

# Chapter 10

## Extension Agronomy

### (Crops & Soils)

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*The information that follows focuses on some of the activities and programs in Extension Agronomy. It should not be viewed as a totally comprehensive review of the Department.*

## Early Developments in Agronomy

In 1874, Professor E. M. Shelton of the Kansas State Agricultural College faculty started a series of experiments on the cultivation of alfalfa, cowpeas and tame grasses.

He continued his observations of varieties and species under different forms of treatment until 1889.

Shelton's research work was probably the first done at the College. Later he became the first director of the Experiment Station.

#### **Farmers' Institutes Provide Way—1881**

The earliest work in crops and soils was done at Farmers' Institutes. In 1881, President Fairchild established the policy that faculty members would participate in as many as six Farmers' Institutes during the year.

The Institutes were organized by agricultural leaders in many parts of the state, and requests made to the College for speakers. During the year 1900-1901, a total of 156 Institute programs were conducted.

#### **Establish Experiment Station—1887**

The Kansas Agricultural Experiment Station was established, following the passage of the Hatch Act, on March 1, 1887. The Kansas legislature accepted the provisions of the Hatch Act on March 3, 1887.

On February 7, 1901, the Kansas legislature accepted a part of the Fort Hays military reservation to be used for an Experiment Station, a western branch of the Kansas State Normal School. Extension

#### **Agronomy on Trains—1906**

The railroads showed much interest in the efforts of the College to reach the rural people. In August of 1906, a "Wheat Train" was operated over the Santa Fe Railway lines in the southwestern part of the state. Over 7,300 people attended the traveling show. The Union Pacific followed with a similar train.

In June of 1907, the Santa Fe Railroad cooperated by furnishing an educational train promoting alfalfa growing in southeastern Kansas.

The Missouri Pacific Railroad, in January of 1907, provided an exhibit car and took the state corn show over its lines in southeast Kansas.

#### **Extension Agronomy Publications—1907**

In 1907, the College began publication of educational leaflets and bulletins. A few of the titles and authors were:

Soil, by J. T. Willard; How Plants Feed & Grow, by J. T. Willard; A Corn Primer, by C. S. Knight; Dry Land Farming, by A. M. TenEyck; Making Hay, by A. M. TenEyck; and Plant Breeding, by Geo. Freeman.

P. E. Crabtree was the pioneer in Extension work in Agronomy. He was a versatile individual who possessed a wide knowledge of farm conditions, and was well informed about livestock, crops, soils, and farm management.

Crabtree participated on many Farmers' Institute programs and became well acquainted with many progressive farmers.

His many contributions made to agricultural education included, for example, the statement that if the soil was not moist three feet deep it would not pay to seed wheat in western Kansas. Research work has proven his statement to be true.

Crabtree's work made a profound impression on the minds of leading farmers throughout the state. His work was fundamental in creating a desire for rural agricultural education.

## **Early Extension Specialists/Methods**

In 1909, 103 Kansas counties had organized County Farmers' Institutes. The institutes were responsible for activities such as judging schools for corn and livestock, Boys' Corn Contests, the Kansas Corn Breeders Association, and many others of a similar nature. The College assisted with those programs whenever possible.

#### **Bulletins**

The information discussed at the early Farmers' Institutes and printed in bulletins included the selection of superior varieties of crops, the use of good seed by seed selection, planning crop rotations, the control of weeds, proper tillage of the soil, improved

soil treatments, pasture improvement and management and soil conservation.

#### **Lectures/Demonstrations**

Lectures and demonstrations were the primary teaching methods used by Extension Specialists through the years. To supplement the voice, charts, objects, pictures and slides have been used.

Method demonstrations were used to explain and show how to perform a practice, such as selection of seed corn or testing seed.

Result demonstrations were usually field plots that gave comparative yields of different varieties, with varied fertilizer treatments.

### **Meetings**

After the organization of County Farm Bureaus in Kansas and subsequent employment of County Agents, community and county-wide educational meetings were held.

### **Tours/Field Days**

Tours and field days became another method of teaching, and became common and widely used. Result demonstrations were usually visited on a tour.

Field days for the Experiment Station, branch stations and experiment fields became established on an annual scheduled basis.

### **Correlated Schools—Early 1920's**

Correlated schools were first organized in the early 1920's when Specialists in crops, soils and engineering pooled their efforts to conduct schools on subjects involving the various fields of interest.

