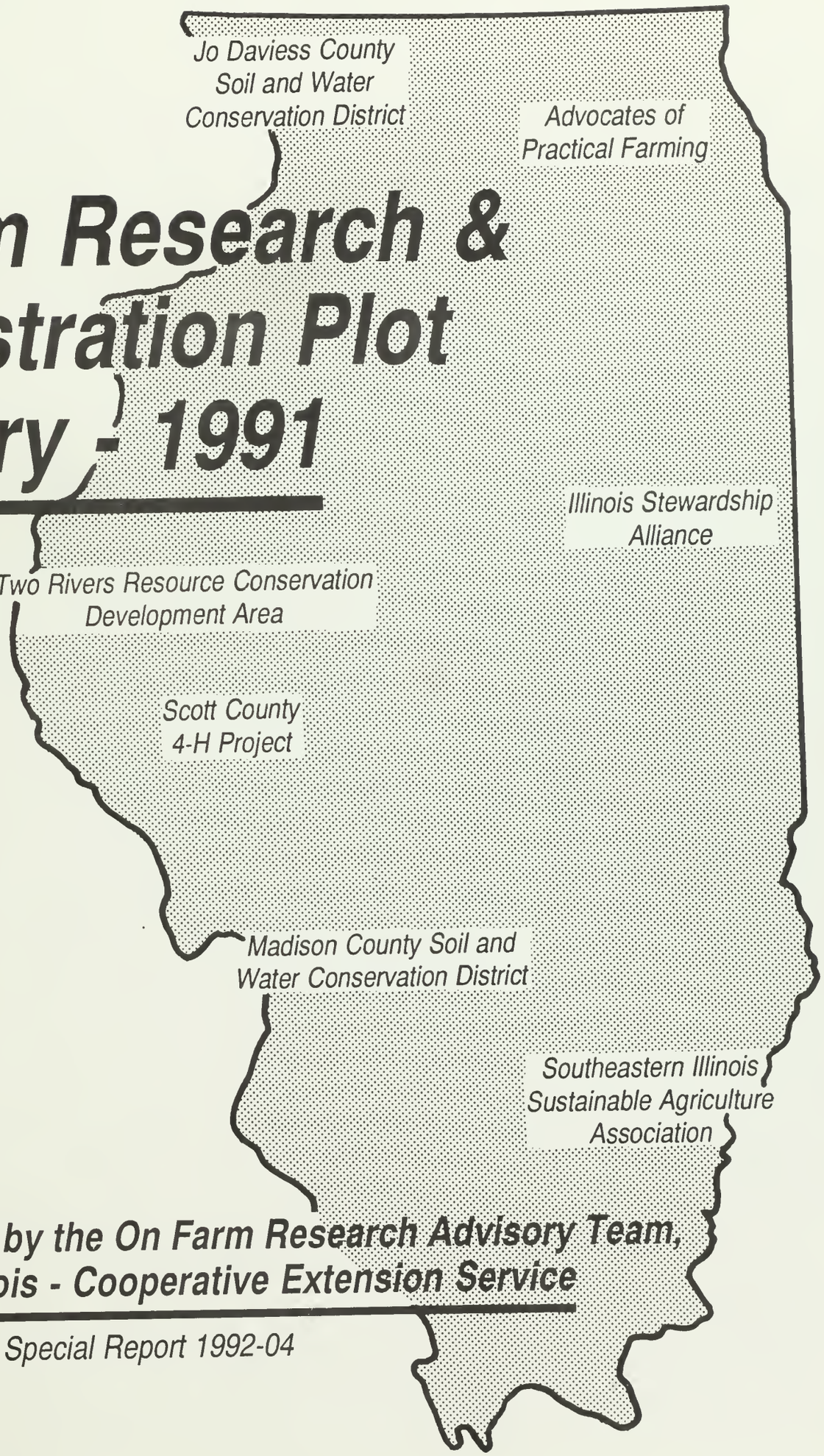

On-Farm Research & Demonstration Plot Summary - 1991

Results compiled by the On Farm Research Advisory Team, University of Illinois - Cooperative Extension Service

Agronomy Special Report 1992-04

ON-FARM RESEARCH & DEMONSTRATION

PLOT SUMMARY — 1991

MAY 1992

The On-Farm Research Advisory Team was composed of the following Extension Specialists:

Gary Pepper (Chair) — Agronomy
David Pike — Agronomy
Emerson Nafziger — Agronomy
Mike Gray — Entomology
Darrin Eastburn — Plant Pathology
John Masiunas — Horticulture

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Illinois Department of Energy and Natural Resources
325 W. Adams Street, Room 300
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INTRODUCTION

A group of Extension Specialists at the University of Illinois organized an On-Farm Research Advisory Team (OFRAT) in the fall of 1990. The purpose of the group was to make available the research training and experience of Extension Specialists to those individuals involved in planning and conducting on-farm research during the 1991 growing season. The goal of the OFRAT was to make on-farm research as productive as possible—allowing cooperators to learn as much as possible from the experiments they conducted.

With funding from the Illinois Department of Energy and Natural Resources, the OFRAT has here compiled results from most of the plot work conducted by seven organizations in our state during 1991. Within many of the seven organizations, both replicated and nonreplicated plot studies were conducted. All cooperators were requested to submit the results of their research and demonstration plots to the OFRAT for inclusion in this document. Members of the seven organizations developed plot plans in the spring of 1991, but some studies are not included in this booklet because the data were not submitted to the OFRAT.

For each plot report, the description of the study is based on information submitted by the cooperator. In many cases, considerable detail was provided on soil fertility, planting dates and rates, etc. In other cases, the information provided was more limited. Readers desiring additional information about the procedures and data collected in the studies reported are encouraged to contact cooperators directly. The mailing address of the cooperator is provided for each research or demonstration plot report included in this booklet.

Results are tabulated for each plot study, and where replication of treatments was used, an analysis of variance was conducted. Only when the Least Significant Difference (LSD) was significant is the calculated value provided. Differences in results due to treatments imposed, which vary by more than the LSD, are considered significantly different at the 95% confidence level. If the statistical analysis revealed no significant differences, the LSD is indicated as "N.S.," meaning that there were no significant differences due to the treatments imposed at that confidence level.

When plots did not have replications, statistical analysis of the data was impossible. Without a statistical analysis, it cannot be determined whether any reported variation in yield was due to the treatments applied, to chance, or to some other factor such as the position of the plot in the field. For this reason, results taken from nonreplicated plots should not be used as a basis for making management changes until other supporting evidence or data also indicate that a change will result in greater yield or greater profit, or is otherwise appropriate.

