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## EC26 Ten Years of Nebraska Agricultural Extension Work in Crops and Soils 1922-1931

P. H. Stewart

D. L. Gross

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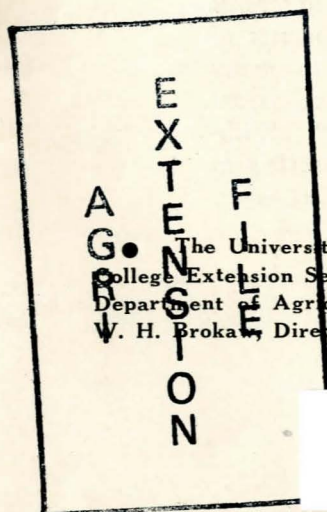
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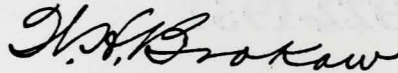
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## FOREWORD

*This report covers the major extension activities in Agronomy (Crops and Soils) during the 10-year period of 1922-31.*

*It has been prepared by Extension Agronomists P. H. Stewart and D. L. Gross at my request as a part of a report on agricultural extension work in Nebraska.*

*Reports on other lines of work will be issued from time to time.*



W. H. Brokaw, Director,  
Agricultural Extension Service,  
Nebraska College of Agriculture.

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## ACKNOWLEDGMENT

*Grateful acknowledgement is made to several thousand progressive, public spirited farmers of the state who cooperated in carrying out the many farm demonstrations and meetings in the different lines of work summarized in this report. Without their help it would have been impossible to accomplish the results given in the following pages.*

## Ten Years of Nebraska Agricultural Extension Work in Crop and Soils 1922-1931

BY P. H. STEWART AND D. L. GROSS \*

The Extension Service takes the results of Experiment Station work to farmers and exchanges ideas and practices among farmers themselves—Page 4.

Nebraska's barley acreage has increased four times in five years—Page 6.

Smooth seed corn ears outyielded rough type seed five bushels per acre in 208 farm tests—Page 11.

Some farmers have picked superior strains of seed corn in their own fields—Page 12.

More than 1,000 contests in the 10-acre corn yield contest have demonstrated the importance of good seed, a rich soil, and the relation of high yields and low costs to profits—Page 14.

Wide distribution of Nebraska 60 wheat has made it possible for farmers to market a uniform product with a good reputation—Page 16.

Several thousand farmers have helped the Extension Service obtain these results. Their cooperation is greatly appreciated.

High quality, pure Ceres and Marquis spring wheat has replaced mixtures formerly grown in western and north-western Nebraska—Page 17.

Nebraska 21 oats has proved popular with 227,000 bushels certified—Page 18.

Wheat smut losses in yield and price discounts have been greatly reduced by seed treatment campaigns—Page 19.

Sweet clover acreage increased twenty times in ten years—Page 22.

Cropping and soil erosion have taken 70 per cent of the organic matter out of some Nebraska soils—Page 27.

"More Legume" campaigns increased clover acreage 131 per cent in nine eastern Nebraska counties—Page 29.

Bindweed and other bad perennials can be killed with chemicals or by continuous, thorough summer fallow for two years—Page 29.

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\* State and Assistant State Extension Agents in Agronomy for the past 13 and 11 years. Mr. Stewart was also county extension agent in Kimball county from April, 1917, to September, 1918, and in Buffalo county from September, 1918, to October 1, 1919.



### Extension Service Works with Farmers

The purpose of agricultural extension work in Crops and Soils is to make available to the folks on the farms of the state, the results, methods, and practices which have been secured and tested at the Agricultural Experiment Stations. In addition to the results of Experiment Station work, many ideas and practices secured from progressive farmers of the state are passed on to others who make use of them to an advantage.

Nebraska has, as a part of the University of Nebraska College of Agriculture at Lincoln, a well equipped experiment station organized to study the problems of agriculture. Substations are maintained at North Platte, Mitchell, Valentine, and Alliance. Investigators in Agronomy work (Crops and Soils) at these institutions are developing, from time to time, improved crop varieties, and new methods and practices for handling crop and soil problems.

#### Summarizes Results on Farms

This circular points out some of the practical things which have been done in crop and soil experimental work during the 10-year period of 1922-31. The summaries tell how, through the Agricultural Extension Service, the results of this work have been made available and of value to the farmers of Nebraska. During this period, the county agricultural agents of the state, assisted by two extension agronomists located at the Nebraska Agricultural College at Lincoln, have carried on organized work to increase the returns from farming by putting into operation over the state some of the facts developed by the experiment station workers.

#### Is Over-Production to Blame?

Production of farm products has increased in the last thirty years. But increasing production is not necessarily undesirable. First of all, production must be considered in relation to population. The volume of farm pro-

*The summary statements on page 3 and this discussion of the purpose and the work of the Extension Service serve as the introduction to the report outlined on page 5 and included in the remainder of the circular.*

duction for each person in the United States has been less in the last ten years than in the ten-year period just before the World War.

Much less feed is required now for horses. Exports of farm products have decreased to about half what they were in the 1906 to 1915 period. **Considering these changes, farm production remaining for consumption per person in this country has neither increased nor decreased much in the ten year period 1920-29 compared with the ten year period 1906-15.**

Progress in every line has been made and will continue to be made through greater efficiency in production, which lowers unit costs. Just because the developing of high yielding crop varieties, the growing of better livestock, and the increasing of soil fertility bring about increased production, is no reason why these improvements should cease. They result in lower unit costs which permit lowering of prices. Decreasing prices, under normal conditions, uncover new uses and new users of products.

**Competition Is Keen**

We cannot prevent farmers of other nations or other states from working for lower costs by increasing acre yields and by other methods. Hence we are under continuous pressure to find and adopt cost reducing methods of our own.

Margins between costs and selling prices of farm products determine the profits from farming. As an individual, the farmer can do little to affect selling price, but he can influence his own costs by

the methods he follows. For him, individually, profitable crop production is mainly a matter of growing a bushel of grain or a ton of hay as cheaply as possible. The pressure of competition gives him no other choice than to try to increase his efficiency as a producer. During this period of low prices, the matter of producing crops as cheaply as possible is of even greater importance than during periods when crop prices were high.

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## DIVISIONS OF REPORT

In the following pages will be found a brief sketch of the program and accomplishments of Extension work in Agronomy (Crops and Soils) on the following projects from 1922 to 1931 inclusive.

BARLEY PRODUCTION.....	Page 6
CORN TYPE, VARIETIES, AND PRODUCTION.....	Page 10
WHEAT PRODUCTION .....	Page 16
OAT PRODUCTION.....	Page 18
SMALL GRAIN DISEASES.....	Page 19
SWEET CLOVER PRODUCTION AND MANAGEMENT.....	Page 22
ALFALFA WINTERKILLING .....	Page 24
SOIL CONSERVATION AND MANAGEMENT.....	Page 27
WEED CONTROL .....	Page 29

Twenty-four pictures and maps in this circular help tell the story of what Nebraska farmers and extension agents have done with crops and soils problems in the past ten years.

## Barley Production

The barley acreage in Nebraska jumped from 240,000 acres in 1927 to almost a million acres in 1932. The acreage had remained about steady for the 5 years, 1922-27.

There are several reasons for this rapid increase in the last 5 years. Most important of these reasons has been the development and distribution of the new improved varieties of barley by the Experiment Stations and the Extension Service of the Agricultural College.

Here is the story—

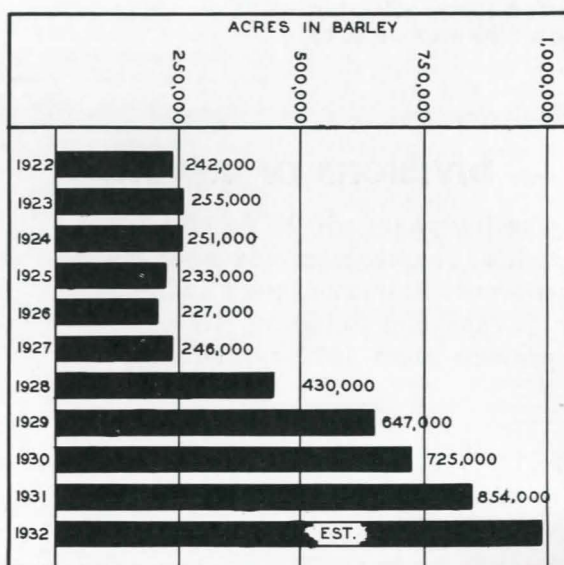


FIG. 1.—The barley acreage in Nebraska from 1922 to 1932.

