyweed	1	1	-	-	1	-	-	1	-	-
Milkweed	1	1	-	-	1	-	-	1	-	-
Perennial sowthistle	1	1	-	-	1	-	-	-	-	1
Wild radish	1	1	-	-	-	-	1	-	-	1

[4] The 9 States reporting were Alabama, Arizona, California, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

weeds and sedges, in addition to the broadleaved species. Farmers applied the herbicides with their own equipment on 66 percent of the treated acreage, and custom operators treated the other 34 percent. (Tables 1, 3, and 14.)

Five States reported good effectiveness from the use of postemergence herbicides and one State rated the postemergence herbicides fair in effectiveness. Six States reported the herbicide-usage trend was up, and no State reported that it was stationary or down. Two States indicated an urgent need for more effective herbicides and four indicated there was little need for more effective herbicides. One State reported residual toxicity problems from the use of herbicides, but five States indicated no residual toxicity problems. (Tables 5 and 14.)

The degree of infestation, extent of damage, and infestation trend of important weeds in rice in the southern rice-producing region are given in table 15. The most serious weeds in the southern rice-production region were barnyardgrass, ducksalad, curly dock, redstem, foxtail, crabgrass, pigweed, goosegrass, smartweed, and johnsongrass. There seemed also to be an increase in the infestation trend of both emerged and submerged aquatics in all production regions. Barnyardgrass remained one of the most damaging weeds in rice production.

Peanuts

In 1962, 310,000 acres of peanuts, 22 percent of the harvested acreage, were treated with herbicides. Farmers invested $1,188,000 in preemergence treatments and $1,377,000 in postemergence treatments--a total of $2,565,000. The average per-acre cost was $9.22 for preemergence treatments and $7.60 for postemergence treatments. Farmers applied the herbicides on 97 percent of the treated acreage, and custom operators treated the other 3 percent. (Tables 1, 3, and 16.)

Three States reported good results and four fair results with preemergence herbicides. Three States reported good results with postemergence herbicides and one State fair results. It is significant, moreover, that none of the States reporting indicated poor results from either preemergence or postemergence herbicides. Seven States indicated that the herbicide-usage trend was up and none indicated that it was stationary or down. Four States indicated an urgent need for better herbicides and two States indicated little need. None of the States reported any herbicide residual toxicity problems associated with the use of herbicides in peanuts. (Tables 4, 5, and 16.)

The degree of infestation, extent of damage, and infestation trend of important weeds in peanuts are given in table 17. Serious weeds in peanut production included crabgrass, nutsedge, coffeeweed, Florida pusley, Florida beggarweed, crowfootgrass, tick-trefoil, common morningglory, cocklebur, pigweed, goosegrass, and common

TABLE 14.--Rice: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend	Need for better herbicides	Residue problems
	Pre-emergence	Post emergence	Pre-emergence	Post emergence	Farmer	Custom operator	Pre-emergence	Post emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Arkansas	-	300	-	[3] 6.33	[4] 82	18	-	G	Up	Little	No
Louisiana	-	240	-	2.96	95	5	-	G	Up	Urgent	No
Mississippi	-	49	-	14.00	50	50	-	G	Up	Urgent	Yes
South Carolina	-	.8	-	5.00	100	0	-	F	Up	Little	No
Texas	-	250.8	-	10.00	10	90	-	G	Up	Little	No
Southern	-	839.8	-	6.91	62	38	-	4-G 1-F	5-Up	2-Urgent 3-Little	1-Yes 4-No
California	-	100	-	4.50	100	0	-	G	Up	Little	No
Western	-	100	-	4.50	100	0	-	1-G	1-Up	1-little	1-No
United States	-	939.8	-	6.65	66	34	-	5-G 1-F	6-Up	2-Urgent 4-Little	1-Yes 5-No

[1] Represents cost of herbicides custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported. [2] G, good; F, fair. [3] 100,000 acres @ $13.00; 200,000 acres @ 3.00. [4] 100,000 @ 95 and 5; 200,000 acres @ 75 and 25.

TABLE 15.--Rice: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[1]										
Barnyardgrass	4	0	1	3	0	0	4	1	3	0
Ducksalad	2	0	0	2	0	0	2	0	2	0
Curly dock	3	0	2	1	0	2	1	1	2	0
Redstem	2	0	1	1	0	1	1	0	2	0
Foxtail	2	1	0	1	1	0	1	1	1	0
Crabgrass	2	0	2	0	0	1	1	1	1	0
Pigweed	2	0	2	0	0	1	1	0	2	0
Goosegrass	3	1	2	0	1	2	0	1	2	0
Smartweed	3	1	2	0	1	2	0	2	1	0
Johnsongrass	1	0	1	0	0	0	1	0	1	0
Redrice	1	0	1	0	0	0	1	1	0	0
Curly indigo	2	0	2	0	0	1	1	1	1	0
Alligatorweed	2	1	1	0	1	1	0	2	0	0
Spikerush	3	1	2	0	1	1	0	1	1	0
Nutsedge	1	0	1	0	0	1	0	0	1	0
Aquatic (submerged)	1	0	1	0	0	1	0	0	1	0
Coffeeweed	1	0	1	0	0	1	0	0	1	0
Plantain	1	0	1	0	0	1	0	0	1	0
Umbrella-sedge	1	0	1	0	0	1	0	0	1	0
Redstone	1	0	1	0	0	1	0	0	1	0
Arrowhead	1	0	1	0	0	1	0	0	1	0
Tall indigo	1	0	1	0	0	1	0	1	0	0
Fimbristylis autumnalis	2	2	0	0	2	0	0	1	1	0
Mexican-weed	1	0	1	0	0	1	0	1	0	0
Paspalum floridanum	1	1	0	0	1	0	0	0	1	0
Jointed sedge	1	1	0	0	1	0	0	1	0	0
Knotgrass	1	1	0	0	1	0	0	1	0	0
Longtom	1	1	0	0	1	0	0	1	0	0
Sprangletop	1	1	0	0	1	0	0	1	0	0
Brachiaria	1	1	0	0	1	0	0	1	0	0
Jungle-rice	1	1	0	0	1	0	0	1	0	0
Panicgrass	1	1	0	0	1	0	0	1	0	0
Western:[2]										
Aquatic (emerged)	1	-	-	1	-	-	1	1	-	-
Barnyardgrass	1	-	1	-	-	-	1	-	1	-
Aquatic (submerged)	1	1	-	-	1	-	-	1	-	-

[1] The 4 States reporting were Arkansas, Louisiana, Mississippi, and South Carolina.

[2] The State reporting was California.

TABLE 16.--Peanuts: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Alabama	13.4	11.9	5.20	2.75	98	2	G	G	Up	Urgent	No
Florida	10	-	6.00	-	75	25	G	-	Up	Little	No
Georgia	10	140	8.00	8.00	98	2	F	G	Up	-	No
North Carolina	72	5	10.00	6.00	95	5	F	F	Up	Urgent	No
Oklahoma	12	.2	-	-	100	0	-	-	-	-	-
South Carolina	.2	-	3.00	-	100	0	G	-	Up	Little	No
Texas	1.0	-	4.00	-	100	0	F	-	Up	Urgent	-
Virginia	10.2	24.1	14.00	8.00	100	0	F	G	Up	Urgent	No
Southern	128.8	181.2	9.22	7.60	97	3	3-G 4-F	3-G 1-F	7-Up	4-Urgent 2-Little	6-No
UNITED STATES	128.8	181.2	9.22	7.60	97	3	3-G 4-F	3-G 1-F	7-Up	4-Urgent 2-Little	6-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair.

TABLE 17.--Peanuts: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[1]										
Crabgrass	6	1	2	3	2	2	2	4	1	1
Nutsedge	5	1	2	2	1	2	2	1	4	-
Coffeeweed	3	1	1	1	1	-	2	2	-	1
Florida pusley	5	1	2	2	-	3	2	4	1	-
Florida beggarweed	1	-	-	1	-	-	1	1	-	-
Crowfootgrass	1	-	-	1	-	-	1	1	-	-
Tick-trefoil	1	-	-	1	-	-	1	1	-	-
Common morningglory	5	2	3	-	1	4	-	5	-	-
Cocklebur	6	3	3	-	3	3	-	6	-	-
Pigweed	4	2	2	-	2	2	-	4	-	-
Goosegrass	5	4	1	-	3	-	2	5	-	-
Common lambsquarters	5	4	1	-	3	1	1	5	-	-
Bermudagrass	5	4	1	-	4	1	-	5	-	-
Smartweed	3	2	1	-	2	1	-	3	-	-
Horsenettle	1	-	1	-	-	1	-	1	-	-
Southern sandbur	1	-	1	-	-	1	-	1	-	-
Barnyardgrass	3	3	-	-	3	-	-	2	1	-
Johnsongrass	3	3	-	-	3	-	-	3	-	-
Purslane	2	2	-	-	2	-	-	2	-	-
Sicklepod	1	1	-	-	1	-	-	-	1	-
Foxtail	1	1	-	-	1	-	-	1	-	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Poorjoe	1	1	-	-	1	-	-	1	-	-
Horseweed	1	1	-	-	1	-	-	1	-	-
Carpetweed	1	1	-	-	1	-	-	1	-	-
Annual panicum	1	1	-	-	1	-	-	1	-	-

[1] The 6 States reporting were Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia.

Western:[2]										
Sandbur	1	-	-	1	-	-	1	1	-	-
Junglerice	1	-	1	-	-	1	-	1	-	-

[2] The State reporting was Arizona.

lambsquarters. As in several other crops, the most serious weeds in peanuts appear to be annual grassy weeds, perennial sedges, perennial grasses, deep-germinating annual broadleaved weeds, and perennial broadleaved species. The degree of infestations of the major weeds in peanut production correlated with the severity of the damage produced. An increasing infestation trend was reported by some States for crabgrass, nutsedge, Florida pusley, barnyardgrass, and sicklepod. Most of the States indicated that weed infestations in peanuts were stationary, and only one State reported that crabgrass and coffeeweed infestations seemed to be down.

After more than a century of cultivation and hand-hoeing, more than 30 weed species were reported as causing damage in peanut production. The infestation trend of only two species was down, but the infestation trend of five species was rated up and the remainder stationary. Undoubtedly, future surveys will determine what, if any, permanent progress can be made by the additional use of herbicides in reducing weed-seed populations in the soil and thus permanent progress in reducing the weed problems in our major crops.

Sugarbeets

In 1962, 331,000 acres of sugarbeets received preemergence herbicide treatments and 31,000 acres received postemergence herbicide treatments--a total of 362,000 acres. Thus, about 33 percent of the harvested acreage was treated. Farmers invested $2,091,000 in preemergence herbicides and $146,000 in postemergence herbicides--a total of $2,237,000. The average per-acre cost for preemergence treatments was $6.32. Farmers applied the herbicides on 65 percent of the treated acreage, and custom operators treated the other 35 percent. (Tables 1, 2, 3, and 18.)

TABLE 18.--Sugarbeets: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Iowa	5	1	2.00	2.00	95	5	F	F	Up	Urgent	No
Michigan	25	-	4.00	-	80	20	F	-	Up	Urgent	Yes
Minnesota	65	-	4.00	-	100	0	F	-	Up	Urgent	No
Nebraska	65	10	5.25	4.25	95	5	P	P	Up	Urgent	No
North Dakota	1	3	4.50	3.00	99	1	G	G	Up	Urgent	No
Ohio	10.4	4.7	4.75	3.25	78	22	F	F	Up	Urgent	Yes
South Dakota	10	2	4.75	5.00	60	40	G	G	Up	Urgent	No
North Central	181.4	20.7	4.48	3.81	91	9	2-G 4-F 1-P	2-G 2-F 1-P	7-Up	7-Urgent	2-Yes 5-No
California	20	1	7.50	7.50	90	10	F	P	Up	Urgent	No
Colorado	100	-	8.50	-	0	100	F	-	Up	Urgent	Yes
Idaho	1	3	12.00	6.00	80	20	F	F	Up	Little	No
Montana	5.5	.5	4.00	2.00	100	0	F	G	Up	Urgent	Yes
Oregon	5	5	17.00	6.50	90	10	F	F	Sta.	Little	No
Utah	2	.5	15.00	15.00	75	25	F	F	Up	Urgent	No
Washington	10	-	10.00	-	75	25	F	-	Up	-	No
Wyoming	6	.1	5.00	5.00	95	5	F	F	Up	Urgent	No
Western	149.5	10.1	8.56	6.63	33	67	8-F	1-G 4-F 1-P	7-Up 1-Sta.	5-Urgent 2-Little	2-Yes 6-No
UNITED STATES	330.9	30.8	6.32	4.73	65	35	2-G 12-F 1-P	3-G 6-F 2-P	14-Up 1-Sta.	12-Urgent 2-Little	4-Yes 11-No

[1] Represents cost of herbicides custom applications and/or cost of farmer-applied herbicides. Regional and Unites States Averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Stationary.

Two States reported the effectiveness of preemergence herbicides was good, 12 fair, and 1 poor; and 3 States reported the effectiveness of postemergence herbicides as good, 6 fair, and 2 poor. Fourteen States reported that the herbicide-usage trend was up, but one State reported a stationary trend in the use of herbicides. Twelve States indicated an urgent need for more effective herbicides, but two indicated little need. Only 4 States reported residual toxicity problems involving the use of herbicides whereas 11 States reported no residual toxicity problems. (Tables 4, 5, and 18.)

The degree of infestation, extent of damage, and infestation trend of important weeds in sugarbeets are given in table 19. Foxtail, wild oat, johnsongrass, smartweed, common lambsquarters, barnyardgrass, crabgrass, wild mustard, sowthistle, pigweed, and Canada thistle appeared to be among the most serious weeds in sugarbeet

TABLE 19.--Sugar beets: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Station-ary	Up	Down
North Central:[1]	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Foxtail	6	1	3	2	1	3	2	5	1	-
Wild oat	2	-	1	1	-	-	2	1	1	-
Johnsongrass	1	-	-	1	1	-	-	1	-	-
Smartweed	3	1	2	-	1	1	1	2	1	-
Common lambsquarters	6	3	3	-	2	4	-	5	1	-
Barnyardgrass	6	3	3	-	3	3	-	5	1	-
Crabgrass	4	2	2	-	2	2	-	3	1	-
Wild mustard	3	1	2	-	1	2	-	2	-	1
Sowthistle	2	-	2	-	-	2	-	1	1	-
Pigweed	5	4	1	-	4	1	-	5	-	-
Canada thistle	2	1	1	-	1	1	-	1	1	-
Goosegrass	1	-	1	-	1	-	-	1	-	-
Quackgrass	1	-	1	-	1	-	-	1	-	-
Kochia	1	-	1	-	-	1	-	1	-	-
Russian thistle	1	-	1	-	-	1	-	1	-	-
Black nightshade	1	-	1	-	1	-	-	1	-	-
Ragweed	4	4	-	-	4	-	-	4	-	-
Purslane	3	3	-	-	3	-	-	3	-	-
Nutsedge	1	1	-	-	1	-	-	-	1	-
Wild buckwheat	1	1	-	-	1	-	-	-	1	-
Bindweed	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Marshelder	1	1	-	-	1	-	-	1	-	-
Western:[2]										
Wild oat	5	1	2	2	1	2	2	3	1	1
Pigweed	6	-	4	2	-	5	1	5	1	-
Wild mustard	2	-	-	2	-	1	1	2	-	-
Barnyardgrass	5	1	3	1	1	2	2	2	2	1
Perennial ground-cherry	1	-	-	1	-	-	1	-	1	-
Dodder	1	-	-	1	-	-	1	1	-	-
Common lambsquarters	5	-	4	1	2	3	-	5	-	-
Canada thistle	3	-	2	1	1	2	-	1	2	-
Bindweed	5	3	2	-	2	3	-	4	1	-
Kochia	3	1	2	-	1	2	-	-	3	-
Green foxtail	2	-	2	-	1	1	-	1	1	-
Quackgrass	4	3	1	-	2	1	1	1	2	1
Curly dock	3	2	1	-	2	1	-	3	-	-
Foxtail	2	1	1	-	1	1	-	2	-	-
Purslane	2	1	1	-	1	1	-	2	-	-
Jungle-rice	2	1	1	-	1	1	-	2	-	-
Sprangletop	1	-	1	-	1	-	-	1	-	-
Cocklebur	3	3	-	-	3	-	-	2	-	1
Russian knapweed	1	1	-	-	-	-	1	-	1	-
Weed bromegrasses	1	1	-	-	-	1	-	-	1	-
Nutsedge	1	1	-	-	1	-	-	-	1	-
Black nightshade	1	1	-	-	1	-	-	-	1	-
Hairy nightshade	1	1	-	-	1	-	-	-	1	-
Silversheath knotweed	1	1	-	-	1	-	-	-	1	-
Nettleleaf goosefoot	1	1	-	-	1	-	-	-	1	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Povertyweed	1	1	-	-	1	-	-	1	-	-
Marshelder	1	1	-	-	1	-	-	1	-	-
Nightshade	1	1	-	-	1	-	-	1	-	-
Russian thistle	1	1	-	-	1	-	-	1	-	-
Sheperdspurse	1	1	-	-	1	-	-	1	-	-
Ticklegrass	1	1	-	-	1	-	-	1	-	-
Yellowflower pepperweed	1	1	-	-	1	-	-	1	-	-
Whitetop	1	1	-	-	1	-	-	-	-	1

[1] The 6 States reporting were Kansas, Michigan, Minnesota, Nebraska, North Dakota, and Ohio.

[2] The 6 States reporting were Arizona, California, Idaho, Montana, Utah, and Wyoming.

production in the North-Central States. In the western region, wild oat, pigweed, wild mustard, barnyardgrass, perennial groundcherry, dodder, common lambsquarters, Canada thistle, bindweed, kochia, green foxtail, quackgrass, and others caused serious damage in sugarbeets.

Sugarcane

No reports were received on the extent and cost of chemical weed control in sugarcane. However, it is estimated that more than 50 percent of the harvested acreage of mainland sugarcane and that produced in offshore locations was treated with herbicides in 1962.

In Hawaii, each year about 100,000 acres of sugarcane are treated four or five times for weed control, amounting to an accumulative acreage of one-half million acres treated per year. The cost of chemical weed control in sugarcane in Hawaii amounts to about $7 million annually. In addition, most of the sugarcane produced on the mainland is also treated with herbicides.

The degree of infestation, extent of damage, and infestation trend of important weeds in sugarcane in Louisiana and Hawaii are given in table 20. There appears to

TABLE 20.--Sugarcane: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[1]										
Barnyardgrass	1	-	-	1	-	-	1	-	1	-
Crabgrass	1	-	-	1	-	-	1	-	1	-
Curly dock	1	-	-	1	-	-	1	-	1	-
Johnsongrass	1	-	-	1	-	-	1	-	1	-
Common chickweed	1	-	-	1	-	-	1	1	-	-
Henbit	1	-	-	1	-	-	1	1	-	-
Common morningglory	1	-	-	1	-	1	-	-	1	-
Bermudagrass	1	-	1	-	-	1	-	-	1	-
Purslane	1	-	1	-	-	1	-	1	-	-
Pigweed	1	-	1	-	-	1	-	1	-	-
Wild mustard	1	-	1	-	-	1	-	1	-	-
Smartweed	1	1	-	-	1	-	-	1	-	-
Wild lettuce	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	-	-	1
Foxtail	1	1	-	-	1	-	-	-	-	1
Goosegrass	1	1	-	-	1	-	-	-	-	1
Nutsedge	1	1	-	-	1	-	-	-	-	1
Ragweed	1	1	-	-	1	-	-	-	-	1
Western:[2]										
Toredograss	1	-	-	1	-	1	-	1	-	-
Commelina diffusa	1	-	-	1	1	-	-	-	-	1
Bermudagrass	1	-	1	-	-	-	1	1	-	-
Aquatic (submerged)	1	-	1	-	-	1	-	-	1	-
Aquatic (emerged)	1	-	1	-	-	1	-	-	1	-
Foxtail	1	-	1	-	-	1	-	1	-	-
Nutsedge	1	-	1	-	-	1	-	1	-	-
Crabgrass	1	-	1	-	-	1	-	-	-	1
Common chickweed	1	-	1	-	-	1	-	-	-	1
Guineagrass	1	-	1	-	-	1	-	-	-	1
Paspalum	1	-	1	-	-	1	-	-	-	1
Sourgrass	1	-	1	-	-	1	-	-	-	1
Paragrass	1	-	1	-	-	1	-	-	-	1
Purslane	1	-	1	-	1	-	-	1	-	-
Windmillgrass	1	-	1	-	1	-	-	1	-	-
Common morningglory	1	1	-	-	-	1	-	1	-	-
Bindweed	1	1	-	-	-	1	-	1	-	-
Johnsongrass	1	1	-	-	1	-	-	1	-	-
Southern sandbur	1	1	-	-	1	-	-	1	-	-
Pigweed	1	1	-	-	1	-	-	-	-	1
Ragweed	1	1	-	-	1	-	-	-	-	1
Sowthistle tasselflower	1	1	-	-	1	-	-	-	-	1
Tarweed	1	1	-	-	1	-	-	-	-	1
Beggarticks	1	1	-	-	1	-	-	-	-	1
Spiny amaranth	1	1	-	-	1	-	-	-	-	1

[1] The State reporting was Louisiana.

[2] The State reporting was Hawaii.

be an increasing shift toward grassy weeds in sugarcane production, both on the mainland and in the offshore producing areas, especially in Hawaii. In Louisiana, barnyardgrass, crabgrass, curly dock, johnsongrass, common chickweed, henbit, and common morningglory heavily infest sugarcane and cause heavy damage. The infestation trend of most of these species was reported up.

Sorghum

In 1962, 2,665,000 acres of grain sorghum, 23 percent of the harvested acreage, were treated with herbicides. Farmers invested $5,258,000 for chemical weed control in grain sorghum. The average per-acre cost was $2.91 for preemergence treatments and $1.88 for postemergence treatments. Farmers treated 66 percent of the acreage with their own equipment, and custom operators treated the other 34 percent. (Tables 1, 3, and 21.)

TABLE 21.--Sorghum: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmers	Custom operators	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollar	Dollar	Percent	Percent					
Massachusetts----	-	1	-	4.00	90	10	-	F	Up	Little	No
Northeastern---	-	1	-	4.00	90	10	-	1-F	1-Up	1-Little	1-No
Illinois---------	0.5	1	4.00	1.25	95	5	G	G	Up	Little	No
Iowa-------------	10	10	3.00	1.00	90	10	F	G	Sta.	Urgent	No
Kansas-----------	10	1,575	6.50	1.85	60	40	F	F	Up	Urgent	Yes
Missouri---------	1	40	4.00	1.50	90	10	-	G	Sta.	Urgent	No
Nebraska---------	100	400	4.25	1.50	85	15	F	G	Up	Urgent	Yes
South Dakota-----	-	15	-	1.35	40	60	-	G	Sta.	Urgent	No
North Central--	121.5	2,041.0	4.33	1.77	67	33	1-G 3-F	5-G 1-F	3-Up 3-Sta.	5-Urgent 1-Little	2-Yes 4-No
Alabama----------	-	1.5	-	.75	100	0	-	F	Sta.	Urgent	No
Arkansas---------	-	.5	-	1.50	100	0	-	G	Sta.	Urgent	No
Georgia----------	-	10	-	3.00	100	0	-	G	Up	Urgent	-
Kentucky---------	1	3	3.00	2.00	95	5	P	P	Sta.	Little	No
Mississippi------	-	5	-	1.00	-	-	-	F	Up	Urgent	Yes
North Carolina---	8	5	4.00	1.50	99	1	F	G	Sta.	Urgent	No
Oklahoma---------	-	.2	-	-	100	0	-	G	-	-	-
South Carolina---	.1	2	6.00	1.50	100	0	P	G	Up	-	No
Tennessee--------	5	5	2.75	1.50	95	5	F	F	Sta.	Little	No
Texas------------	-	250	-	2.00	40	60	-	F	Up	Urgent	Yes
Virginia---------	-	.1	-	2.00	100	0	-	F	Up	Urgent	No
Southern-------	14.1	282.3	3.50	1.99	48	52	2-F 2-P	5-G 5-F	4-Up 5-Sta.	7-Urgent 2-Little	2-Yes 7-No
Arizona----------	-	5	-	2.00	100	0	G	G	Sta.	Little	No
California-------	-	50	-	3.50	50	50	-	G	Sta.	Little	No
Colorado---------	100	-	.50	-	100	0	F	-	Up	Urgent	No
New Mexico-------	-	15	-	2.50	50	50	-	G	Sta.	Little	No
Washington-------	-	25	-	3.00	100	0	-	F	Up	-	No
Wyoming----------	-	.1	-	3.00	90	10	-	F	Up	Urgent	No
Hawaii-----------	5	5	15.00	15.00	100	0	G	G	Up	Little	No
Western--------	105.0	100.1	1.19	3.72	84	16	2-G 1-F	4-G 2-F	4-Up 3-Sta.	2-Urgent 4-Little	7-No
UNITED STATES--	240.6	2,424.4	2.91	1.88	66	34	3-G 5-F 2-P	14-G 9-F 1-P	13-Up 11-Sta.	14-Urgent 8-Little	4-Yes 19-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta., stationary.