Many plots suffered weather (drought) stress during 1991, and as a consequence, treatment effects may have been reduced or eliminated. For example, in a number of plots the variable studied was reduced rates of nitrogen on corn. Under droughty conditions, minimal or no response in yield to nitrogen application may have been detected because water was a much more limiting factor for the crop than was nitrogen supply. Any trends or differences resulting from treatments imposed under stressful conditions need further study under more normal or favorable conditions.

Each report on a plot study or demonstration concludes with a section of comments. These are added for the reader's consideration and are intended to assist the reader with evaluation and interpretation of the results. In some cases, particularly those involving reduced rates of chemical application for pest control, the reader may be reminded that applications of a product outside label rates will likely release manufacturers from their warranty for product performance. When comments on soil fertility level are made, they are based on the recommendations on soil fertility included in the Agronomy Handbook, Cooperative Extension Circular 1311.

Well-planned and well-documented research is a tool for gathering new information on crop production, and farmers are encouraged to conduct on-farm studies on issues they are concerned with. Research efforts are most productive when experiments are well designed, data is carefully collected, and results are statistically analyzed. Anyone wishing assistance in the design of future on-farm studies is encouraged to contact Cooperative Extension Specialists at the University of Illinois working in the area of their research interest.

Gary E. Pepper
Chairman, On-Farm Research
Advisory Team

PROFILES OF REPORTING ORGANIZATIONS

Advocates of Practical Farming

The Advocates of Practical Farming is an organization comprised of the Soil and Water Conservation Districts of Boone, DeKalb, and McHenry Counties, and the Cooperative Extension Service of DeKalb County. The purpose of the cooperative organization is to encourage producers in northeastern Illinois to adopt sustainable farming techniques by promoting demonstrations in the tri-county area and by seeking funds for demonstrations and education.

Contact: Joe Bybee
DeKalb County Soil and Water Conservation District
315 North Sixth Street
DeKalb, IL 60115
(815) 756-3237

Illinois Stewardship Alliance

The Illinois Stewardship Alliance is a membership organization that works to empower citizens of rural Illinois to change policies, institutions, and attitudes that threaten the quality of life and foster the degradation of the environment. The mission of the Alliance is to assist farming families and residents of rural Illinois to promote the stewardship of natural resources and build healthy rural communities.

Contact: Doug Zehr
Illinois Stewardship Alliance
R.R. 2 Box 121
Gibson City, IL 60936
(217) 749-2398

Jo Daviess County Soil and Water Conservation District

The activities of the Jo Daviess County Soil and Water Conservation District include information programs, field demonstrations, and direct field assistance to landowners and farm operators. Many of the activities directly support a sustainable agriculture concept. Information programs are community-based with cooperation from local groups, school districts, and local agencies.

Contact: Lester Johnson
227 N. Main
Elizabeth, IL 61028
(815) 858-2229

Madison County Soil and Water Conservation District

The Madison County Soil and Water Conservation District assists landowners in the protection and wise use of their natural resources. The objectives of the District include assisting landowners in planning and applying conservation practices, developing orderly land use plans to protect prime farmland while allowing for urban growth, and maintaining a well-informed public and a cooperative relationship with agencies involved in natural resource management.

Contact: Larry Firkus
Madison County Soil and Water Conservation District
P. O. Box 482
Edwardsville, Il 62025
(618) 656-5166

Scott County 4-H Project

Scott County 4-H projects are supported by the Scott County Extension Office under a grant for sustainable agriculture research received from the Illinois Department of Energy and Natural Resources.

Contact: Gary Bickmeier
24 S. Main
Winchester, IL 62694
(217) 742-9572

Southeast Illinois Sustainable Agriculture Association

The Southeast Illinois Sustainable Agriculture Association is an organization of farmers in a 14-county region in southeastern Illinois. The primary purpose of the organization is to assist farmers to explore tillage, cropping system, fertilization, and pest control practices that utilize appropriate technologies to improve efficiency, profitability, farm survival, water quality, soil and energy conservation, and other essential components of agricultural sustainability.

Contact: Tom Hortin
Chairman, SISAA
R. 1, Box 254
Albion, IL 62806
(618) 445-3028

Two Rivers Resource Conservation and Development Project

The Two Rivers Resource Conservation and Development Area program is a project of the U.S. Department of Agriculture which operates in the five west central Illinois counties of Adams, Brown, Calhoun, Pike, and Schuyler. The purpose of the project is to assist local citizens in promoting economic growth, protecting the environment, and addressing the social concerns of the five counties.

Contact: William W. McCartney
110 E. Fayette,
Pittsfield, IL 62363
(217) 285-4114

Advocates of Practical Farming — 1991

. . . Replicated Studies

Cooperator:

Paul Butler
Rt 1 Box 203
Malta, IL 60150

Objective of Research:

To evaluate the effects of different nitrogen rates on corn yield.

Procedure:

Corn was planted following an unidentified hay crop. Rates of nitrogen applied to corn varied from 0 to 75 pounds per acre. No details were provided on soil tests, date of seeding, method of nitrogen application, or tillage method used. Four replications of treatments were used in the study.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
0	114
25	143
50	149
75	148

$LSD_{.05} = 9$

Comments from OFRAT:

Yields of corn across the 25- to 75-pound-per-acre rates did not vary significantly. The unidentified hay crop, which preceded the corn, may have provided residual nitrogen to help meet the needs of the corn crop. From the yields reported, it appears that little supplemental nitrogen was required to produce full yields when corn followed the unidentified hay crop.

Cooperator:

Robert & Chris Watson
RR 1 Box 117
Malta, IL 60150

Objective of Research:

To evaluate the effects of reduced side-dressed nitrogen applications on the yield of corn.

Procedure:

The field, which produced corn in 1990, was planted on May 2, 1991, at 26,000 kernels per acre. The field had been chisel-plowed in the fall, disked in the spring, and cultivated prior to planting. The row spacing used was 38 inches. No soil test data were provided for the field. Side-dress nitrogen was applied at three rates, with two replications of each nitrogen rate. A single plot, not included in the analysis of variance, received preplant nitrogen at a rate of 200 pounds per acre.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
Side-dress	
100	99.3
150	98.0
175	96.9
	$LSD_{.05}$ = N.S.
Preplant-applied	
200	111.4

Comments from OFRAT:

At rates used for nitrogen side-dress, corn yield did not vary significantly. A control (zero nitrogen rate) plot would have been helpful in determining whether nitrogen application benefited yield. The single plot receiving a preplant application of 200 pounds per acre of nitrogen appeared to yield slightly better, but that plot cannot be compared to side-dressed plots.