Specialists in Crops and Livestock coordinated their efforts, as did Livestock or Dairy Specialists and the Extension Veterinarian. More and more people became interested in the schools being held by the Extension Specialists.

### **Extension Crops Specialists—1920-23**

On July 1, 1920, Luther Willoughby was appointed Extension Crops Specialist on July 1. He had been serving as a District Demonstration Agent with headquarters at Hays.

He remained at Hays until December 1, 1920, serving as a general Specialist with headquarters at the Experiment Station. When he came to Manhattan he was assigned work in corn improvement, bindweed control, and legume work.

Ernest Wells was appointed Crops and Soil Management Specialist on August 1, 1920 and was assigned soils work.

Harlan Sumner was employed January 1, 1923 and assigned responsibilities with pure seed of adapted varieties, and the Wheat Belt Program. He also served as secretary of the Kansas Crop Improvement Association.

### **Truck Tour—1924**

In 1924, a truck tour was organized for three southeast Kansas counties. Educational materials and exhibits were transported from town to town by truck.

That idea was expanded in 1925 and the truck tour was operated through most of the southeast Kansas counties.

### **Train Tours—1926**

A train operated in 1926 by the Missouri Pacific Railroad was known as the "Missouri Pacific Soil Improvement Special."

A similar train, in 1928, was operated over the Santa Fe lines in eastern Kansas with 57 stops and 96,287 persons visiting it.

In 1930, another train was devoted to wheat production and improvement. It made 58 stops in 47 counties and was visited by 106,150 persons.

### **Agronomy Project—1927**

In 1927, the various activities in crops and soils were combined into the agronomy project effective December 1, 1927.

In 1929 the Soil Management and Crop production project included these sub-projects:

- 1) Crop Improvement.
- 2) Legume Production.
- 3) Soil Improvement.
- 4) Soil Management.
- 5) Bindweed Control.
- 6) Corn Production.

By 1961, the sub-projects had changed a bit:

- 1) Crop Improvement.
- 2) Legume Production and Soil Improvement.
- 3) Pasture Improvement.
- 4) Soil Management.
- 5) Weed Control.
- 6) Soil Conservation.

### **Leader Training—1930's**

About 1930, L. E. Willoughby, Extension Crops Specialist, developed the idea of training leaders. For several years leader training was given heavy emphasis.

The County Extension Agents and the trained leaders then conducted community schools in an effort to reach maximum numbers of farmers in a county.

### **Crops Contests—1930's**

In the 1930's and later, contests became a means of developing further interest in crop and livestock production.

Local Chambers of Commerce, in addition to those in Wichita, Kansas City and St. Joseph, gave generous awards for achievements as determined by the Extension Specialists, or committees, selected

to determine those who were considered worthy of an award.

### **County Agronomy Plans of Work—1937**

In 1937, the Specialists in Agronomy developed a plan for preparing a plan of work for each county Extension program in the agronomy field.

A full day was devoted to a meeting with the County Agent and leaders. A half-day was given to instruction in newer information in agronomy and the other half-day to developing an Extension plan of

work in agronomy for the next two years.

That system was followed for several years, until the procedure for planning county Extension programs to include all Specialists had been developed.

Agronomy Specialists gave much attention to training agents and leaders at district meetings and special county meetings; and by providing educational and illustrative materials.

## **Crop Improvement**

The first Extension work done in agronomy in Kansas was to encourage the improvement of crops by the use of better seed. This work involved seed selection, seed testing, and development of better strains of crops.

### **Crop Improvement Association—1914**

The Kansas Corn Breeders Association was organized in 1910 as a result of the corn improvement program. In 1914, that Association was reorganized into the Kansas Crop Improvement Association to:

- 1) Serve as a seed certifying agency.
- 2) Do educational and promotional work to improve crops.

In 1926, H. R. Sumner, Extension Crops Specialist, gave about one-fourth of his time to serve as secretary of the Crop Improvement Association. It had 207 members at that time.

Ernest Wells, Extension Agronomy Specialist, served as secretary from 1928 to 1935.

In 1935, A. L. Clapp became secretary of the Crop Improvement Association. He was a former Extension Crops Specialist but at that time was in charge of cooperative experiments in the Department of Agronomy.

From 207 members in 1926, the Association grew to 369 members by 1932. It dropped to 219 in 1933 due to the drought and unfavorable crop growing conditions, but grew to 589 members by 1937.