The effectiveness of preemergence herbicides was rated good by three States, fair by six, and poor by two. Fourteen States rated the effectiveness of postemergence herbicides good, nine fair, and one poor. Thirteen States reported the herbicide-usage trend was up, and 11 States reported the trend as stationary. Fourteen States indicated an urgent need for more effective herbicides, but eight States reported little need. Only 4 States indicated that residual toxicity problems were involved in the use of herbicides, whereas 19 States indicated no problems. (Tables 4, 5, and 21.)

The degree of infestation, extent of damage, and infestation trend of the important weeds in grain sorghum are given in table 22.

Forage and Turf Crops Grown for Seed

In 1962, 439,000 acres of forage and turf seed crops, 16 percent of the harvested acreage, were treated with herbicides. Farmers invested $2,416,000 in chemical methods of weed control in forage and turf seed crops. The average per-acre cost was $10.72 for preemergence treatments and $4.64 for postemergence treatments. Farmers used their own equipment to apply the chemicals on 62 percent of the treated acreage, and custom operators treated the other 38 percent. (Tables 1, 3, and 23.)

Three States rated the effectiveness of the preemergence herbicides good, four fair, and one poor. Seven States rated the effectiveness of postemergence herbicides good, nine fair, and two poor. Fifteen States indicated the herbicide-usage trend was up, and six indicated the trend was stationary. Fifteen States indicated an urgent need for more effective herbicides and six indicated little need. Three States reported residual toxicity problems, but 17 States indicated no problems. (Tables 4, 5, and 23.)

The degree of infestation, extent of damage, and infestation trend of important weeds in forage and turf seed crops are given in table 24. Quackgrass, common chickweed, common lambsquarters, pigweed, dodder, wild mustard, crabgrass, barnyardgrass, ragweed, nutsedge, and foxtail were among the most serious weeds in the northeastern region. Weed bromegrasses, Canada thistle, curly dock, and corncockle, in addition to most of those in the northeastern region, were serious in the north-central region. Dodder was reported as being one of the most serious weeds in forage seed crops in the Western States, where heavy infestations cause heavy damage in many States. In addition, green foxtail, bermudagrass, and weeds similar to those in the Northeastern and North-Central States also cause serious damage.

Other Crops

Although no estimates were received on the extent and cost of chemical weed control methods in other agronomic crops, data on weed infestations are also reported for tobacco in tables 25 and 26, flax in table 27, mustard in table 28, safflower in table 29, and sunflower in table 30.

TABLE 22.--Sorghum: Number of States reporting degree of infestation, extent of damage, and infestation of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Common lambsquarters----	1	-	1	-	-	1	-	1	-	-
Pigweed----------	1	-	1	-	-	1	-	1	-	-
Crabgrass----------	1	-	1	-	1	-	-	1	-	-
Foxtail----------	1	1	-	-	1	-	-	1	-	-
Barnyardgrass----------	1	1	-	-	1	-	-	1	-	-
Ragweed----------	1	1	-	-	1	-	-	1	-	-
Smartweed----------	1	1	-	-	1	-	-	1	-	-
Wild mustard----------	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Foxtail----------	4	-	3	1	-	3	1	-	4	-
Johnsongrass----------	3	1	1	1	1	1	1	-	3	-
Smartweed----------	4	-	4	-	1	3	-	3	1	-
Pigweed----------	4	-	4	-	1	3	-	3	-	1
Common morningglory-----	4	1	3	-	-	4	-	2	1	1
Barnyardgrass----------	4	1	3	-	2	2	-	1	2	1
Common lambsquarters----	3	-	3	-	1	2	-	2	-	1
Crabgrass----------	3	-	3	-	2	1	-	2	1	-
Cocklebur----------	4	2	2	-	1	3	-	1	-	3
Ragweed----------	2	-	2	-	1	-	-	2	-	-
Velvetleaf----------	2	1	1	-	-	2	-	-	1	1
Bindweed----------	3	2	1	-	2	1	-	2	-	1
Canada thistle----------	1	-	1	-	-	1	-	-	-	1
Quackgrass----------	1	-	1	-	-	1	-	-	-	1
Wild mustard----------	1	-	1	-	-	1	-	-	-	1
Horsenettle----------	1	-	1	-	-	1	-	1	-	-
Wild sorghum----------	1	-	1	-	-	1	-	-	1	-
Western waterhemp-------	1	-	1	-	-	1	-	-	-	-
Goosegrass----------	1	-	1	-	1	-	-	1	-	-
Shattercane----------	1	1	-	-	-	-	1	-	-	1
Milkweed----------	1	1	-	-	-	1	-	-	1	-
Dogbane----------	1	1	-	-	-	1	-	1	-	-
Southern:[3]										
Crabgrass----------	6	-	3	3	-	2	4	3	3	-
Cocklebur----------	6	1	3	2	1	3	2	1	4	1
Johnsongrass----------	6	1	3	2	1	3	2	3	3	-
Common morningglory-----	7	2	4	1	1	5	1	1	5	1
Brachiaria----------	1	-	-	1	-	-	1	-	1	-
Nutsedge----------	6	2	3	1	1	5	-	1	5	-
Pigweed----------	7	2	4	1	3	4	-	3	3	1
Bermudagrass----------	6	4	2	-	4	2	-	5	1	-
Barnyardgrass----------	4	2	2	-	2	2	-	1	3	-
Smartweed----------	4	2	2	-	4	-	-	3	-	1
Common lambsquarters----	4	3	1	-	3	-	1	3	-	1
All vines----------	1	-	1	-	-	1	-	-	1	-
Coffeeweed----------	1	-	1	-	-	1	-	1	-	-
Southern sandbur--------	1	-	1	-	-	1	-	1	-	-
Florida beggarweed------	1	-	1	-	-	1	-	1	-	-
Goosegrass----------	4	3	1	-	4	-	-	3	1	-
Ragweed----------	3	2	1	-	3	-	-	3	-	-
Annual panicum----------	1	-	1	-	1	-	-	-	1	-
Sicklepod----------	1	-	1	-	1	-	-	-	1	-
Foxtail----------	2	2	-	-	1	1	-	2	-	-
Sandbur----------	1	1	-	-	1	-	-	-	1	-
Florida pusley----------	2	1	1	-	1	1	-	1	1	-
Horsenettle----------	1	1	-	-	1	-	-	1	-	-
Trumpetvine----------	1	1	-	-	1	-	-	1	-	-
Western:[4]										
Pigweed----------	4	-	2	2	1	2	1	3	-	1
Groundcherry----------	1	-	-	1	-	-	1	1	-	-
Junglerice----------	1	-	-	1	1	-	-	1	-	-
Purslane----------	1	-	-	1	1	-	-	-	-	1
Spiny amaranth----------	1	-	-	1	1	-	-	-	-	1
Green amaranth----------	1	-	-	1	1	-	-	-	-	1
Apple-of-Peru----------	1	-	-	1	1	-	-	-	-	1
Johnsongrass----------	2	-	2	-	-	1	1	2	-	-
Barnyardgrass----------	3	1	2	-	2	-	1	3	-	-
Common morningglory-----	2	-	2	-	1	-	1	1	-	1
Sunflower----------	2	-	2	-	1	1	-	2	-	-
Bindweed----------	3	2	1	-	2	-	1	3	-	-
Foxtail----------	1	-	1	-	-	1	-	-	1	-
Crabgrass----------	1	-	1	-	-	1	-	1	-	-

[1] The State reporting was New Jersey.

[2] The 4 States reporting were Illinois, Kansas, Missouri, and Nebraska.

[3] The 7 States reporting were Alabama, Arkansas, Georgia, Mississippi, North Carolina, South Carolina, and Virginia.

TABLE 22.--Sorghum: Number of States reporting degree of infestation, extent of damage, and infestation of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Western:[4]--Con.										
Nutsedge	1	-	1	-	-	1	-	1	-	-
Silverleaf nightshade	1	-	1	-	-	1	-	1	-	-
Russian thistle	1	-	1	-	-	1	-	1	-	-
Cocklebur	1	-	1	-	-	1	-	-	-	1
Common lambsquarters	2	2	-	-	2	-	-	2	-	-
Bermudagrass	1	1	-	-	-	1	-	1	-	-
Smartweed	1	1	-	-	1	-	-	1	-	-
Common chickweed	1	1	-	-	1	-	-	-	-	1

[4] The 4 States reporting were Arizona, California, Hawaii, and New Mexico.

TABLE 23.--Forage seeds: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better control methods, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Vermont	0.1	1.1	-	-	10	90	G	G	Up	Urgent	Yes
Northeastern	.1	1.1	-	-	10	90	1-G	1-G	1-Up	1-Urgent	1-Yes
Minnesota	-	10	-	2.00	90	10	-	F	Up	Urgent	No
Missouri	-	15	-	2.00	95	5	-	F	Sta.	Urgent	No
Nebraska	1	2.5	11.50	2.50	100	0	F	G	Up	Little	No
North Dakota	-	.5	-	1.50	100	0	-	G	Up	Little	No
South Dakota	-	10	-	1.50	100	0	-	-	Up	Urgent	No
North Central	1	38	11.50	1.89	96	4	1-F	2-G 2-F	4-Up 1-Sta.	2-Little 3-Urgent	5-No
Florida	-	.5	-	5.00	100	0	-	-	Up	Little	No
Kentucky	-	40	-	2.25	95	5	-	F	Sta.	Urgent	No
North Carolina	-	1	-	-	99	1	P	P	Sta.	Urgent	No
Virginia	-	.2	-	4.25	100	0	-	P	Up	Urgent	No
Southern	-	41.7	-	2.30	95	5	1-P	1-F 2-P	2-Up 2-Sta.	1-Little 3-Urgent	4-No
Arizona	-	3	-	15.00	100	0	-	F	Up	Urgent	No
California	5	50	12.00	10.00	75	25	F	F	Sta.	Urgent	Yes
Colorado	-	2.5	-	2.00	100	0	-	G	Sta.	Urgent	No
Idaho	1	8	20.00	7.00	25	75	F	F	Up	Urgent	No
Montana	.2	1	7.00	1.50	100	0	G	G	Up	Little	No
Nevada	-	.5	-	3.00	60	40	-	F	Up	Urgent	Yes
New Mexico	-	5	-	1.50	100	0	-	F	Sta.	Urgent	No
Oregon	-	200	-	4.00	60	40	-	G	Up	Little	No
Utah	5	-	35.00	-	25	75	F	-	Up	Urgent	No
Washington	50	25	8.00	6.00	25	75	G	F	Up	Urgent	-
Wyoming	-	1	-	5.00	50	50	-	G	Up	Little	No
Western	61.2	296	10.73	5.31	55	45	2-G 3-F	4-G 6-F	8-Up 3-Sta.	3-Little 8-Urgent	2-Yes 8-No
UNITED STATES	62.3	376.8	10.72	4.64	62	38	3-G 4-F 1-P	9-G 9-F 2-P	15-Up 6-Sta.	15-Urgent 6-Little	3-Yes 17-No

[1] Represents cost of herbicides custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair; P, poor.
[3] Sta., stationary.

TABLE 24.--Forage Seeds: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Quackgrass	2	-	1	2	-	1	2	2	-	1
Common chickweed	4	1	2	1	1	3	-	3	1	-
Common lambsquarters	2	-	1	1	-	1	1	2	-	-
Pigweed	2	-	1	1	-	1	1	2	-	-
Dodder	1	-	-	1	-	-	1	1	-	-
Wild mustard	3	-	3	-	-	1	2	1	1	1
Crabgrass	2	-	2	-	-	2	-	1	1	-
Barnyardgrass	2	-	2	-	-	2	-	2	-	-
Ragweed	2	-	2	-	-	2	-	2	-	-
Nutsedge	2	1	1	-	-	1	1	-	2	-
Foxtail	2	1	1	-	1	1	-	1	1	-
Smartweed	4	2	2	-	2	2	-	3	1	-
Curly dock	2	1	1	-	1	1	-	2	-	-
Cinquefoil	1	-	1	-	-	1	-	-	1	-
Catchfly	1	-	1	-	-	1	-	1	-	-
Plantains	1	-	1	-	-	1	-	1	-	-
Chicory	1	-	1	-	-	1	-	1	-	-
Annual fleabane	1	-	1	-	-	1	-	1	-	-
Henbit	1	-	1	-	-	1	-	1	-	-
Corncockle	1	-	1	-	-	1	-	1	-	-
Buckhorn plantain	1	-	1	-	-	1	-	1	-	-
Virginia pepperweed	1	-	1	-	-	1	-	-	1	-
Corn spurry	1	-	1	-	-	1	-	-	1	-
Canada thistle	2	2	-	-	2	-	-	2	-	-
Yellow rocket	1	1	-	-	-	1	-	1	-	-
Purslane	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Corncockle	1	-	-	1	-	-	1	-	1	-
Barnyardgrass	2	-	2	-	-	2	-	2	-	-
Foxtail	2	-	2	-	-	2	-	2	-	-
Curly dock	1	-	1	-	-	-	1	1	-	-
Weed bromegrasses	2	1	1	-	-	2	-	1	1	-
Crabgrass	2	1	1	-	1	1	-	2	-	-
Canada thistle	1	-	1	-	-	1	-	1	-	-
Common lambsquarters	1	-	1	-	-	1	-	1	-	-
Pigweed	1	-	1	-	-	1	-	1	-	-
Quackgrass	1	-	1	-	-	1	-	1	-	-
Ragweed	1	-	1	-	-	1	-	1	-	-
Horseweed	1	-	1	-	-	1	-	1	-	-
Wild oat	1	-	1	-	-	1	-	1	-	-
Wild mustard	1	-	1	-	-	1	-	1	-	-
Cinquefoil	1	1	-	-	-	1	-	-	1	-
Buttercup	1	1	-	-	-	1	-	-	1	-
Field pennycress	1	1	-	-	-	1	-	-	1	-
Hoary alyssum	1	1	-	-	-	1	-	-	1	-
Common chickweed	1	1	-	-	-	1	-	1	-	-
Dodder	1	1	-	-	-	1	-	1	-	-
Smartweed	1	1	-	-	-	1	-	1	-	-
Kochia	1	1	-	-	-	1	-	1	-	-
Southern:[3]										
Quackgrass	1	-	1	-	-	-	1	1	-	-
Wild onion and wild garlic	1	-	1	-	-	-	1	1	-	-
Curly dock	1	1	-	-	1	-	-	1	-	-
Dodder	1	1	-	-	1	-	-	1	-	-

[1] The 4 States reporting were Maryland, New Hampshire, Rhode Island, and Vermont.

[2] The 2 States reporting were Minnesota and Nebraska.

[3] The State reporting was Virginia.

TABLE 24.--Forage Seeds: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Western:[4]										
Dodder	7	2	2	3	-	3	4	5	2	-
Green foxtail	2	1	-	1	1	1	-	1	1	-
Off type bermudagrass	1	-	-	1	-	-	1	1	-	-
Browntop panicum	1	-	-	1	-	-	1	1	-	-
Jungle-rice (watergrass)	1	-	-	1	-	1	-	1	-	-
Pigweed	7	2	5	-	2	5	-	7	-	-
Barnyardgrass	6	2	4	-	2	4	-	5	1	-
Curly dock	5	1	4	-	1	2	2	5	-	-
Canada thistle	4	1	3	-	-	1	3	2	2	-
Kochia	3	-	3	-	-	3	-	1	2	-
Bindweed	6	4	2	-	3	1	2	4	2	-
Common lambsquarters	6	4	2	-	4	2	-	6	-	-
Quackgrass	5	3	2	-	3	1	1	3	2	-
Whitetop	2	-	2	-	-	1	1	1	-	1
Russian thistle	2	-	2	-	1	1	-	2	-	-
Foxtail	5	4	1	-	3	2	-	5	-	-
Wild mustard	4	3	1	-	3	1	-	3	-	1
Weed bromegrasses	2	1	1	-	-	1	1	1	1	-
Bermudagrass	2	1	1	-	1	-	1	1	1	-
Johnsongrass	2	1	1	-	-	2	-	1	1	-
Buckhorn plantain	1	-	1	-	-	-	1	-	1	-
Annual ryegrass	1	-	1	-	-	1	-	1	-	-
Poverty weed	1	-	1	-	-	1	-	-	1	-
Alfalfa	1	-	1	-	1	-	-	1	-	-
Tumble pigweed	1	-	1	-	1	-	-	1	-	-
Dallisgrass	1	1	-	-	-	-	1	-	1	-
Bristly oxtongue	1	1	-	-	-	1	-	-	1	-
Douglas fiddleneck	1	1	-	-	-	1	-	-	1	-
White cockle	1	1	-	-	-	1	-	1	-	-
Oxeye daisy	1	1	-	-	-	1	-	1	-	-
Wild oat	1	1	-	-	1	-	-	-	1	-
Russian knapweed	1	1	-	-	-	1	-	-	1	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Bassia	1	1	-	-	1	-	-	1	-	-
Aquatic (submerged)	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	-	-	1

[4] The 8 States reporting were Arizona, California, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

TABLE 25.--Tobacco: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Nutsedge	1	-	1	-	-	1	-	-	1	-
Quackgrass	1	-	1	-	-	1	-	1	-	-
Crabgrass	1	1	-	-	1	-	-	-	1	-
Barnyardgrass	1	1	-	-	1	-	-	1	-	-
Canada thistle	1	1	-	-	1	-	-	1	-	-

[1] The State reporting was Massachusetts.

Southern:[2]										
Crabgrass	2	-	1	1	1	-	1	1	1	-
Nutsedge	1	-	-	1	-	-	1	-	1	-
Pigweed	1	-	-	1	-	1	-	1	-	-
Common morningglory	1	-	1	-	-	1	-	1	-	-
Bermudagrass	1	-	1	-	-	1	-	1	-	-
Prickly sida	1	-	1	-	-	1	-	1	-	-
Horsenettle	1	-	1	-	-	1	-	1	-	-
Barnyardgrass	2	1	1	-	2	-	-	2	-	-
Goosegrass	2	1	1	-	2	-	-	2	-	-
Sandbur	1	-	1	-	1	-	-	-	1	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Foxtail	1	1	-	-	1	-	-	1	-	-
Johnsongrass	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	1	-	-
Purslane	1	1	-	-	1	-	-	1	-	-
Ragweed	1	1	-	-	1	-	-	1	-	-

[2] The 2 States reporting were Kentucky and North Carolina.

TABLE 26.--Tobacco Plant Beds: North Carolina reporting degree of infestation, extent of damage, and infestation trend of specified weeds, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:										
Red sorrel----------	1	1	-	-	1	-	-	-	1	-
Cheat----------	1	1	-	-	1	-	-	1	-	-
Shepherdspurse---------	1	1	-	-	1	-	-	1	-	-

TABLE 27.--Flax: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
North-Central:[1]										
Wild mustard----------	3	1	1	1	1	1	1	1	-	2
Foxtail----------	2	-	1	1	-	1	1	-	2	-
Wild buckwheat---------	2	-	1	1	-	1	1	-	2	-
Wild oat----------	2	-	1	1	-	1	1	1	1	-
Barnyardgrass----------	3	1	2	-	1	2	-	2	1	-
Canada thistle---------	3	1	2	-	1	2	-	2	-	-
Quackgrass----------	3	1	2	-	2	1	-	2	1	-
Common lambsquarters---	3	1	2	-	1	2	-	3	-	-
Pigweed----------	3	1	2	-	1	2	-	3	-	-
Ragweed----------	3	1	2	-	1	2	-	3	-	-
Smartweed----------	3	1	2	-	1	2	-	3	-	-
Sowthistle----------	2	-	2	-	1	1	-	1	1	-
Bindweed----------	3	2	1	-	2	1	-	1	1	1
Curly dock----------	3	2	1	-	2	1	-	3	-	-
Kochia----------	1	-	1	-	-	1	-	-	1	-
Common morningglory----	1	1	-	-	1	-	-	1	-	-
Crabgrass----------	1	1	-	-	1	-	-	1	-	-
Cocklebur----------	1	1	-	-	1	-	-	1	-	-
Sunflower----------	1	1	-	-	1	-	-	1	-	-

[1] The 3 States reporting were Iowa, Minnesota, and North Dakota.

TABLE 28.--Mustard: North Dakota reporting degree of infestation, extent of damage, and infestation trend of specified weeds, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
North-Central:										
Foxtail----------	1	-	1	-	-	1	-	-	1	-
Wild oat----------	1	-	1	-	-	1	-	-	1	-
Kochia----------	1	-	1	-	-	1	-	-	1	-
Wild mustard----------	1	-	1	-	-	1	-	1	-	-
Russian thistle--------	1	-	1	-	-	1	-	1	-	-
Purslane----------	1	1	-	-	1	-	-	1	-	-
Wild buckwheat---------	1	1	-	-	1	-	-	1	-	-

TABLE 29.--Safflower: Number of states reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
North Central:[1]										
Kochia	1	-	-	1	-	1	-	-	1	-
Russian thistle	1	-	-	1	-	1	-	-	1	-
Foxtail	1	-	1	-	-	1	-	-	1	-
Wild oat	1	-	1	-	-	1	-	-	1	-
Wild mustard	1	-	1	-	1	-	-	1	-	-
Pigweed	1	1	-	-	1	-	-	1	-	-
Wild buckwheat	1	1	-	-	1	-	-	1	-	-
Western:[2]										
Kochia	1	-	-	1	-	-	1	-	1	-
Russian thistle	1	-	-	1	-	-	1	1	-	-
Pigweed	1	-	1	-	-	-	1	1	-	-
Common lambsquarters	1	-	1	-	-	1	-	1	-	-
Wild oat	1	-	1	-	-	1	-	1	-	-
Wild mustard	1	-	1	-	-	1	-	1	-	-
Wild buckwheat	1	-	1	-	-	1	-	1	-	-
Foxtail	1	1	-	-	-	1	-	1	-	-
Ragweed	1	1	-	-	-	1	-	1	-	-

[1] The State reporting was North Dakota.

[2] The State reporting was Montana.

TABLE 30.--Sunflower: North Dakota reporting degree of infestation, extent of damage, and infestation trend of specified weeds, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
North Central:										
Wild oat	1	-	1	-	1	-	-	-	1	-
Foxtail	1	-	1	-	1	-	-	1	-	-
Pigweed	1	1	-	-	1	-	-	1	-	-
Wild mustard	1	1	-	-	1	-	-	1	-	-
Wild buckwheat	1	1	-	-	1	-	-	1	-	-

HORTICULTURAL CROPS

Modern weed control technology has done much to alleviate weed problems in some horticultural crops. Though these accomplishments of research are of great value, further improvements in control methods are needed for these crops and much additional new research is needed to develop control methods for numerous additional crops as yet untouched by the technological advances in weed control.

The scope of the weed problem in horticultural crops is not extensive in terms of crop acreage, comparatively speaking. It is vast, however, in terms of crop species, crop values, crop quality, weed species, specialized cultural methods, soil and climatic requirements, and the initial and continuing investment in materials and maintenance. All these factors must be considered in the development of effective methods of control.

Horticultural crop production methods are intensive, and their cost is supported by high crop values. For example, in 1961 the commercial vegetable acreage, including potatoes, was approximately 5 million acres which had an on-the-farm value of $1.5 billion, or an average of about $300 per acre. On-the-farm values of many

ornamental, fruit, and nut crops are much higher. Strawberries are a good example. In 1961, 90 thousand acres of strawberries had an on-the-farm value of $89 million, or approximately $1,000 per acre. The value of these crops justify extensive research on production problems, such as weed control.

Weeding costs in many vegetable crops have ranged from $50 to $100 per acre. Weeding costs in strawberries have reached $200 per acre in some areas in the past. Weeding costs in some ornamentals and in plant propagating beds have soared to $1,000 per acre in some instances. Reduction of these weeding costs through the development of efficient and economical chemical, mechanical, and cultural weed control practices, and combinations of these, is an outstanding research contribution to the efficiency of horticultural crop production methods.

Weed research has made major advances in many areas of horticultural crop production. Effective preplanting soil-incorporated, preemergence, and postemergence chemical weed control materials and methods have been devised for a number of crops and have been widely accepted by growers. Research on formulation including solvents, surfactants, and granular carriers have provided avenues for major technological advances in this crop area. Yet, weed control methods for many crops are lacking because of the complexity of the problem.

Vegetable Crops[2]

In the present survey 29 States reported on the extent and cost of chemical weed control in vegetable crops. The States reporting include all those with major commercial vegetable crop acreages. The data should therefore show quite accurately the trends of usage of herbicides in the various regions and on the specific crops listed. Approximately 474,000 acres of vegetable crops received preemergence and 477,000 acres postemergence treatments with herbicides in 1962, or a total of 951,000 acres treated. This is about 27 percent of the total vegetable acreage estimated in 1962. The total cost was more than 10 million dollars. Cost of preemergence and postemergence treatments for weed control in vegetables averaged $11.45 and $6.72 per acre, respectively. Farmers used their own equipment to treat 75 percent of the total acreage; custom operators treated the remaining 25 percent. (Table 1 and 31.)

In 1962, 9 States reported the effectiveness of preemergence applications of herbicides as good, 12 fair, and 3 poor. Results of postemergence treatments were good in 13 States, fair in 8 States, and poor in 1 State. The trend of usage was reported as upward for 24 States and static for 5. Of the 29 States reporting, 23 indicated an urgent need for better herbicides and 5 indicated little need for better herbicides.