Cooperator:

John Carmichael
P.O. Box 138
Garden Prairie, IL 60138

Objective of Research:

To evaluate the effect of nitrogen rates on corn yield.

Procedure:

Two corn hybrids, AgVenture 449 and AgVenture 551 were planted using a split-plot design with three replications of treatments. No details were provided on field history, soil test data, or tillage system used.

Results:

The analysis of variance showed a lack of corn hybrid x nitrogen rate interaction, which indicated the two hybrids responded to nitrogen in a similar manner. Because of the lack of this interaction, only yield averaged across hybrids is provided in the table below.

Nitrogen rate pounds / acre	Corn yield bushels / acre
0	97
40	126
80	131
120	132
160	133
200	138

$LSD_{.05} = 7$

Comments from OFRAT:

The yields resulting from a nitrogen rate of 80 pounds per acre or more suggest that a source of residual nitrogen (for example, soybeans) was in the field the preceding year. It appears that the rates above 80 pounds per acre resulted in noneconomic gains in yield.

Advocates of Practical Farming — 1991

. . . Nonreplicated Demonstrations

Cooperator:

Max Burrows
10116 Burrows Rd.
Marengo, IL 60152

Objective:

To demonstrate the effects of nitrogen fertilizer on corn yield.

Procedure:

Two corn hybrids, Garst 8574 and Crows 488 were planted on May 2, 1991, into a field which the previous year produced corn. The rate of nitrogen application varied from 0 to 150 pounds per acre. The same nitrogen rates were not applied to both hybrids. Instead, hybrid-nitrogen rate combinations were used in the plot. Some replication of nitrogen treatment levels was done, but no analysis of variance was possible on the yield data due to confounding of hybrid with nitrogen rate.

Results:

Hybrid planted	Nitrogen rate pounds / acre	Corn yield bushels / acre
Crows 488	0	90
Garst 8574	100	102
Crows 488	130	100
Garst 8574	150	111

Comments from OFRAT:

In plots in which 100 or more pounds per acre of nitrogen were applied, there appeared to be some yield benefit. Optimum nitrogen rate will depend on the hybrid used and the environment in which it is produced.

Cooperator:

Bob Kemp
18528 Poplar Grove Rd.
Poplar Grove, IL 61065

Objective:

To demonstrate nitrogen rate effects on corn yield.

Procedure:

Two 20-acre fields received either 56 or 148 pounds of nitrogen. For comparison purposes, a strip of 24 rows in each field received no nitrogen. It was not reported whether the yield shown below for 0 nitrogen was from one of the two 20-acre fields, or was the average of the two strips not receiving nitrogen.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
0	104
56	118
148	115

Comments from OFRAT:

Differences in yield reported could be associated with location in the field rather than nitrogen applied.

Cooperator:

Nick Moore
3508 S. Creso Rd.
DeKalb, IL 60115

Objective:

To demonstrate the effect of chemical versus mechanical weed control on grain yield of corn.

Procedure:

The use of Bicep and Banvel in one strip of corn was compared to mechanical cultivation in an adjoining strip.

Results:

Weed control method	Corn yield bushels / acre
Mechanical	130.7
Chemical	133.5

Comments from OFRAT:

It appears that corn yield was not affected by mechanical weed control versus a chemical program for weed control. Slight differences in yield could be due to location in the field rather than the type of weed control measures used. Notes on the degree to which weeds were a problem would be useful in such a comparison.

Cooperator:

Michael Book / Book Farms
22414 Striet Rd.
Harvard, IL 60033

Objective:

To demonstrate the effect on corn yield of variations in the amount and timing of nitrogen applications.

Procedure:

Treatments used in the nitrogen demonstration plot included preplant nitrogen at 100 and 150 pounds per acre, and 28 percent nitrogen applied at planting at 70 pounds per acre.

Results:

Hybrid planted	Nitrogen applied pounds / acre	Corn yield bushels / acre
	preplant	
Crows 488	100	98
Noblebear 422	100	108
	preplant	
Crows 488	150	100
Noblebear 422	150	107
	at planting	
Noblebear 422	70	101

Comments from OFRAT:

Differences in yield do not appear to be associated with the rate of nitrogen application. The use of a zero-rate nitrogen plot would have helped indicate if nitrogen was even needed by the corn crop produced.

Cooperator:

Dick Stoxen
8605 Maxon Rd.
Harvard, IL 60033

Objective:

To demonstrate the effects of nitrogen rates on corn yield.

Procedure:

Nitrogen at 40, 90, and 140 pounds per acre was applied to the three plots in the demonstration.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
40	165
90	156
140	152

Comments from OFRAT:

Data do not suggest enhanced yield from the nitrogen applied. Location in the field, rather than nitrogen application, may account for differences in yield.

Illinois Stewardship Alliance — 1991

. . . Replicated Studies

Cooperator:

Jeff and Jay Dahl
R 2 Box 10
Orion, IL 61273

Objective of Research:

To evaluate the effectiveness of Extrazine rates for weed control in corn.

Procedure:

Prior to the current study, corn was produced in 1990. The soil test data reported were P_1 = 134, K = 293, and pH = 6.2. Five replications of treatments were used in the study.

Results:

Herbicide rate Extrazine / acre	Corn yield bushels / acre
0	66.5
1 pint	91.5
2 pints	94.8
4 pints	92.8
	$LSD_{.05}$ = 10.8

Comments from OFRAT:

Herbicide rates from 1 pint to 4 pints resulted in very similar corn yields, all of which were better than no herbicide control. Reducing application rates of herbicides below those indicated on the label will release chemical suppliers from their guarantee of weed control by their product.

Cooperator:

Gayle Goold
R 2 Box 153
Paxton, IL

Objective of Research:

To evaluate nitrogen side-dress rates on corn grain yield.

Procedure:

Corn, following soybeans in 1990, was planted in ridge-till on April 4, 1991. Cargill 7877 was the hybrid used in the study. Side-dress nitrogen was applied on June 4, 1991. Four replications of treatments were used in the study. Soil test data reported for the field were P_1 = 189, K = 340, and pH = 6.4.

Results:

Treatment nitrogen side-dressed pounds / acre	Corn yield bushels / acre
0	93.0
40	96.0
80	98.0

$LSD_{.05}$ = N.S.