Except for wheat, Nebraska's grain crops are largely used as feed for livestock and are not marketed as grain. The returns from an acre of corn, oats, or barley may be measured, therefore, by the amount of pork, beef, or milk that an acre of these grain crops will produce. Barley as a fattening feed for hogs is 84 per cent as efficient as corn. In years of corn shortage, a crop of barley may be used to finish out a bunch of hogs which would otherwise have to be sold as feeders. Barley

is harvested in early July and makes excellent feed before the corn crop is ready.

### Station Introduced New Barleys

In 1924, the Nebraska Experiment Station at Lincoln began testing some newly developed smooth bearded varieties of barley such as Comfort and Velvet. Later on, Glabron and others were added. In the past, many farmers have objected to growing barley because of the barbed, harsh, un-



TABLE 1.—RELATIVE YIELD OF SMOOTH BEARDED VS. COMMON ROUGH BEARDED BARLEY, 1927-31

	Yield per Acre	
	Bushels	Relative per Cent
Common six-row barley .....	38.7	100
Comfort .....	47.5	120
Velvet .....	41.2	106
Glabron .....	50.1	129
Trebi .....	50.4	130

pleasant beards. These smooth varieties have beards but they are smooth and slick, making the crop much less unpleasant to handle. The straw is also more valuable for feed and bedding.

In Station tests, the best smooth bearded sorts yielded from 15 to 30 per cent more than the ordinary rough bearded barley which was commonly grown. They were also superior in strength of straw. Table 1 shows the yields of Comfort, Glabron, Velvet, and Trebi barley in comparison with the common 6-row.

#### Barley Outyields Oats 76%

Oats and barley are interchangeable crops in the rotation system. Figures on the average yields of oats and barley in Nebraska during 1926-30 show that barley made 28.8 bushels per acre compared to 29.8 for oats. However, when put on the basis of pounds of hull-free grain per acre, barley produced 1,175 pounds as compared to 667 pounds for oats, or approximately 76 per cent more.

#### Talked Barley at 201 Meetings

In 1928, when tests had showed improved varieties of barley, such as Comfort, Velvet, and Trebi, to be superior to common barley, the County Extension Agents, assisted by the Extension Agronomists, put on a statewide program of publicity and meetings to increase the

acreage of barley in the state. **During the 1927-31 period, County Extension Agents held 201 meetings and demonstrations on barley production.** In 1928 and again in 1929, 23 county crops days were held at which time the merits of barley and production practices were discussed. The advantages of the smooth bearded varieties and the idea that more barley should be grown in Nebraska was shown by exhibits and was made a part of the discussion on the "Better Crops" demonstration trains operated over the state which were visited by 78,880 people. Much interest was aroused in barley production by this work as is shown by the statistics on barley acreage in Nebraska. Figure 1 shows the annual acreage in Nebraska from 1922 to 1932.

#### Farmers Watched 83 Demonstrations

Since 1927, 83 barley variety demonstrations, including Comfort, Velvet, Trebi, and other promising sorts have been planted on farms out in the state in cooperation with county extension agents and interested farmers. Figure 2 shows the distribution of these tests for the 1927-31 period. These variety demonstrations afforded an opportunity for farmers to compare the smooth bearded and other improved varieties with common barley. The yields from these tests as well as those at the Experiment Station demonstrated



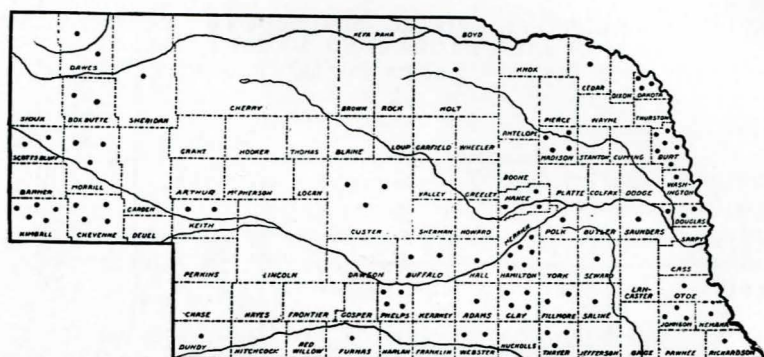


FIG. 2.—Each dot indicates a barley variety demonstration during the 5-year period, 1927-31. These 83 demonstrations afforded an opportunity to farmers to compare the different varieties and to determine their yields under local conditions.

the attractiveness and superiority of the smooth bearded varieties in eastern Nebraska and of Trebi in western Nebraska.

Foundation seed of Velvet and Comfort barley was distributed through the Department of Agronomy to four farmers in 1927, six farmers in 1928, and seven farmers in 1929. The crop produced by this seed was inspected and certified by the Nebraska Crop Growers' Association in cooperation with the Extension Service, thus making available local

sources of pure high quality seed. Table 2 shows the amount of such seed certified during the 1927-31 period.

During the 1927-31 period, practically all of the certified barley seed was sold for planting. For instance, in 1927 the four growers who had 1,340 bushels of certified seed grown from foundation seed secured through the Agricultural College, sold this to 70 Nebraska farmers. The distribution of this 1,340 bushels of seed is shown in Figure 3.

TABLE 2.—PRODUCTION OF CERTIFIED SEED OF COMFORT, VELVET, AND GLABRON AND TREBI BARLEY IN NEBRASKA, 1927-31.

Year	Smooth Bearded Varieties*		Trebi Barley	
	Number Certified Growers	Bushels of Certified Seed Produced	Number Certified Growers	Bushels of Certified Seed Produced
1927	4	1,340	3	4,100
1928	50	10,200	7	10,600
1929	105	43,800	14	22,600
1930	58	44,400	9	7,600
1931	31	26,700	4	3,200

\* Includes Comfort, Velvet, and Glabron.

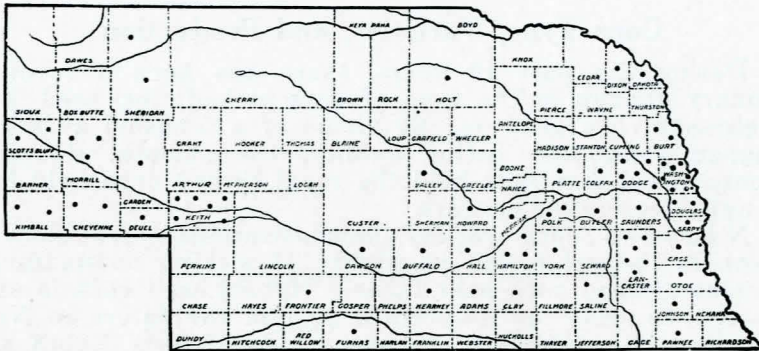


FIG. 3.—In 1927, 1,340 bushels of *Comfort* and *Velvet* barley were certified in Nebraska. Each dot indicates a farmer, 70 in all, who bought some of this certified seed.

In addition to the certified seed, much uncertified seed of these same varieties was used. At the present time, it is estimated that more than 75 per cent of the barley acreage of Nebraska is sown to *Comfort*, *Velvet*, *Glabron*, and *Trebi* barley. Since these improved varieties are now extensively grown and much local seed is available, seed certification has

declined some in recent years.

The *Trebi*, a high yielding rough bearded variety, is confined largely to western Nebraska where the combine is commonly used for harvesting the crop. The smooth bearded varieties, such as *Comfort*, *Glabron*, and *Velvet*, are grown chiefly in the eastern two-thirds of the state, although some is grown in western Nebraska.

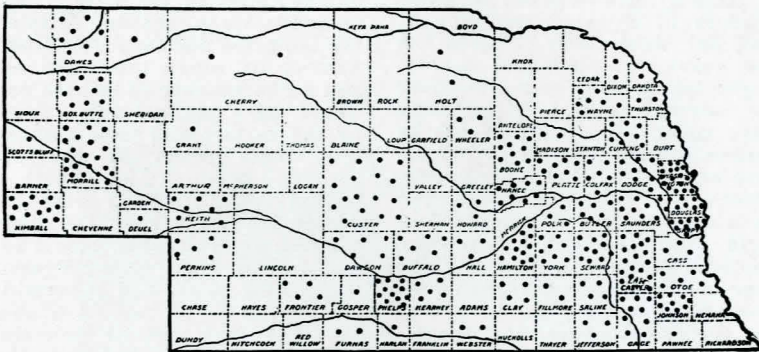


FIG. 4.—Each dot shows a certified barley seed grower during the 1927-31 period. A total of 174,500 bushels was certified during these 5 years for 336 growers.