In the survey of the occurrence of residue problems, 15 States reported in the affirmative and 13 in the negative. These data suggest the need for education of the grower in the safe and effective use of herbicides and for intensified research to provide additional fundamental information on the subject.

Results of the survey of effectiveness, trend of usage, and need for better herbicides show an active interest in the use of herbicides in vegetable production. These data also show that successful results have been obtained through the use of herbicides and that there is recognition of an urgent need for improved methods of weed control.

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[2] Potatoes, sweet corn, dry beans, and onions are discussed separately in the following sections.

TABLE 31.--Vegetables: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Connecticut	6	1	5.00	5.00	95	5	G	G	Sta.	Urgent	No
Maine	2	1	4.50	2.50	100	0	G	G	Sta.	Urgent	Yes
Maryland	15	25	5.00	3.50	50	50	G	G	Sta.	Urgent	Yes
Massachusetts	9	1	12.00	20.00	95	5	G	F	Up	Urgent	Yes
New Hampshire	.1	.6	5.00	4.00	100	0	F	G	Up	Urgent	Yes
New Jersey	10	9	10.00	8.00	92	8	F	F	Up	Urgent	Yes
New York	75	50	12.50	10.75	95	5	G	G	Up	Urgent	No
Rhode Island	.5	-	-	-	100	0	F	-	Up	Urgent	Yes
Northeastern	117.6	87.6	10.76	8.30	86	14	5-G 3-F	5-G 2-F	5-Up 3-Sta.	8-Urgent	6-Yes 2-No
Illinois	6	5	10.00	2.00	90	10	F	G	Up	Little	Yes
Indiana	18.2	-	4.00	-	99	1	-	-	Up	Little	No
Minnesota	22	47	10.00	2.00	25	75	G	G	Up	Urgent	Yes
Wisconsin	75	50	8.00	4.00	95	5	F	G	Up	Little	Yes
North Central	121.2	102.0	7.86	2.98	73	27	1-G 2-F	3-G	4-Up	1-Urgent 3-Little	3-Yes 1-No
Arkansas	2	-	-	-	25	75	G	-	Up	Urgent	No
Florida	80	20	20.00	10.00	90	10	G	G	Up	Urgent	Yes
Georgia	9	-	10.00	-	100	0	F	-	Up	Urgent	No
Kentucky	1	-	8.00	-	95	5	F	-	Up	Urgent	Yes
North Carolina	1	.5	10.00	8.00	99	1	P	P	Sta.	Urgent	No
South Carolina	7	.5	8.00	12.00	100	0	F	F	Up	Urgent	Yes
Tennessee	5	-	10.00	-	90	10	F	-	Up	Urgent	No
Texas[3]	-	65	-	7.50	90	10	-	G	Up	Urgent	Yes
Virginia	23	-	11.00	-	90	10	F	-	Up	Urgent	No
Southern	128	86	16.40	8.11	90	10	2-G 5-F 1-P	2-G 1-F 1-P	8-Up 1-Sta.	9-Urgent	4-Yes 5-No
Arizona	4.5	.5	8.00	2.00	50	50	-	F	Up	Urgent	No
California	30	30	12.00	10.00	50	50	P	G	Up	Urgent	Yes
Idaho	3	10	6.00	1.50	70	30	F	F	Up	Little	No
Nevada	-	.5	-	25.00	80	20	-	F	Sta.	Urgent	Yes
Oregon	-	140	-	7.50	50	50	-	G	Up	Urgent	No
Utah	4	11	12.50	6.25	65	35	P	F	Up	Urgent	-
Washington	65	10	10.00	3.00	80	20	F	F	Up	-	No
Hawaii	.2	.3	12.00	17.00	100	0	G	G	Up	Little	No
Western	106.7	202.3	10.46	7.33	59	41	1-G 2-F	3-G 5-F	7-Up 1-Sta.	5-Urgent 2-Little	2-Yes 5-No
UNITED STATES	473.5	477.9	11.45	6.72	75	25	9-G 12-F 1-P	13-G 8-F 1-P	24-Up 5-Sta.	23-Urgent 5-Little	15-Yes 13-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides.
[2] G, good; F, fair; P, poor.
[3] Stationary.

The weed species in vegetable crops surveyed for 1962 are shown in table 32 for the four geographical regions by degree of infestation, extent of damage, and infestation trend. The most important weeds in the Northeastern States are pigweed, quackgrass, crabgrass, common lambsquarters, common chickweed, and purslane. The most important weeds in the North-Central States are smartweed, crabgrass, common lambsquarters, pigweed, foxtail, purslane, quackgrass, and Canada thistle. The most important weeds in the Southern States are crabgrass, pigweed, henbit, nutsedge, common lambsquarters, ragweed, johnsongrass, and purslane. The most important weeds in the Western States are wild mustard, purslane, jungle-rice, pigweed, common lambsquarters, common chickweed, sowthistle tasselflower, and Canada thistle.

TABLE 32.--Vegetables: Number of States reporting degree of infestation, extext of damage, and infestation trends of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
Northeastern:[1]	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Pigweed	9	-	5	4	2	6	1	6	2	1
Quackgrass	9	1	5	3	2	4	3	5	2	2
Crabgrass	8	-	5	3	1	4	3	5	1	2
Common lambsquarters	8	1	4	3	1	6	1	7	1	-
Common chickweed	9	-	6	3	3	6	-	7	1	1
Purslane	9	-	7	2	4	5	-	8	-	1
Barnyardgrass	9	4	3	2	3	5	1	6	2	1
Ragweed	8	3	3	2	3	4	1	7	-	1
Smartweed	7	2	3	2	5	2	-	6	-	1
Wild mustard	5	1	3	1	4	1	-	3	1	1
Henbit	4	2	1	1	2	1	1	3	1	-
Foxtail	5	3	1	1	3	2	-	4	1	-
Knotweed	8	3	5	-	1	4	3	1	6	1
Bindweed	4	3	1	-	4	-	-	2	1	1
Galinsoga	3	2	1	-	1	2	-	1	2	-
Goosegrass	2	1	1	-	1	-	1	1	1	-
Shepherdspurse	1	-	1	-	-	1	-	-	1	-
Common morningglory	6	6	-	-	6	-	-	4	1	1
Bermudagrass	2	2	-	-	-	1	1	-	2	-
Canada thistle	2	2	-	-	2	-	-	1	-	-
Johnsongrass	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Smartweed	6	2	2	2	2	2	2	4	1	1
Crabgrass	5	-	4	1	-	4	1	-	3	2
Common lambsquarters	6	1	4	1	1	4	1	5	-	1
Pigweed	6	1	4	1	1	4	1	5	-	1
Foxtail	5	-	4	1	1	3	1	-	3	2
Purslane	5	-	4	1	2	3	1	4	-	1
Quackgrass	4	-	3	1	-	2	1	1	2	1
Canada thistle	5	2	2	1	2	2	1	3	1	1
Ragweed	6	2	4	-	3	3	-	4	-	2
Barnyardgrass	4	-	4	-	3	1	-	1	2	1
Common chickweed	4	1	3	-	2	2	-	5	2	1
Nutsedge	2	-	2	-	-	2	-	-	1	1
Bindweed	3	1	2	-	1	2	-	2	-	1
Wild mustard	3	1	2	-	1	2	-	2	-	1
Goosegrass	2	1	1	-	1	1	-	2	-	-
Henbit	2	1	1	-	1	1	-	2	-	-
Common morningglory	1	-	1	-	-	1	-	-	-	1
Curly dock	2	2	-	-	2	-	-	1	1	-
Dodder	2	2	-	-	2	-	-	2	-	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Carpetweed	1	1	-	-	1	-	-	1	-	-
Southern:[3]										
Crabgrass	9	-	3	6	-	3	6	3	6	-
Pigweed	10	4	1	5	5	1	4	7	3	-
Henbit	6	-	2	4	1	1	4	5	1	-
Nutsedge	7	2	1	4	2	1	4	-	7	-
Common lambsquarters	6	2	1	3	2	2	2	4	2	-
Ragweed	8	3	3	2	4	3	1	6	2	-
Johnsongrass	6	2	2	2	2	3	1	2	4	-
Purslane	5	2	1	2	2	2	1	3	2	-
Bermudagrass	6	1	4	1	1	3	2	2	4	-
Common chickweed	5	-	4	1	1	2	2	1	4	-
Smartweed	7	4	2	1	4	1	2	5	2	-
Goosegrass	5	3	1	1	2	-	1	2	1	-
Foxtail	3	2	-	1	2	-	1	2	1	-
Cocklebur	3	2	-	1	2	-	1	2	1	-
Wild onion and wild garlic	2	1	-	1	1	-	1	1	1	-
Aquatic (submerged)	1	-	-	1	-	-	-	1	-	-
Aquatic (emerged)	1	-	-	1	-	-	-	1	-	-
Common morningglory	6	3	3	-	2	4	-	5	1	-
Wild mustard	4	1	3	-	2	2	-	3	1	-
Barnyardgrass	4	3	1	-	2	2	-	3	1	-
Bindweed	3	2	1	-	2	1	-	2	1	-
Curly dock	2	1	1	-	1	1	-	1	1	-
Trumpetcreeper	1	-	1	-	-	1	-	-	1	-
Jungle-rice	1	-	1	-	-	1	-	-	1	-
Coffeeweed	1	-	1	-	-	1	-	1	-	-
Annual panicum	1	-	1	-	-	1	-	1	-	-

[1] The 9 States reporting were Connecticut, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

[2] The 6 States reporting were Illinois, Indiana, Iowa, Minnesota, Ohio, and Wisconsin.

TABLE 32.--Vegetables: Number of States reporting degree of infestation, extext of damage, and infestation trends of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern [3]--Con.										
Southern sandbur	1	-	1	-	-	1	-	1	-	-
Florida pusley	1	-	1	-	-	1	-	1	-	-
Florida beggarweed	1	-	1	-	-	1	-	1	-	-
Red sorrel	1	-	1	-	1	-	-	-	1	-
Plantain	1	-	1	-	1	-	-	1	-	-
Quackgrass	2	2	-	-	2	-	-	-	1	1
Nettleleaf goosefoot	1	1	-	-	-	1	-	1	-	-
Wild oat	1	1	-	-	1	-	-	-	1	-
Nightshade	1	1	-	-	1	-	-	-	1	-
Wild sweetpotato	1	1	-	-	1	-	-	-	1	-
Greenbrier	1	1	-	-	1	-	-	-	1	-
Bitterweed	1	1	-	-	1	-	-	1	-	-
Weed bromegrasses	1	1	-	-	1	-	-	1	-	-
Bullthistle	1	1	-	-	1	-	-	1	-	-
Western: [4]										
Wild mustard	3	-	1	2	1	2	-	2	1	-
Purslane	3	-	2	1	-	1	2	2	1	-
Jungle-rice	1	-	-	1	-	-	1	1	-	-
Pigweed	4	-	3	1	-	4	-	3	1	-
Common lambsquarters	5	1	3	1	2	3	-	4	1	-
Common chickweed	3	1	1	1	1	2	-	2	1	-
Sowthistle tasselflower	1	-	-	1	-	1	-	1	-	-
Canada thistle	2	1	-	1	1	-	1	1	-	-
Quackgrass	2	-	2	-	-	2	-	-	2	-
Barnyardgrass	3	1	2	-	2	1	-	3	-	-
Nutsedge	2	-	2	-	-	1	1	-	2	-
Bermudagrass	2	1	1	-	-	2	-	2	-	-
Crabgrass	2	1	1	-	1	1	-	1	1	-
Foxtail	2	1	1	-	1	1	-	1	1	-
Wild oats	2	1	1	-	1	-	1	1	-	1
Johnsongrass	1	-	1	-	-	1	-	1	-	-
Spiny pigweed	1	-	1	-	-	1	-	1	-	-
Smooth pigweed	1	-	1	-	-	1	-	1	-	-
Barley	1	-	1	-	-	1	-	1	-	-
Prostrate knotweed	1	-	1	-	-	1	-	1	-	-
Amaranthus viridus	1	-	1	-	-	1	-	1	-	-
Spiny sowthistle	1	-	1	-	1	-	-	1	-	-
Little mallow	1	-	1	-	1	-	-	1	-	-
Bindweed	1	-	1	-	-	1	-	-	1	-
Hairy nightshade	1	1	-	-	-	1	-	-	1	-
Black nightshade	1	1	-	-	-	1	-	-	1	-
Curly dock	1	1	-	-	1	-	-	1	-	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Smartweed	1	1	-	-	1	-	-	1	-	-
Nightshade	1	1	-	-	1	-	-	1	-	-
Broadleaf sedge	1	1	-	-	1	-	-	1	-	-

[3] The 10 States reporting were Alabama, Arkansas, Florida, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Texas. and Virginia.

[4] The 7 States reporting were Alaska, Arizona, California, Hawaii, Idaho, Nevada, and Utah.

Potatoes

Information on the extent and cost of weed control was obtained from only 4 States. The average cost of preemergence and postemergence treatments was $5.93 and $6.20, respectively, (table 33).

Weed problems in potatoes are presented in table 34 by species, degree of infestation, extent of damage, and infestation trend on the basis of reports from 15 States. In the northeastern region the most important weeds in potatoes are barnyardgrass, common lambsquarters, pigweed, quackgrass, nutsedge, foxtail, and crabgrass. The most important weeds in potatoes in the north-central region are wild oats, quackgrass, and foxtail. The most important weeds in potatoes in the southern region are common morningglory, nutsedge, cocklebur, and crabgrass. General conclusions should be avoided because the data for the southern region were from North Carolina

Table 33.--Potatoes: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post emergence	Pre-emergence	Post emergence	Farmer	Custom operator	Pre-emergence	Post emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Maine	120	-	3.50	-	100	0	G	-	Sta.	Little	No
New York	10	3	25.00	15.00	98	2	G	G	Up	Urgent	No
Vermont	.9	-	-	-	100	0	G	F	Up	Little	No
Northeastern	130.9	3	5.15	15.00	100	0	3-G	1-G 1-F	2-Up 1-Sta.	1-Urgent 2-Little	3-No
Wisconsin	25	12	10.00	4.00	100	0	G	G	Up	Little	Yes
North Central	25	12	10.00	4.00	100	0	1-G	1-G	1-Up	1-Little	1-Yes
UNITED STATES	155.9	15	5.93	6.20	100	0	4-G	2-G 1-F	3-Up 1-Sta.	1-Urgent 3-Little	1-Yes 3-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair.
[3] Sta., stationary.

only. The reports show that there are severe weed problems in the potato crop in North Carolina and that severe problems and losses are associated with common morningglory and nutsedge. In the Western States 15 weed species are considered important in potato production. The reports came from three important potato-producing States. The most important weeds are pigweed and common lambsquarters.

Sweet Corn

Data on sweet corn were reported from New York State. Fifteen thousand acres of sweet corn were treated preemergence and postemergence. The average cost of preemergence and postemergence treatments was $7.50 and $5.00 per acre, respectively. Ninety-five percent of the acreage was treated by farmers with their own equipment. The results of preemergence and postemergence treatments were good. The herbicide-usage trend was reported as stationary. Little need for better herbicides was expressed. Residue problems were considered nonexistent (table 35).

Dry Beans

Reports on the cost and extent of chemical weed control in dry beans were received from New York and Wyoming (table 36). Preemergence treatments were used on 15,500 acres in these States at an average cost of $7.39 per acre. Postemergence treatments were not used. Farmers applied 95 percent of the herbicides with their own equipment. Results of treatments were fair to good. Herbicide-usage trend is up for both New York and Wyoming. New York indicated an urgent need for better herbicides. Wyoming indicated little need for better herbicides. Residue problems were not indicated by either State.

New York, Nebraska, and Idaho reported on the degree of weed infestation, extent of damage, and infestation trend (table 37). Important weeds in New York are pigweed, quackgrass, wild mustard, and common lambsquarters. Black nightshade is an important weed in dry beans in Nebraska. Red sorrel, catchfly, cockle, and foxtail are the most important weeds in dry beans in Idaho.

TABLE 34.--Potatoes: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Barnyardgrass	6	1	3	2	1	4	1	1	4	1
Common lambsquarters	6	1	4	1	1	4	1	5	-	1
Pigweed	6	1	4	1	2	3	1	5	-	1
Quackgrass	6	2	3	1	1	2	3	2	2	2
Nutsedge	5	1	3	1	1	2	2	-	4	1
Foxtail	3	1	1	1	1	2	-	2	1	-
Crabgrass	4	-	4	1	-	4	-	2	2	-
Ragweed	5	1	4	-	2	2	1	5	-	-
Smartweed	5	2	3	-	3	2	-	4	1	-
Wild mustard	5	2	3	-	5	-	-	3	-	2
Canada thistle	2	1	1	-	-	2	-	1	1	-
Fall panicum	1	-	1	-	-	1	-	-	1	-
Bindweed	3	3	-	-	1	2	-	1	2	-
Common morningglory	2	2	-	-	1	1	-	2	-	-
Dodder	1	1	-	-	-	1	-	1	-	-
North-Central:[2]										
Wild oat	2	-	1	1	1	1	-	-	2	-
Quackgrass	3	-	3	-	1	2	-	1	1	1
Foxtail	4	2	2	-	4	-	-	4	-	-
Canada thistle	2	1	1	-	1	1	-	1	1	-
Nutsedge	2	1	1	-	1	1	-	1	1	-
Sowthistle	2	1	1	-	1	1	-	1	1	-
Wild mustard	2	1	1	-	1	1	-	1	-	1
Barnyardgrass	4	3	1	-	4	-	-	4	-	-
Common lambsquarters	4	3	1	-	4	-	-	4	-	-
Pigweed	4	3	1	-	4	-	-	4	-	-
Purslane	2	1	1	-	2	-	-	2	-	-
Ragweed	3	3	-	-	3	-	-	3	-	-
Crabgrass	2	2	-	-	2	-	-	2	-	-
Smartweed	2	2	-	-	2	-	-	2	-	-
Common chickweed	1	1	-	-	1	-	-	1	-	-
Southern:[3]										
Common morningglory	1	-	-	1	-	-	1	-	1	-
Nutsedge	1	-	-	1	-	-	1	-	1	-
Cocklebur	1	-	-	1	-	-	1	1	-	-
Crabgrass	1	-	-	1	1	-	-	1	-	-
Bermudagrass	1	-	1	-	-	1	-	1	-	-
Barnyardgrass	1	-	1	-	-	1	-	1	-	-
Pigweed	1	-	1	-	-	1	-	1	-	-
Johnsongrass	1	-	1	-	1	-	-	1	-	-
Common lambsquarters	1	-	1	-	1	-	-	1	-	-
Foxtail	1	1	-	-	1	-	-	1	-	-
Goosegrass	1	1	-	-	1	-	-	1	-	-
Smartweed	1	1	-	-	1	-	-	1	-	-
Western:[4]										
Pigweed	3	1	1	1	1	1	1	1	2	-
Common lambsquarters	3	2	-	1	-	3	-	3	-	-
Canada thistle	3	1	2	-	1	1	1	1	2	-
Quackgrass	3	2	1	-	1	1	1	1	2	-
Bindweed	2	1	1	-	-	1	1	2	-	-
Wild oat	2	1	1	-	1	1	-	2	-	-
Barnyardgrass	1	-	1	-	-	1	-	-	1	-
Foxtail	1	-	1	-	-	1	-	1	-	-
Smartweed	1	-	1	-	-	1	-	1	-	-
Wild mustard	1	-	1	-	-	1	-	1	-	-
Shepherds purse	1	-	1	-	-	1	-	1	-	-
Field pennycress	1	-	1	-	-	1	-	1	-	-
Green foxtail	1	1	-	-	1	-	-	-	1	-
Dodder	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	-	-	1

[1] The 7 States reporting were Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

[2] The 4 States reporting were Michigan, Minnesota, North Dakota, and Wisconsin.

[3] The State reporting was North Carolina.

[4] The 3 States reporting were Colorado, Idaho, and Montana.

TABLE 35.--Sweet Corn: Estimated extent and cost of chemical weed control and effectiveness, usage trend, need for better herbicides and residue problems, New York, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
New York----------	15	15	7.50	5.00	95	5	G	G	Sta.	Little	No
Northeastern----	15	15	7.50	5.00	95	5	1-G	1-G	1-Sta.	1-Little	1-No
UNITED STATES---	15	15	7.50	5.00	95	5	1-G	1-G	1-Sta.	1-Little	1-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good.
[3] Sta., stationary.

TABLE 36.--Dry Beans: Estimated extent and cost of chemical weed control, and effectiveness, usage trend, need for better herbicides and residue problems, New York and Wyoming, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
New York----------	15	-	7.50	-	95	5	F	-	Up	Urgent	No
Northeastern----	15	-	7.50	-	95	5	1-F	-	1-Up	1-Urgent	1-No
Wyoming----------	.5	-	4.00	-	95	5	G	-	Up	Little	No
Western---------	.5	-	4.00	-	95	5	1-G	-	1-Up	1-Little	1-No
UNITED STATES---	15.5	-	7.39	-	95	5	1-G 1-F	-	2-Up	1-Urgent 1-Little	2-No

[1] Represents cost of herbicides custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair.

Onions

New York reported on chemical weed control in onions. Thirteen thousand acres were treated preemergence and postemergence with herbicides at a cost of $20 and $30 per acre, respectively (table 38). Most of the acreage was treated by the farmers with good results. Herbicide-usage trend appeared static, and little need for improved herbicides was indicated. No residue problems were reported.

Tree Fruits and Nuts

Data on fruits and nuts were received from 21 States. More than 107,000 acres were treated preemergence and 160,000 acres were treated after emergence at a total cost of more than $2-1/3 million. The average cost of preemergence and post-emergence treatment was $8.61 and $9.21 per acre, respectively. Farmers treated 86 percent of the total acreage with their own equipment. Three States reported good and five reported fair preemergence application results. Postemergence results were reported good by 10 States and fair by 10. The herbicide-usage trend was up in 20 States and static in 1 State. The need for better herbicides was reported urgent in 15 States, and little need was reported in 4 States. Twelve States indicated residue problems, and eight States indicated none. (Tables 1, 2, and 39.)

TABLE 37.--Drybeans: Extimated extent and cost of chemical weed control, and effectiveness, usage trend, need for better herbicides, and residue problems, United States,1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Pigweed	1	-	-	1	-	-	1	1	-	-
Quackgrass	1	-	-	1	-	-	1	1	-	-
Wild mustard	1	-	-	1	-	1	-	1	-	-
Common lambsquarters	1	-	-	1	-	-	1	1	-	-
Nutsedge	1	-	1	-	-	-	1	1	-	-
Ragweed	1	-	1	-	-	-	1	1	-	-
Foxtail	1	-	1	-	-	1	-	1	-	-
North Central:[2]										
Black nightshade	1	-	1	-	-	1	-	-	1	-
Kochia	1	1	-	-	-	1	-	1	-	-
Western:[3]										
Red sorrel	1	-	-	1	-	-	1	-	1	-
Catchfly	1	-	-	1	-	-	1	-	1	-
Cockles	1	-	-	1	-	-	1	-	1	-
Foxtail	1	-	-	1	-	-	1	1	-	-
Barnyardgrass	1	-	1	-	-	1	-	-	1	-
Quackgrass	1	-	1	-	-	1	-	1	-	-
Nightshade	1	-	1	-	-	1	-	1	-	-
Perennial groundcherry	1	-	1	-	-	1	-	1	-	-
Bindweed	1	-	1	-	-	1	-	-	-	1
Canada thistle	1	-	1	-	-	1	-	-	-	1
Common lambsquarters	1	1	-	-	1	-	-	1	-	-
Pigweed	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	-	-	1

[1] The State reporting was New York.

[2] The State reporting was Nebraska.

[3] The State reporting was Idaho.

TABLE 38.--Onions: Estimated extent and cost of chemical weed control, and effectiveness, usage trend, need for better herbicides, and residue problems, New York, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operators	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
New York	13	13	20.00	30.00	98	2	G	G	Sta.	Little	No
Northeastern	13	13	20.00	30.00	98	2	1-G	1-G	1-Sta.	1-Little	1-No
UNITED STATES	13	13	20.00	30.00	98	2	1-G	1-G	1-Sta.	1-Little	1-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good.

[3] Sta., stationary.

The weed species in tree fruit and nut crops surveyed for 1962 are shown in table 40 for the four geographical regions by degree of infestation, extent of damage, and infestation trend.