Comments from OFRAT:

If adequate nitrogen is available in a field, no side-dress response will occur. Phosphorus and potassium soil tests suggest that manure or heavy fertility applications may have been applied previously, building up phosphorus and potassium, and possibly nitrogen as well. This might explain the lack of response noted from side-dress nitrogen.

Cooperator:

Jerry Albrecht
R 2 Box 116
Gibson City, IL 60936

Objective of Research:

To evaluate nitrogen side-dress rates on corn produced using conventional tillage.

Procedure:

Side-dress nitrogen, using ammonia as the source, was applied on May 30, 1991, at rates from 140 to 200 pounds per acre. Pioneer 3379 was planted following soybeans in 1990, using conventional tillage in the research field. Two replications of treatments were completed in the study. Soil test data reported were P_1 = 50, K = 325, and pH = 6.5.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
140	54.1
160	48.6
180	67.3
200	58.4

$LSD_{.05}$ = N.S.

Comments from OFRAT:

Dry weather can be credited with the generally low corn yields reported in the study. Drought may have effectively canceled out any treatment effect from nitrogen applied. Another possibility is that the lowest rate used may have been adequate for the field where the study was conducted. A control (zero rate nitrogen) treatment would have helped determine if yield responded to nitrogen at all.

Cooperator:

Jerry Albrecht
R 2 Box 116
Gibson City, IL 60936

Objective of Research:

To evaluate nitrogen rate effects on corn grain yield under no-till production.

Procedure:

Nitrogen rates from 140 to 200 pounds per acre (using ammonia) were side-dressed on May 30. Pioneer 3379 was planted on April 30 using no-till in the experiment. Soil test data reported for the field were P_1 = 50, K = 325, and pH = 6.5. Two replications of each treatment were used in the study.

Results:

Nitrogen side-dress rate pounds / acre	Corn yield bushels / acre
140	66.7
160	76.8
180	72.3
200	68.8

$LSD_{.05}$ = N.S.

Comments from OFRAT:

Dry weather stress on the crop generally reduced yield potential of the crop. The lowest rate of nitrogen, 140 pounds per acre, may have been adequate for the field, even under favorable conditions. Alternatively, the weather stress may have canceled out any effect of the nitrogen treatment imposed. Whatever the explanation, no significant variation in yield resulted from the treatments imposed. A control (zero rate nitrogen) treatment would have helped determine if yield responded to nitrogen at all.

Cooperator:

Moye Farms
R 1 Box 70
Ridgway, IL 62979

Objective of Research:

To evaluate corn response to different nitrogen sources and rates.

Procedure:

Corn, after corn in 1990, was provided with different nitrogen sources and rates. Application of nitrogen was made preplant, with corn planted on April 6, 1991. Three replications of treatments were used in the study.

Results:

Nitrogen rate	Corn yield bushel / acre
Super U (46% nitrogen) Nitrogen at 150 pounds / acre	129
NH3 (82% nitrogen) Nitrogen at 120 pounds / acre	121
NH3 (82% nitrogen) Nitrogen at 162 pounds / acre	126

$LSD_{.05} = 3$

Comments from OFRAT:

The LSD figure for the data set is extremely small, indicating uniform conditions in the field. Since the rates of nitrogen were not the same for the different sources of nitrogen, it is impossible to tell whether significant differences were due to rate or to the form of nitrogen applied.

Cooperator:

Myron Graber
R 1 Box 77
Secor, IL 61771

Objective of Research:

To evaluate the effects of Nutra-Gro Plant Food (20-18-18) on corn grain yield.

Procedure:

Nutra-Gro applications were made 5 days prior to planting McCurdy 6660 corn on April 26, 1991. A no-till system was used in the corn study. Soybeans were produced in the field the preceding season. Soil test data reported for the field were P_1 = 53, K = 223, and pH = 6.0. Three replications of treatments were included in the experiment.

Results:

Nutra-Gro rate pounds / acre	Corn yield bushels / acre
0	139.7
4	149.8
8	154.7
11	156.8

$LSD_{.05}$ = N.S.

Comments from OFRAT:

No significant differences were indicated among harvested yields, reflecting large variation within replications of the experiment. While yield differences were not significant, when an alternative statistical method was applied to the data (regression), it was found that a good association between yield and rate of Nutra-Gro did exist in the data. Further study of this fertilizer product appears warranted.

Cooperator:

Carl Anderson
RR 1 Box 100
Broughton, IL 62817

Objective of Research:

To evaluate the effect of added fertility on soybean grain yield.

Procedure:

Soybeans were planted in a field having milo the preceding year. The application of dry fertilizer to the soybean field and no supplemental fertility in the field were compared in two experiments. No soil test data were available for the field. Pennyrile and Callahan 7510 were soybean varieties used in the two experiments, each having three replications of treatments.

Results:

Fertilizer applied pounds / acre	Soybean yield bushels / acre: Callahan 7510 variety	Soybean yield bushels / acre: Pennyrile variety
0	40.5	18.6
11-52-60	42.5	22.3
	$LSD_{.05}$ = N.S.	$LSD_{.05}$ = N.S.

Comments from OFRAT:

Yield enhancement with added fertility for soybean appears to have occurred for both varieties, but increases were not statistically significant. Soil testing of the field would confirm whether the soil is low in phosphorus and potassium, and add to the usefulness of the data.

Cooperator:

LaVern Zehr
Box 626
Fisher, IL 60936

Objective of Research:

To evaluate the effects of nitrogen side-dress application rates on corn grain yield.

Procedure:

Corn was grown no-till using varying rates of nitrogen side-dress. Side-dressing was done on May 25, 1991 using 28 percent solution. Soybeans were grown in the field the preceding season. Three replications of treatments were used in the experiment which was planted on April 26, 1991.

Results:

Treatment pounds nitrogen per acre as 28% solution	Corn yield bushels / acre
0	50.4
124	63.1
138	72.4
200	65.3

$LSD_{.05} = 5.5$

Comments from OFRAT:

Dry weather stress on corn reduced yield in all corn plots of the study. Stress from weather likely influenced efficiency of nitrogen uptake and use by the crop. It is likely that a considerable amount of nitrogen remained unused in the soil after such a dry season. Nitrogen application increased yields, but under the weather-stressed conditions of the experiment, it is impossible to determine an optimum rate.

Illinois Stewardship Alliance — 1991

. . . Nonreplicated Demonstrations

Cooperator:

Thomas R. Anderson
R 3 Box 223
Eldorado, IL 62930

Objective:

To demonstrate the effects of fertilizer on the yield of soybeans.