### **Crop Standardization Project—1923**

The sub-project, "Pure Seed of Adapted Varieties," was established in 1923. In 1926, the name was changed to "Crop Standardization" for brevity.

Promotional work to encourage the use of good

seed of adapted varieties included county seed exchanges, seed shows, fair exhibits, tours, the Wheat Belt Program, demonstrations, publicity, and the soil improvement train.

### **Corn Demonstrations—1923**

In 1923, Luther Willoughby, Extension Agronomy Specialist, conducted demonstrations on selection of seed corn, showing how to select the most desirable type of ear and discussing methods of storing.

Another early demonstration was to encourage farmers to seed a few rows of an undesirable type of corn beside the desirable type, and make yield notations at harvest time.

### **County Seed Exchanges—1924**

County seed exchanges provided an excellent opportunity for sellers and local buyers to get together. All samples brought in for display were tested for germination and purity.

The first county seed exchange was conducted in Osage County in 1924. In 1926, 53,985 bushels of seed were sold through the county seed exchanges. The State Seed Testing Laboratory tested 8,819 samples of seed in 1926.

In 1931, 46 county seed exchanges sold 56,106 bushels of good seed, 61 exchanges sold 160,571 bushels in 1933, and 90 exchanges sold 367,017 bushels from 5,251 samples in 1935.

### **Certified Seed—1927**

The Kansas Crop Improvement Association gave full support to their production of pure seed from its limited resources.

In 1927, sales of certified seed amounted to more than 25,000 bushels of wheat, 3,734 of sorghum, 2,372 of corn, 7,372 of oats, 656 of alfalfa, and 219 of sweet clover.

In 1937, the 589 members produced 279,942 bushels of certified seed.

The increase in certified seed was in the following varieties of crops: 94,225 bushels of Tenmarq wheat; 34,355 of Atlas Sorgo, 39,000 of Kawvale wheat, and 22,980 of Blackhull wheat.

In 1938, the Association had 437 members who produced 314,887 bushels of certified seed.

#### **Variety Tests—1927**

Cooperative variety tests conducted by the Department of Agronomy were an important factor in encouraging farmers to use adapted varieties.

In 1927, there were 105 such tests for wheat, 87 for corn, 19 for barley, 17 for oats, 93 for sorghums, 22 for soybeans, 54 for alfalfa, and 29 of a miscellaneous nature in Kansas.

#### **Variety Demonstrations**

By 1937, the variety and fertilizer demonstrations numbered 817 in 99 counties. And, in 1958, 393 such field demonstrations were conducted.

About 1952, the cooperative variety tests as conducted by the Department of Agronomy were discontinued and subsequently replaced by Extension variety demonstrations under the supervision of the Agronomy Specialists.

Frank Bieberly had charge until 1960 at which time Howard Wilkins was assigned the responsibility.

#### **Crop Improvement Project—1928**

In 1928, the Crop Improvement Association and the Extension Agronomy Specialists developed the sub-project known as "Crop Improvement." Prior to 1928, corn had received the primary emphasis in crop improvement work.

#### **Seed Testing—1930's**

The state seed laboratory tested 12,694 samples of seed in 1931, 6,370 in 1933, and 13,759 in 1935. The fluctuations were brought about by the drought of the early 1930's, the economic conditions, and variability in the quality of seed due to the drought.

The volume of seed testing became so great that in some years the state laboratory was unable to test all samples submitted and counties were given an allotment per week.

Some counties purchased seed germination equipment to alleviate the burden on the state laboratory and provide farmers with a germination report on their seed without delay.

In 1947, 25 counties were operating their own seed germination equipment.

The county seed exchanges continued as a service to farmers who had good seed to sell and to those who needed to buy good seed.

#### **Seed Grower Awards—1930**

As work progressed on the pure seed program, the idea of giving recognition to outstanding seed growers developed.

In 1930, a recognition program sponsored by the Kansas Crop Improvement Association, the State Board of Agriculture, and the Kansas City Chamber of Commerce was initiated.

The first "Premier Seed Grower" awards were given to: C. C. Cunningham, El Dorado; Bruce Wilson, Keats; J. K. Freed, Scott City; and Fred Laptad, Lawrence.

Usually two "Premium Seed Growers" were recognized each year at the time of the annual meetings of the Crop Improvement Association.