The most important weeds in the Northeastern States are lambsquarters, crabgrass, and foxtail. In the North-Central States two States reported on 23 weed species in fruit and nut crops. The most important weeds are foxtail, common lambsquarters, barnyardgrass, crabgrass, quackgrass, common chickweed, purslane, pigweed, bindweed, curly dock, common morningglory, goosegrass, johnsongrass, nutsedge, ragweed, wild onion, wild garlic, sandbur, poison-ivy, and Canada thistle. In seven important

TABLE 39.--Tree Fruits and Nuts: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operators	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Maryland	-	3.5	-	12.86	100	0	-	G	Up	Urgent	Yes
Massachusetts	2	1	35.00	100.00	20	80	F	F	Up	Urgent	No
New Hampshire	-	.1	-	10.00	100	0	-	G	Up	Urgent	Yes
New Jersey	-	2.2	-	18.00	92	8	F	F	Up	Urgent	Yes
Pennsylvania	-	2	-	12.00	100	0	-	G	Up	Urgent	-
West Virginia	-	.1	-	40.00	100	0	-	G	Up	Urgent	No
Northeastern	2	8.9	35.00	24.00	76	24	2-F	4-G 2-F	6-Up	6-Urgent	3-Yes 2-No
Indiana	1	2	-	-	99	1	-	-	Up	Little	No
Minnesota	.1	.3	-	-	100	0	F	F	Up	Urgent	Yes
North-Central	1.1	2.3	-	-	99	1	1-F	1-F	2-Up	1-Urgent 1-Little	1-Yes 1-No
Arkansas	.4	2.4	5.00	1.50	100	0	G	G	Up	Urgent	No
Florida	-	1	-	15.00	25	75	-	F	Up	Urgent	Yes
Kentucky	1.2	.6	15.00	5.00	95	5	F	G	Up	-	Yes
North Carolina	-	.5	-	10.00	99	1	-	F	Up	Urgent	No
Tennessee	.5	.3	12.50	12.50	100	0	F	F	Up	Urgent	No
Texas	-	4	-	2.00	80	20	-	G	Up	Urgent	Yes
Virginia	-	2	-	7.00	100	0	-	G	Up	Little	Yes
Southern	2.1	10.8	12.50	4.85	87	13	1-G 2-F	4-G 3-F	7-Up	5-Urgent 1-Little	4-Yes 3-No
Arizona	-	7	-	8.00	80	20	-	G	Up	Little	No
California	100	100	8.00	9.00	90	10	G	F	Up	Urgent	Yes
Idaho	-	1	-	2.00	75	25	-	F	Up	Urgent	Yes
Oregon	-	26	-	7.50	50	50	-	G	Up	Little	No
Washington	-	1	-	5.00	100	0	-	F	Up	-	Yes
Hawaii	2	3	-	-	100	0	G	F	Sta.	Urgent	Yes
Western	102	138	8.00	8.58	86	14	2-G	2-G 4-F	5-Up 1-Sta.	3-Urgent 2-Little	4-Yes 2-No
UNITED STATES	107.2	160	8.61	9.21	86	14	3-G 5-F	10-G 10-F	20-Up 1-Sta.	15-Urgent 4-Little	12-Yes 8-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair.
[3] Sta., stationary.

Southern States 50 weed species were evaluated. The most important weeds are common lambsquarters, crabgrass, foxtail, pigweed, curly dock, ragweed, smartweed, and orchardgrass. Four States reported on 41 weed species for the Western States. The most important weeds are nutsedge, wild mustard, commelina diffusa, spiny pigweed, sowthistle tasselflower, jungle-rice, and bermudagrass.

Pineapples

Hawaii reported on 14 weed species in pineapples. The most important weeds are oak brush, Florida waltheria, foxtail, broomsedge, sowthistle tasselflower, vaseygrass, pigweed, spiny amaranthus, sourgrass, redtop, and hairy beggarticks (table 41).

Small Fruits and Berries[3]

The degree of infestation, extent of damage, and infestation trend of weed species occurring in small fruits and berries are presented in table 42. Four Northeastern States reported on 21 weed species found in small fruits and berries. The most

[3] For cranberries, see p. 45.

TABLE 40.--Tree Fruits and Nuts: Number of States reporting by degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Common lambsquarters---	3	1	1	1	1	1	1	3	-	-
Crabgrass----------	2	-	1	1	-	1	1	2	-	-
Foxtail----------	2	1	-	1	1	-	1	2	-	-
Common chickweed-------	2	-	2	-	2	-	-	1	1	-
Pigweed----------	3	1	2	-	2	1	-	2	1	-
Curly dock----------	1	-	1	-	-	1	-	-	1	-
Ragweed----------	1	-	1	-	-	1	-	1	-	-
Smartweed----------	1	-	1	-	-	1	-	1	-	-
Orchardgrass----------	1	-	1	-	-	1	-	1	-	-
Dodder----------	1	1	-	-	1	-	-	1	-	-
Quackgrass----------	2	2	-	-	2	-	-	2	-	-
Barnyardgrass----------	1	1	-	-	1	-	-	1	-	-
Common morningglory----	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Foxtail----------	2	-	2	-	-	2	-	1	1	-
Common lambsquarters---	2	-	2	-	-	2	-	1	1	-
Barnyardgrass----------	2	-	2	-	-	2	-	1	1	-
Crabgrass----------	2	-	2	-	-	2	-	2	-	-
Quackgrass----------	2	-	2	-	-	2	-	-	1	1
Common chickweed-------	2	1	1	-	1	1	-	1	1	-
Purslane----------	1	-	1	-	-	1	-	-	1	-
Pigweed----------	1	-	1	-	-	1	-	-	1	-
Bindweed----------	2	1	1	-	1	1	-	2	-	-
Curly dock----------	2	1	1	-	1	1	-	2	-	-
Common morningglory----	1	-	1	-	-	1	-	1	-	-
Goosegrass----------	1	-	1	-	-	1	-	1	-	-
Johnsongrass----------	1	-	1	-	-	1	-	1	-	-
Nutsedge----------	1	-	1	-	-	1	-	1	-	-
Ragweed----------	1	-	1	-	-	1	-	1	-	-
Smartweed----------	1	-	1	-	-	1	-	1	-	-
Wild onion and wild garlic----------	1	-	1	-	-	1	-	1	-	-
Sandbur----------	1	-	1	-	-	1	-	1	-	-
Poison-ivy----------	1	-	1	-	-	1	-	1	-	-
Canada thistle---------	2	1	1	-	1	1	-	2	-	-
Weed bromegrasses------	1	1	-	-	1	-	-	1	-	-
Milkweed----------	1	1	-	-	1	-	-	1	-	-
Black nightshade-------	1	1	-	-	1	-	-	1	-	-
Southern:[3]										
Crabgrass----------	6	-	2	4	3	2	1	6	-	-
Bermudagrass----------	5	1	3	1	2	2	1	2	2	1
Nutsedge----------	3	1	1	1	1	2	-	1	2	-
Pigweed----------	4	2	1	1	2	2	-	4	-	-
Henbit----------	3	1	1	1	2	1	-	3	-	-
Common chickweed-------	2	-	1	1	1	1	-	2	-	-
Johnsongrass----------	6	2	4	-	1	4	1	3	2	1
Balsam-apple----------	1	-	1	-	-	-	1	-	1	-
Rosarypea ----------	1	-	1	-	-	-	1	-	1	-
Torpedograss----------	1	-	1	-	-	-	1	1	-	-
Annual panicum---------	1	-	1	-	-	-	1	1	-	-
Quackgrass----------	3	2	1	-	1	2	-	2	1	-
Southern sandbur-------	1	-	1	-	-	1	-	-	1	-
Florida pusley---------	1	-	1	-	-	1	-	-	1	-
Maypop passionflower---	1	-	1	-	-	1	-	-	1	-
Coffeeweed----------	1	-	1	-	-	1	-	-	1	-
Weed bromegrasses------	1	-	1	-	-	1	-	-	1	-
Smartweed----------	3	2	1	-	2	1	-	2	1	-
Bindweed----------	1	-	1	-	-	1	-	-	1	-
Common lambsquarters---	2	1	1	-	1	1	-	2	-	-
Paragrass----------	1	-	1	-	-	1	-	1	-	-
Maidencane ----------	1	-	1	-	-	1	-	1	-	-
Pangolagrass----------	1	-	1	-	-	1	-	1	-	-
Guineagrass----------	1	-	1	-	-	1	-	1	-	-
Jerusalem-oak----------	1	-	1	-	-	1	-	1	-	-
Nightshades----------	1	-	1	-	-	1	-	1	-	-
Fleabane----------	1	-	1	-	-	1	-	1	-	-
Foxtail----------	2	1	1	-	2	-	-	1	1	-
Barnyardgrass----------	2	1	1	-	2	-	-	2	-	-
Bluegrass----------	1	-	1	-	1	-	-	1	-	-
Orchardgrass----------	1	-	1	-	1	-	-	1	-	-
Wild lettuces----------	1	-	1	-	1	-	-	1	-	-

[1] The 3 States reporting were Maryland, New Hampshire, and New Jersey.

[2] The 2 States reporting were Illinois and Iowa.

TABLE 40.--Tree Fruits and Nuts: Number of States reporting by degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[3]--Con.										
Evening primrose	1	-	1	-	1	-	-	1	-	-
Ragweed	3	2	1	-	3	-	-	2	-	-
Poison-ivy	2	2	-	-	2	-	-	2	-	-
Common morningglory	2	2	-	-	2	-	-	2	-	-
Curly dock	2	2	-	-	2	-	-	2	-	-
Cocklebur	2	2	-	-	2	-	-	2	-	-
Goosegrass	2	2	-	-	2	-	-	2	-	-
Wild onion and wild garlic	1	1	-	-	-	1	-	1	-	-
Red sorrel	1	1	-	-	-	1	-	1	-	-
Dodder	1	1	-	-	-	1	-	1	-	-
Virginia creeper	1	1	-	-	1	-	-	1	-	-
Wild mustard	1	1	-	-	1	-	-	1	-	-
Pokeweed	1	1	-	-	1	-	-	1	-	-
Poison-oak	1	1	-	-	1	-	-	1	-	-
Eupatorium	1	1	-	-	1	-	-	1	-	-
Wild carrot	1	1	-	-	1	-	-	1	-	-
Bitterweed	1	1	-	-	1	-	-	1	-	-
Jungle-rice	1	1	-	-	1	-	-	1	-	-

[3] The 7 States reporting were Arkansas, Florida, Georgia, North Carolina, Tennessee, Texas, and Virginia.

Western:[4]										
Nutsedge	2	-	1	1	1	1	-	2	-	-
Wild mustard	1	-	-	1	-	1	-	1	-	-
Commelina diffusa	1	-	-	1	-	1	-	1	-	-
Spiny pigweed	1	-	-	1	-	1	-	1	-	-
Sowthistle tasselflower	1	-	-	1	-	1	-	1	-	-
Jungle-rice	1	-	-	1	1	-	-	1	-	-
Wild oat	1	-	-	1	1	-	-	1	-	-
Bermudagrass	4	1	3	-	-	2	2	-	4	-
Johnsongrass	3	1	2	-	-	2	1	1	1	1
Foxtail	3	1	2	-	2	1	-	3	-	-
Purslane	2	-	2	-	2	-	-	1	-	1
Redroot pigweed	2	-	2	-	2	-	-	1	-	1
Quackgrass	1	-	1	-	-	1	-	-	1	-
Cyperus sp	1	-	1	-	-	1	-	-	1	-
Bindweed	2	1	1	-	1	1	-	2	-	-
Crabgrass	2	1	1	-	1	1	-	1	-	1
Puncturevine	1	-	1	-	-	1	-	1	-	-
Sourgrass	1	-	1	-	-	1	-	1	-	-
Windmillgrass	1	-	1	-	-	1	-	1	-	-
Drymary	1	-	1	-	1	-	-	1	-	-
Smooth pigweed	1	-	1	-	1	-	-	1	-	-
Sedges	1	-	1	-	1	-	-	1	-	-
Spiny sowthistle	1	-	1	-	1	-	-	1	-	-
Guava	1	-	1	-	1	-	-	1	-	-
Prostrate knotweed	1	-	1	-	1	-	-	1	-	-
Horse purslane	1	-	1	-	1	-	-	1	-	-
Ripgut brome	1	-	1	-	1	-	-	-	-	1
Weed bromegrasses	1	-	1	-	1	-	-	-	-	1
Soft chess	1	-	1	-	1	-	-	-	-	1
Falsevalerian	1	-	1	-	1	-	-	-	-	1
Wild barley	1	-	1	-	1	-	-	-	-	1
Cocklebur	2	2	-	-	2	-	-	2	-	-
Leafy spruge	1	1	-	-	-	1	-	-	1	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
Barnyardgrass	1	1	-	-	1	-	-	1	-	-
Canada thistle	1	1	-	-	1	-	-	1	-	-
Common chickweed	1	1	-	-	1	-	-	1	-	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Whitetop	1	1	-	-	1	-	-	1	-	-
Amaranthus viridus	1	1	-	-	1	-	-	1	-	-

[4] The 4 States reporting were Arizona, California, Hawaii, and Utah.

TABLE 41.--Pineapples: Hawaii reporting degree of infestation, extent of damage, and infestation trend of specified weeds, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Western:										
Oak brush	1	-	-	1	-	1	-	-	-	1
Florida waltheria	1	-	-	1	1	-	-	-	-	1
Broomsedge	1	-	1	-	-	1	-	-	-	1
Sowthistle tasselflower	1	-	1	-	-	1	-	-	-	1
Vaseygrass	1	-	1	-	-	1	-	-	-	1
Pigweed	1	-	1	-	-	1	-	-	-	1
Spiny amaranth	1	-	1	-	1	-	-	-	-	1
Sourgrass	1	-	1	-	1	-	-	-	-	1
Redtop	1	-	1	-	1	-	-	-	-	1
Hairy beggarticks	1	-	1	-	1	-	-	-	-	1
Bermudagrass	1	-	1	-	1	-	-	-	-	1
Crabgrass	1	1	-	-	-	1	-	-	-	1
Dodder	1	1	-	-	1	-	-	-	-	1

weeds are bunchgrass, poplar brush, crabgrass, quackgrass, common chickweed, pigweed, common lambsquarters, barnyardgrass, foxtail, fern, galinsoga, and oak brush. In the southern region four States reported on 36 weed species found in small fruits and berries. The most important weeds are crabgrass, common chickweed, henbit, pigweed, bermudagrass, eveningprimrose, nutsedge, red sorrel, smartweed, foxtail, plantain, barnyardgrass, and weed bromegrasses. For the western region a single State, California, reported on nine weed species found in small fruits and berries. The most important weeds are bindweed, johnsongrass, bermudagrass, barnyardgrass, weed bromegrasses, ripgut brome, soft chess, and barley.

Cranberries

One State, Massachusetts, reported on the occurrence of 18 weed species in cranberries (table 43). The most important weeds are bindweed, nutsedge, loosestrife, and rice cutgrass.

Ornamentals

The survey of weeds in ornamentals covered all geographical regions with 15 States reporting. Preemergence herbicide treatments were used on 7,300 acres, and postemergence treatments were used on 43,900 acres. The average cost for preemergence and postemergence treatments were $13.24 and $19.86 per acre, respectively. The total cost of these treatments was approximately $969,000. Farmers treated approximately 34 percent of the acreage with their own equipment, and custom operators treated the remainder. Effectiveness of preemergence herbicide treatments was evaluated as good in five States, fair in four States, and poor in one State. Postemergence herbicide treatments were evaluated as good in three States, fair in six States, and poor in five States. The herbicide-usage trend was up in 14 States and static in 1. The need for better herbicides was urgent in 10 States, and

TABLE 42.--Small fruits and berries: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Crabgrass	4	-	2	2	-	2	2	3	1	-
Quackgrass	3	-	1	2	-	1	2	2	1	-
Chickweed	4	-	3	1	-	3	1	3	1	-
Pigweed	4	-	3	1	-	3	1	3	1	-
Common lambsquarters	3	-	2	1	1	1	1	2	1	-
Barnyardgrass	4	2	1	1	2	1	1	2	2	-
Foxtail	3	2	-	1	2	-	1	2	1	-
Bunchgrass	1	-	-	1	-	-	1	-	1	-
Poplar brush	1	-	-	1	-	-	1	-	1	-
Smartweed	3	1	2	-	1	2	-	3	-	-
Purslane	4	3	1	-	3	1	-	4	-	-
Nutsedge	3	2	1	-	2	1	-	3	-	-
Henbit	3	2	1	-	2	1	-	2	1	-
Fern	1	-	1	-	-	1	-	-	1	-
Galinsoga	1	-	1	-	-	1	-	1	-	-
Oak brush	1	-	1	-	-	1	-	1	-	-
Ragweed	3	3	-	-	3	-	-	3	-	-
Wild mustard	2	2	-	-	2	-	-	2	-	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
Wild oat	1	1	-	-	-	1	-	-	-	1
Shepherdspurse	1	1	-	-	1	-	-	1	-	-
Southern:[2]										
Crabgrass	4	-	-	4	-	-	4	2	1	1
Common chickweed	4	-	-	4	-	3	1	4	-	-
Henbit	4	-	1	3	-	4	-	4	-	-
Pigweed	3	1	1	1	1	1	1	3	-	-
Bermudagrass	3	2	-	1	1	-	2	-	2	1
Eveningprimrose	2	1	-	1	1	-	1	1	1	-
Nutsedge	2	1	-	1	1	-	1	-	1	1
Red sorrel	3	-	3	-	-	2	1	1	2	-
Smartweed	4	2	2	-	2	2	-	4	-	-
Foxtail	3	1	2	-	1	1	1	2	1	-
Plantain	2	-	2	-	-	2	-	2	-	-
Barnyardgrass	2	-	2	-	-	2	-	2	-	-
Weed bromegrasses	2	-	2	-	1	1	-	1	1	-
Wild onion and wild garlic	3	2	1	-	3	-	-	2	1	-
Quackgrass	2	1	1	-	1	1	-	1	1	-
Bindweed	1	-	1	-	-	1	-	1	-	-
Annual panicum	1	-	1	-	-	1	-	1	-	-
Cheat	1	-	1	-	-	1	-	1	-	-
Fleabane	1	-	1	-	1	-	-	-	1	-
Wild barley	1	-	1	-	1	-	-	-	1	-
Greenbrier	1	-	1	-	1	-	-	1	-	-
Curly dock	3	3	-	-	3	-	-	-	2	1
Goosegrass	3	3	-	-	3	-	-	3	-	-
Ragweed	3	3	-	-	3	-	-	3	-	-
Purslane	2	2	-	-	2	-	-	2	-	-
Common morningglory	2	2	-	-	2	-	-	2	-	-
Johnsongrass	2	2	-	-	2	-	-	1	1	-
Common lambsquarters	2	2	-	-	2	-	-	2	-	-
Shepardspurse	2	2	-	-	2	-	-	2	-	-
Pepperweed	2	2	-	-	2	-	-	2	-	-
Fleabanes	1	1	-	-	-	1	-	1	-	-
Carolina geranium	1	1	-	-	-	1	-	1	-	-
Spurge	1	1	-	-	-	1	-	1	-	-
Wild mustard	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	-	-	1
Sandbur	1	1	-	-	1	-	-	1	-	-
Western:[3]										
Bindweed	1	-	1	-	-	-	1	-	1	-
Johnsongrass	1	-	1	-	-	-	1	-	1	-
Bermudagrass	1	-	1	-	-	1	-	-	1	-
Barnyardgrass	1	-	1	-	1	-	-	1	-	-
Weed bromegrasses	1	-	1	-	1	-	-	-	-	1
Ripgut brome	1	-	1	-	1	-	-	-	-	1
Soft chess	1	-	1	-	1	-	-	-	-	1
Barley	1	-	1	-	1	-	-	-	-	1
Nutsedge	1	1	-	-	1	-	-	-	1	-
Common lambsquarters	1	1	-	-	1	-	-	-	-	1
Pigweed	1	1	-	-	1	-	-	-	-	1

[1] The 4 States reporting were Maryland, New Hampshire, New Jersey, and West Virginia.

[2] The 4 States reporting were Arkansas, Kentucky, North Carolina, and Tennessee.

[3] The State reporting was California.

TABLE 43.--Cranberries: Massachusetts reporting degree of infestation, extent of damage, and infestation trend of specified weeds, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:										
Bindweed	1	-	-	1	1	-	-	1	-	-
Nutsedge	1	-	-	1	-	1	-	-	1	-
Loosestrife	1	-	-	1	1	-	-	-	1	-
Rice cutgrass	1	-	-	1	-	1	-	-	1	-
Aquatic (submerged)	1	-	1	-	1	-	-	-	1	-
Aquatic (emerged)	1	-	1	-	1	-	-	-	1	-
Poison-ivy	1	-	1	-	-	1	-	-	1	-
Needlegrass	1	-	1	-	-	1	-	1	-	-
Brambles	1	-	1	-	-	1	-	-	1	-
Bermudagrass	1	-	1	-	1	-	-	1	-	-
Summer grass	1	-	1	-	1	-	-	-	-	1
Briers	1	1	-	-	-	1	-	-	1	-
Dodder	1	1	-	-	1	-	-	1	-	-
Ragweed	1	1	-	-	1	-	-	1	-	-
Barnyardgrass	1	1	-	-	1	-	-	1	-	-
Bindweed	1	1	-	-	1	-	-	1	-	-
Crabgrass	1	1	-	-	1	-	-	1	-	-

better herbicides were not needed in 4. Seven States indicated the existence of residue problems, and eight States indicated that there were no residue problems. (Tables 1, 2, 3, and 44).

The weed species in ornamental crops surveyed for 1962 are shown in table 45 for the four geographical regions by degree of infestation, extent of damage, and infestation trend. Four Northeastern States reported on 21 weed species occurring in ornamentals. The most important weeds are quackgrass, purslane, common chickweed, common lambsquarters, crabgrass, pigweed, and barnyardgrass. Illinois was the only North-Central State reporting on weeds in ornamentals. Thirteen weed species were evaluated. Infestations were considered moderate for all these. Seven Southern States reported on 38 weed species in ornamentals. The most important weeds are nutsedge, crabgrass, common chickweed, bermudagrass, henbit, johnsongrass, pigweed, ragweed, bindweed, wild onion, and wild garlic. In the Western States, California and Hawaii reported on weeds in ornamentals. Twenty-two weed species were evaluated. The most important weeds are nutsedge, windmillgrass, creeping woodsorrel, leafy spurge, crabgrass, and common chickweed.

TABLE 44.--Ornamentals: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better control methods, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[2]	Need for better herbicides	Residue problems
	Pre-emergence	Post emergence	Pre-emergence	Post-emergence	Farmer	Custom operators	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Massachusetts----	-	0.4	-	17.00	20	80	-	G	Up	Urgent	No
New Hampshire----	-	.2	-	10.00	100	0	-	F	Up	Urgent	Yes
New Jersey-------	-	.4	-	12.00	95	5	F	P	Up	Urgent	No
Pennsylvania-----	3	2	17.00	15.75	90	10	F	G	Up	Urgent	No
Rhode Island-----	.1	.1	-	-	100	0	G	G	Sta.	Little	No
Northeastern---	3.1	3.1	17.00	15.03	86	14	1-G 2-F	3-G 1-F 1-P	4-Up 1-Sta.	4-Urgent 1-Little	1-Yes 4-No
Illinois---------	1	-	5.00	-	90	10	G	-	Up	Little	Yes
Minnesota--------	.1	-	5.00	-	100	0	G	-	Up	Urgent	No
North-Central--	1.1		5.00	-	91	9	2-G		2-Up	1-Urgent 1-Little	1-Yes 1-No
Florida----------	.7	1.2	4.00	25.00	63	37	F	P	Up	Urgent	Yes
Georgia----------	-	1	-	100.00	100	0	-	F	Up	Urgent	Yes
Kentucky---------	.3	-	15.00	-	100	0	G	-	Up	Little	No
North Carolina---	-	4	-	10.00	99	1	F	F	Up	Little	No
Tennessee--------	-	3.5	-	17.50	100	0	-	F	Up	Urgent	No
Southern-------	1	9.7	7.30	23.8	93	7	1-G 2-F	3-F 1-P	5-Up	3-Urgent 2-Little	2-Yes 3-No
California-------	2	30	15.00	18.00	0	100	P	P	Up	Urgent	Yes
Washington-------	-	1	-	5.00	100	0	-	F	Up	-	Yes
Hawaii----------	.1	.1	15.00	25.00	100	0	G	F	Up	Urgent	Yes
Western--------	2.1	31.1	15.00	17.60	4	96	1-G 1-P	2-F 1-P	3-Up	2-Urgent	3-Yes
UNITED STATES--	7.3	43.9	13.24	19.86	34	66	5-G 4-F 1-P	3-G 6-F 3-P	14-Up 1-Sta.	10-Urgent 4-Little	7-Yes 8-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta., stationary.

TABLE 45.--Ornamentals: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Quackgrass	2	-	-	2	-	-	2	-	2	-
Purslane	3	1	1	1	3	-	-	3	-	-
Common chickweed	4	-	3	1	2	2	-	4	-	-
Common lambsquarters	4	-	4	-	2	2	-	4	-	-
Crabgrass	3	-	3	-	1	2	-	3	-	-
Pigweed	3	-	3	-	-	3	-	3	-	-
Barnyardgrass	2	-	2	-	1	1	-	2	-	-
Mugwort	1	-	1	-	-	-	1	1	-	-
Foxtail	2	1	1	-	1	1	-	2	-	-
Common morningglory	1	-	1	-	1	-	-	1	-	-
Nutsedge	2	1	1	-	2	-	-	2	-	-
Weed bromegrasses	1	-	1	-	1	-	-	1	-	-
Wild mustard	2	1	1	-	2	-	-	2	-	-
Henbit	3	3	-	-	3	-	-	3	-	-
Ragweed	3	3	-	-	3	-	-	3	-	-
Smartweed	2	2	-	-	2	-	-	2	-	-
Wild oat	1	1	-	-	1	-	-	1	-	-
Yellow woodsorrel	1	1	-	-	1	-	-	1	-	-
Johnsongrass	1	1	-	-	1	-	-	1	-	-
Dodder	1	1	-	-	-	1	-	1	-	-
Bindweed	1	1	-	-	1	-	-	1	-	-

[1] The 4 States reporting were Massachusetts, New Hampshire, New Jersey, and Rhode Island.