Procedure:

Soybeans, using conventional tillage, were planted following milo production in 1990. Soil test data for the field were P_1 = 60 and K = 200. Planting was done on June 10, 1991.

Results:

Fertility applied pounds / acre	Soybean yield bushels / acre
none	35.4
N-P-K: 18-46-60	36.4

Comments from OFRAT:

The potassium level from soil tests suggests that additional potassium might result in increased yield. We cannot be certain whether there was a potassium response, because variability across the field could account for the small difference in yield.

Cooperator:

Scott Luckett
R 1 Box 44A
Junction, IL 62954

Objective:

To demonstrate the effect of supplemental fertility on corn produced following set-aside acres of 1990.

Procedure:

Soil test data for the field were P_1 = 85, K = 300, and pH = 5.9. Pioneer 3140 was planted at 20,000 kernels per acre on May 25, 1991, with wet areas of the field planted on June 10, 1991.

Results:

Supplemental fertility pounds of nutrients / acre			Corn yield bushels / acre
N	P	K	
65	0	0	19.6
65	25	60	19.8
100	25	60	38.0
150	25	60	37.0

Comments from OFRAT:

The cooperator reported only 2.1 inches of rain fell from planting to harvest, resulting in drastically lower than normal yield levels. Wet weather delayed planting a portion of the plots, further reducing yield potential. No conclusion should be drawn from data collected under such stressful and unfavorable conditions.

Cooperator:

Jack Jackson
P.O. Box 541
Ridgway, IL 62979

Objective:

To demonstrate the phosphorus and potassium response of soybean produced in no-till plots.

Procedure:

Soybeans in the plots followed corn, with Jader 4881 soybeans planted with a no-till drill on May 15, 1991. Soil test data for the field were P_1 = 65, K = 209, and pH = 7.2.

Results:

Treatment pounds / acre			Soybean yield bushels / acre
N	P	K	
0	0	0	42
0	35	15	43
0	69	30	45
0	104	45	46

Comments from OFRAT:

Soil test data indicate an ample amount of phosphorus in the field at the time of planting, but the potassium level was below the recommended level, perhaps limiting yields. The response in yield associated with supplemental fertility may have been from the potassium applied, but could also have been a result of plot location within the field.

Cooperator:

Don Birkey
R 1 Box 39
Foosland, IL 61845

Objective:

To demonstrate the effect of different chemicals and application rates on weed control in soybeans.

Procedure:

Application rates of Classic, Harmony, and Option were compared, along with rates of Pursuit. Notes on weed control were taken.

Results:

Herbicide material and rate	Soybean yield bushels / acre	Comments on weeds
1/2 rate of Classic, Harmony, & Option	41.4	clean
3/4 rate of Classic, Harmony, & Option	36.7	trace of grass
Full rate of Classic, Harmony, & Option	37.3	some grass
1/2 rate of Pursuit	37.0	some grass
Full rate of Pursuit	39.0	clean

Comments from OFRAT:

When cutting rates, remember that using herbicide rates below those indicated on the label will release chemical suppliers from their guarantee of weed control by their product.

Cooperator:

Don Birkey
RR 1 Box 39
Foosland, IL 61845

Objective:

To demonstrate the effect of different herbicides and application rates on yield of soybeans.

Procedure:

Different herbicides and application rates were used to manage weeds in Asgrow 3322 soybeans planted on May 1, 1991. Conventional tillage was used in the field with soil tests of P_1 = 55, K = 400, and pH = 6.5. Soybeans followed corn grown in 1990.

Results:

Herbicide program	Soybean yield bushels / acre
1* : Option at 1/2 rate on 5/22; Classic and Harmony at 1/2 rate on 5/29	40.9
2* : Option at 3/4 rate on 5/22; Classic and Harmony at 3/4 rate on 5/29	36.7
3* : Option at full rate 5/22; Classic and Harmony at full rate on 5/29	37.3
4* : Pursuit at 1/2 rate on 5/22	37.0
5* : Pursuit at full rate on 5/22	39.0
6 : Option at 1/2 rate on 5/22	33.9

* also had 3 gallons / acre 5-15-15 at planting

Comments from OFRAT:

The use of a herbicide below the label-directed rate generally releases chemical suppliers from their warranty for product performance. The differences in yield found in this demonstration may be due to field variability rather than treatments imposed. Notes on weed control would have been useful.

Cooperator:

Mark Cender
R 1 Box 40
Fisher, IL 61843

Objective:

To demonstrate corn yield response to different side-dress nitrogen rates in no-till production.

Procedure:

No-till planting of corn followed soybeans in 1990. Noble Bear 422 was no-till planted on April 26, 1991. Soil tests indicated P_1 = 34, K = 262, and pH = 5.5. Side-dress nitrogen was applied on May 29, 1991.

Results:

Treatment nitrogen side-dressed pounds / acre	Corn yield bushels / acre
100	54.3
130	64.5
160	66.6

Comments from OFRAT:

Dry weather stress greatly inhibited yield. There may have been a response to nitrogen in the demonstration, but field position in the plots may also have been responsible for yield differences.

Cooperator:

Allen Williams
R 2 Box 184
Cerro Gordo, IL 61818

Objective:

To compare soybean production with and without herbicides.

Procedure:

Soybeans, following corn in 1990, were grown in both wide and narrow rows with the use of herbicides, and in wide rows without herbicides. The soil test data for the field were P_1 = 71, K = 307, and pH = 6.1. LS 301 variety of soybeans was planted on May 20, 1991.

Results:

Soybean production system used	Soybean yield bushels / acre
30-inch rows with herbicides	37.6
Drilled soybeans with herbicides	33.2
30-inch rows with no herbicides	35.2

Comments from OFRAT:

The yield variations reported could be accounted for by variation across the field used. Notes on weed infestations would have been a useful complement to yield data. There appears to be no penalty to yield when labor is substituted for herbicides for weed control.

Cooperator:

John Cender
R 1 Box 80
Foosland, IL 61845

Objective:

To demonstrate corn yield response to side-dress nitrogen in no-till production.

Procedure:

Asgrow 788 corn was planted on May 3, 1991, into a field with reported soil test data of P_1 = 25, K = 153, and pH = 5.6. Soybeans were produced in the field during 1990. Nitrogen side-dress was applied on June 4, 1991.