#### **County Crops Schools—1933**

County Crops schools, held in 1933, were known as "Crops Carnivals." A seed exchange was on exhibit, a Crops Judging Contest conducted, and weed seed identification instruction given at these meetings.

#### **National Seed Committee—1935**

A National Seed Stocks Committee was established in 1935 for the purpose of locating and making available to farmers sources of reliable and pure seed supplies.

E. B. Wells, Agronomy Specialist, worked with the National Committee.

#### **State Seed Committee—1935**

A similar state committee was established and Luther Willoughby, Agronomy Specialist, was assigned to the committee as the Extension representative.

#### **Seed Fields—1935**

Specialists, in 1935, encouraged producers of good seed to establish "seed fields" in which special care would be given to maintain purity and quality.

Those seed fields proved to be a very satisfactory source of good seed for the various crops.

"Produce enough good seed in a county to supply the county's need" was a Crop Improvement goal established by the Agronomy Specialists.

### **Oats—1939**

Fulton oats was certified for the first time in 1939. Osage and Neosho oats were released in 1945. Nemaha, Cherokee and Clinton oats were distributed in 1947.

In 1962, the oats acreage was 378,372, perhaps the lowest acreage for many years. A total of 105 acres of oats was approved for certification in 1962.

### **WIA Directors—1945**

Clifford Skiver, a former Extension Specialist in another state, succeeded Dr. Parker as director of the Wheat Improvement Association in 1945.

Charles Pence, a former County Agricultural Agent in Saline County, became director in 1952.

### **District Schools—1946**

Following World War II emphasis was placed on maximum production, and renewed attention was paid to the fundamentals of producing certified seed.

A series of district schools for certified seed producers and County Agents was held, under the leadership of L. L. Compton who became secretary of the Association in 1946, and by the Extension Agronomy Specialists in 1948.

District schools were continued for almost a decade in an effort to thoroughly train seed growers and County Agents as to the importance of careful production methods, the importance of keeping pure seed pure, preparation of seed for market, and the fees necessary to adequately support a seed certification program.

### **Flax—1940's**

The flax acreage dwindled to a few acres following WW II, with only around 12,500 acres devoted to the crop annually. An occasional new variety or strain was made available and used in the eastern portion of the state.

### **Seed Distribution of New Varieties—1949**

In 1949, the Seed Stocker Distribution Committee was established. This was an Experiment Station committee, but Frank Bieberly, Agronomy Specialist, was the Extension representative.

The responsibility of the Seed Distribution Committee was to supervise the increase and distribution of seed of each new and improved crop variety produced by or under the direction of the Kansas Agricultural Experiment Station.

One method of increasing seed supplies more rapidly for general distribution was to select out-stand-

ing seed growers and make seed of a new variety available to them. The grower had to agree to grow the crop according to the rules for certification, and to sell the crop at a reasonable price.

### **Drill Box Surveys—1958**

Field comparison test plots of the seed wheat farmers were using was continued from time to time on a moderate scale. From 1958 to 1960, "drill box surveys" were made by County Agents to emphasize the need for higher quality seed wheat.

From one test in Kingman County, 17 farmers were advised that the seed wheat they were using was a varietal mixture that would reduce yields.

In 1961, seed from five farmers out of 97 samples was not saleable due to the presence of noxious weed seed.

### **Plan Ahead Seed Selection—1960's**

A program was launched to encourage farmers to obtain their seed requirements early before the supplies might be marketed through other channels.

In 1962, the Agronomy Specialists reported the acreage of the major crops approved for certification to be: alfalfa, 895; barley, 362; hybrid corn, 198; forage sorghum, 625; grain sorghum, 25; hybrid sorghum, 269; soybeans, 1073; wheat, 15,126; grasses, 236; oats, 105.

The number of acres planted with seed of recommended varieties in 1962 was: wheat, 9,362,850; sorghum, 3,737,892; corn, 1,577,394; oats, 378,372; soybeans, 584,300; and barley, 739,202.

### **Irrigation in Wallace County—1972**

Irrigation had caused change in the cropping program in Wallace County. Wheat, however, is still the number-one crop, with one half of the total yearly crop acres devoted to it.

Progress in cultural practices of wheat, shown by increased yields, has been offset by price cutbacks of wheat. This price dilemma has fashioned a cloud of doubt in the farmers' minds especially in less productive years.