North-Central:[2]										
Bindweed	1	-	1	-	-	1	-	1	-	-
Crabgrass	1	-	1	-	-	1	-	1	-	-
Common chickweed	1	-	1	-	-	1	-	1	-	-
Foxtail	1	-	1	-	-	1	-	1	-	-
Goosegrass	1	-	1	-	-	1	-	1	-	-
Nutsedge	1	-	1	-	-	1	-	1	-	-
Purslane	1	-	1	-	-	1	-	1	-	-
Common morningglory	1	-	1	-	-	1	-	-	-	1
Barnyardgrass	1	-	1	-	-	1	-	-	-	1
Common lambsquarters	1	-	1	-	-	1	-	-	-	1
Pigweed	1	-	1	-	-	1	-	-	-	1
Ragweed	1	-	1	-	-	1	-	-	-	1
Wild mustard	1	-	1	-	-	1	-	-	-	1

[2] The State reporting was Illinois.

Southern:[3]										
Nutsedge	7	-	3	4	2	2	2	1	4	-
Crabgrass	7	1	2	4	1	3	2	3	1	1
Common chickweed	7	1	2	4	3	2	1	3	1	1
Bermudagrass	7	3	2	2	3	2	1	2	2	1
Henbit	5	1	2	2	3	2	-	3	-	1
Johnsongrass	5	1	2	2	2	1	2	3	1	-
Pigweed	6	2	2	2	2	2	1	3	-	-
Ragweed	5	1	2	2	1	3	-	2	-	-
Bindweed	2	-	-	2	1	1	-	1	-	-
Wild onion and wild garlic	2	-	-	2	1	1	-	-	1	-
Dodder	3	2	-	1	-	1	1	1	1	-
Quackgrass	3	-	2	1	-	2	1	2	-	-
Aquatic (submerged)	1	-	-	1	-	-	1	-	-	1
Aquatic (emerged)	1	-	-	1	-	-	1	-	-	1
Florida pusley	3	2	-	1	1	-	-	1	-	-
Curly dock	2	1	-	1	2	-	-	1	-	-
Weed bromegrasses	1	-	-	1	-	1	-	1	-	-
Purslane	4	-	3	1	1	2	-	2	1	-
Spurge	1	-	-	1	-	-	-	-	-	-
Common lambsquarters	3	-	3	-	-	3	-	2	-	-
Barnyardgrass	4	1	3	-	2	1	-	2	1	-
Goosegrass	4	1	3	-	1	2	-	2	-	-
Common morningglory	5	3	2	-	3	1	-	2	-	-
Canada thistle	1	-	1	-	1	-	-	-	-	-
Smartweed	3	-	3	-	-	3	-	2	-	-
Annual panicum	1	-	1	-	-	1	-	-	1	-
Sicklepod	1	-	1	-	-	3	-	2	-	-
Brachiara	1	-	1	-	-	-	-	-	-	-
Red sorrel	2	-	2	-	-	1	-	-	1	-
Cocklebur	2	1	1	-	2	-	-	-	-	-
Foxtail	2	2	-	-	2	-	-	2	-	-
Coffeeweed	2	2	-	-	1	-	-	1	-	-

TABLE 45.--Ornamentals: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
Southern:[3]--Con.	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern sandbur	2	2	-	-	1	-	-	1	-	-
Horsenettle	1	1	-	-	1	-	-	1	-	-
Trumpetcreeper	1	1	-	-	1	-	-	1	-	-
Florida beggarweed	1	1	-	-	1	-	-	1	-	-
Crowfootgrass	1	1	-	-	-	-	-	-	-	-
Western:[4]										
Nutsedge	2	-	1	1	-	2	-	1	1	-
Windmillgrass	1	-	-	1	-	1	-	-	1	-
Creeping woodsorrel	1	-	-	1	-	1	-	1	-	-
Leafy spurge	2	-	2	-	1	1	-	1	1	-
Crabgrass	2	-	2	-	1	1	-	1	1	-
Common chickweed	2	-	2	-	2	-	-	2	-	-
Bermudagrass	2	1	1	-	-	1	1	1	1	-
Purslane	2	1	1	-	-	2	-	1	1	-
Pigweed	2	1	1	-	1	1	-	2	-	-
Cyperus sp.	1	-	1	-	-	1	-	-	1	-
Amaranthus viridus	1	-	1	-	-	1	-	1	-	-
Goosegrass	1	-	1	-	1	-	-	1	-	-
Sowthistle tasselflower	1	-	1	-	-	1	-	-	-	1
Smooth pigweed	1	-	1	-	-	1	-	-	-	1
Common lambsquarters	1	-	1	-	1	-	-	1	-	-
Woodsorrel	1	-	1	-	1	-	-	1	-	-
Quackgrass	1	1	-	-	-	1	-	-	1	-
Dodder	1	1	-	-	-	1	-	1	-	-
Weed bromegrasses	1	1	-	-	-	1	-	1	-	-
Foxtail	1	1	-	-	1	-	-	1	-	-
Bindweed	1	1	-	-	1	-	-	1	-	-
Spiny pigweed	1	1	-	-	1	-	-	1	-	-

[3] The 7 States reporting were Florida, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, and Virginia.

[4] The 2 States reporting were California and Hawaii.

LAWNS

Turf occupies an estimated 14 million acres in the United States. Of the estimated 8 million acres of lawn in the United States (table 2), home lawns make up the largest portion, with 4.9 million acres. The estimated annual maintenance cost in the United States exceeds $2 billion, with an average per capita cost of about $11. This indicates that turf is an important segment of our economy and provides an important market for herbicides.

Twenty-three States estimated that approximately two-thirds million acres of turf were treated with herbicides in 1962 at a total cost of $15-1/3 million. Of this acreage, 104 thousand acres were treated preemergence and 568 thousand acres postemergence. Only about 17 percent of the acreage was treated by custom operators. (Tables 1 and 2.)

About half of the States reported good effectiveness for the preemergence treatments. For postemergence treatments, 13 States reported good effectiveness and 9 fair. All except 1 of the 23 States said use of herbicides on turf was increasing; of 22 States, 10 said there was urgent need for better herbicides. (Tables 4, 5, and 46.)

TABLE 46.--Lawns: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trends, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Maryland	-	5	-	25.00	90	10	-	G	Up	Little	No
Massachusetts	-	3	-	8.00	95	5	-	F	Up	Little	No
New Jersey	4	6	100.00	16.00	97	3	G	G	Up	Little	No
Pennsylvania	2	20	6.00	5.50	70	30	F	G	Up	Urgent	No
Rhode Island	3	1	120.00	150.00	90	10	G	F	Up	Urgent	No
Northern	9	35	85.78	14.43	82	18	2-G 1-F	3-G 2-F	5-Up	2-Urgent 3-Little	5-No
Illinois	2	5	50.00	5.00	90	10	G	G	Up	Little	Yes
Michigan	2	15	-	5.00	90	10	F	G	Up	Little	No
Minnesota	20	30	2.00	5.00	80	20	G	G	Up	Little	No
Nebraska	10	25	150.00	15.00	75	25	G	G	Up	Urgent	No
North-Central	34	75	51.25	8.33	81	19	3-G 1-F	4-G	4-Up	1-Urgent 3-Little	1-Yes 3-No
Alabama	.2	5	100.00	10.00	98	2	G	G	Up	Urgent	Yes
Arkansas	-	.6	-	6.00	98	2	-	F	Up	Urgent	No
Florida	.7	6.3	100.00	40.00	86	14	F	P	Up	Urgent	Yes
Georgia	10	30	5.00	5.00	100	0	G	G	Up	Little	No
North Carolina	-	160	-	10.00	100	0	-	G	Sta.	Little	No
Tennessee	-	5	-	10.00	80	20	-	F	Up	Little	Yes
Virginia	-	67	-	20.00	50	50	-		Up	Little	No
Southern	10.9	273.9	12.84	12.58	88	12	2-G 1-F	4-G 2-F 1-P	6-Up 1-Sta.	3-Urgent 4-Little	3-Yes 4-No
California	50	60	50.00	30.00	70	30	F	F	Up	Urgent	Yes
Colorado	-	100	-	-	90	10	-	G	Up	Urgent	No
Nevada	-	.8	-	5.00	80	20	-	F	Up	Little	No
Utah	.2	2	50.00	10.00	50	50	F	F	Up	Urgent	Yes
Washington	-	20	-	100.00	60	40	-	F	Up	-	No
Wyoming	-	1	-	2.00	50	50	-	G	Up	Little	No
Hawaii	.1	.5	20.00	20.00	50	50	F	F	Up	Urgent	Yes
Western	50.3	184.3	49.94	45.50	77	23	3-F	2-G 5-F	7-Up	4-Urgent 2-Little	3-Yes 4-No
UNITED STATES	104.2	568.2	49.55	17.96	83	17	7-G 6-F	13-G 9-F 1-P	22-Up 1-Sta.	10-Urgent 12-Little	7-Yes 16-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta., stationary.

Crabgrass was rated an important lawn weed in all regions (table 47). In the northeastern region the most important lawn weeds were crabgrass, wild onion and garlic, common chickweed, annual bluegrass, dandelions, plantains, and ground ivy. In the north-central region the most important lawn weeds were crabgrass, goosegrass, ground ivy, common chickweed, knotweed, dandelion, foxtail, nimblewill, and plantain. In the southern region the most important lawn weeds were crabgrass, common chickweed, wild onion and garlic, nutsedge, henbit, red sorrel, sandbur, goosegrass, bermudagrass, curly dock, and plantain. In the western region the most important lawn weeds were crabgrass, nutsedge, bermudagrass, and leafy spurge.

TABLE 47.--Lawns: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Crabgrass	6	-	2	4	-	2	4	3	2	1
Wild onion and wild garlic	4	1	1	2	1	1	2	2	1	1
Common chickweed	6	1	3	2	1	4	1	5	-	1
Annual bluegrass	2	-	-	2	-	1	1	1	1	-
Dandelion	3	-	2	1	1	1	1	1	2	-
Plantain	4	1	2	1	1	1	2	4	-	-
Bermudagrass	2	1	-	1	-	1	1	-	2	-
Goosegrass	2	1	-	1	-	1	1	2	-	-
Nimblewill	2	1	-	1	1	-	1	-	2	-
Henbit	1	-	-	1	-	-	1	1	-	-
Red sorrel	2	1	-	1	1	-	1	1	-	1
Ground ivy	3	1	2	-	1	1	1	2	1	-
White clover	2	-	2	-	1	1	-	2	-	-
Quackgrass	4	3	1	-	3	-	1	3	-	1
Hawkweed	3	2	1	-	2	1	-	2	1	-
Ragweed	3	2	1	-	2	1	-	3	-	-
Purslane	1	-	1	-	-	1	-	1	-	-
Spotted spurge	1	-	1	-	-	1	-	1	-	-
Common lambsquarters	2	1	1	-	2	-	-	2	-	-
Wild mustard	1	-	1	-	1	-	-	1	-	-
Nutsedge	3	3	-	-	2	1	-	2	1	-
Pigweed	3	3	-	-	3	-	-	3	-	-
Curly dock	2	2	-	-	2	-	-	2	-	-
Foxtail	2	2	-	-	2	-	-	2	-	-
Smartweed	1	1	-	-	1	-	-	1	-	-
Yarrow	1	1	-	-	1	-	-	1	-	-
Woodsorrel	1	1	-	-	1	-	-	1	-	-
Speedwell	3	3	-	-	3	-	-	3	-	-
Sourgrass	1	1	-	-	1	-	-	1	-	-
Cinquefoil	1	1	-	-	1	-	-	1	-	-
Knawel	2	2	-	-	2	-	-	1	-	-
Knotweed	1	1	-	-	1	-	-	2	-	-
Spurge	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Crabgrass	5	-	2	3	-	2	3	-	2	2
Henbit	2	1	-	1	1	-	1	1	-	-
Goosegrass	4	1	2	1	1	3	-	2	-	1
Ground ivy	2	-	2	-	-	1	1	-	2	-
Rough fescue	1	-	1	-	-	-	1	-	1	-
Common chickweed	5	-	5	-	-	5	-	2	1	1
Knotweed	3	-	3	-	-	3	-	2	1	-
Dandelion	3	-	3	-	-	3	-	-	-	3
Foxtail	5	3	2	-	3	2	-	1	-	3
Nimblewill	2	-	2	-	-	2	-	-	2	-
Plantain	2	-	2	-	-	2	-	-	-	2
Quackgrass	4	3	1	-	2	2	-	4	-	-
Red sorrel	2	1	1	-	1	1	-	-	2	-
Nutsedge	3	2	1	-	2	1	-	2	-	-
Wild onion and wild garlic	2	1	1	-	1	1	-	2	-	-
Bindweed	3	3	-	-	3	-	-	1	-	1
Curly dock	2	2	-	-	2	-	-	1	-	-
Bermudagrass	1	1	-	-	-	1	-	-	-	-
Barnyardgrass	1	1	-	-	1	-	-	-	-	1
Canada thistle	1	1	-	-	1	-	-	1	-	-
Purslane	1	1	-	-	1	-	-	1	-	-
Sandbur	1	1	-	-	1	-	-	1	-	-
Chicory	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	-	-	-
Southern:[3]										
Crabgrass	7	1	2	4	1	-	5	2	3	1
Common chickweed	8	-	4	4	-	4	3	2	4	1
Wild onion and wild garlic	6	1	2	3	3	1	2	2	3	1
Nutsedge	6	3	1	2	3	-	2	2	3	-
Henbit	7	-	5	2	1	4	2	4	2	1
Redvine	2	-	-	2	1	1	-	1	1	-
Trumpetvine	1	-	-	1	-	-	1	-	1	-
Red sorrel	4	-	3	1	-	2	1	1	2	-

[1] The 6 States reporting were Connecticut, Maryland, New Hampshire, New Jersey, Rhode Island, and West Virginia.

[2] The 5 States reporting were Indiana, Iowa, Kansas, Ohio, and Wisconsin.

TABLE 47.--Lawns: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[3]--Con.										
Sandbur	2	1	2	1	1	1	1	-	3	-
Spurge	1	-	-	1	-	-	-	-	-	-
Goosegrass	4	2	2	-	1	1	2	2	2	-
Purslane	3	1	2	-	1	-	1	1	1	-
Bermudagrass	5	3	2	-	-	4	-	1	2	1
Curly dock	5	3	2	-	2	2	-	3	-	-
Plantain	3	1	2	-	-	3	-	3	-	-
Barnyardgrass	2	1	1	-	1	1	-	1	-	-
Annual panicum	2	1	1	-	1	1	-	1	1	-
Texas millet	2	1	1	-	1	1	-	-	1	1
Nightshades	1	-	1	-	-	1	-	1	-	-
Wild sweetpotato	1	-	1	-	-	1	-	-	1	-
Florida pusley	2	1	1	-	1	1	-	2	-	-
All vines	1	-	1	-	-	1	-	-	1	-
Common morningglory	1	-	1	-	1	-	-	-	-	-
Brachiaria	1	-	1	-	-	-	-	-	-	-
Greenbrier	1	-	1	-	-	-	-	-	-	-
Crowfootgrass	1	-	1	-	-	-	-	-	-	-
Paspalum floridanum	1	-	1	-	-	1	-	-	1	-
Johnsongrass	1	-	1	-	-	1	-	-	-	-
Foxtail	2	2	-	-	2	-	-	1	-	-
Juniper	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	-	-	-
Quackgrass	2	-	-	-	2	-	-	2	-	-
Poison-ivy	1	1	-	-	1	-	-	-	-	-
Wild mustard	1	1	-	-	1	-	-	1	-	-
Tick-trefoil	1	1	-	-	-	-	-	-	-	-
Fleabane	1	1	-	-	1	-	-	1	-	-
Carpetweed	1	1	-	-	1	-	-	1	-	-
Western:[4]										
Crabgrass	5	1	2	2	1	3	1	4	1	-
Nutsedge	3	-	1	2	-	2	1	-	3	-
Bermudagrass	4	1	2	1	1	1	2	2	2	-
Leafy spurge	2	-	1	1	-	1	1	1	1	-
Quackgrass	2	2	-	1	1	1	1	-	3	-
Spiny sowthistle	2	1	-	1	2	-	-	2	-	-
Goosegrass	3	2	-	1	2	-	1	1	2	-
Cyperus sp.	1	-	-	1	-	-	1	-	1	-
Paspalum conjugatum	1	-	-	1	-	-	1	-	1	-
Desmodium cannin	1	-	-	1	-	-	1	-	-	1
Prostrate spurge										
Creeping bellflower	1	-	-	1	-	-	1	-	1	-
Wild mustard	1	-	-	1	-	-	1	1	-	-
Punctturevine	1	-	-	1	-	-	1	1	-	-
Dandelion	4	-	4	-	-	4	-	1	2	1
Henbit	2	-	2	-	-	2	-	2	-	-
Common chickweed	5	4	1	-	3	2	-	5	-	-
Black medic	2	1	1	-	-	2	-	2	-	-
Pigweed	2	1	1	-	2	-	-	2	-	-
Kikuyugrass	1	-	1	-	-	-	1	-	1	-
Windmillgrass	1	-	1	-	-	-	1	-	1	-
Dallisgrass	1	-	1	-	-	1	-	-	1	-
Creeping woodsorrel	1	-	1	-	-	1	-	-	1	-
Foxtail	1	-	1	-	-	1	-	1	-	-
Purslane	1	-	1	-	-	1	-	1	-	-
Australian brassbuttons	1	-	1	-	-	1	-	1	-	-
English daisy	1	-	1	-	-	1	-	1	-	-
Burclover	1	-	1	-	-	1	-	1	-	-
Annual bluegrass	1	-	1	-	-	1	-	1	-	-
Johnsongrass	1	-	1	-	-	1	-	1	-	-
Mediterranean-grass	1	-	1	-	-	1	-	1	-	-
Bindweed	3	3	-	-	2	1	-	1	1	1
Plantain	3	3	-	-	2	1	-	3	-	-
Canada thistle	2	2	-	-	1	1	-	1	1	-
Knotweed	1	1	-	-	-	1	-	1	-	-
Wild sensitive plant	1	1	-	-	-	1	-	1	-	-
Senna	1	1	-	-	-	1	-	-	1	-
Amaranthus viridis	1	1	-	-	2	-	-	1	1	-
Byzantine speedwell	1	1	-	-	1	-	-	-	1	-
Weed bromegrasses	1	1	-	-	1	-	-	1	-	-

[3] The 9 States reporting were Alabama, Florida, Georgia. Kentucky, North Carolina, Oklahoma, South Carolina, Tennessee, and Virginia.

[4] The 6 States reporting were Arizona, California, Hawaii, Montana, Nevada, and Wyoming.

HAY

Information from 33 States showed that postemergence herbicides were used on 387 thousand acres of hay crops in 1962 at a cost of almost $1-2/3 million and that preemergence herbicides were used on 25 thousand acres at a cost of about $200 thousand. Farmers applied 78 percent of the herbicides used on hay crops. (Tables 2, 3, and 48.)

Nine of the States reported good effectiveness of herbicides, 17 fair, and 6 poor. An urgent need for better herbicides was reported by 19 States, and 24 indicated that the use of herbicides is increasing. (Tables 4, 5, and 48.)

In the Northeastern States the most important weeds in hay crops reported were common chickweed, quackgrass, Canada thistle, wild mustard, pigweed, curly dock, buckhorn plantain, and foxtail. In the north-central States the most important weeds reported were yellow rocket, Canada thistle, wild carrot, foxtail, ragweed, wild mustard, white cockle, and hoary alyssum. In the Southern States the most important weeds in hay were reported as common chickweed, crabgrass, wild onion and wild garlic, henbit, ragweed, nutsedge, wild mustard, dodder, foxtail, weed bromegrasses, and barnyardgrass. In the Western States the most important hay weeds reported were wild mustard, foxtail, bermudagrass, Russian knapweed, weed bromegrasses, Canada thistle, hairy whitetop, quackgrass, and curly dock. (Table 49.)

TABLE 48.--Hay: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Maryland	-	30	-	4.00	75	25	-	F	Sta.	Little	No
Massachusetts	-	5	-	3.00	20	80	-	P	Up	Urgent	Yes
New Hampshire	-	.1	-	4.00	100	0	-	P	Sta.	Urgent	Yes
New Jersey	-	15.4	-	5.00	95	5	-	F	Up	Urgent	No
Pennsylvania	-	40	-	8.00	90	10	-	F	Up	Urgent	No
Rhode Island	-	.1	-	-	100	0	-	G	Up	Urgent	No
Vermont	.1	.6	-	-	25	75	-	F	Up	Urgent	No
West Virginia	-	1	-	4.00	100	0	-	P	Up	Urgent	No
Northeastern	.1	92.2	-	5.86	82	18	-	1-G 4-F 3-P	6-Up 2-Sta.	7-Urgent 1-Little	2-Yes 6-No
Michigan	-	10	-	2.50	80	20	-	G	Up	Little	No
Minnesota	-	10	-	4.00	100	0	-	F	Up	Little	No
Nebraska	-	10	-	11.50	60	40	-	F	Up	Urgent	No
Ohio	-	6	-	7.50	90	10	-	F	Up	Little	No
South Dakota	-	100	-	1.35	80	20	-	-	Sta.	Little	No
Wisconsin	-	5	-	1.80	80	20	-	F	Sta.	Urgent	No
North-Central	-	141	-	2.62	80	20	-	1-G 4-F	4-Up 2-Sta.	2-Urgent 4-Little	6-No
Arkansas	-	6	-	2.00	90	10	-	F	Up	Little	No
Florida	-	10	-	3.00	50	50	-	F	Up	Little	No
Kentucky	1	19	10.00	2.00	95	5	F	P	Up	Urgent	No
North Carolina	-	5	-	-	99	1	-	P	-	Urgent	No
Oklahoma	-	.5	-	2.00	100	0	-	G	Up	Little	No
South Carolina	1	5	3.00	1.25	75	25	F	F	Up	Little	Yes
Tennessee	-	1	-	3.00	95	5	-	G	Up	Little	No
Virginia	-	52.5	-	5.90	90	10	-	F	Up	Urgent	No
Southern	2	99.0	6.50	4.26	87	13	2-F	2-G 4-F 2-P	7-Up	3-Urgent 5-Little	1-Yes 7-No
Arizona	-	.2	-	4.00	100	0	-	G	Sta.	Little	No
California	3	12	8.50	7.50	80	20	G	G	Up	Urgent	Yes
Colorado	-	3	-	1.50	100	0	-	P	Sta.	Urgent	No
Montana	-	.5	-	3.00	90	10	-	F	Up	Little	No
Nevada	-	5	-	3.00	50	50	-	F	Up	Urgent	Yes
New Mexico	-	10	-	2.00	100	0	-	F	Sta.	Urgent	No
Oregon	-	5	-	5.00	75	25	F	-	Up	Urgent	Yes
Washington	20	5	8.00	6.00	25	75	G	F	Up	Urgent	No
Wyoming	-	10	-	3.50	50	50	-	G	Up	Little	No
Alaska	-	4	-	10.00	90	10	-	G	Sta.	Urgent	No
Hawaii	-	2	-	12.00	100	0	-	G	Up	Little	No
Western	23.0	54.9	8.07	4.81	60	40	2-G 1-F	5-G 5-F 1-P	7-Up 4-Sta.	7-Urgent 4-Little	3-Yes 8-No
UNITED STATES	25.1	387.1	7.91	4.12	78	22	2-G 2-F	9-G 17-F 6-P	24-Up 8-Sta.	19-Urgent 14-Little	6-Yes 27-No

[1] Represents cost of herbicides custom application and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta., stationary.