Results:

Treatment nitrogen side-dressed pounds / acre	Corn yield bushels / acre
100	26.3
125	21.0
150	31.5

Comments from OFRAT:

Drought stress was reported by the cooperator, accounting for the very low yields in general. The amounts of phosphorus and potassium as indicated by the soil tests are below recommended levels, and may have helped limit yields. It cannot be concluded that the differences in yield are due to nitrogen application, because field location of individual plots can account for variation in yield. If there was a nitrogen response, it was confounded by marginal phosphorus and potassium levels, in addition to drought.

Cooperator:

Neil Dahl
R 1 Box 196
Sherrard, IL 61281

Objective:

To demonstrate the fertility response of corn to various amounts and types of fertilizer.

Procedure:

Pioneer 3617 corn was planted on May 12, 1991, at 24,000 kernels per acre in a conventionally tilled field. No soil test data were provided for the field.

Results:

Fertilizer applied pounds / acre				Corn yield bushels / acre
N	P	K	S	
0	0	0	0	99
81	6	41	0	118
41	3	20	0	120
32	14	8	32	104

Comments from OFRAT:

Soil test data are needed to accurately formulate fertilizer needs. All fertilizer rates were quite low, and the response (if any) appears to be inconsistent. Field position may have had considerable effect on yields.

Cooperator:

Bill Dahl
Box 383
Orion, IL 61273

Objective:

To demonstrate the effect of fertility applications on corn yield.

Procedure:

Two demonstration plots involving different fertility treatments were set up, with Sindelar corn planted in both. Soil test data for the field were reported to be P_1 = 33, K = 152, and pH = 6.7. Plot 1 was planted on May 8, 1991, and plot 2 on May 13.

Results:

Fertility applications		Corn yield bushels / acre
Plot 1 — corn following oats in 1990		
1. 200 pounds / acre 16-7-4-16 Manure (rate not given) 60 pounds / acre nitrogen as 28% side-dress on 6/17	. . . . .	85
2. Manure only (rate not given)	. . . . .	65
Plot 2 — second year corn		
1. 60 pounds / acre nitrogen as 28% side-dress on 6/17 Manure (rate not given)	. . . . .	69
2. Manure only (rate not given)	. . . . .	81
3. 200 pounds / acre 16-7-4-16 Manure (rate not given)	. . . . .	83

Comments from OFRAT:

The cooperator reported severe drought and heat during the season, which generally lowered yield potential.

Jo Daviess County Soil and Water Conservation District

. . . Nonreplicated Demonstrations

Cooperator:

Tom Arnold
997 N. Salem Road
Elizabeth, IL 61028

Objective:

To demonstrate the use of soybean and soybean-rye mixtures as groundcover in corn.

Procedure:

Soil test data were P_1 = 60 and K = 200 in the plot area. Corn was planted in 38-inch rows on May 15, 1991, following two diskings of the field. Bladex-Dual was used for herbicide. Groundcover was broadcast after cultivation of corn on June 11.

Results:

Groundcover treatment	Corn yield bushels / acre
83 pounds / acre soybeans	144
96 pounds / acre soybeans & 21 pounds / acre rye	136
62 pounds / acre soybeans & 13 pounds / acre rye	116
Control (no soybeans or rye planted)	138

Comments from OFRAT:

Variables in addition to the groundcover, such as location of the plot in the field, could account for variation in corn yield. If groundcover influenced weed growth, notes on weed population would have been valuable.

Cooperator:

Ronald Lawfer
4389 S. Willow Rd
Kent, IL 61044

Objective:

To demonstrate the use of spring-planted rye to suppress weeds in corn.

Procedure:

All demonstration plots received 135 pounds ammonia, 200 pounds 9-23-30, and 10 tons dairy manure. In the two previous years, corn was grown in the field. Tillage prior to planting included chisel plowing and disking. Crows 482 hybrid was planted in all plots on May 9, 1991. Soil test data indicated phosphorus and potassium levels in all plots exceeded recommended levels. The table of results describes the combinations of rye, herbicide, and cultivation that were used.

Results:

Rye management	Corn yield bushels / acre
no rye planted Bladex @ 2 quarts per acre & Dual @ 2 pints per acre cultivation for weeds	85
rye seeded April 24, 1991 Banvel @ 1 pint per acre no cultivation for weeds	35
no rye planted Bladex @ 2 quarts per acre & Dual @ 2 pints per acre no cultivation for weeds	80
rye seeded immediately after corn was planted Banvel 1 pint per acre no cultivation for weeds	30

Comments from OFRAT:

Rye appears to have used moisture critical to corn yield during the season. The cooperator reported corn to be slightly shorter in plots with rye. Notes on weed infestations would have added to the information gathered.

Madison County Soil and Water Conservation District

. . . Nonreplicated Demonstrations

Cooperator:

Francis Boeser
12155 Rose Road
Trenton, IL 62293

Objective:

To demonstrate the feasibility of producing soybeans using mechanical weed control measures rather than herbicides.

Procedure:

Into a field that produced corn in 1990, soybeans were planted on May 27, 1991. Corn stalks had been disked in the fall, with additional disking and field cultivation done in the spring. Weed control in soybeans was accomplished with two rotary hoeings and two cultivations. Four varieties were planted in the demonstration.

Results:

Soybean variety	Soybean yield bushels / acre
Bell	47
Jack	42
Gutwein 7280	37
Bergmann-Taylor 399C	39

Comments from OFRAT:

Yield levels generally suggest that mechanical tillage adequately substituted for chemical weed control. Plots with the same varieties using chemical control of weeds would have been useful for comparison. Notes on weed infestations would have been of interest.

Cooperator:

Anthony Joehl
6610 Godfrey Road
Godfrey , IL 62035

Objective:

To demonstrate residual nitrogen benefit from alfalfa to corn.

Procedure:

A four-year-old stand of alfalfa was killed with herbicide and then planted to corn using no-till. The amount and type of fertilizer applied to all plots were 100 pounds per acre 6-24-24, 75 pounds per acre 0-46-0, and 300 pounds per acre 0-0-60. Corn was planted at 25,800 seeds per acre. Weed control was achieved using 4 quarts of Extrazine and 1 pint of Banvel per acre. In addition to the three no-till plots with varied nitrogen rates, a plot was plowed in late summer of 1990 and received 150 pounds per acre of nitrogen.

Results:

	Nitrogen rate pounds / acre		Corn yield bushels / acre
No-till into	57	. . . . .	121
herbicide-killed	107	. . . . .	123
alfalfa	157	. . . . .	120
Into alfalfa plowed late in 1990	150	. . . . .	113

Comments from OFRAT:

Lack of replications eliminates statistical evaluation, but yields suggest that supplemental nitrogen was not needed following alfalfa. The density of the alfalfa stand would influence the residual nitrogen available to corn.