## Corn Type, Varieties, and Production

During the past 10 years, there has been a revolutionary change in the type of ears picked for seed by Nebraska corn growers. By virtue of a 5-bushel average higher yield and better quality, the smooth, dimple-dented seed ears now hold the royal throne once held by rough, deep-kerneled ears.

Ninety-two corn variety demonstrations have shown farmers the value and possibility of picking outstanding strains of seed corn near home. Hybrid seed corn is expected to play an important part in the future in Nebraska corn production. Because of the 92 tests, Nebraska farmers are acquainted with the progress already made with hybrids and are ready to take advantage of future developments with this interesting phase of corn breeding.

The ten-acre corn yield contest has brought the importance of soil fertility, high yields per acre, low cost per bushel, and production methods of the winners to the attention of the general public as well as other farmers of the state.

Corn is Nebraska's major crop. The annual acreage exceeds by nearly 3 million acres that of all other grain crops combined. Because of its major importance, a great deal of experimental and extension work has been done with this crop. The Nebraska Experiment Station was among the first to initiate tests designed to guide farmers in choosing the type of seed ear most likely to give the best results in yield and quality. Beginning in 1905 and continuing for several years, experiments were conducted at the Nebraska Station wherein ears of the rough, deep-kerneled type, the kind very generally selected by farmers even as late as 1920, were compared in yield with the smooth, dimple-dented, more shallow-kerneled type of ear. **Although these tests showed a decided yield advantage for the smooth type, and the results were first published in bulletin form in December of 1909. Nebraska farmers as a whole continued to select the rough type of seed as late as 1921 to 1922. This was because organized effort to**

**bring the results of these experiments to the attention of farmers was not as well developed previous to 1920 as in more recent years.**

### Type Comparisons Started 1921

Beginning in 1921, extension workers in crops and soils introduced corn type demonstrations on the farms of the state. These demonstrations consisted of selecting from the farmer's own corn a number of rough type seed ears and a like number of smooth ears. These were planted side by side by the farmer and yield comparisons were made in the fall. Twenty-one rough and smooth selection demonstrations were conducted in eight counties during the first year. County agents held meetings at these demonstrations at husking time, and determined the results. For the 21 demonstrations, the smooth selections yielded seven bushels higher than the rough type. In 1922, farmers grew 58 such demonstrations in 28 counties, with the smooth out-yielding the rough 7.5 bushels per acre.

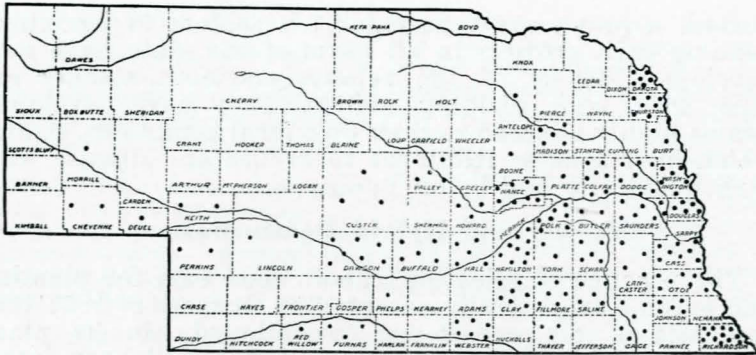


FIG. 5.—Corn type demonstrations, which compared rough and smooth seed ears, were conducted on 208 farms during 1921-27. In these comparisons, the smooth selections averaged 5 bushels more than the rough seed ears.

These tests were continued as a part of the county extension agents' programs during a 7-year period, 1921-27. **In all, 208 of these demonstrations were recorded with an average yield of 5 bushels greater for the smooth than for the rough selections. (See Figure 5.)**

### Changed Seed Corn Type

As evidence of the effectiveness of these demonstrations, and the meetings held in connection with them, one needs only to visit the present day corn show and note the great change that has taken place during the last 10 years. Formerly, the smooth exhibits, if any were displayed at all, were considered an oddity. Today the reverse is true. In those communities where extension work has been con-



FIG. 6.—Looking over the results of a corn type demonstration on the Chas. Grau farm in Douglas county



ducted, a rough ear type exhibit is seldom to be found. Leading corn growers in all parts of the state have now developed strains of the relatively smooth, slender ear type with high yielding ability. They have developed strains highly adapted to their own local conditions, strains which have greater resistance to drouth and disease with earlier maturity and better quality.

### Variety and Hybrid Demonstrations

The practice of selecting smooth seed ears for planting had become so generally accepted by farmers in 1927 that emphasis on this project was discontinued. In its place the variety trial demonstrations, which had been introduced in 1923, were given greater prominence. Experiment Station tests and farm trials in connection with the smooth and rough ear demonstrations, had shown striking differences between strains of corn developed by different farmers. Since a strain of corn reaches its highest worth from the yield and adaptation standpoint in but a limited area surrounding its place of origin, strains developed at an experiment station ordinarily do not have a wide enough adaptation to make them of special value in communities some distance from the station. This is particularly true in Nebraska where the range in length of growing season, amount of rainfall, temperature, length of day and elevation is quite wide. **As a consequence, the determination of the best varieties or strains for one given community must be accomplished by trials in that particular area.**

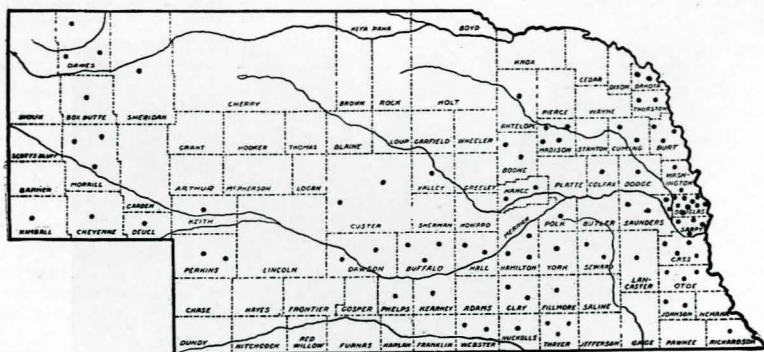


FIG. 7.—Corn variety demonstration. Each dot shows a farm on which a number of varieties and hybrids were grown in comparison. A total of 92 demonstrations were held during 1923-31.

### Farmers Grew 92 Tests

During the period from 1923 to 1931, 92 variety trial demonstrations were conducted by farmers in 45 counties under the direction of county and state extension agents. (See Figure 7.) These demonstrations have developed certain outstanding strains of corn in each community and have influenced many farmers to change to better adapted and higher yielding strains of corn.

### Try Out Hybrid Corn

In connection with the variety trials, a number of hybrid strains of corn have been included each year. Hybrid corn is a product of Experiment Stations since its development is entirely too technical and laborious to be undertaken on the average farm. It is a cross between two or more self-fertilized lines. The self-fertilized parents are the result of several years of inbreeding, during which time the undesirable character-

istics within a strain are bred out and eliminated. Through this process of inbreeding and re-crossing, many quite remarkable hybrids have been developed. Some of these have not only consistently outyielded ordinary strains by from 15 per cent to as much as 30 per cent, but they have shown other desirable characteristics, such as resistance to lodging, comparative freedom from disease and barrenness, and extreme uniformity. It is expected that hybrid corn will play an important part in corn production in the near future. Nebraska farmers, because of the variety and hybrid trials conducted in many parts of the state, are well informed as to the progress of hybrid corn development, and are ready to take advantage of this new principle of corn breeding as soon as promising hybrids are thoroughly tested and made available for general distribution.



FIG. 8.—This crowd is listening to a discussion of corn varieties and hybrids at the C. Y. Thompson farm in Cuming county preliminary to looking over the field results.

### Ten-acre Corn Yield Contest

In order to bring before the public, in a more general way, the advantages of high yielding strains of corn, and to call attention to other factors which have an important bearing on economical corn production and profits, the Nebraska 10-acre corn yield contest was inaugurated in 1924. Cost account records and successful farming experience had demonstrated certain principles which must be observed if the greatest possible net income is to be derived from the corn crop.