TABLE 49.--Hay: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Common chickweed	6	1	3	2	1	5	-	4	2	-
Quackgrass	5	1	2	2	1	1	3	3	2	-
Canada thistle	6	2	3	1	2	3	1	5	1	-
Wild mustard	3	-	2	1	1	2	-	2	1	-
Henbit	2	1	-	1	1	1	-	2	-	-
Ragweed	2	1	-	1	1	-	1	2	-	-
Pigweed	4	1	3	-	1	3	-	3	1	-
Curly dock	6	3	3	-	3	2	1	5	1	-
Buckhorn plantain	2	-	2	-	-	2	-	1	1	-
Foxtail	3	1	2	-	1	2	-	3	-	-
Common lambsquarters	4	2	2	-	3	1	-	3	1	-
Dodder	3	2	1	-	1	1	1	1	2	-
Nutsedge	3	2	1	-	2	1	-	1	2	-
Shepherdspurse	1	-	1	-	-	1	-	-	1	-
Dandelion	1	-	1	-	-	1	-	-	1	-
Chicory	1	-	1	-	-	-	1	-	-	1
Yellow rocket	1	-	1	-	-	1	-	1	-	-
Horsenettle	1	-	1	-	-	1	-	1	-	-
Plantain	1	-	1	-	-	1	-	1	-	-
Cinquefoils	1	-	1	-	-	-	1	-	-	1
Crabgrass	2	1	1	-	1	1	-	2	-	-
Barnyardgrass	1	1	-	-	1	-	-	1	-	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Yellow rocket	3	-	2	1	1	1	1	1	2	-
Canada thistle	4	2	1	1	2	1	1	2	1	1
Wild carrot	2	-	1	1	-	2	-	1	1	-
Foxtail	5	2	3	-	2	3	-	2	3	-
Ragweed	4	2	2	-	1	3	-	2	2	-
Wild mustard	2	-	2	-	-	2	-	1	1	-
White cockle	2	-	2	-	-	2	-	-	2	-
Hoary alyssum	2	-	2	-	-	2	-	-	1	1
Curly dock	6	5	1	-	5	1	-	5	1	-
Weed bromegrasses	4	3	1	-	2	2	-	3	1	-
Quackgrass	3	2	1	-	1	2	-	1	2	-
Johnsongrass	2	1	1	-	2	-	-	1	1	-
Fleabane	1	-	1	-	-	1	-	1	-	-
Wirestem muhly	1	-	1	-	-	1	-	1	-	-
Horsenettle	1	-	1	-	-	1	-	1	-	-
Sowthistle	1	-	1	-	-	1	-	1	-	-
Spotted knapweed	1	-	1	-	-	1	-	-	1	-
Buckhorn	1	-	1	-	-	1	-	1	-	-
Smartweed	4	4	-	-	3	1	-	4	-	-
Crabgrass	3	3	-	-	3	-	-	3	-	-
Dodder	3	3	-	-	2	-	1	3	-	-
Common lambsquarters	3	3	-	-	3	-	-	3	-	-
Pigweed	3	3	-	-	2	1	-	3	-	-
Common chickweed	3	3	-	-	2	1	-	2	1	-
Goosegrass	2	2	-	-	1	1	-	1	1	-
Barnyardgrass	1	1	-	-	-	1	-	-	1	-
Nutsedge	1	1	-	-	1	-	-	-	1	-
Bindweed	1	1	-	-	1	-	-	-	1	-
Cinquefoil	1	1	-	-	1	-	-	1	-	-
Henbit	1	1	-	-	1	-	-	1	-	-
Wild onion and wild garlic	1	1	-	-	1	-	-	1	-	-
Dandelion	1	1	-	-	1	-	-	-	1	-
Chicory	1	1	-	-	1	-	-	-	-	1
Southern:[3]										
Common chickweed	4	-	1	3	1	-	3	2	2	-
Crabgrass	5	-	3	2	1	2	2	2	3	-
Wild onion and wild garlic	4	-	2	2	1	2	1	1	3	-
Henbit	5	1	3	1	2	2	1	2	3	-
Knawel	2	1	-	1	1	-	1	1	1	-
Ragweed	4	1	2	1	1	3	-	3	1	-
Curly dock	4	2	1	1	1	3	-	1	2	1
Nutsedge	3	-	3	-	-	3	-	1	2	-
Wild mustard	4	2	2	-	1	3	-	2	2	-
Dodder	4	2	2	-	2	2	-	2	2	-
Foxtail	4	2	2	-	2	2	-	2	2	-

[1] The 7 States reporting were Maryland, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Virginia, and West Virginia.

[2] The 6 States reporting were Kansas, Illinois, Michigan, Missouri, Ohio, and Wisconsin.

TABLE 49. --Hay: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Southern:[3]--Con.										
Weed bromegrasses	4	1	3	-	1	3	-	2	2	-
Speedwell	2	-	2	-	1	1	-	1	1	-
Barnyardgrass	2	-	2	-	-	2	-	1	1	-
Plantain	3	2	1	-	1	2	-	1	2	-
Bitterweed	2	1	1	-	-	2	-	1	1	-
Red sorrel	2	1	1	-	-	2	-	1	1	-
Pigweed	3	2	1	-	2	1	-	2	1	-
Johnsongrass	3	2	1	-	2	1	-	-	3	-
Common lambsquarters	3	2	1	-	3	-	-	2	1	-
Purslane	2	1	1	-	1	1	-	-	2	-
Smartweed	2	1	1	-	1	1	-	1	1	-
Sumpweed	1	-	1	-	-	1	-	-	1	-
Cranesbill	1	-	1	-	-	1	-	-	1	-
Darnel	1	-	1	-	-	1	-	-	1	-
Shepherdspurse	1	-	1	-	-	1	-	-	1	-
Horsenettle	2	2	-	-	1	1	-	-	2	-
Goosegrass	2	2	-	-	2	-	-	2	-	-
Broomsedge	1	1	-	-	-	1	-	-	1	-
Quackgrass	1	1	-	-	-	1	-	1	-	-
Sedges	1	1	-	-	1	-	-	-	1	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
Bermudagrass	1	1	-	-	1	-	-	1	-	-
Mayweed	1	1	-	-	1	-	-	1	-	-
Corn gromwell	1	1	-	-	1	-	-	1	-	-
Rattlebox	1	1	-	-	1	-	-	1	-	-
Buttercup	1	1	-	-	1	-	-	1	-	-
Western:[4]										
Wild mustard	4	-	2	2	1	3	-	3	1	-
Foxtail	6	1	4	1	2	3	1	5	1	-
Bermudagrass	5	1	3	1	2	2	1	4	-	1
Russian knapweed	3	2	-	1	1	1	1	-	3	-
Common lambsquarters	4	3	-	1	2	2	-	3	1	-
Windmillgrass	1	-	-	1	-	-	1	-	1	-
Apple-of-Peru	1	-	-	1	-	-	1	-	-	1
Dandelion	1	-	-	1	-	-	1	-	1	-
Spiny pigweed	1	-	-	1	-	1	-	1	-	-
Jungle-rice	1	-	-	1	1	-	-	1	-	-
Bindweed	7	2	5	-	3	4	-	5	1	1
Weed bromegrasses	4	-	4	-	1	3	-	3	1	-
Shepherdspurse	3	-	3	-	3	-	-	1	2	-
Canada thistle	5	2	3	-	2	3	-	2	2	1
Hairy whitetop	3	-	3	-	-	1	2	2	1	-
Quackgrass	4	1	3	-	2	2	-	1	3	-
Johnsongrass	3	1	2	-	2	1	-	2	-	1
Barnyardgrass	3	1	2	-	2	1	-	2	-	1
Pigweed	3	1	2	-	2	1	-	2	-	1
Wild oat	3	1	2	-	3	-	-	2	-	1
Curly dock	3	1	2	-	1	2	-	3	-	-
Russian thistle	2	-	2	-	1	1	-	-	2	-
Little wild barley	2	-	2	-	-	2	-	2	-	-
Dodder	5	4	1	-	4	-	1	1	4	-
Spiny sowthistle	1	1	1	-	2	-	-	2	-	-
Sandbur	3	1	1	1	-	3	-	1	2	-
Smooth pigweed	1	-	1	-	-	1	-	-	-	1
Green foxtail	1	-	1	-	1	-	-	-	1	-
Tansy-mustard	1	-	1	-	1	-	-	-	1	-
Pepperweed	1	-	1	-	1	-	-	-	1	-
Purslane	1	-	1	-	1	-	-	-	-	1
Kochia	3	2	1	-	2	1	-	2	1	-
Leafy spurge	2	2	-	-	1	1	-	1	1	-
Ragweed	2	2	-	-	2	-	-	2	-	-
Nutsedge	2	2	-	-	2	-	-	2	-	-
Fivehook bassia	1	1	-	-	1	-	-	-	1	-
Tumble mustard	1	1	-	-	1	-	-	-	1	-
Crabgrass	1	1	-	-	1	-	-	1	-	-
Gumweed	1	1	-	-	1	-	-	1	-	-
Povertyweed	1	1	-	-	1	-	-	1	-	-
Little mallow	1	1	-	-	1	-	-	1	-	-
Tumble pigweed	1	1	-	-	1	-	-	1	-	-
Smartweed	1	1	-	-	1	-	-	-	-	1
Hempnettle	1	1	-	-	1	-	-	-	1	-
Spurry	1	1	-	-	1	-	-	1	-	-

[3] The 5 States reporting were Arkansas, Kentucky, North Carolina, South Carolina, and Virginia

[4] The 10 States reporting were Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

PASTURES

Approximately 310 million acres of land are pastured in the 31 Eastern States of the Continental United States (table 2). Weeds and brush are a problem on all this land, either during the period of establishment of forage crops or during production of pasturage.

Nearly 4-3/4 million acres of pasture were sprayed with herbicides in 1962 at a total cost of $13-1/3 million. The postemergence treatments were much preferred--93 percent of the total treated acreage was sprayed with postemergence herbicides. Sixty-four percent of the acreage sprayed was sprayed by farmers. (Tables 1, 2, and 50.)

Seventeen States reported good weed control effectiveness through use of postemergence herbicides, 23 reported fair effectiveness, and only 2 reported poor results (tables 4 and 50).

There is still a wide gap between usage of herbicides in pastures and the need for usage. Less than 2 percent of the pasture acreage is sprayed while best estimates indicate about 20-percent loss to weeds in land pastured. One of the reasons for this lag is the urgent need for more effective and economical herbicides for killing problem weed species. Sixteen States indicated an urgent need for better herbicides for pasture weeds (tables 5 and 50).

Thirty-four States reported weed species that present problems in pastures (table 51). Thirty-three weeds were listed in the Northeast, 55 in the North-Central States, 60 in the South, and 39 in the West.

The most serious weeds in pastures in the northeastern region were quackgrass, Canada thistle, wild onion and wild garlic, horsenettle, yellow rocket, nutsedge, common chickweed, dandelions, buttercups, common lambsquarters, and wild mustard. Other problem weeds listed by two or more States were foxtail, smartweed, juniper, curly dock, henbit, ragweed, barnyardgrass, pigweed, and cocklebur. Weeds whose infestation trend is upward in two or more States are quackgrass, Canada thistle, nutsedge, and dandelions.

In the north-central region the 15 most important weeds listed were ragweed, ironweed, quackgrass, foxtail, vervain, brush species, Canada thistle, weed bromegrasses, broomsedge, curly dock, bindweed, oxeye daisy, yarrow, wild onion and wild garlic, and wild carrot. Good control of about half of these can be obtained by the phenoxy herbicides, although repeated treatments may be required. For the others, more effective and selective herbicides are required.

In the Southern Region, 16 weeds were listed as common and serious problems. These weeds were wild onion and wild garlic, bitterweed, horsenettle, nutsedge, curly dock, crabgrass, chickweed, henbit, weed bromegrasses, bullthistle, broomsedge, ragweed, mayweed, brush species, johnsongrass, and sandbur. The phenoxy herbicides are effective on about half of these, although repeated annual treatments are required for most of them.

In the western region the most important weeds listed were quackgrass, wild mustard, curly dock, Canada thistle, foxtails, bermudagrass, and brush species. Weeds increasing in infestation in two or more States include quackgrass, Canada thistle, foxtails, milkweed, and leafy spurge.

These appraisals on importance of pasture weeds are based on the number of States reporting heavy-to-moderate degree of infestation and heavy-to-moderate damage. A number of the species were important in more than one region.

TABLE 50.--Pastures: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post emergence	Pre-emergence	Post emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Maine	-	1	-	1.50	100	0	-	F	Up	Urgent	Yes
Maryland	-	15	-	1.50	80	20	-	F	Sta.	Little	No
Massachusetts	-	5	-	4.00	20	80	-	P	Up	Urgent	Yes
New Hampshire	-	.2	-	4.00	100	0	-	P	Sta.	Urgent	Yes
New Jersey	-	6.1	-	3.00	95	5	-	G	Up	Little	No
Pennsylvania	-	35	-	3.75	95	5	-	G	Up	Urgent	No
Rhode Island	.2	.5	-	-	86	14	F	F	Up	Urgent	No
Vermont	-	1	-	-	75	25	-	G	Up	Little	No
West Virginia	-	1	-	2.00	100	0	-	F	Up	Urgent	No
Northeastern	.2	64.8	-	3.10	86	14	1-F	3-G 4-F 2-P	7-Up 2-Sta.	6-Urgent 3-Little	3-Yes 6-No
Illinois	-	100	-	1.50	90	10	-	G	Sta.	Little	No
Indiana	-	8	-	1.10	99	1	-	F	Up	Urgent	Yes
Iowa	-	500	-	2.00	85	15	-	G	Up	Little	No
Kansas	-	1,025	-	5.00	20	80	-	F	Sta	Little	No
Michigan	-	10	-	2.50	80	20	-	G	Up	Little	No
Minnesota	-	150	-	2.50	95	5	-	F	Up	Little	No
Missouri	-	80	-	2.25	95	5	-	F	Up	Little	No
Nebraska	-	450	-	2.50	70	30	-	F	Up	Urgent	No
North Dakota	-	15	-	2.00	100	0	-	F	Up	Little	No
Ohio	-	90	-	2.25	90	10	-	F	Up	Little	No
South Dakota	-	200	-	1.35	80	20	-	-	Up	Little	No
Wisconsin	-	100	-	2.40	80	20	-	G	Sta.	Urgent	No
North-Central	-	2,728	-	3.20	59	41	-	4-G 7-F	9-Up 3-Sta.	3-Urgent 9-Little	1-Yes 11-No
Alabama	-	75	-	1.00	95	5	-	F	Up	Urgent	No
Arkansas	17	193	2.00	2.00	75	25	F	F	Up	Little	-
Florida	-	50	-	3.00	50	50	-	F	Up	Little	No
Georgia	-	150	-	3.00	98	2	-	G	Up	Urgent	No
Kentucky	-	160	-	2.00	95	5	-	F	Up	Urgent	No
Louisiana	5	100	4.00	1.25	85	15	G	G	Up	Little	No
Mississippi	-	150	-	1.50	90	10	-	G	Up	Urgent	No
North Carolina	-	20	-	2.00	95	5	-	F	Sta.	Little	No
Oklahoma	-	4	-	-	25	75	-	-	-	-	-
South Carolina	-	104.7	-	1.25	75	25	-	G	Up	Little	No
Tennessee	-	5	-	3.00	95	5	-	G	Up	Little	No
Texas	-	600	-	2.00	40	60	-	G	Up	Urgent	No
Virginia	-	58	-	11.00	95	5	-	F	Up	Urgent	No
Southern	22	6,669.7	2.45	2.25	69	31	1-G 1-F	6-G 5-F	11-Up 1-Sta.	6-Urgent 6-Little	11-No
Arizona	-	.5	-	3.00	100	0	-	G	Sta.	Little	No
California	-	30	-	5.00	70	30	-	G	Sta.	Little	No
Colorado	-	100	-	.75	100	0	-	F	Sta.	Little	No
Idaho	-	10	-	-	-	-	-	-	-	-	-
Montana	-	.5	-	1.75	100	0	-	G	Up	Little	No
Nevada	-	3	-	4.50	50	50	-	F	Up	-	Yes
Oregon	-	20	-	3.00	100	0	-	F	Up	Little	Yes
Utah	-	1	-	3.00	80	20	-	F	Sta.	Urgent	No
Washington	10	40	8.00	3.00	30	70	F	F	Up	-	No
Wyoming	-	10	-	3.50	50	50	-	G	Up	Little	No
Hawaii	-	5	-	8.00	100	0	-	F	Up	Urgent	Yes
Western	10	220	8.00	2.38	77	23	1-F	4-G 6-F	6-Up 4-Sta.	2-Urgent 6-Little	3-Yes 7-No
United States	32.2	4,682.5	4.18	2.82	64	36	1-G 3-F	17-G 23-F 2-P	34-Up - 10 Sta.	16-Urgent 24-Little	7-Yes 35-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta., stationary.

TABLE 51.--Pastures: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Quackgrass	7	-	5	2	1	4	2	5	4	1
Canada thistle	9	4	4	1	4	4	1	7	2	-
Wild onion and wild garlic	4	1	3	-	2	2	-	2	1	1
Horsenettle	3	1	2	-	1	2	-	2	1	-
Yellow rocket	3	-	3	-	2	1	-	2	1	-
Nutsedge	3	1	2	-	1	2	-	-	3	-
Common chickweed	5	2	3	-	2	3	-	4	1	-
Foxtail	2	1	1	-	1	1	-	2	-	-
Smartweed	2	1	1	-	1	1	-	1	1	-
Juniper	2	1	1	-	1	1	-	1	-	1
Dandelion	2	-	2	-	-	2	-	-	2	-
Wintercress	1	-	1	-	-	1	-	-	1	-
Bedstraw	1	-	1	-	-	1	-	-	-	1
Buttercup	2	-	2	-	-	2	-	2	-	-
Milkweed	1	-	1	-	-	1	-	1	-	-
Weed bromegrasses	1	-	1	-	-	1	-	1	-	-
Common lambsquarters	2	-	1	1	1	1	-	1	1	-
Muskthistle	-	-	1	-	1	-	-	-	1	-
Ironweed	1	-	1	-	1	-	-	1	-	-
Chickory	1	-	1	-	1	-	-	1	-	-
Shepherdspurse	1	-	1	-	1	-	-	1	-	-
Curly dock	4	4	-	-	4	-	-	4	-	-
Henbit	3	3	-	-	3	-	-	2	-	1
Ragweed	2	2	-	-	1	1	-	1	-	1
Barnyardgrass	4	3	1	-	3	1	-	2	1	1
Pigweed	1	1	1	-	1	1	-	1	1	-
Field pennycress	1	1	-	-	1	-	-	1	-	-
Pepperweed	1	1	-	-	1	-	-	1	-	-
Bullthistle	1	1	-	-	1	-	-	-	1	-
Crabgrass	1	1	-	-	1	-	-	-	-	1
Wild mustard	3	-	3	-	-	3	-	3	-	-
Cocklebur	2	1	1	-	1	1	-	1	1	-
Devils paintbrush	1	-	1	-	-	1	-	1	-	-

[1] The 7 States reporting were Connecticut, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Vermont, and West Virginia.

North-Central:[2]										
Ragweed	7	-	5	2	-	5	2	4	3	-
Ironweed	5	1	3	1	-	5	-	2	3	-
Quackgrass	4	1	2	1	-	4	-	4	-	-
Foxtail	3	1	1	1	1	1	1	1	2	-
Vervain	3	1	1	1	1	2	-	2	1	-
Pigweed	2	1	-	1	1	1	-	1	1	-
Canada thistle	8	3	5	-	2	5	1	6	2	-
Weed bromegrasses	5	2	3	-	2	2	1	3	2	-
Broomsedge	2	-	2	-	-	1	1	1	1	-
Muskthistle	1	-	1	-	-	-	1	-	1	-
Scotchthistle	1	1	-	-	-	-	1	-	1	-
Curly dock	8	5	3	-	5	3	-	6	2	-
Bindweed	5	3	2	-	3	2	-	4	1	-
Oxeye daisy	4	2	2	-	2	2	-	4	-	-
Yarrow	3	1	2	-	1	2	-	2	1	-
Wild onion and wild garlic	3	1	2	-	1	2	-	2	1	-
Wild carrot	2	-	2	-	-	2	-	1	1	-
Common chickweed	1	1	-	-	1	1	-	1	-	-
Johnsongrass	4	3	1	-	2	2	-	2	2	-
Smartweed	3	2	1	-	2	1	-	3	-	-
Hoary alyssum	2	1	1	-	-	2	-	-	2	-
Sowthistle	2	1	1	-	1	1	-	2	-	-
White cockle	2	1	1	-	1	1	-	1	1	-
Bracken fern	1	-	1	-	-	1	-	-	1	-
Leafy spurge	1	-	1	-	-	1	-	-	1	-
Sagewort	1	-	1	-	-	1	-	-	1	-
Crabgrass	2	1	1	-	2	-	-	2	-	-
Little wild barley	2	1	1	-	1	1	-	2	-	-
Western whorled milkweed	1	-	1	-	-	1	-	1	-	-
Goldenrod	1	-	1	-	-	1	-	1	-	-
Wirestem muhly	1	-	1	-	-	1	-	1	-	-
Dogbane	1	-	1	-	-	1	-	1	-	-
Bullthistle	1	1	-	-	-	1	-	-	-	1
Yucca	1	1	-	-	-	1	-	1	-	-

TABLE 51.--Pastures: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
North-Central[2]--Con.	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Nutsedge	1	1	-	-	1	-	-	-	1	-
Nimblewill	1	1	-	-	-	1	-	-	1	-
Orange hawkweed	1	1	-	-	1	-	-	1	-	-
St. Johnswort	1	1	-	-	1	-	-	1	-	-
Cinquefoil	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Goosegrass	1	1	-	-	1	-	-	1	-	-
Common mullein	1	1	-	-	1	-	-	1	-	-
Gumweed	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	1	-	-
Cactus	1	1	-	-	1	-	-	1	-	-
Bitterweed	1	1	-	-	1	-	-	-	-	1
Brush:										
Buckbrush	3	-	3	-	-	3	-	1	2	-
Hazel	2	-	2	-	-	2	-	1	1	-
Oak	2	1	1	-	1	1	-	1	1	-
Sagebrush	2	1	1	-	1	1	-	1	1	-
Juniper	1	1	-	-	1	-	-	1	-	-
Willow	1	-	1	-	-	1	-	1	-	-
Multiflora rose	1	1	-	-	-	-	-	-	1	-
Russian-olive	1	1	-	-	1	-	-	-	-	1
Mixed species	2	-	1	1	-	1	1	-	2	-

[2] The 10 States reporting were Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and Wisconsin.

Southern:[3]										
Wild onion and wild garlic	9	1	3	5	1	3	5	3	6	-
Bitterweed	8	2	1	5	2	1	5	4	3	1
Horsenettle	6	1	3	2	1	4	1	1	5	-
Nutsedge	7	1	2	2	5	1	1	4	3	-
Curly dock	9	2	6	1	1	7	1	7	1	1
Crabgrass	6	-	5	1	1	5	-	4	2	-
Common chickweed	6	3	2	1	3	3	-	4	2	-
Henbit	6	3	2	1	3	3	-	5	1	-
Weed bromegrasses	4	-	3	1	1	1	2	2	2	-
Bullthistle	3	-	2	1	-	2	1	-	3	-
Pigweed	6	4	1	1	4	1	1	4	2	-
Little wild barley	5	4	-	1	3	1	-	2	3	-
Quackgrass	1	-	-	1	-	1	-	1	-	-
Buttercup	2	1	-	1	1	1	-	2	-	-
Erigeron	1	-	-	1	-	1	-	-	1	-
Broomsedge	2	-	-	2	-	2	-	-	2	-
Ragweed	9	6	3	-	6	3	-	8	1	-
Mayweed	4	1	3	-	1	3	-	2	2	-
Johnsongrass	3	1	2	-	1	2	-	-	2	1
Common lambsquarters	5	4	2	-	4	1	-	5	-	-
Wild mustard	4	2	2	-	3	1	-	2	2	-
Bermudagrass	3	2	1	-	2	1	-	3	-	-
Dodder	3	2	1	-	3	-	-	2	1	-
Foxtail	2	1	1	-	1	1	-	2	-	-
Smartweed	3	2	1	-	2	1	-	2	1	-
Purslane	2	1	1	-	1	1	-	2	-	-
Common morningglory	2	1	1	-	1	1	-	-	1	1
Nimblewill	1	-	1	-	-	1	-	1	-	-
Poorjoe	1	-	1	-	-	1	-	1	-	-
Sticktight	1	-	1	-	-	1	-	1	-	-
Sowthistle	1	-	1	-	-	1	-	-	1	-
Bracken fern	1	-	1	-	-	1	-	-	1	-
Muskthistle	1	-	1	-	-	-	1	-	1	-
Horseweed	1	-	1	-	1	-	-	1	-	-
Barnyardgrass	1	1	-	-	-	1	-	1	-	-
Goosegrass	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Red sorrel	3	3	-	-	2	1	-	3	-	-
Sandbur	3	1	1	-	1	2	-	-	3	-
Nightshade	1	1	-	-	1	-	-	1	-	-
Hawkweed	1	1	-	-	-	1	-	1	-	-
Spotted knapweed	1	1	-	-	1	-	-	1	-	-
Smutgrass	1	1	-	-	1	-	-	-	1	-
Goldenrod	1	1	-	-	1	-	-	-	1	-
Starthistle	1	1	-	-	1	-	-	-	1	-
Common mullein	1	1	-	-	1	-	-	-	1	-
Ironweed	1	1	-	-	1	-	-	1	-	-
Buckhorn plantain	1	1	-	-	1	-	-	1	-	-
Annual fleabane	1	1	-	-	1	-	-	1	-	-
Goatweed	1	1	-	-	1	-	-	-	1	-

TABLE 51.--Pastures: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
Southern[3]--Con.	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Yankeeweed	1	1	-	-	1	-	-	1	-	-
White heath aster	1	1	-	-	1	-	-	1	-	-
Milkweed	1	1	-	-	1	-	-	1	-	-
Brush:										
Juniper	2	2	-	1	3	-	-	2	-	-
Virginia-creeper	5	3	2	-	4	1	-	5	-	-
Trumpetcreeper	2	1	1	-	1	1	-	1	1	-
Coralberry	2	1	1	-	1	1	-	2	-	-
Oak	1	1	-	-	1	-	-	1	-	-
Mixed species	2	-	2	-	-	2	-	1	1	-
Western:[4]										
Quackgrass	4	-	3	1	2	1	1	2	2	-
Dandelion	1	-	-	1	-	-	1	-	1	-
Wild mustard	2	-	1	1	-	2	-	2	-	-
Curly dock	6	1	5	-	1	5	-	6	-	-
Canada thistle	5	1	4	-	-	5	-	1	4	-
Foxtail	5	-	5	-	-	5	-	1	4	-
Bermudagrass	3	-	3	-	-	2	1	2	1	-
Milkweed	2	-	2	-	1	1	-	-	2	-
Johnsongrass	2	-	2	-	1	1	-	2	-	-
Bindweed	5	4	1	-	3	1	1	3	1	1
Weed bromegrasses	2	1	1	-	-	1	1	1	1	-
Sagebrush	1	-	1	-	-	-	1	1	-	-
American falsepennyroyal	1	-	1	-	-	-	1	1	-	-
Pigweed	2	1	1	-	-	2	-	2	-	-
Leafy spurge	2	1	1	-	1	1	-	-	2	-
Hairy whitetop	2	1	1	-	1	1	-	1	1	-
Common lambsquarters	2	1	1	-	1	1	-	2	-	-
Dallisgrass	1	-	1	-	-	1	-	-	1	-
Knapweed	1	-	1	-	-	1	-	-	1	-
Bullthistle	1	-	1	-	-	1	-	1	-	-
Plantain	1	-	1	-	-	1	-	1	-	-
Saltcedar	1	-	1	-	-	1	-	1	-	-
Ragweed	3	2	1	-	3	-	-	3	-	-
Iris	1	-	1	-	1	-	-	-	1	-
Gumweed	1	-	1	-	1	-	-	1	-	-
Spiny sowthistle	2	2	-	-	2	-	-	2	-	-
Crabgrass	1	1	-	-	-	1	-	-	1	-
Chicory	1	1	-	-	-	1	-	1	-	-
Cocklebur	5	5	-	-	4	1	-	5	-	-
Russian knapweed	1	1	-	-	-	1	-	1	-	-
Camelthorn	1	1	-	-	-	1	-	1	-	-
Dodder	1	1	-	-	1	-	-	-	1	-
Barnyardgrass	1	1	-	-	1	-	-	1	-	-
Nettle	1	1	-	-	1	-	-	1	-	-
Field pennycress	1	1	-	-	1	-	-	1	-	-
Horsetail	1	1	-	-	1	-	-	1	-	-
Poison hemlock	1	1	-	-	1	-	-	1	-	-
Blue vervain	1	1	-	-	1	-	-	1	-	-
Little mallow	1	1	-	-	1	-	-	1	-	-
Waterhemlock	1	1	-	-	1	-	-	1	-	-

[3] The 9 States reporting were Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, North Carolina, South Carolina, and Virginia.