Scott County 4-H Project — 1991

. . . Replicated Studies

Cooperator:

Kara Dufelmeier
RR 1
Chapin, IL 62628

Objective of Research:

To evaluate the effects of starter fertilizer at planting on grain yield of corn.

Procedure:

Corn was planted on April 30, 1991 with and without starter fertilizer. No data were provided on soil tests for the field. Five replications of both treatments (corn planted with and without starter) were included in the experiment.

Results:

Treatment at planting	Corn yield bushels / acre
No starter fertilizer	185.3
Starter applied	184.8
	$LSD_{.05}$ = N.S.

Comments from OFRAT:

Fertilizer at planting will only be beneficial if the soil cannot provide nutrients required. A low fertility status in the field prior to planting might have enhanced positive results from the starter fertilizer treatment. Soil test data is needed in planning fertility programs.

Cooperator:

Angela Worrell
RR 2 Box 82
Winchester, IL 62694

Objective of Research:

To evaluate the effect of reduced rates of Counter insecticide on corn yields.

Procedure:

Two experiments were set up to evaluate rates of Counter applied at corn planting. One experiment was conducted in corn following corn, and had four replications of treatments. The second experiment, with three replications of treatments, was conducted on corn following soybeans. In both studies, three treatment rates were used. These treatments included no application, and applications at one-half and full label rate of Counter.

Results:

Counter treatment (rate)	Experiment 1 corn after corn: yield bushels / acre	Experiment 2 corn after soybeans: yield bushels / acre
0	128.9	129.6
1/2 rate	133.5	122.3
full rate	130.3	127.7
	$LSD_{.05}$ = N.S.	$LSD_{.05}$ = 6.8

Comments from OFRAT:

In experiment 2, in which corn followed soybeans, significant differences in yield were found for Counter rates applied, but no explanation can be developed for the observed trends in yield, because yield was clearly not associated with Counter rate used. Weeds, stand density, and soil fertility variation within replications could have accounted for variation in yields measured.

Cooperator:

Daniel Benner
RR 1 Box 315
Winchester, IL 62694

Objective of Research:

To compare sheep management effects on body weight gain of male and female sheep.

Procedure:

Ewes with and without RALGRO implants were compared, and rams were compared to wethers with RALGRO. Three animals were available for each treatment in each comparison. Body weight gain during the 3-month period of study was determined and statistically analyzed.

Results:

Comparison 1:

Sheep management female animals	Body weight gain pounds
Ewes without RALGRO	44.4
Ewes with RALGRO	43.8
	$LSD_{.05}$ = N.S.

Comparison 2:

Sheep management male animals	Body weight gain pounds
Rams without RALGRO	53.6
Wethers with RALGRO	45.1
	$LSD_{.05}$ = N.S.

Comments from OFRAT:

The number of animals involved in each treatment group is very small for an experiment comparing body weight gains. Because inherent variation among animals is considerable, the use of a larger number of animals in each management group would have better evaluated differences resulting from the treatments being compared.

Cooperator:

Jill Stice
RR 2 Box 158
Winchester, IL 62694

Objective of Research:

To evaluate conventional versus no-till production on grain yield of corn.

Procedure:

A conventional tillage system providing corn with 180 pounds per acre of nitrogen, 46 pounds per acre of P_2O_5, and 60 pounds per acre of K_2O was compared to a no-till program providing 120 pounds per acre of nitrogen, 40 pounds per acre of P_2O_5, and 60 pounds per acre of K_2O. Fertility amendments were applied preplant. Three replications of each tillage management system were included in the study. No soil test data were available for the test field.

Results:

Tillage program	Corn yield bushels / acre
No-till	 174
Conventional	 178

$LSD_{.05}$ = N.S.

Comments from OFRAT:

The comparison done involved different tillage systems, but was confounded by different amounts of fertility applied before planting. Differences found in yields were not significant, but may have been influenced by preplant fertility rates, the tillage system used, the combination of these two factors, or unknown variation across the field.

Cooperator:

Keith Hart
RR 1 Box 169
Bluffs, IL 62621

Objective of Research:

To evaluate the effect of different rates of Lorsban insecticide applied at planting on grain yield of corn.

Procedure:

At corn planting, Lorsban was applied at various rates from none to full label rate. Grain yields associated with various insecticide rates were measured. Three replications of treatments were included in the study. No crop history or soil test data were provided by the cooperator.

Results:

Lorsban rate	Corn yield bushels / acre
0	153
2/5	153
3/4	153
full	154

$LSD_{.05}$ = N.S.

Comments from OFRAT:

No variation in grain yield was found across the Lorsban rates used. This lack of variation suggests that there was no need for insect management. The crop history of the field would be useful to possibly explain the lack of response noted from the use of insecticide at corn planting.

Cooperator:

Matt Powell
RR 2 Box 104AA
Winchester, IL 62694

Objective of Research:

To evaluate the effect on corn grain yield of Lorsban applied to corn following soybeans.

Procedure:

Corn yield in plots where Lorsban was used at the label rate was compared to corn yield in plots where Lorsban was not applied at planting. The hybrid planted, fertility, tillage, and herbicide used were uniform across the entire research area. Seven replications of treatments were used in the research area, which in the previous year produced soybeans.

Results:

Lorsban application rate	Corn yield bushels / acre
none	189
label rate	189

$LSD_{.05}$ = N.S.

Comments from OFRAT:

The lack of soil insect problems, typically found in corn following soybeans, would have been expected to result in no observable benefit from the use of Lorsban for control of insects.

Southeast Illinois Sustainable Agriculture Association

. . . Replicated Studies

Cooperator:

Joe Strullmyer
RR 2 Box 114
Looloottee, IL 62838

Objective of Research:

To evaluate the effect of captan seed treatment on corn yield.

Procedure:

Four replications of treated and untreated seed were planted on ridges on May 3, 1991. Soil test data were P_1 = 78, K = 150, and pH = 6.1. Side-dress nitrogen was applied on May 31 at 120 pounds per acre. Ridges were cultivated on June 17, 1991.

Results:

Seed treatment	Corn yield bushels / acre
With captan	94
Without captan	94

$LSD_{.05}$ = N.S.

Comments from OFRAT:

Seed treatment had no effect on yield in the environment where the test was done. Under conditions in which diseases present could reduce stands, seed treatment might have affected yield through better stand establishment.