These principles may be briefly stated as follows:

1. High acre yields mean low cost per bushel.

2. Low bushel cost plus large acreages per man bring the greatest net income.

3. Proper choice of seed, adequate soil fertility, and careful and thoughtful tillage practices are essential to high yields and economical production.

#### Cost and Quality Count

The Nebraska contest has been based not on yield alone but on economy of production as well. Winners are scored on the basis of 65 per cent for yield, 25 per cent for profit per acre, and 10 per cent for the quality of the product. Since 1924 there have been over 1,000 entrants in the contest starting with 45 in 1924 and ending with over 200 in 1931. The contest has continued to grow in popularity from year to year, and has greatly stimulated interest in better methods of corn production. The story of the winners, as published in the news items each year, has influenced many to accept and use new practices which the winning contestants have demonstrated to be profitable and practical.

#### Showed Up Value of Sweet Clover

Perhaps the greatest change that has taken place since the inauguration of the contest has been the increased acreage of sweet clover. Starting with 145,000 acres in 1924, the acreage has increased each year until in 1931, 1,200,00 acres were grown. Because the contest lends itself to wide publicity and because the winners have been strong advo-

cates of sweet clover for improving soil fertility, there is not much question but that the contest has had a large influence in stimulating interest towards a greater acreage of this valuable legume.

The contest must be credited also with a large part in the general improvement in the type and variety of seed corn used for planting. The winners without exception have been those who have developed high yielding smooth dented types of corn. They have sold much seed, particularly in their own communities, resulting in general improvement in the type of seed used over the entire state.

#### Farmers Used Big Machinery

Another important change that has taken place since the contest started is the reduction of men hours necessary for the proper handling of an acre of corn (see table). This has been brought about by an increase in the use of larger machinery. The percentage of farmers using multiple row cultivators increased from 25 per cent to 75 per cent in the period, 1924-31. This, together with the more general use of other types of labor-saving machinery, was associated with a decrease of man labor expended on an acre of corn from 8.9 hours in 1924 to 5.9 hours in 1931. This has enabled farmers to handle a larger acreage of corn per man, and made it possible for them to do the various tillage operations more timely.

A summary of the contest, with the lessons to be drawn from it, has been used as the topic for discussion at 243 corn meetings held during the last seven years, with a total attendance of 14,088.

TABLE 3.—MACHINERY AND LABOR TRENDS IN CORN PRODUCTION IN EASTERN NEBRASKA.

	1924	1925	1926	1927	1928	1929	1930	1931
Per cent of contestants using 2-3-4 row cultivators.....	25	34	60	63	69	77	86	74
Average hours of man labor per acre.....	8.9	8.3	7.6	6.9	6.4	6.2	5.6	5.9

### 4-H Corn Clubs

Four-H clubs have offered a splendid opportunity for the promotion of sound principles in corn production. Many of the boys who have taken the club lessons during their club careers are now farming for themselves and making good use of the knowledge gained in this work. They have not only learned the principles of economical corn production, but through their public demonstrations, fair exhibits, and grain judging experience, they have become more useful members of their community.



FIG. 9.—Floyd Wetzel of Valley county, leader of a corn club, discussing corn judging with a group of corn club boys.

During the 10-year period, the total enrollment in crop clubs, consisting of corn clubs, weed clubs, and certified small grain clubs, has been 1,451. Each year the members have put up special booth displays at the state fair depicting some principle or practice in crop production. They have taken part in special public demonstrations and have developed grain judging teams which compete against one another for high honors at the state fair. Nebraska's winning 4-H grain judging teams go to Chicago each winter to compete against like teams from other states. In the

national contest, no Nebraska team has ever placed below second place. This is a tribute to the caliber and training of our Nebraska boys.

Crop club members have provided a means for the growing and distributing of improved seed. Improved crop varieties are distributed from time to time through club members, who have them certified by the Nebraska Crop Growers' Association. The seed is then sold by the club members to neighbors and others, thus effecting a wide distribution of improved crops.



## Wheat Production

Wheat, which Nebraska normally grows on some 3½ million acres of land, is Nebraska's most important cash grain crop. The Nebraska Experiment Station since its early inception has carried on extensive investigations relating to wheat improvement and production. Much of this work has been for the purpose of developing and testing varieties and strains of wheat as to winter hardiness, stiffness of straw, rust and smut resistance, yield, and quality of the grain.

Experiment station tests showed two Nebraska selections known as Nebraska 6 and Nebraska 60 to be superior in yield to Turkey Red from which they were selected. These two strains were increased and distributed to farmers in 1919 for the first time. Later in 1920 and 1921 more foundation seed of these strains was distributed to 81 farmers in all parts of the state.

In farm comparisons, Nebraska 6 and Nebraska 60 outyielded local wheat as they did at the Nebraska Experiment Station. In 1920, for instance, 13 fields of Nebraska 6 grown on farms out in the state yielded 26.2 bushels per acre compared to 21.8 bushels for local seed grown in comparison. In similar farm comparisons in 1920, 9 growers reported that Nebraska 60 secured as foundation seed from the Nebraska College of Agriculture yielded 22 bushels compared to 17 bushels for local varieties.

In 1926, two bushels of certified Nebraska 60 winter wheat was

distributed from the "Better Crops Train" to each of 75 farmers living in 27 counties of the state. This wheat was planted beside wheat of the farmers' own raising. The Nebraska 60 wheat averaged 27.7 bushels per acre as compared to 25.8 for the local seed, according to reports sent in by growers.

### Started Certification in 1920

Beginning in 1920 the Extension Agronomists developed plans in cooperation with the Nebraska Crop Growers' Association whereby seed of these two varieties might be certified. The following table shows the amount of Nebraska 60 wheat certified during the 1922-31 period.

These figures show an increasing popularity for Nebraska 60 seed wheat during the 1923-31 period. This was shown by the increase in demand for seed and an increasing number of certified growers and amount of seed certified.

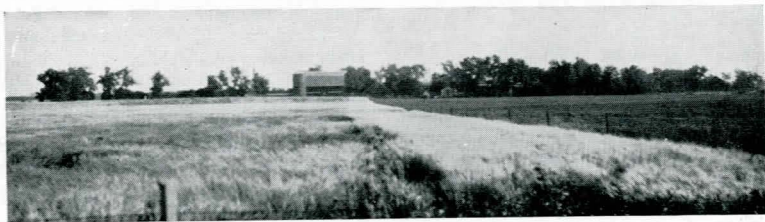


FIG. 10.—A farm demonstration in Saunders county comparing an improved wheat (on right) with local seed.

SUMMARY OF CERTIFICATION WORK  
ON NEBRASKA 60 WINTER  
WHEAT, 1922-31.

Year	Growers	Bus. Certified Nebr. 60 Seed
1922	18	10,850
1923	2	1,200
1924	4	3,000
1925	11	4,800
1926	22	25,125
1927	63	36,400
1928	83	113,200
1929	71	85,225
1930	64	98,875
1931	34	32,700

The wide distribution of Nebraska 60 wheat over the state has made it possible for Nebraska to supply carloads of uniform quality milling wheat which has been a factor in creating a strong demand for relatively good price from millers for Nebraska wheat. It is estimated that from 60 to 75 per cent of the wheat acreage in Nebraska is now seeded to the Nebraska 60 variety.

### Spring Wheat

Only about 5 per cent of Nebraska's wheat crop is spring wheat. Practically all of this is grown in the Panhandle counties of the state. A survey of this area in 1925 showed the spring wheat to be badly mixed as to varieties and types. Grain men complained that a high percentage of the spring wheat from the area was a mixture of red spring, and amber and red durum types. Considerable red durum was being grown which was undesirable for milling purposes and usually sold at a strong discount.

In 1926, in an attempt to improve the spring wheat condition, the Chadron Milling Company cooperated with the County Agent of Dawes county and the Extension Agronomists in shipping in a carload of approved Marquis seed wheat from Montana. This was distributed to 60 Dawes county growers and resulted in a decided improvement in the milling value

of spring wheat from that territory. In 1927 fifty bushels of pure Canadian Marquis seed was secured and used as foundation seed for certification.