[4] The 8 States reporting were Arizona, California, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

RANGELAND

Brush species infest an estimated 320 million acres of grazing land in the United States. This includes 70 million acres of mesquite, 76 million acres of juniper, and 96 million acres of sagebrush. In addition, vast areas of rangeland are infested with many nonwoody weeds, including downy brome, bitterweed, halogeton, and medusa-head. Herbicides have demonstrated their usefulness in killing many undesirable range plants and for hastening desirable plant succession or altering the direction of successional trends so that increased grazing and land conservation can be accomplished.

Nineteen States reported more than 2-1/4 million acres of rangeland sprayed with postemergence herbicides in 1962 at a cost of over $6-1/4 million. The average

cost per acre was $2.77. Sixty-three percent of the acreage was treated by custom operators. (Tables 1, 2, 3, and 52.)

Eleven States reported good effectiveness of herbicides in controlling rangeland weeds and seven fair. Eighteen States reported usage of herbicides was increasing and one State stationary. Half of the States indicated urgent need for better herbicides. (Tables 4, 5, and 52.)

Six Western States, one North-Central State and one Southeastern State reported on specific range weed problems (table 53). The most important range weed problems reported on western rangelands were sagebrush, juniper, oak brush, mesquite, weed bromegrasses, Canada thistle, halogeton, medusahead, broomweed, cocklebur, leafy spurge, Russian knapweed, larkspur, and locoweed. Some of these are well controlled by the phenoxy herbicides. For example, sagebrush is well controlled by spraying with 2,4-D. However, many others are not efficiently controlled by presently known weed control treatments. Most yield very slowly to improved grazing management treatments or not at all. Therefore, more efficient herbicides are needed that may be integrated into range-management practices to reduce the weed component of productive rangelands.

TABLE 52.--Rangeland: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
Kansas	-	270	-	2.50	5	95	-	F	Up	Urgent	-
Nebraska	-	100	-	2.50	30	70	-	F	Up	Urgent	No
North Dakota	-	15	-	2.00	100	0	-	F	Up	Little	No
South Dakota	-	200	-	1.35	80	20	-	-	Up	Little	No
North-Central	-	585	-	2.09	37	63	-	3-F	4-Up	2-Urgent 2-Little	3-No
Arkansas	-	9	-	7.00	90	10	-	F	Up	Urgent	No
Florida	-	25	-	4.00	50	50	-	F	Up	Urgent	No
Oklahoma	-	100	-	2.00	25	75	-	G	Up	Little	No
Texas	-	1,082.6	-	3.00	50	50	-	G	Up	Urgent	Yes
Southern	-	1,216.6	-	2.97	48	52	-	2-G 2-F	4-Up	3-Urgent 1-Little	1-Yes 3-No
Arizona	-	10	-	3.00	25	75	-	G	Up	Little	No
California	-	50	-	6.50	10	90	-	G	Up	Urgent	No
Colorado	-	10	-	1.25	0	100	-	F	Sta.	Little	No
Idaho	-	10	-	-	-	-	-	-	-	-	-
Montana	-	10	-	3.00	15	85	-	G	Up	Little	No
Nevada	-	50	-	2.25	5	95	-	G	Up	Little	No
New Mexico	-	10	-	2.00	100	0	-	G	Up	Urgent	No
Oregon	-	50	-	2.00	20	80	-	G	Up	Little	No
Utah	-	200	-	2.75	0	100	-	G	Up	Urgent	No
Washington	-	5	-	2.50	5	95	-	G	Up	-	No
Wyoming	-	50	-	3.50	5	95	-	G	Up	Little	No
Hawaii	-	5	-	8.00	100	0	-	F	Up	Urgent	Yes
Western	-	460	-	3.13	9	91	-	9-G 2-F	10-Up 1-Sta.	4-Urgent 6-Little	1-Yes 10-No
UNITED STATES	-	2,261.6	-	2.77	37	63	-	11-G 7-F	18-Up 1-Sta.	9-Urgent 9-Little	2-Yes 16-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair.
[3] Sta., stationary.

TABLE 53.--Rangeland: Number of States reporting degree of infestation, extent of damage, and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
North-Central:[1]										
Leafy spurge	1	1	-	-	1	-	-	-	1	-
Sagebrush	1	1	-	-	1	-	-	1	-	-
Buckbrush	1	1	-	-	1	-	-	1	-	-
Southern:[2]										
Saw-palmetto	1	1	-	-	1	-	-	1	-	-
Oak brush	1	1	-	-	1	-	-	1	-	-
Western:[3]										
Weed bromegrasses	4	1	-	3	1	-	3	1	2	1
Canada thistle	5	3	1	1	2	2	1	1	4	-
Halogeton	3	1	1	1	-	1	2	1	2	-
Medusahead	2	-	1	1	-	-	2	-	2	-
Broomweed	2	-	1	1	-	1	1	1	1	-
Curly dock	2	1	-	1	1	-	1	1	1	-
Johnsongrass	2	1	-	1	1	-	1	1	1	-
Spotted knapweed	2	1	-	1	1	-	1	-	2	-
Waxmyrtle	1	-	-	1	-	-	1	1	-	-
Eupatorium	1	-	-	1	-	-	1	1	-	-
Common lambsquarters	1	-	-	1	-	-	1	-	1	-
Bindweed	3	2	-	1	2	2	1	1	1	1
Foxtail	2	1	-	1	-	2	-	2	-	-
Sourgrass	1	-	-	1	-	1	-	-	1	-
Emex spinosa	1	-	-	1	-	1	-	1	-	-
Cocklebur	4	1	3	-	1	3	-	2	2	-
Leafyspurge	3	1	2	-	-	2	1	-	3	-
Russian knapweed	3	1	2	-	1	1	1	-	3	-
Larkspur	4	3	1	-	1	2	1	3	1	-
Locoweed	3	2	1	-	1	2	1	3	-	-
Quackgrass	2	1	1	-	-	2	-	1	1	-
Wyethia	1	-	1	-	-	-	1	-	1	-
Styphelia tameiameiae	1	-	1	-	-	1	-	1	-	-
Dodonaea eriocarpa	1	-	1	-	-	1	-	1	-	-
Sedges	1	-	1	-	-	1	-	-	-	1
Aquatic (submerged)	1	-	1	-	-	1	-	1	-	-
Aquatic (emerged)	1	-	1	-	-	1	-	1	-	-
Pricklypear	1	-	1	-	-	1	-	-	1	-
Rabbitbrush	1	-	1	-	-	1	-	-	1	-
Hairy whitetop	1	-	1	-	-	1	-	-	1	-
Russian thistle	1	-	1	-	-	1	-	-	1	-
Yellow starthistle	1	-	1	-	-	1	-	-	1	-
Eriogonum	1	-	1	-	-	1	-	1	-	-
Burroweed	1	-	1	-	-	1	-	-	1	-
Goatweed	1	-	1	-	-	1	-	-	-	1
Lupine	2	2	-	-	1	1	-	2	-	-
Deathcamas	2	2	-	-	1	1	-	2	-	-
Ragweed	2	2	-	-	2	-	-	2	-	-
Dalmatian toadflax	1	1	-	-	-	-	1	-	1	-
Shrubby cinquefoil	1	1	-	-	-	-	1	1	-	-
St. Johnswort	1	1	-	-	-	-	1	-	-	1
Goatgrass	1	1	-	-	-	-	1	-	1	-
Falsevalerian	1	1	-	-	1	-	-	-	-	1
Italian thistle	1	1	-	-	-	1	-	1	-	-
Diffuse knapweed	1	1	-	-	1	-	-	1	-	-
Horsebrush	1	1	-	-	1	-	-	1	-	-
Wild onion and wild garlic	1	1	-	-	1	-	-	1	-	-
Field pennycress	1	1	-	-	1	-	-	1	-	-
Dodder	1	1	-	-	1	-	-	1	-	-
Wild mustard	1	1	-	-	1	-	-	1	-	-
Brush:										
Sagebrush	10	3	3	4	-	6	4	7	2	1
Juniper	5	2	2	1	2	3	-	3	2	-
Lantana	1	-	-	1	-	-	1	1	-	-
Guava (4 species)	1	-	-	1	-	-	1	-	-	1
Oak species	5	-	5	-	-	2	2	3	2	-
Mesquite	2	-	2	-	1	1	-	-	1	1
Coyotebrush	1	-	1	-	-	-	1	1	-	-
Chamise	1	-	1	-	-	-	1	1	-	-
Gorse	1	-	1	-	-	1	-	1	-	-
Ceanothus	1	-	1	-	-	1	-	1	-	-
Scotch-broom	1	1	-	-	-	-	1	-	1	-
Blackberry	1	1	-	-	-	-	1	1	-	-
Wildrose	1	1	-	-	-	1	-	1	-	-
Willow	1	1	-	-	1	-	-	1	-	-
Chockcherry	1	1	-	-	1	-	-	1	-	-

[1] The State reporting was North Dakota.

[2] The State reporting was Florida.

[3] The 6 States reporting were Arizona, California, Colorado, Idaho, Nevada, and New Mexico.

FOREST PLANTINGS

Responses to the questionnaire deal amost exclusively with forest plantings or Christmas tree plantations. Therefore, the amount of plant control in established woods is not included. Burns and Box,[4] who surveyed southern foresters, found, in a response from a little over one-half of the industrial foresters, that about 400 thousand acres received some form of hardwood control. If these are typical of all southern commercial forests, then the total treated would be between 700 and 800 thousand acres. This illustrates the inadequacies of the presented data.

Eighteen States reported 274 thousand acres of forest plantings treated with herbicides at a total cost of 2-3/4 million. About two-thirds of the herbicides was applied by custom operators. All States indicated a trend of increasing acreage treated with herbicides and 11 of the 18 said there was urgent need for better herbicides. (Tables 1, 5, and 54.)

Weed species that are common problems in the various regions are given in table 55.

[4] Burns, P. Y., and B. H. Box. Current Status of Herbicides in Southern Forestry: A Southwide Survey. Ann. Meeting South. Weed Conf. Proc., 14:251. 1961.

TABLE 54.--Forest Plantings: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better herbicides, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
New Jersey-------	-	26	-	15.00	98	2	-	G	Up	Urgent	No
Northeastern---	-	26	-	15.00	98	2	-	1-G	1-Up	1-Urgent	1-No
Illinois---------	1	-	15.00	-	90	10	G	-	Up	Little	Yes
Michigan---------	-	5	-	-	50	50	-	-	Up	-	No
Minnesota--------	20	5	10.00	5.00	100	0	G	F	Up	Little	No
Nebraska---------	5	1	13.50	13.50	50	50	G	G	Up	Urgent	Yes
South Dakota-----	2	-	10.00	-	-	-	-	-	Up	Urgent	No
North-Central--	28	11	10.80	6.42	85	15	3-G	1-G 1-F	5-Up	2-Urgent 2-Little	2-Yes 3-No
Alabama----------	-	10	-	8.00	20	80	-	F	Up	Little	No
Arkansas---------	-	33	-	8.00	25	75	-	F	Up	Little	No
Florida----------	.3	2.3	20.00	8.26	31	69	G	F	Up	Urgent	No
Georgia----------	-	150	-	10.00	10	90	-	F	Up	Urgent	No
Kentucky---------	-	5	-	5.00	95	5	-	F	Up	Urgent	No
North Carolina---	-	1	-	10.00	100	0	-	F	Up	Little	No
Virginia---------	.1	1.7	120.00	10.00	85	15	F	F	Up	Urgent	No
Southern-------	.4	203.0	45.00	9.43	16	84	1-G 1-F	7-F	7-Up	4-Urgent 3-Little	7-No
California-------	-	2	-	7.50	5	95	-	F	Up	Urgent	No
Montana----------	.5	.2	-	6.50	100	0	-	G	Up	Little	Yes
Oregon-----------	-	1	-	4.50	80	20	-	F	Up	Urgent	No
Washington-------	1	1	10.00	3.00	50	50	F	F	Up	Urgent	-
Hawaii-----------	-	.1	-	5.00	100	0	-	F	Up	Urgent	No
Western--------	1.5	4.3	10.00	5.65	47	53	1-F	1-G 4-F	5-Up	4-Urgent 1-Little	1-Yes 3-No
UNITED STATES--	29.9	244.3	11.24	9.89	34	66	4-G 2-F	3-G 12-F	18-Up	11-Urgent 6-Little	3-Yes 14-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.
[2] G, good; F, fair.

TABLE 55.--Forest Plantings: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeastern:[1]										
Crabgrass	1	-	1	-	-	-	1	-	1	-
Orchardgrass	1	-	1	-	1	-	-	1	-	-
Common chickweed	1	-	1	-	-	1	-	1	-	-
Common lambsquarters	1	-	1	-	-	1	-	1	-	-
Pigweed	1	-	1	-	-	1	-	1	-	-
Bindweed	1	1	-	-	1	-	-	1	-	-
Henbit	1	1	-	-	1	-	-	1	-	-
Smartweed	1	1	-	-	1	-	-	1	-	-
Common morningglory	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Canada thistle	1	-	2	-	-	2	-	2	-	-
Poison-ivy	1	-	1	-	-	-	1	1	-	-
Common morningglory	1	-	1	-	-	1	-	1	-	-
Bindweed	1	-	1	-	-	1	-	1	-	-
Curly dock	1	-	1	-	-	1	-	1	-	-
Common chickweed	1	-	1	-	-	1	-	1	-	-
Cocklebur	1	-	1	-	-	1	-	1	-	-
Foxtail	1	-	1	-	-	1	-	1	-	-
Common lambsquarters	1	-	1	-	-	1	-	1	-	-
Quackgrass	1	-	1	-	-	1	-	1	-	-
Ragweed	1	-	1	-	-	1	-	1	-	-
Wild onion and wild garlic	1	-	1	-	-	1	-	1	-	-
Sowthistle	1	-	1	-	-	1	-	1	-	-
Yarrow	1	-	1	-	-	1	-	1	-	-
Vervain	1	-	1	-	-	1	-	1	-	-
Southern:[3]										
Turkey oak	1	-	-	1	-	-	1	1	-	-
Sagebrush	1	-	-	1	-	-	1	1	-	-
Bermudagrass	1	-	-	1	-	-	1	1	-	-
Sweetgum	2	-	-	2	-	1	1	1	2	-
Oak brush	2	-	2	-	-	2	-	-	2	-
Hickory	2	1	1	-	-	2	-	2	-	-
Saw-palmetto	1	-	1	-	-	1	-	1	-	-
Gallberry	1	-	1	-	-	1	-	1	-	-
Japanese honeysuckle	1	1	-	-	-	-	1	-	1	-
Kudzu	1	1	-	-	-	1	-	-	1	-
Western:[4]										
Bracken fern	1	-	1	-	-	-	1	1	-	-
Mountainmisery	1	-	1	-	-	-	1	1	-	-
Weed bromegrasses	1	-	1	-	-	1	-	1	-	-
Oak brush	1	1	-	-	-	1	-	1	-	-
Barley	1	1	-	-	-	1	-	1	-	-
Tanoak	1	1	-	-	-	1	-	1	-	-
Annual ryegrass	1	1	-	-	-	1	-	1	-	-

[1] The State reporting was New Jersey.

[2] The State reporting was Illinois.

[3] The 3 States reporting were Alabama, Arkansas, and Florida.

[4] The State reporting was California.

NONCROPLAND

Herbicides were used for weed control on approximately 3.6 million acres of noncropland in the 31 States that reported in 1962 (table 1). Approximately three-fourths of the acreage was treated by custom operators--a much higher percentage than of most cropland areas, pastures, and lawns. The reports of herbicide usage on noncropland did not include the use of herbicides on aquatic weeds in irrigation and drainage canals, ponds, lakes, and marshlands, which is believed to be considerable.

Preemergence herbicides were used on 1,492,000 acres. Nine States reported the use of preemergence herbicides, with Iowa and California reporting the most extensive use. All 31 States, except Iowa, reported using postemergence herbicides on noncropland, with California, Idaho, Kansas, Michigan, and Minnesota reporting the most extensive acreages treated. The costs per acre of preemergence and postemergence treatments were approximately $23.00. (Tables 2 and 3.)

Of the nine States using preemergence herbicides, five reported good results and four reported fair results. Of the 29 States reporting results from postemergence herbicidal applications, 12 reported good results, 15 fair, and 2 poor. Only 7 of 31 States using herbicides on noncropland reported a residue problem. (Table 56.)

The trend of usage of herbicides on noncropland in 1962 was up in 27 of the 31 reporting States. The need for better herbicides on noncropland was reported as urgent in 12 States, but not urgent in 17 States. (Tables 5 and 56.)

Reports on specified weeds on noncropland by degree of infestation, extent of damage, and infestation trend were received from 14 States in the four regions (table 57). Seventy weed species were reported to be slight to severe problems on noncropland. The trends of infestation of about half of these species were reported to be increasing, and the trends were stationary for most of the other species.

Johnsongrass, Canada thistle, ragweed, and curly dock were reported by 9 to 11 States, and bindweed, smartweed, quackgrass, emerged aquatic weeds, submerged aquatic weeds, and wild garlic were reported by 6 to 8 States. Aquatic weeds were classified as moderate or heavy as to degree of infestation and extent of damage by all reporting States, and the trend of infestation was reported to be up in all States except one. Canada thistle, bindweed, johnsongrass, and quackgrass were classified as moderate or heavy as to degree of infestation and extent of damage by half or more of the reporting States, and the trend of infestation was reported to be up in about half the States and stationary or down in the other half. The trends of infestation of curly dock, ragweed, and wild garlic were classified as downward by 60 to 80 percent of the reporting States.

TABLE 56.--Noncropland: Estimated extent and cost of chemical weed control, and States reporting effectiveness, usage trend, need for better control methods, and residue problems, United States, 1962

State and region	Acreage treated		Average cost per acre[1]		Acreage treated by--		Effectiveness of herbicides[2]		Herbicide-usage trend[3]	Need for better herbicides	Residue problems
	Pre-emergence	Post-emergence	Pre-emergence	Post-emergence	Farmer	Custom operator	Pre-emergence	Post-emergence			
	1,000 acres	1,000 acres	Dollars	Dollars	Percent	Percent					
New Jersey	-	14	-	100.00	75	25	-	P	Up	Urgent	No
Pennsylvania	-	8	-	-	100	0	-	F	Up	-	Yes
Northeastern	-	22	-	100.00	84	16	-	1-F 1-P	2-Up	1-Urgent	1-Yes 1-No
Illinois	-	5	-	10.00	90	10	-	G	Up	Little	No
Iowa	1,000	-	20.00	-	25	75	F	-	Up	Little	No
Kansas	-	205	-	2.50	50	50	-	F	Up	Urgent	No
Michigan	-	200	-	10.00	5	95	-	G	Up	Little	No
Minnesota	-	200	-	25.00	50	50	-	F	Up	Little	No
Missouri	-	30	-	2.50	90	10	-	F	Up	Little	No
Nebraska	5	100	120.00	5.00	15	85	F	G	Up	Little	No
North Dakota	-	15	-	1.00	90	10	-	F	Up	Little	No
South Dakota	-	10	-	1.35	50	50	-	-	Up	Urgent	No
Wisconsin	-	30	-	3.00	60	40	-	F	Up	Little	No
North-Central	1,005	795	20.50	10.38	30	70	2-F	3-G 5-F	10-Up	2-Urgent 8-Little	10-No
Arkansas	.1	5.5		15.00	90	10	-	F	Up	Urgent	No
Florida	-	3	-	10.00	75	25	G	G	Up	Urgent	Yes
Georgia	80	20	40.00	40.00	10	90	G	G	Up	Little	No
Kentucky	-	50	-	10.00	40	60	-	F	Up	Little	No
North Carolina	-	8	-	-	99	1	-	F	Sta.	Little	Yes
Tennessee	-	20	-	30.00	5	95	-	G	Up	Little	No
Texas	-	75	-	10.00	90	10	-	G	Up	Urgent	Yes
Virginia	-	120	-	50.00	10	90	-	F	Sta.	Urgent	No
Southern	80.1	301.5	40.00	29.86	33	67	2-G	4-G 4-F	6-Up 2-Sta.	4-Urgent 4-Little	3-Yes 5-No
Arizona	--	10	-	20.00	50	50	-	F	Sta.	Little	No
California	400	600	25.00	25.00	10	90	G	F	Up	Urgent	No
Colorado	-	30	-	15.00	20	80	-	F	Up	Urgent	No
Idaho	-	300	-	50.00	40	60	-	P	Up	Urgent	No
Montana	1	1	10.00	10.00	90	10	-	G	Up	Little	Yes
Nevada	-	2	-	3.00	25	75	-	F	Up	Urgent	No
Oregon	-	.5	-	12.50	80	20	G	G	Up	Little	No
Utah	.5	2	75.00	11.00	60	40	F	F	Up	Urgent	No
Washington	5	50	10.00	3.00	0	100	F	G	Up	-	Yes
Wyoming	-	1	-	100.00	90	10	-	G	Up	Little	Yes
Hawaii	.5	5	15.00	15.00	0	100	G	G	Sta.	Little	No
Western	407.0	1,001.5	24.83	30.97	17	83	3-G 2-F	5-G 5-F 1-P	9-Up 2-Sta.	5-Urgent 5-Little	3-Yes 8-No
UNITED STATES	1,492.1	2,120.0	22.73	23.49	26	74	5-G 4-F	12-G 15-F 2-P	27-Up 4-Sta.	12-Urgent 17-Little	7-Yes 24-No

[1] Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

[2] G, good; F, fair; P, poor.

[3] Sta., stationary.