### **Irrigation Expansion—1972**

For the past two decades, the KSU Extension has provided the leadership for an intensive educational program designed to attain the full development, wise use, and responsible management of land and water available for irrigation farming.

At the beginning of this period, estimates indi-

cated that 10,000,000 acres of land in the state were suitable for irrigation farming, and that water resources were sufficient to support the development of 3,500,000 acres of these lands for sustained irrigation farming.

Average annual expansion of irrigation in Kansas is about 80,000 acres. If this rate continues, a goal of 3,500,000 acres by 1980 will be almost obtained.

#### **Winter Production Schools in SW—1974**

Public meetings, referred to as Winter Schools, remain one of the most popular Extension techniques of presenting new research and recommendations to agriculture producers.

The Southwest Area has 22 counties and they held 53 winter schools which attracted 4,168 participants.

Topics ranged from broad overviews of crops to specific wheat, corn, grain sorghum, alfalfa, silage, irrigation, soils, and chemical problems.

#### **Grain Harvesting & Handling Schools—1974**

Farmers need more information about harvesting, storing, and drying to adequately improve the volume and quality of grain marketed.

In-depth schools for approximately 500 farmers in eight counties were held by Extension engineering specialists.

An additional 800 producers in 15 counties were prompted to participate in sessions on grain drying and aeration management by the shortage and high price of fuel for drying grain.

#### **High Plains Grain Conference—1974**

Extension Specialists from Kansas, Oklahoma, and Texas planned and held the second annual High Plains Grain Conference in Liberal, Kansas to "promote discussion about solutions to problems common and unique to the grain in the High Plains area."

About 175 grain producers, elevator operators, grain handling equipment distributors, feedlot operators and businessmen from five states participated in the two-day conference.

#### **Variety Demonstrations—1975-76**

Soybean and wheat variety seed is supplied annually to County Extension Agricultural Agents for planting demonstrations. For 1975-76, seed for 42 soybean demonstrations, each consisting of six varieties, was provided to 81 counties.

Demonstrations are the highlight of county crops tours. Attendance has exceeded 200 persons in some

counties. Since plot markers identify varieties, county agents have observed individual producers visiting plots throughout the season, another indication of the popularity of the demonstration program.

#### **High Plains Grain Confab—1976**

The High Plains Grain Conference was continued in 1976 as an effective educational event. It provided the latest technical information from university and industrial sources on specific programs relating to grain production, harvesting, handling, storage, marketing, and utilization in the High Plains.

The conference brings together grain producers, livestock feeders, local elevator operators, representatives of the grain marketing trade, and manufacturers and distributors of equipment and supplies used for grain storage and handling systems.

The program is planned and sponsored by Extension specialists at Kansas State and Oklahoma State Universities and alternated between Liberal, Kansas and Guymon, Oklahoma.

Attendance in 1976 included 97 registered participants, 55 students, 20 exhibitors and 15 professionals appearing on or assisting the program.

#### **Observe 100 Years of Production—1976**

The 1976 Agronomy Field Day at Manhattan was highlighted by a set of plots where crops grown in 1976 were compared with those grown about 100 years ago.

Important crops grown in 1876 were sorghum molasses, open pollinated corn, red clover, foxtail millet, buckwheat, broom corn, and flax. Only red clover and foxtail millet are grown in the state now.

#### **Agronomy Field Day—1977**

When attendance at the Annual Agronomy Research Farm field day in Manhattan dwindled to the point that consideration was given to discontinuing the event, Extension was given the task of making it more attractive to farmers.

From field day attendance of less than 30 people in the mid-1960's, attendance rose to 621 in 1967, the first year it was coordinated by Extension. Attendance has increased steadily since then, reaching a record 1,763 in 1976.

Innovations at the Agronomy Field Day included:



- 1) Short walking tours.
- 2) Browsing tent where professors and specialists from all disciplines in agriculture answer questions of visitors.
- 3) Special displays and demonstrations.
- 4) Special women's programs.
- 5) Luncheon on the grounds.

The Field Day is promoted by state, area and county Extension staff members, many of whom also participate in the event.

### **Grain Grading Schools—1977**

One of the oldest on-going Extension programs in Kansas is the annual Grain Grading Schools to help grain handlers more accurately determine quality and condition of stored grain.

Four to six licensed inspectors served as instructors this year for the 400 participants from Kansas county elevators, terminals, flour mills, and feedlots.