Station and farm tests showed Ceres spring wheat to be earlier, more rust resistant, and higher yielding than the Marquis which is valued so high for milling purposes. The Extension Agronomists arranged for foundation seed of Ceres variety from North Dakota and this was added to the list of varieties eligible for certification. All of the Ceres and Marquis seed now being certified in western Nebraska traces to the two foundation lots of seed shipped in. It is estimated that more than 50 per cent of the spring wheat acreage in western Nebraska now traces to this foundation seed of Marquis and Ceres. The following table shows the amount of Marquis and Ceres seed wheat certified in Nebraska during the 1922-31 period.

TABLE 4.—SUMMARY OF CERTIFICATION WORK ON MARQUIS AND CERES SPRING WHEAT, 1922-31.

Year	Marquis		Ceres	
	No. of Growers	Amount	No. of Growers	Amount
1928	11	2,800	....	.....
1929	12	7,545	3	1,400
1930	9	5,400	11	6,930
1931	7	2,700	4	1,300



## Oat Production

Nebraska grows annually about 2½ million acres of oats. The crop, on the whole, is the least profitable of all of the common grain crops. It is grown extensively because it makes a good nurse crop, fits into the rotation nicely, and is valued highly as a feed for work horses and growing stock. Any yield increase by means of better varieties or cultural practices is important in raising the acre returns from a crop too often produced at a loss.

### Station Introduced Kherson Oat

The Nebraska Experiment Station has had an important influence on oat production in Nebraska and surrounding states. In 1899 Professor F. W. Taylor of the Nebraska College of Agriculture introduced from the Province of Kherson in Russia an early variety now widely grown under the name of Kherson oats. At that time Nebraska farmers generally were growing tall strawed late varieties which now have been practically all discarded.

The Nebraska 21 variety is an improved selection of the Kherson. It differs in that it has white kernels, whereas the Kherson has yellow grains. It has a somewhat stiffer straw and is about a day later in maturity.

In station tests covering many years, the Nebraska 21 variety has outyielded the original Kherson about 5 per cent.

In 1919 foundation seed of Nebraska 21 oats was first distributed from the Nebraska College of Agriculture. Each year since that time additional seed has been distributed to different parts of the state.

In 1920, 44 farmers grew Nebraska 21 oats in comparison with local oats. The reports from these men showed an average yield of 45.2 bushels for local seed compared to 54.2 bushels for the Nebraska 21, a difference of 9 bushels per acre. While this difference can hardly be expected on the average, yet Nebraska 21 oats has proved to be a very satisfactory variety.

TABLE 5.—CERTIFIED SEED OF NEBRASKA 21 OATS, 1920-31.

Year	No. Certified Seed Growers	Bushels of Seed
1920.....	86	49,300
1921.....	109	71,700
1922.....	16	12,600
1923.....	21	15,400
1924.....	12	9,900
1925.....	10	5,200
1926.....	12	9,700
1927.....	13	11,100
1928.....	20	11,900
1929.....	22	12,100
1930.....	15	8,800
1931.....	18	10,000
Total.....		227,700

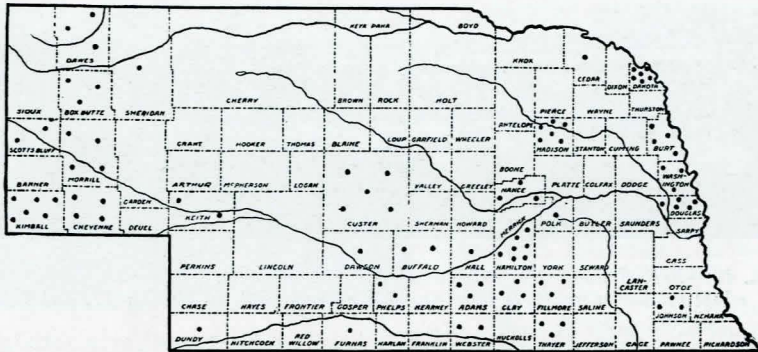


FIG. 11.—During 1925-31, 84 oat variety farm demonstrations were carried on in Nebraska.

In cooperation with the Nebraska Crop Growers' Association, plans were developed for certifying Nebraska 21 oats in 1920. Table 5 shows the amount of certified Nebraska 21 oats for the 1920-31 period. Nebraska 21 oats is now the most widely grown variety in Nebraska.

Since 1925, 84 oat variety demonstrations have been grown on farms out in the state. The Nebraska Experiment Station supplies seed of from 6 to 10 of the outstanding varieties which seem worthy of further trial. These are seeded side by side under

farm conditions and compared for stiffness of straw, earliness, disease resistance, yield, and quality. Figure 11 shows the distribution of the oat variety demonstrations carried on during the 1925-31 period. During the 1922-31 period, county extension agents have held 303 meetings and demonstrations dealing with oat production.

These tests have helped to demonstrate the superiority of Nebraska 21 oats and some of the Burt selections over the varieties being commonly grown.

## Small Grain Diseases

### Wheat Smut Serious

Wheat smut (bunt) has been a common disease in Nebraska wheat fields and has resulted in serious losses to Nebraska wheat growers. The presence of stinking smut in wheat fields reduces the yields approximately in proportion to the number of heads infected. The smutty grain suffers a dockage in price, depending on the degree of smut present.

Figures from the Omaha Grain Exchange show the following percentage of cars of wheat grading smutty at that market for the past several years.

TABLE 6.—PERCENTAGE OF CARS OF WINTER WHEAT GRADING SMUTTY ON THE OMAHA GRAIN EXCHANGE.

1922.....	18.0%
1923.....	14.2%
1924.....	26.0%
1925.....	39.8%
1926.....	39.8%
1927.....	21.4%
1928.....	28.0%
1929.....	28.4%
1930.....	30.0%
1931.....	12.5%

Tests carried on at the Nebraska Experiment Station proved that treating seed wheat with either copper carbonate or for-



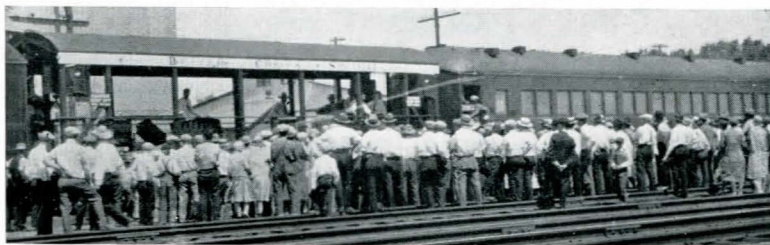


FIG. 12.—Special trains with exhibits and demonstrations on wheat smut control and wheat production practices were operated over the state in 1926, 1927, and 1928.

maldehyde very effectively controls stinking smut in wheat, and that the loss due to smut, estimated to be many thousands of dollars, could be saved by properly treating the seed wheat.

#### Smut Cost Over Two Millions

In 1928 Nebraska produced 70,000,000 bushels of wheat. Of this, 20,000,000 bushels graded smutty, selling at a price reduction estimated at 3 cents per bushel. This would mean a loss of \$600,000. Probably an equal loss, if not a still greater one, was caused by the reduction in yields. This would make well over a million dollar loss to the 55,000 wheat growers in Nebraska for the covered smut loss in wheat in 1928. In 1925 and 1926, the loss is estimated at more than twice this amount, as the percentage of smutty wheat on the market was much higher and the wheat was more smutty, causing a greater price reduction per bushel. Some farmers have lost as much as one-half of their crop from covered smut, and in addition they have

been unable to sell at a satisfactory price what they did harvest. Badly smutted wheat must be thoroughly washed and scoured before it can be milled.

In 1927 the Omaha Grain Exchange officials became very much concerned over the wheat smut situation as buyers were discriminating against Nebraska wheat. An intensive campaign was planned to promote seed treatment, and the use of better and pure seed in the production of wheat.

#### 163,807 Visit Exhibit Trains

In cooperation with the Omaha Grain Exchange and railroad officials, special exhibit and demonstration trains were run over the state to promote seed treatment and better wheat growing practices. The following table shows the number of stops made and the attendance at these trains which were operated over the Burlington, Union Pacific, and Chicago and Northwestern lines through wheat growing areas.

TABLE 7.—SUMMARY OF WHEAT TRAIN ATTENDANCE.