Cooperator:

Joe Strullmyer
RR 2 Box 114
Loolootee, IL 62838

Objective of Research:

To evaluate the effects of different nitrogen rates on the yield of corn planted into a hairy vetch cover crop.

Procedure:

Soil test data for the site of the study were P_1 = 66, K = 216, and pH = 5.9. Corn was planted on April 24, 1991, into the hairy vetch stand, which was about 8 inches tall. A spray of 2,4-D was applied on May 2 to control the vetch. On May 23, nitrogen at rates from 0 to 120 pounds per acre was side-dressed onto the corn using a 28 percent solution. Ridge cultivation was done on June 3. Two replications of treatments were done in the test.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
0	49
40	83
80	103
120	114

$LSD_{.05}$ = 6.4

Comments from OFRAT:

Supplemental nitrogen was associated with enhanced corn yield when planting was done into hairy vetch. In this study, it appears that adequate nitrogen for a full corn crop was not made available from the hairy vetch stand.

Cooperator:

Joe Strullmyer
RR 2 Box 114
Looloottee, IL 62838

Objective of Research:

To evaluate the accuracy of the Iowa State nitrogen test in predicting nitrogen needs of corn.

Procedure:

The Iowa State nitrogen test was conducted. A reading of 16 was obtained, which resulted in a recommendation of 48 pounds per acre of nitrogen for corn production. Corn planted on May 1, 1991, was provided with 50 and 100 pounds per acre nitrogen. Two replications of the 50- and 100-pound nitrogen treatments were included in the study.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
50	101
100	99

$LSD_{.05}$ = N.S.

Comments from OFRAT:

Under the conditions of the study, exceeding the nitrogen application rate suggested by the Iowa State nitrogen test did not result in improved yield. The use of a control (zero nitrogen rate) plot would have been helpful in determining whether any supplemental nitrogen was actually needed by the corn.

Cooperator:

Tom Hortin
R 3 Box 254
Albion, IL 62806

Objective of Research:

To evaluate the effect of different nitrogen rates on the yield of corn planted no-till into a hairy vetch cover crop.

Procedure:

Vetch was planted into the demonstration field in August of 1990. The growth of vetch had reached 12 to 14 inches when an ice storm in January, 1991, severely damaged the crop. Corn was planted no-till on May 8, 1991, into the hairy vetch field. Roundup was applied at planting to suppress competition to the corn. Nitrogen rates applied to corn ranged from 0 to 120 pounds per acre. Three replications of nitrogen rate treatments were included in the study.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
0	74
40	80
80	80
120	76

$LSD_{.05}$ = N.S.

Comments from OFRAT:

Dry weather generally limited corn yield in the study. Under the 1991 conditions, it appears that the hairy vetch met the nitrogen needs of the corn crop. Repetition of the study, in more favorable seasons, is needed to establish the supplemental nitrogen rate needed by corn planted into hairy vetch.

Two Rivers Resource Conservation and Development Project

. . . Replicated Studies

Cooperator:

Jeff Reuschel
RR 1 Box 19
Golden, IL 62339

Objective of Research:

To evaluate the benefit of Airway and Ariate tillage operations on the yield of soybeans.

Procedure:

Soybeans were produced using no-till, with burn-down spray applied on June 11, 1991, and planting done on June 14, 1991. The Airway and Ariate operations were also done on June 14. Two replications of treatments were included in the study. Soil test data were P_1 = 60, K = 146, and pH = 6.2.

Results:

Treatment	Soybean yield bushels / acre
No-till	41.2
Airway	40.2
Airway + Ariate	39.3

$LSD_{.05}$ = N.S.

Comments from OFRAT:

No effects on soybean yield were indicated from the treatments imposed.

Cooperator:

Jeff Reuschel
RR 1 Box 19
Golden, IL 62339

Objective of Research:

To evaluate the effect of composted turkey manure on the yield of no-till soybeans.

Procedure:

Soybeans were planted no-till on June 14, 1991. The field soil test data were P_1 = 60, K = 146, and pH = 6.2. Four replications of treatments were used in the test. The rate of manure application was not stated.

Results:

Turkey manure applied	Soybean yield bushels / acre
No	42.4
Yes (rate unreported)	44.0
	$LSD_{.05}$ = N.S.

Comments from OFRAT:

Variation in yield was not significantly different, but might suggest a small response to fertility contained in turkey manure. The potassium soil test for the field suggests that additional potassium is needed to meet recommended soil test levels. Further evaluation of a potassium response in the field appears justified.

Two Rivers Resource Conservation and Development Project

. . . Nonreplicated Demonstrations

Cooperator:

Kenneth Althoff
RR 2
Mendon, IL 62351

Objective:

To demonstrate nitrogen contribution to corn yield from hairy vetch which was allowed to grow to two different dates. Nitrogen rate on corn ranged from 0 to 150 pounds per acre on each of the planting dates for corn.

Procedure:

Corn was planted at 26,000 kernels per acre on May 10 and June 7, 1991, following disking of the vetch stand and conventional tillage to prepare the seedbed. No herbicide was used in any of the plots, but cultivation for weeds was done twice. Soil pH was 6.6, but other soil test data were not provided for the field.

Results:

Planting date of corn	Nitrogen rate pounds / acre	Corn yield bushels / acre
5/10/91	0	148
5/10/91	75	125
5/10/91	150	121
6/7/91	0	169
6/7/91	75	147
6/7/91	150	143

Comments from OFRAT:

All plots were reported by the cooperator to be very weedy. The trends seen in the data tend to run contradictory to current thinking on the benefits of timely planting and nitrogen fertilizer response from corn. Plot location in the field and weed pressure may have been responsible for variation in yields reported.

Cooperator:

Jeff Reuschel
RR 1 Box 19
Golden, IL 62339

Objective:

To demonstrate nitrogen contribution for corn production from a cover crop of hairy vetch.

Procedure:

A hairy vetch cover crop was planted on August 1, 1990. On June 10, 1991, the field was disked and the corn planted; a herbicide spraying followed on June 16. For those plots to which additional nitrogen was applied, the treatment was applied on July 6, 1991. Soil test data for the field were P_1 = 31, K = 47, and pH = 5.9. The harvest population in the field was 21,000 plants per acre.

Results:

Nitrogen rate pounds / acre	Corn yield bushels / acre
0	124
42	117
85	125

Comments from OFRAT:

The design of the plot, while intended to have two replications, was inappropriate for statistical evaluation. Differences in yield are likely due to position in the field rather than from the nitrogen applied.