### **Farm Machinery—1978**

The technology of grain crop harvesting is undergoing a significant change, following the introduction of rotary type combines by several manufacturers.

These machines are especially important to a wheat state such as Kansas, since they replace the straw walkers of a conventional combine with a more effective rotary separation device. Historically the straw walkers have been the major source of grain loss in wheat.

In order to assess the effectiveness of rotary combines under Kansas conditions, a cooperative study involving both Extension and research personnel was organized in 1978.

The project compared conventional and rotary machines at three different locations in the state, and the relative grain yield from the various machines was determined along with the grain crackage and dockage from each test.

### **Grain Storage—1979**

Producers are placing more grain in on-farm storage. Many of the farm grain storage bins and systems are larger and more complex.

Department of Agriculture loan programs provided a potential for increasing the lengths of the storage period. There is a trend toward earlier harvesting of grains. Producer experience with stored grain management is often limited.

The potential for excessive in-storage grain losses as a result of this set of factors prompted the planning and delivery of an expanded grain storage educational program thrust in 1979.

### **High Yielding Varieties and Hybrids—1980**

Results from Kansas State University performance tests on corn, grain sorghum, soybeans and wheat indicate the importance of proper selection of varieties and hybrids.

Yield differences of 20 to 50 bushels per acre occur frequently on corn and grain sorghum, 10 bushels on soybeans and 15 or more on wheat. Several private soybean varieties have a higher yield potential than public varieties.

Accordingly, producers desire information for selecting high yielding varieties and hybrids adapted for their area and which offer the best tolerance for pest control.

The State Extension Crops Specialist supplied wheat variety seed to 70 counties during the past year. Agents at demonstration sites affording procedures an opportunity to observe new varieties compared with older releases and study variety performance under local conditions.

### **Multi-Discipline Programs—1983**

Educational efforts in 1983 were multi-disciplinary and in some events closely coordinated with other groups.

To illustrate, eight Soybean Profit Seminars were conducted throughout the state in cooperation with the Kansas Soybean Association and Kansas Soybean Commission. Over 800 soybean growers attended these events. The noon luncheon was provided by industry.

The 1983 Soybean Production Contest is especially significant. Cooperators include the Cooperative Extension Service and Kansas soybean producers who provide an awards luncheon during which time contest winners are recognized with prizes.

This activity has stimulated producers to implement their best management practices. A record number of 145 growers entered the contest in 1983.

The severe drought of 1983 seriously reduced yields on 1.6 million acres. A record 1.85 million acres of soybeans were planted in Kansas in 1982 with a yield of 26 bushels per acre.

The record state average yield of 30 bushels per acre was achieved in 1981.

# Wheat

## Wheat Varieties—1919-1960

For many years, Turkey was the only variety of wheat grown in Kansas. The first improvement came about by selection from Turkey. Kanred and Blackhull were the first improved varieties grown by Kansas farmers. Early Blackhull was a selection from Blackhull.

The next wheat improvement work was by plant breeding. The first new variety developed by breeding was Tenmarq.

New varieties were made available to farmers as follows: 1919 — Kanred and Blackhull

1928 — Early Blackhull

1932 — Tenmarq

1942 — Comanche

1943 — Pawnee

1944 — Wichita

1945 — Triumph

1951 — Ponca

1954 — Concho

1956 — Bison

1960 — Ottawa and Kaw

## Rye/Wheat Mix Problem—1926

Rye in wheat in the central counties of Kansas lowered the milling value about \$200,000 a year. Therefore, the examination of rye in wheat became a part of the Crop Improvement program in 1926.

### Banker-Farmer Project

In Reno County, a Banker-Farmer project encouraged reducing the amount of rye in wheat.

A five-year contest was inaugurated to recognize townships that showed the greatest improvement during the five-year period.

## Goat Grass Eradication—1927

In 1927, aegilops, or goat grass, was added to the rye-eradication program in central Kansas. "Know What You Sow" was selected as a slogan for use in the program of improved wheat quality.

## Five-Year Wheat Belt Program—1926

In January, 1926, a five-year program for the Kansas wheat belt (the western two-thirds of the state) was planned by Extension Specialists and resident faculty members. It was reviewed by County Extension Agents in February.

The program involved entomology, plant pathology, marketing, soil management and pure seed of adapted varieties.

The program was designed to encourage the production of milling wheat of acceptable quality.