Year	Railroads Cooperating	No. of Meetings	Attendance
1926	Union Pacific .....	43	22,923
1927	Burlington .....	27	17,125
1928	U. P. and N. W. ....	36	38,732
	State Fairs.....		84,927
	Total.....		163,807

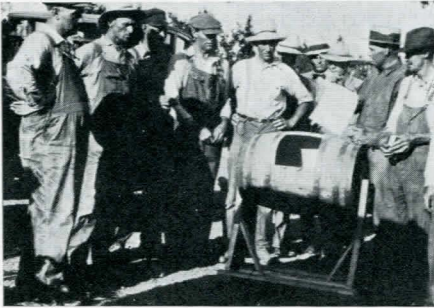


FIG. 13.—County Agent Heine of Phelps county demonstrating a barrel treater for wheat smut control.

In 1927 and 1928 the exhibit trains were displayed at the Nebraska State Fair where 84,927 people passed through them, observing the demonstrations and exhibits.

#### Eighty-two Per Cent Treated

Following the operation of the train, a survey was made of 1,861 farmers to determine what effect the campaign had had on the treatment of seed wheat for smut. This survey showed that along Burlington lines 46.6 per cent of the farmers treated in 1926, while in 1927, following the exhibit and demonstration train, 81.9 per cent treated, or 35.3 per cent more than during the previous year.

Oat and barley smut losses in the state are also serious. County agents throughout the state annually put on demonstrations and campaigns for the treating of all small grain seed. Each year since 1929 a survey of the state is made to locate areas producing smutty wheat. Local campaigns are then put on in these localities to promote seed treatment.

#### Smut Infection Is Light

While considerable smutty wheat is still being produced, reports from grain men show that this is, for the most part, very light infection. In many cases it is only sufficient to cause the

wheat to be classified as smutty. The price dockage and the loss of yield in the field, therefore, is much less than in 1925 and 1926 before the treating campaign was put on.

The following statement from Harry R. Clark, Chief Grain Inspector at the Omaha Grain Exchange, outlines the wheat smut situation at that market:

"Back in 1925 and 1926 the percentage of smutty cars arriving in the Omaha market was 39.8 per cent. This percentage was usually high but it did not tell the entire story, as a very large number of cars grading smutty were very badly infected, with the result that discounts ranged from 1 cent to 15 cents per bushel.

"In August, 1926, the Union Pacific Better Crops Special was run. The percentage of smutty cars arriving in the Omaha market during 1927 was 21.4 per cent, a marked decrease from 1926.

"In August, 1927, the Burlington Smut Special was run in Nebraska, Colorado, and Kansas. The percentage of smutty cars arriving in Omaha during 1928 was 27.7 per cent.

"In August, 1928, the Wheat Harvest Special was run in Nebraska over the Union Pacific and Northwestern. The percentage of smutty cars arriving in Omaha during 1929 was 28.4 per cent. This was the last train run and the percentage of smutty cars arriving in this market during 1930 was 30.1 per cent.

"Since 1927 there has been a gradual increase in the percentage of smutty cars, but the percentage of badly infected cars was very light, I might say practically none. The fact that the usual discount is in the neighborhood of one cent per bushel bears out this statement. In my opinion the elimination of bad 'smear smut' is due largely to the active campaign that was put on over the state.

"In conclusion, I will say that we cannot rest on our oars and expect a permanent cure on bad smut infection. It will be very necessary that we wage a vigorous campaign each year to hold the ground we have gained."

## Sweet Clover Production and Management

The remarkable evolution of sweet clover from a farm weed and pest to a one and a quarter million acre crop in a little over a ten-year period, is a story of agricultural interest and importance in Nebraska.

From the standpoint of soil fertility and conservation, pasture, seed, and hay, no crop means more to Nebraska farmers than sweet clover. Yet in 1920 less than 30,000 acres of sweet clover were grown in the entire state. Now each of several counties grows considerably more than this amount annually.

The credit for establishing the value of sweet clover in Nebraska must be shared with a few progressive farmers who, in spite of their neighbors' objections, sowed the crop and praised its value. To such men as S. M. Switzer, Frank Murphy, and Fred Tegler of Madison county, C. Y. Thompson of Cuming county, John Messman of Fillmore county, Val Kuska and Frank Odell of Lancaster county, and others, belongs the credit for pioneer work done in establishing the value of sweet clover in Nebraska.

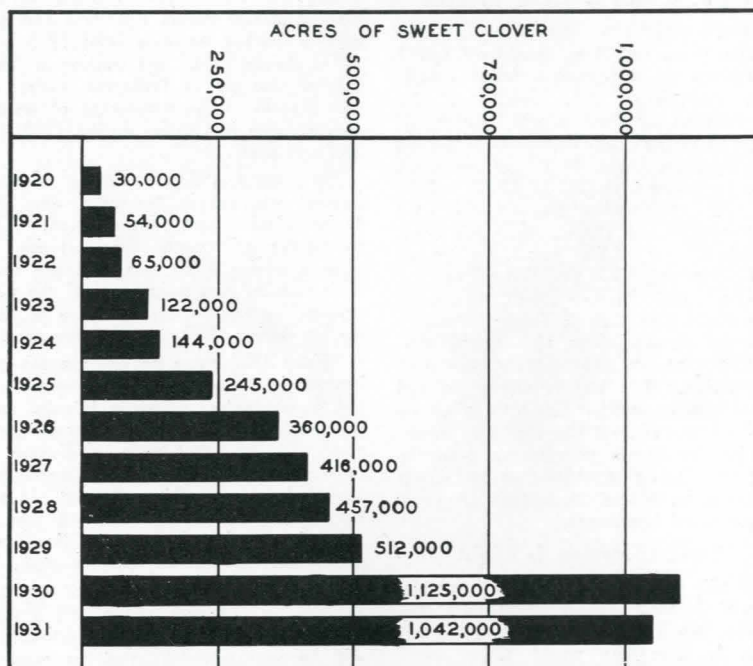


FIG. 14.—The sweet clover acreage in Nebraska during the past 12 years.



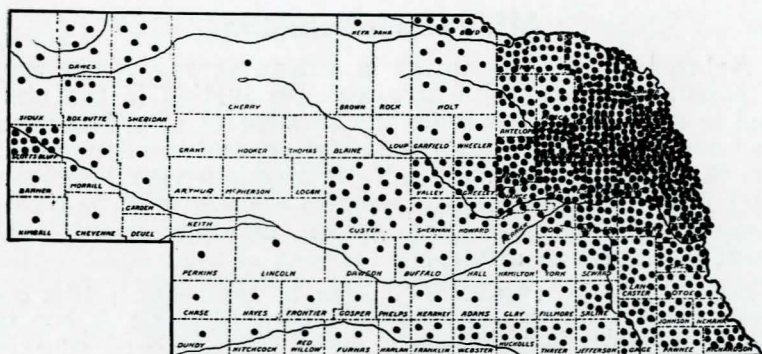


FIG. 15.—The distribution of sweet clover in Nebraska in 1930. Each dot represents 1,000 acres.

#### County Agents Held 609 Meetings

In 1914, the Nebraska College of Agriculture published a circular on sweet clover by Prof. T. A. Kiesselbach. This was the first Nebraska publication on this crop. In 1919, 1923, and 1931 new circulars were prepared by the extension agronomists. Beginning in 1919, an extension project was started to increase the acreage of sweet clover in Nebraska. Lantern slide talks on the crop were given at school house meetings arranged for by county extension agents. Many articles for farm papers were written, and demonstration meetings and farm tours were held on sweet clover. During the 1922-31 period, county extension agents held 609 meetings, tours, and demonstrations on sweet clover. Through this period most county extension programs included a

project for an increased acreage of sweet clover.

Special sweet clover exhibits were prepared for county and state fairs, and for the three "Better Crops Trains" operated throughout the state. It is believed that the work carried on by the agricultural extension service had much to do with the rapid increase of sweet clover production in the state.

Figure 14 shows the sweet clover acreage in Nebraska for each year from 1920 to 1931. The distribution of sweet clover in Nebraska in 1930 is shown in Figure 15. The production of this crop has rebuilt many badly eroded farms, supplied much pasture, seed, and hay, and added greatly to the returns from Nebraska farms.

The part that sweet clover has played in increasing yields of corn is discussed on page 14. The effect of "More Legume" campaigns is shown in Table 8 on page 28.

## Alfalfa Winterkilling

Nebraska leads the nation in alfalfa acreage. The crop is essential to profitable livestock production in the state and is very important from the standpoint of soil fertility and conservation. In the Platte Valley, and to a less extent in other parts of the state, alfalfa hay is a very important cash crop, being shipped to eastern and southern markets. Since 1918, Nebraska has grown annually more than 1,125,000 acres of alfalfa.