TABLE 57.--Noncropland: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
Northeastern:[1]	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Johnsongrass	1	-	-	1	-	1	-	1	-	-
Wild onion and wild garlic	1	-	-	1	-	1	-	1	-	-
Aquatic (submerged)	2	-	2	-	-	2	-	1	1	-
Japanese honeysuckle	2	-	2	-	-	2	-	2	-	-
Poison-ivy	2	-	2	-	-	1	1	2	-	-
Bermudagrass	1	-	1	-	-	1	-	1	-	-
Weed bromegrasses	1	-	1	-	-	-	1	1	-	-
Aquatic (emerged)	1	-	1	-	-	1	-	-	1	-
Virginia-creeper	1	-	1	-	-	1	-	1	-	-
Trumpetvine	1	-	1	-	-	1	-	1	-	-
Pokeweed	1	-	1	-	-	1	-	1	-	-
Common lambsquarters	1	-	1	-	1	-	-	1	-	-
Pigweed	1	-	1	-	1	-	-	1	-	-
Ragweed	1	-	1	-	1	-	-	1	-	-
Multiflora rose	1	1	-	-	-	-	1	-	1	-
Japanese knotweed	1	1	-	-	-	-	1	-	1	-
Barnyardgrass	1	1	-	-	1	-	-	1	-	-
Canada thistle	1	1	-	-	-	1	-	1	-	-
Foxtail	1	1	-	-	1	-	-	1	-	-
Nutsedge	1	1	-	-	1	-	-	-	1	-
Quackgrass	1	1	-	-	1	-	-	1	-	-
North-Central:[2]										
Foxtail	4	-	2	2	-	2	1	1	3	-
Johnsongrass	5	2	1	2	1	2	1	2	3	-
Quackgrass	3	1	1	1	-	2	-	2	1	-
Canada thistle	5	2	3	-	2	2	-	4	1	-
Bindweed	5	2	3	-	2	2	-	3	2	-
Ragweed	3	-	3	-	-	2	-	2	1	-
Curly dock	3	1	2	-	1	1	-	2	1	-
Cocklebur	2	-	2	-	-	1	-	1	1	-
Smartweed	4	3	1	-	2	1	-	3	1	-
Sowthistle	3	2	1	-	2	1	-	2	1	-
Juniper	3	2	1	-	1	1	-	3	-	-
Bitterweed	2	1	1	-	-	1	-	2	-	-
Common morningglory	2	1	1	-	-	1	-	2	-	-
Pigweed	2	1	1	-	-	1	-	2	-	-
Wild onion and wild garlic	2	1	1	-	-	1	-	1	1	-
Common chickweed	2	1	1	-	-	1	-	2	-	-
Dodder	1	-	1	-	-	1	-	1	-	-
Wirestem muhly	1	-	1	-	-	1	-	1	-	-
Dogbane	1	-	1	-	-	1	-	1	-	-
Kochia	1	-	1	-	-	1	-	1	-	-
Poison-ivy	1	-	1	-	-	1	-	1	-	-
Chicory	1	-	1	-	-	1	-	1	-	-
Yarrow	1	-	1	-	-	1	-	1	-	-
Ironweed	1	-	1	-	-	1	-	1	-	-
Hoary alyssum	1	-	1	-	-	1	-	1	-	-
Weed bromegrasses	1	-	1	-	-	-	-	-	1	-
Common lambsquarters	1	-	1	-	-	-	-	1	-	-
Russian thistle	1	-	1	-	1	-	-	1	-	-
Henbit	2	2	-	-	1	-	-	1	1	-
Sunflower	1	1	-	-	1	-	-	1	-	-
Barnyardgrass	1	1	-	-	-	-	-	-	1	-
Bermudagrass	1	1	-	-	-	-	-	1	-	-
Crabgrass	1	1	-	-	-	-	-	1	-	-
Goosegrass	1	1	-	-	-	-	-	1	-	-
Oak brush	1	1	-	-	-	-	-	1	-	-
Southern:[3]										
Aquatic (submerged)	2	-	1	1	-	-	2	-	2	-
Aquatic (emerged)	2	-	1	1	-	-	2	-	2	-
Nutsedge	3	2	-	1	1	-	1	-	3	-
Common morningglory	1	-	-	1	-	-	1	1	-	-
Bermudagrass	1	-	-	1	-	1	-	-	-	1
Common chickweed	1	-	-	1	-	1	-	-	-	1
Bitterweed	2	1	-	1	-	-	-	-	2	-
Broomsedge	1	-	-	1	-	-	-	-	1	-
Johnsongrass	3	1	2	-	-	3	-	-	2	1

[1] The 2 States reporting were Maryland and New Jersey.

[2] The 5 States reporting were Illinois, Kansas, Missouri, North Dakota, and Wisconsin.

TABLE 57.--Noncrop land: Number of States reporting degree of infestation, extent of damage and infestation trend of specified weeds, United States, 1962--Continued

Weeds by region	States reporting	Degree of infestation			Extent of damage			Infestation trend		
		Slight	Moderate	Heavy	Slight	Moderate	Heavy	Stationary	Up	Down
Southern[3]--Con.	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Ragweed	3	1	2	-	-	3	-	-	2	1
Henbit	3	1	2	-	-	2	-	1	1	1
Wild onion and wild garlic	3	1	2	-	-	2	-	-	1	1
Cocklebur	2	1	1	-	-	2	-	1	1	-
Curly dock	3	2	1	-	1	1	-	2	1	-
Crabgrass	2	1	1	-	-	1	-	-	1	1
Japanese honeysuckle	1	-	1	-	-	1	-	-	1	-
Oak brush	1	-	1	-	-	1	-	1	-	-
Little wild barley	1	-	1	-	-	-	-	-	1	-
Sandbur	3	2	1	-	2	1	-	-	2	1
Horsenettle	2	2	-	-	2	-	-	-	2	-
Common lambsquarters	2	2	-	-	1	-	-	1	1	-
Smartweed	2	2	-	-	1	-	-	1	1	-
Poison-ivy	1	1	-	-	-	1	-	-	1	-
Poison-oak	1	1	-	-	-	1	-	-	1	-
Mugwort	1	1	-	-	-	1	-	-	1	-
Dogfennel	1	1	-	-	1	-	-	-	1	-
Japanese knotweed	1	1	-	-	1	-	-	1	-	-
Coffeeweed	1	1	-	-	1	-	-	-	1	-
Canada thistle	1	1	-	-	1	-	-	1	-	-
Barnyardgrass	1	1	-	-	-	-	-	-	1	-
Foxtail	1	1	-	-	-	-	-	-	1	-
Goosegrass	1	1	-	-	-	-	-	-	1	-
Purslane	1	1	-	-	-	-	-	-	1	-
Pigweed	1	1	-	-	-	-	-	-	1	-
Weed bromegrasses	1	1	-	-	1	-	-	-	1	-
Cattail	1	1	-	-	1	-	-	-	1	-
Poorjoe	1	1	-	-	1	-	-	-	1	-
Red sorrel	1	1	-	-	1	-	-	-	1	-
Goldenrod	1	1	-	-	1	-	-	-	1	-
Starthistle	1	1	-	-	1	-	-	-	1	-
Common mullein	1	1	-	-	1	-	-	-	1	-
Ironweed	1	1	-	-	1	-	-	-	1	-
Yankeeweed	1	1	-	-	1	-	-	-	1	-

[3] The 3 States reporting were Arkansas, Georgia, and North Carolina.

Western:[4]										
Aquatic (emerged)	3	-	1	2	-	1	2	1	2	-
Canada thistle	3	1	-	2	-	2	1	-	3	-
Quackgrass	3	1	1	1	1	2	-	-	3	-
Aquatic (submerged)	2	-	1	1	-	1	1	-	2	-
Weed bromegrasses	2	-	1	1	-	1	1	1	1	-
Kochia	2	-	1	1	-	2	-	1	1	-
Johnsongrass	2	1	-	1	1	-	1	1	1	-
Punctureviné	1	-	-	1	-	1	-	-	1	-
Bermudagrass	1	-	-	1	-	-	1	1	-	-
Bindweed	3	-	3	-	-	2	1	1	2	-
Hairy whitetop	3	1	2	-	-	2	1	-	3	-
Leafy spurge	2	-	2	-	-	1	1	-	2	-
Curly dock	3	1	2	-	1	2	-	3	-	-
Foxtail	3	1	2	-	1	2	-	3	-	-
Russian knapweed	2	1	1	-	-	1	1	-	2	-
Reed canarygrass	2	1	1	-	1	-	1	-	2	-
Smartweed	2	1	1	-	1	-	1	-	2	-
Barnyardgrass	2	1	1	-	-	2	-	2	-	-
Ragweed	2	1	1	-	2	-	-	2	-	-
Spotted knapweed	1	-	1	-	-	-	1	-	1	-
Blue vervain	1	-	1	-	-	-	1	-	1	-
Bur franseria	1	-	1	-	-	1	-	-	1	-
Burdock	1	-	1	-	-	1	-	-	1	-
Sedge	1	-	1	-	-	1	-	-	1	-
Willow	1	-	1	-	-	1	-	-	1	-
Wild oat	1	-	1	-	-	1	-	1	-	-
Pigweed	2	2	-	-	2	-	-	2	-	-
Toadflax	1	1	-	-	-	-	1	-	1	-
Dalmation toadflax	1	1	-	-	-	-	1	-	1	-
Spiny sowthistle	1	1	-	-	-	-	1	-	1	-
Wild mustard	1	1	-	-	-	1	-	1	-	-
Goldenrod	1	1	-	-	1	-	-	-	1	-
Wild rose	1	1	-	-	1	-	-	1	-	-
Cocklebur	1	1	-	-	1	-	-	1	-	-
Common lambsquarters	1	1	-	-	1	-	-	1	-	-
Sandbur	1	1	-	-	1	-	-	1	-	-

[4] The 4 States reporting were California, Montana, Nevada, and Wyoming.

APPENDIX A--WEEDS ARRANGED ALPHABETICALLY BY COMMON NAME

[In some instances it was not possible to assign a scientific name to the common name reported in the survey; thus, the following list is not a complete list of all the common names listed in the tables.]

COMMON NAME	SCIENTIFIC NAME
Alligatorweed	Alternanthera philoxeroides (Mart.) Griseb.
Alyssum, hoary	Berteroa incana (L.) DC.
Amaranth	Amaranthus spp.
green. (See Pigweed, smooth.)	
spiny	A. spinosus L.
Apple-of-Peru	Nicandra physalodes (L.) Gaertn.
Arrowhead	Sagittaria sp.
Aster, white heath	Aster pilosus Willd.
Balsam-apple	Echinocystis lobata (Micht.) Torr. & Gray
Barley	Hordeum sp.
little wild	H. pusillum Nutt
wild	H. leporinum Link
Barnyardgrass	Echinochloa crusgalli (L.) Beauv.
Bassia, fivehook	Bassia hyssopifolia (Pall.) Ktze.
Bedstraw	Galium sp.
Beggarticks	Bidens sp.
hairy	B. pilosa L.
Beggarweed, Florida	Desmodium tortuosum (Sw.) DC.
Bellflower, creeping	Campanula rapunculoides L.
Bermudagrass	Cynodon dactylon (L.) Pers.
Bindweed	Convolvulus sp.
Bitterweed. (See Rubberweed, bitter.)	
Blackberry, wild	Rubus sp.
Black medic	Medicago lupulina L.
Bluegrass, annual	Poa annua L.
Bluemustard	Chorispora tenella DC.
Blueweed, Texas	Helianthus ciliaris DC.
Brachiaria	Brachiaria sp.
Brassbuttons, Australian	Cotula australis (Sieb.) Hook
Bracken, fern	Pteridium aquilinum (L.) Kuhn
Brome, ripgut	Bromus rigidus Roth
Bromegrasses, weed	Bromus spp.
Broomsedge	Andropogon virginicus L.
Broomweed	Gutierrezia sp.
Buckbrush	Symphoricarpos sp.
Buckhorn	Plantago lanceolata L.
Buckwheat, wild	Polygonum convolvulus L.
Burclover, California	Medicago hispida Gaertn.
Burdock	Arctium sp.
Burroweed	Haplopappus tenuisectus (Greene) Blake ex Benson
Buttercup	Ranunculus sp.
Cactus	Opuntia sp.
Camelthorn	Alhagi pseudalhagi (Bieb.) Desv.
Canarygrass, reed	Phalaris arundinacea L.
Carpetweed	Mollugo verticillata L.
Carrot, wild	Daucus carota L.

COMMON NAME	SCIENTIFIC NAME
Catchfly	Silene sp.
Cattail	Typha sp.
Ceanothus	Ceanothus sp.
Chamise	Adenostoma sp.
Cheat	Bromus secalinus L.
Chess, soft	B. mollis L.
Chickweed, common	Stellaria media (L.) Cyrill.
Chicory	Cichorium intybus L.
Chokecherry	Prunus virginiana L.
Cinquefoil	Potentilla sp.
shrubby	P. fruticosa L.
Cockle:	
corn	Agrostemma githago L.
cow	Saponaria vaccaria L.
white	Lychnis alba Mill.
Cocklebur	Xanthium sp.
Coffeeweed	Daubentonia texana Pierce
Coralberry	Symphoricarpos orbiculatus Moench.
Coyotebrush	Bacharis pilularis DC.
Crabgrass	Digitaria sp.
Cranesbill	Geranium sp.
Crowfootgrass	Dactyloctenium aegyptum (L.) Richter
Cucumber, wild	Echinocystis lobata (Michx.) Torr. & Gray
Cuphea, clammy. (See Redstem.)	
Cutgrass, rice	Leersia oryzoides (L.) Swartz.
Daisy	Chrysanthemum sp.
English	Bellis perennis L.
oxeye	Chrysanthemum leucanthemum L.
Dallisgrass	Paspalum dilatatum Poir.
Dandelion	Taraxacum sp.
Darnel	Lolium temulentum L.
Deathcamas	Zigadenus sp.
Devils-paintbrush	Hieracium pratense Tausch
Dock, curly	Rumex crispus L.
Dodder	Cuscuta sp.
Dogbane	Apocynum sp.
Dogfennel	Eupatorium capillifolium (Lam.) Small
Drymary	Drymaria cordata (L.) Willd.
Ducksalad	Heteranthera limosa (SW.) Willd.
Eriogonum	Eriogonum sp.
Eupatorium	Eupatorium sp.
Eveningprimrose	Oenothera sp.
Falseflax	Camelina sp.
Falsepennyroyal, American	Hedeoma pulegioides (L.) Pers.
Falsevalerian	Stachytarpheta sp.
Fennel, dog	Eupatorium capillifolium (Lam.) Small
Fern, bracken	Pteridium aquilinum (L.) Kuhn
Fescue, rough	Festuca scabrella Torr.
Fiddleneck:	
Coast	Amsinckia intermedia Fisch. & Mey
Douglas	A. douglasiana A. DC.
Fleabane	Erigeron sp.
annual	E. annuus (L.) Pers.
Fountaingrass	Pennisetum setaceum (Forsk.) Chiov.

COMMON NAME	SCIENTIFIC NAME
Foxtail	Setaria spp.
giant	S. faberii Herrm.
green	S. viridis (L.) Beauv.
yellow	S. glauca (L.) Beauv.
Franseria, bur	Franseria discolor Nutt.
Fumitory	Fumaria officinalis L.
Galinsoga	Galinsoga ciliata (Raf.) Blake
Gallberry	Ilex glabra (L.) Gray
Garlic, wild	Allium vineale L.
Geranium, Carolina	Geranium carolinianum L.
Goatgrass	Aegilops sp.
Goatweed	Croton sp.
Goldenrod	Solidago sp.
Goosefoot, nettleleaf	Chenopodium murale L.
Goosegrass	Eleusine indica (L.) Gaertn.
Gorse	Ulex europaeus L.
Guineagrass	Panicum maximum Jacq.
Greenbrier	Smilax sp.
Gromwell	Lithospermium officinale L.
corn	L. arvense L.
Groundcherry	Physalis sp.
perennial	P. subglabrata Mack. & Bush.
Guava	Psidium sp.
Gum, black	Nyssa sylvatica Marsh.
Gumweed	Grindelia squarrosa (Pursh) Dunal
Halogeton	Halogeton glomeratus (M. Bieb.) C. A. Mey.
Hawkweed	Hieracium sp.
orange	H. aurantiacum L.
Hazel (brush)	Corylus sp.
Hemlock, poison	Conium maculatum L.
Hempnettle	Galeopsis tetrahit L.
Henbit	Lamium amplexicaule L.
Hickory	Carya sp.
Honeysuckle, Japanese	Lonicera japonica Thunb.
Horsebrush	Tetradymia sp.
Horsenettle	Solanum sp.
Horsetail, field	Equisetum arvense L.
Horseweed	Erigeron canadensis L.
Indigo	
curly	Aeschynomene virginica (L.) BSP
tall	Sesbania exaltata (Raf.) Cory
Iris	Iris sp.
Ironweed	Vernonia sp.
Ivy, ground	Glechoma hederacea L.
Jerusalem-Oak	Chenopodium botrys L.
Jimsonweed	Datura stramonium L.
Johnsongrass	Sorghum halepense (L.) Pers.
Jungle-rice	Echinochloa colonum (L.) Link
Juniper	Juniperus sp.

COMMON NAME	SCIENTIFIC NAME
Kikuyugrass	Pennisetum clandestinum Hochst. ex Chior.
Knapweed	Centaurea sp.
diffuse	C. diffusa Lam
Russian	C. repens L.
spotted	C. maculosa Lam.
Knawel	Scleranthus annuus L.
Knotgrass	Paspalum distichum L.
Knotweed	Polygonum sp.
Japanese	P. cuspidatum Sieb. and Zucc.
prostrate	P. aviculare L.
silversheath	P. argyrocoleon Steud. ex Kunze
Kochia	Kochia scoparia (L.) Schrad.
Lambsquarters, common	Chenopodium album L.
Lantana, common	Lantana camara L.
Larkspur	Delphinium sp.
Lettuce, wild	Lactuca sp.
prickly	L. serriola L.
Locoweed	Astragalus sp. or Oxytropis sp.
Longtom	Paspalum sp.
Loosestrife	Lythrum sp.
Lupine	Lupinus sp.
Maidencane	Panicum hemitomon Schult.
Mallow, little	Malva parviflora L.
Marshelder	Iva xanthifolia Nutt.
Mayweed	Anthemis cotula L.
Medic, black	Medicago lupulina L.
Mediterranean-grass	Schismus barbatus (L.) Thell.
Medusahead	Elymus caput-medusae L.
Mesquite	Prosopis juliflora (Sw.) DC.
Milkweed	Asclepias sp.
western whorled	A. verticillata L
Millet, Texas	Panicum texanum Buckl.
Morningglory, common	Ipomoea purpurea (L.) Roth.
Mountainmisery	Chamaebatia foliosa Benth.
Mugwort	Artemisia vulgaris L.
Muhly	Muhlenbergia spp.
wirestem	M. frondosa (Poir.) Fern.
Mullein, common	Verbascum thapsus L.
Mustard	Brassica sp.
blue	Chorispora tenella DC.
tansy	Descurainia pinnata (Walt.) Britt.
tumble	Sisymbrium altissimum L.
wild	Brassica kaber (DC.) L. C. Wheeler
Needlegrass	Stipa sp.
Nightshade	Solanum sp.
black	S. nigrum L
hairy	S. villosum Mill.
silverleaf	S. elaeagnifolium Cav.
Nimblewill (See also muhly)	Muhlenbergia schreberi J. F. Gmel.
Nutsedge	Cyperus sp.

COMMON NAME	SCIENTIFIC NAME
Oak (brush)	Quercus sp.
blue	Q. douglasii Hook. & Arn.
live	Q. virginiana Mill.
Turkey	Q. laevis Walt.
Oat, wild	Avena fatua L.
Onion, wild	Allium canadense L.
Orchardgrass	Dactylis glomerata L.
Oxtongue, bristly	Picris echioides L.
Pangolagrass	Digitaria decumbens Stent.
Panicgrass	Panicum sp.
Panicum:	
annual	Panicum sp.
browntop	P. fasciculatum Swartz.
fall	P. dichotomiflorum Michx.
Paragrass	P. purpurascens Raddi.
Passionflower, maypop	Passiflora incarnata L.
Pennycress, field	Thlaspi arvense L.
Pepperweed	Lepidium sp.
Virginia	L. virginicum L.
yellowflower	L. perfoliatum L.
Pigweed. (See Amaranth.)	
redroot	Amaranthus retroflexus L.
smooth	A. hybridus L.
tumble	A. albus L.
Plantain	Plantago sp.
buckhorn	P. lanceolata L.
Poison-ivy	Rhus radicans L.
Poison-oak	R. toxicodendron L.
Pacific	R. diversiloba T. & G.
Pokeweed	Phytolacca americana L.
Poorjoe	Diodia teres Walt.
Poplar (brush)	Populus sp.
Povertyweed	Iva axillaris Pursh
Pricklypear	Opuntia sp.
Puncturevine	Tribulus terrestris L.
Purpletop	Triodia flava (L.) Smyth
Purslane	Portulaca oleracea L.
horse	Trianthema portulacastrum L.
Pusley, Florida	Richardia scabra L.
Quackgrass	Agropyron repens (L.) Beauv.
Rabbitbrush	Chrysothamnus sp.
Radish, wild	Raphanus raphanistrum L.
Ragged-robin	Lychnis flos-cuculi L.
Ragweed	Ambrosia sp.
Rattlebox	Crotalaria sagittalis L.
Redstem	Cuphea petiolata (L.) Koehne
Redtop	Agrostis alba L.
Reed Canarygrass	Phalaris arundinacea L.
Red Vine	Brunnichia cirrhosa Gaertn.
Rice, red	Oryza sativa L.
Rocket, yellow	Barbarea vulgaris R. Br.
Rosarypea	Abrus sp.

COMMON NAME	SCIENTIFIC NAME
Rose:	
multiflora	Rosa multiflora Thunb.
wild	R. sp.
Rubberweed, bitter	Hymenoxys odorata DC.
Russian-olive	Elaeagnus angustifolia L.
Ryegrass, Italian (annual)	Lolium multiflorum Lam.
Sagebrush	Artemisia sp.
Sagewort	Arenaria serpyllifolia L.
St. Johnswort	Hypericum perforatum L.
Saltcedar	Tamarix pentandra Pall.
Sandbur	Cenchrus pauciflorus Benth.
southern	C. echinatus L.
Saw-palmetto	Serenoa repens (Bartr.) Small
Scotch-broom	Cystisus scoparius (L.) Link.
Scotch-thistle	Onopordum sp.
Sedge:	
broadleaf	Carex sp.
jointed	C. sp.
umbrella	C. sp.
Senna	Cassia sp.
Sensitiveplant, wild	Mimosa pudica L.
Sesbania	Sesbania sp.
Shattercane	Sorghum vulgare Pers.
Shepherdspurse	Capsella bursa-pastoris (L.) Medic.
Sicklepod	Cassia tora L.
Sida, prickly	Sida spinosa L.
Smartweed	Polygonum sp.
Smutgrass	Sporobulus poiretti (Roem. & Schult.) Hitchc.
Sorrel	Rumex acetosa L.
red	R. acetosella L.
Sourgrass	Trichachne insularis (L.) Nees
Sowthistle	Sonchus sp.
perennial	S. arvensis L.
spiny	S. asper (L.) Hill.
Speedwell	Veronica sp.
Byzantine	V. buxbaumii Tenore
Spikerush	Eleocharis sp.
Sprangletop	Leptochloa sp.
Spurry	Spergula sp.
corn	S. arvensis L.
Starthistle	Centaurea sp.
yellow	C. solstitialis L.
Sticktight	Lappula sp.
Stinkgrass	Eragrostis cilianensis (All.) Vignolo Lutati
Spurge	Euphorbia sp.
leafy	E. esula L.
prostrate	E. supina Raf.
spotted	E. maculata L.
Sumpweed	Iva sp.
Sunflower	Helianthus sp.
Sweetgum	Liquidambar styraciflua L.
Sweetpotato, wild	Ipomoea batatas (L.) Lam.

COMMON NAME	SCIENTIFIC NAME
Tanoak	Lithocarpus densiflora (H. & A.) Rehd.
Tansymustard	Descurainia pinnata (Walt.) Britt.
Tarweed	Madia sp.
Tasselflower, sowthistle	Emilia sonchifolia DC.
Thistle, blessed	Cnicus benedictus L.
bull	Cirsium vulgare (Savi) Tenore
Canada	C. arvense (L.) Scop.
Italian	Carduus pycnocephalus L.
musk	C. nutans L.
Russian	Salsola kali L. var. tenuifolia Tausch
Tick-trefoil	Desmodium canadense (L.) DC.
Ticklegrass	Agrostis hyemalis (Walt.) BSP.
Toadflax	Linaria sp.
dalmatian	L. dalmatica (L.) Mill
yellow	L. vulgaris Hill
Torpedograss	Panicum repens L.
Trumpetcreeper. (See trumpetvine.)	
Trumpetvine	Campsis radicans (L.) Seem.
Tumblemustard	Sisymbrium altissimum L.
Turnip, wild	Brassica campestris L.
Umbrella-sedge	Carex sp.
Vaseygress	Paspalum urvillei Stend.
Velvetleaf	Abutilon theophrasti Medic.
Vervain	Verbena sp.
blue	V. hastata L.
Vetch	Vicia sp.
Virginia-creeper	Parthenocissus quinquefolia (L.) Planch.
Waltheria, Florida	Waltheria americana L.
Waterhemlock	Cicuta sp.
Waterhemp, western	Acnida tamariscina (Nutt.) Wood
Waxmyrtle	Myrica sp.
Whitetop	Cardaria draba (L.) Desv.
hairy	C. pubescens (C. C. Meyer) Rollins
Willow	Salix sp.
Wintercress	Barbarea sp.
Witchgrass	Panicum capillare L.
Woodsorrel	Oxalis sp.
creeping	O. corniculata L.
yellow	O. stricta L.
Wyethia	Wyethia sp.
Yankeeweed	Eupatorium compositifolium Walt.
Yarrow	Achillea sp.
Yucca	Yucca sp.

APPENDIX B--WEEDS ARRANGED ALPHABETICALLY BY SCIENTIFIC NAME

(This list contains the names of weeds reported by their scientific name.)

Amaranthus viridis L.

Artemisia glauca Pall.

Commelina diffusa Burm.

Cyperus sp.

Desmodium canum Schinz & Thellung.

Dodonaea eriocarpa Sm.

Emex spinosa Campd. Rum.

Fimbristylis autumnalis (L.) R. & S.

Paspalum conjugatum Bergius

Paspalum floridanum Michx.

Styphelia tameiameiae F. Muell.