Beginning about 1920-21 Nebraska farmers experienced more and more trouble in maintaining satisfactory stands in alfalfa meadows. During the winter of 1924-25, many counties lost from one-sixth to as much as one-third of their alfalfa acreage. Many farmers secured good stands of alfalfa on newly seeded fields only to find that the stand killed out badly during the next year or two. This condition caused a great deal of concern and monetary loss to the farmers of the state. Observations in important alfalfa growing counties showed a marked difference in the permanence of adjacent meadows which traced to seed from different sources.

### Farmers Sowed Unhardy Seed

An investigation of the alfalfa seed situation showed that begin-

ning in 1920 much alfalfa seed was imported each year into the United States from foreign countries. In 1920 nearly 19 million pounds were imported. In 1922, 7 million pounds, in 1923 nearly 9 million, and in 1924, 13 million pounds were imported. Much of this seed reached Nebraska and was sown by Nebraska farmers. In addition to this imported seed, much seed from southwestern states found its way into the state.

In 1922 the Nebraska Experiment Station planted extensive alfalfa variety and source of seed experiments in an effort to determine the cause of the winter killing and loss of stands which were so common throughout the state. Seed of the different varieties, as well as that from



FIG. 16.—Northern Common alfalfa (on left) and unhardy southwestern seed (on right) at the Nebraska Experiment Station. Note that only a few plants in the unhardy plat survived the winter.



various states and countries, was included in these experiments.

These tests promptly showed that much of the seed being sold at that time to the farmers of the state was not hardy enough for Nebraska conditions. Fields seeded to imported seed from Argentina, Africa, Italy, and France killed out badly within a few seasons. Domestic seed from the southwestern states, such as Arizona, California, Texas, Oklahoma, and New Mexico, also proved unhardy under Nebraska conditions.

#### Farmers Compared Seed

As soon as the Nebraska Experiment Station determined that much of the seed then being sold to Nebraska farmers was unhardy and unsatisfactory, the Agricultural Extension Service arranged for demonstrations of alfalfa seed of different sources and varieties on farms out in the state. These demonstrations consisted of lots of seed of eight or ten varieties and sources, seeded side by side as a part of a field being put into alfalfa. Figure 17 shows the distribution of these variety demonstrations for the 1922-31 period. Meetings were held at these demonstrations in the spring at which time the difference in hardiness of the various kinds could be observed. Information on alfalfa

seed supplies was distributed over the state by the Agricultural Extension Service by means of bulletins, school house and field meetings, tours, illustrated lectures, and a series of circular letters. During the 1922-31 period, the county extension agents of Nebraska held 584 alfalfa meetings and demonstrations. The use of alfalfa seed of known hardy origin was emphasized in these meetings. Exhibits on alfalfa production, varieties, and sources of seed were a part of two of the special "Better Crops Trains" and of the "Hog Train" operated over the state.

#### Wilt Caused Loss of Stands

The Nebraska Experiment Station also found that alfalfa wilt, a bacterial disease, was an important factor in causing premature loss of stands in alfalfa meadows, particularly where the fields were plentifully supplied with water as under irrigation or on sub-irrigated bottom and bench lands. Certain lots of seed showed a much greater resistance to wilt than others.

In 1920-21 County Agent Hecht of Dawson county pointed out the fact that certain fields in that county maintained their stands even though nearly twenty years old. In testing alfalfa varieties

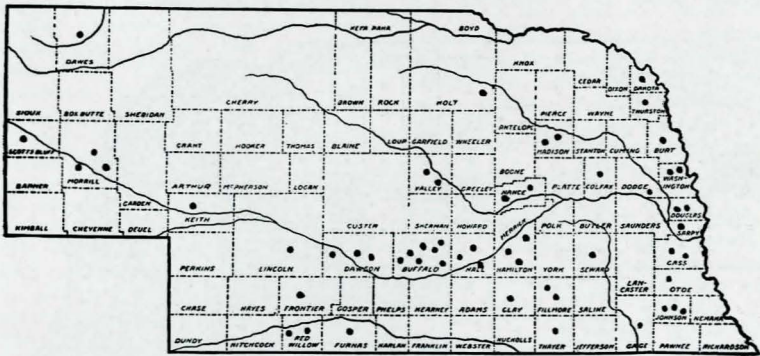


FIG. 17.—Alfalfa variety demonstration were planted on 56 Nebraska farms during the 1922-31 period.





FIG. 18.—A group of Buffalo and Dawson county alfalfa growers and their county extension agents on a tour studying the cause of alfalfa killing out.

for resistance to wilt, the Experiment Station found that seed from the old Arnold Brothers field near Cozad was one of the most resistant to wilt. In 1929 eight bushels of seed from this field were secured and put out to growers for increase. The variety was named **Hardistan** and is being increased as rapidly as possible, as it offers great promise as a variety for conditions where alfalfa wilt is troublesome.

The Agricultural Extension Service, in cooperation with the United States Department of Agriculture, and the Nebraska Crop Growers' Association developed plans for verifying, ap-

proving, and certifying alfalfa seed which can be depended on by buyers. Nebraska farmers no longer need to sow alfalfa seed of unknown origin. Under these plans the Nebraska Crop Growers' Association approved and certified 313,440 pounds of alfalfa seed during the 1929-31 period.

The information relative to the hardiness and wilt susceptibility of alfalfa of different varieties and sources, which has been disseminated among the farmers of the state, and the development of reliable sources of hardy approved and certified seed, has been of great value and an essential factor in maintaining the acreage of alfalfa in Nebraska.

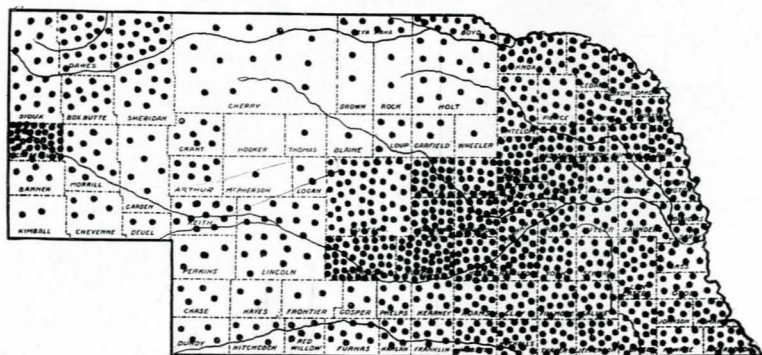


FIG. 19.—The distribution of alfalfa in Nebraska in 1930.

## Soil Conservation and Management

Nebraska's virgin soils are, on the whole, rich and productive. Although Nebraska is a relatively new state, there are already numerous farms the soils of which are greatly depleted in fertility and badly injured by sheet erosion and gullying. In certain counties, soil depletion has reached the point where some fields have been abandoned for cultivated crops. Many farms, particularly those on hilly land, which have been rented for years, have been grain farmed so much that weeds and low fertility make them unprofitable.



FIG. 20.—Continuous grain farming greatly reduced the organic matter of the soil of this field, causing gullying which ruined it for farming purposes.

### A Public Responsibility

The conservation and maintenance of the fertility of the soils of the state is a public responsibility. Serious injury to the soil of a farm by erosion or depleted fertility lowers its productiveness and value, thereby throwing a greater burden of taxation on neighboring farms that are well maintained. Every farmer should, therefore, be interested in the management and conservation of the soil of all farms of the state.

Experiment Station investigators in soils have shown that the organic matter and nitrogen content of cultivated Nebraska soils have been rapidly reduced. Well maintained fields show a loss of about 10 per cent of the organic matter content of virgin land while poorly managed, eroded, hilly fields have lost as much as 70 per cent of the virgin organic matter content. Investigations have shown that soils low

in organic matter have a deficiency of nitrogen, tend to be in poor physical condition and are inclined to erode and blow more than soils which are kept well supplied.

### Legumes Maintain Organic Matter

During the past 10 years, the Agricultural Extension Service, through its county extension agents and specialists, has carried on an aggressive soil conservation and management program. The greatest soil problem in Nebraska is that of organic matter maintenance. This can be accomplished best by the growing of legume crops in the rotation. Legumes not only supply organic matter and nitrogen but they also tend to prevent soil washing. The construction of brush dams, soil-saving dams, and terraces has also been promoted for the control of erosion and for the conservation of rainfall.



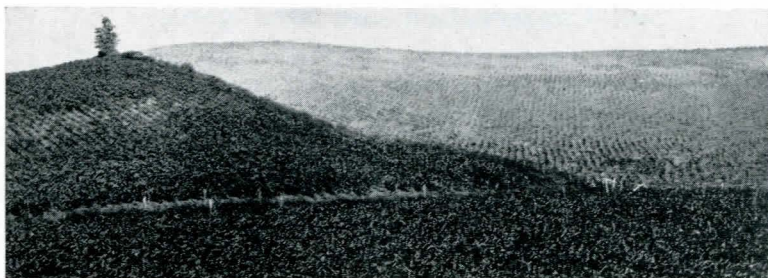


FIG. 21.—The field in the distance has been reduced in organic matter and nitrogen due to continuous grain farming. The other two fields have been in clovers and manured.

In 1924, the county agents, assisted by extension specialists, carried out intensive soil conservation and management programs in Johnson, Cass, Otoe, Washington, Lancaster, Thurston, Dakota, and Dawson counties. In 1925, this work was extended into Saunders, Colfax, Custer, Madison, and Frontier counties. A series of four illustrated letters, showing good soil management practices, was sent by county agents to all farmers in these counties. School house meetings were held. Mock trials of the "soil robber" were put on. Field demonstrations were started which involved mapping and laying out good rotation systems for certain badly run-down farms, the proper

seeding methods for alfalfa and sweet clover, and the installation of brush and soil-saving dams and terraces. "A legume crop with every acre of small grain" was the slogan and aim of the program in these eastern Nebraska counties.

#### "More Legumes" Program Results

In 1926 a study was made of the results of these county programs to maintain soils and prevent erosion by the greater use of legume crops. Federal and state statistics were used as a basis for comparing the increase in sweet clover in counties carrying on the campaigns, with adjoining counties which did not have soil improvement programs. Table 8 shows the results of this study.

TABLE 8.—INCREASE IN LEGUMES IN COUNTIES WITH "MORE LEGUMES" PROGRAM AS COMPARED TO OTHERS.

Eastern Nebraska Counties	1925 Sweet Clover Acreage	1926 Sweet Clover Acreage	Per Cent of Increase
Twelve counties with no county agent .....	51,924	82,481	59
Eight counties with county agents but no "More Legumes" campaign .....	20,984	40,895	93
Nine counties with "More Legumes" Extension campaign .....	24,792	57,234	131



quests for help in testing soils and in applying lime reach the Agricultural College.

In 1926, approximately four carloads of agricultural limestone was distributed to 78 farmers for demonstration work in testing the need of lime. These farmers were distributed in the following counties: Saunders 14, Lancaster 18, Otoe 13, Cass 12, and Johnson 21. This work answered many questions as to the practicability of liming southeastern Nebraska soils for legumes.

Madison county, under the direction of the county extension agent, also carried on 20 farm demonstrations, some of which showed a marked benefit from lime on Elkhorn Valley sandy soils.

In certain eastern Nebraska counties considerable trouble and loss is experienced in establishing satisfactory stands of sweet clover and alfalfa. Annually many re-

Perennial weeds are an increasing menace to agriculture in Nebraska. The small-flowered morning glory, also known as bindweed, Creeping Charley and Creeping Jenny, can now be found in every county of the state and in some counties on practically every farm. This weed pest is the worst one with which we have to deal in Nebraska. In some instances, it now covers single areas as large as 320 acres. Many 80-acre fields can be found which are practically entirely covered with this serious pest.

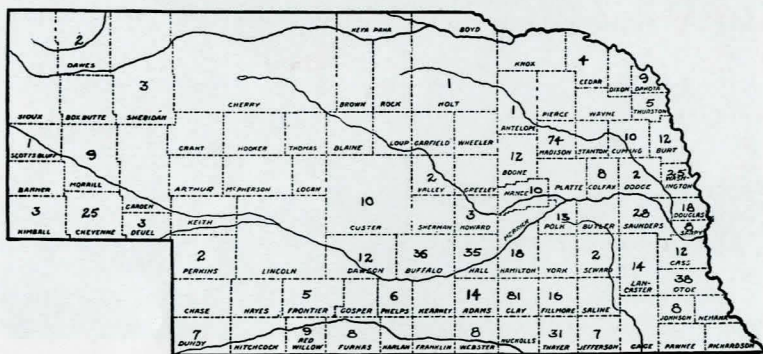


FIG. 22.—During 1928-31, 670 weed meetings and control demonstrations were held in the state, distributed as shown above.

Unlike common weeds, bindweed, once it is established on a farm, spreads in patches of ever-increasing size by means of deep-lying spreading root stalks beyond the reach of tillage machinery. Infested areas are practically worthless for the production of grain crops.

Patches of other serious perennial weeds, such as Canada thistle, tan-weed, white weed, hoary cress or perennial mustard, leafy spurge, knapweed, and others, are of this same character. They spread from year to year and present greater and greater problems.

#### **Bindweed Control Vital Problem**

The control of such very serious weed pests as the small-flowered morning glory is a vital problem which concerns the entire state. Surveys in some of the worst infested areas show that this weed develops seed in small grain fields, particularly in winter wheat and rye. As many as 26,000 seeds of bindweed have been found in a single bushel of wheat grown on a badly infested field. The use of infested seed as well as the use of tools in cultivating the field which spread patches are frequent causes of new infestations. Wagons, hay racks, threshing machines, and barnyard manure may also be the means of spreading bindweed.

#### **Chemicals or Cultivation Kill Perennial Weeds**

The Nebraska Experiment Station has carried on considerable research work on the eradication of bad perennial weeds such as bindweed, by means of chemicals. Work has also been done on the eradication of weeds of this type by means of summer fallow. **These experiments have definitely shown that the perennial weed pests can be killed by using chemicals such as sodium chlorate or by means of two seasons of very careful and thorough summer fallow.**

#### **Held 670 Meetings**

There has been, for several years, a strong demand for some method which could be used for the eradication of small patches of bindweed, Canada thistle, and quack grass and other serious pests. Beginning in 1928, the Extension Agronomists and County Agricultural Agents of the state put on demonstrations showing the proper use of sodium chlorate. Meetings were held at these demonstrations where weed control in general was discussed as well as the detail of applying chlorate. The principle of clean cultivation to eradicate bad perennial weeds was also discussed at these meetings and demonstra-



FIG. 23.—County Agent Adams of Dawson county demonstrating the application of chlorates as a spray on a small patch of bindweed.



tions. During the 1928-31 period, 670 meetings and demonstrations on weeds were held in the state. The distribution of these demonstrations is shown in Figure 22.

These meetings and demonstrations have created a great interest in weeds among Nebraska farmers. However, unless there is still greater activity on the part of Nebraska farmers to eradicate and control these serious weed pests, an even greater spread will occur which will result in low crop yields on infested areas and greatly reduced land values. Many loan companies have already

reached the stage where they refuse to make a loan on a farm which is infested with bindweed. The control of weeds of this type is a community and state problem. Badly infested farms, on which the weeds are not controlled, are a continual threat and menace to adjoining farms. Unless definite aggressive action is taken and a program developed for the control of serious weed pests like the bindweed, eradication will become a nearly hopeless task, and the agricultural land values of the state will be tremendously reduced.



FIG. 24.—Untreated bindweed in the rear and chlorate treated area in foreground. Note that corn cannot successfully compete with the bindweeds for moisture and fertility.



## Nebraska Extension Circulars

Prepared by Extension Agronomists  
on Crops and Soils Subjects

1922-31

- Cir. 114. Four Bad Nebraska Weeds.
- Cir. 116. The Use of Chlorates for the Eradication of Noxious Weeds.
- Cir. 120. Wheat in Nebraska.
- Cir. 121. Soybeans in Nebraska.
- Cir. 122. Sweet Clover in Nebraska.
- Cir. 123. Soil Washing.
- Cir. 127. Seed Corn Testing.
- Cir. 129. Profitable Wheat Production.
- Cir. 131. Marketing Wheat on a Protein Basis.
- Cir. 132. Smut Control in Cereals.
- Cir. 133. The Management of Nebraska Soils.
- Cir. 134. Sweet Clover Management.
- Cir. 135. Field Bean Production in Nebraska.

Copies of these circulars are available upon request to the County Agricultural Agents or to the Nebraska College of Agriculture at Lincoln.

800

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