Production problems included those of insect damage, control of rust and other wheat diseases, use of adapted varieties, tillage methods to reduce soil erosion, and marketing methods including recognition by the market of high quality wheat.

After approval by the heads of the departments concerned, President F. D. Farrell called a conference in Kansas City, Missouri, and invited 38 representatives of organizations and businessmen interested. That group approved the proposed five-year program.

Prior to 1926, emphasis had been given to improvement in wheat production. In 1925, a wheat train was operated over the Santa Fe Railroad lines, made 44 stops in 35 counties and was visited by 117,000 persons.

The Santa Fe and the Rock Island Railroad operated two wheat trains cooperatively in 1926. The trains made 60 stops in 44 counties and were visited by 158,300 persons.

In 1926, 19 counties adopted the Wheat Belt Program as their county Extension program. Emphasis was continued throughout the wheat belt during the next few years.

The Union Pacific Farm Special was operated in the northern ten Kansas counties in 1929, with 14 stops and 9,389 visitors.

During the same year, five grain grading schools were conducted for grain buyers. State grain inspection staff members assisted with the grain grading schools.

## Wheat Schools—1929

Six district wheat schools were conducted at Wichita, Dodge City, Salina, Hays, Smith Center, and Colby during January and February of 1929.

They were attended by County Agents, Farm Bureau Presidents and selected leaders. At the end of the two-day school an examination was given. Grades varied from 98 down to 19.

## Moisture Demonstrations—1929

Soil moisture demonstrations were started in 1929.

Fifteen counties equipped their County Agents with soil augers for taking soil samples to determine moisture content. One hundred nine demonstrations were established.

#### **National Recognition—1930's**

The Kansas Wheatbelt Program gained national recognition. The program was not designed to increase wheat acreage, nor to increase the total number of bushels produced annually.

Its purpose was to increase efficiency in production and marketing through adoption of improved practices developed by experiment stations, wheat farmers, and other agencies.

The counties that conducted the Wheatbelt Program for five years reported an average of 82 percent of the wheat land tilled by August 1.

Two points emphasized in the soil management part of the Wheatbelt Program were:

- 1) Necessity of storing moisture before the crop was planted.
- 2) Use of shovel-type tillage tools.

#### **New Variety Releases—1935-44**

The release and use of new varieties of wheat substantially increased income from the wheat crop.

In 1935, 221,628 acres of Tenmarq wheat, the new variety possessing high milling quality, were grown.

Pawnee and Comanche wheat varieties were first grown by seed producers in 1944. Twenty-eight growers produced 9,880 bushels of Comanche and 50 growers produced 6,680 bushels of Pawnee.

Wichita wheat was planted for increase at Garden City, Dodge City experimental field and on the farm of Herman Cudney in Edwards County.

In 1945, 1.2 million bushels of Comanche and Pawnee were produced.

By 1949 the use of Comanche and Pawnee varieties was common, so the total production, on the acres they were grown, was increased by 26 million bushels with a value of \$39 million annually.

#### **Wheat Testing Plan—1937**

The Canadian Wheat Testing Plan was initiated in 1937 by Dr. John Parker, Department of Agronomy, Kansas State University.

The plan provided that single rows, one rod long, be seeded with seed obtained from farmers, the seed

being what each farmer was using to plant his fields. Samples of pure certified seed were also used.

The master plot, in 1937, was located one mile east of Junction City on Kansas Highway 57. The Hogan Milling Company of Junction City cooperated in the program.

#### **Wheat Field Day at Test Plot—1938**

A field day was held in June, 1938 to provide an opportunity for anyone interested to inspect the demonstration. Dr. Parker and Agronomy Specialists discussed the great variations observed among the samples of seed being used on the farms as compared to the wheat grown from pure seed.

Each farmer who had a sample in the plot knew the number of his sample, but it was not known to others. Wheat millers became very much interested in the results of this demonstration.

#### **Kansas Wheat Improvement Assn.—1938**

The Kansas Wheat Improvement Association, succeeding the Southwest Wheat Improvement Association, was organized in 1938 with Parker as Director. Membership consisted largely of millers, grain merchants and commercial bakers.

The Association sponsored 25 wheat test plots with rod-rows seeded with samples from farmers' seed wheat in the area, plus samples of certified seed. Those demonstration plots were located generally in central Kansas.

In 1940, 31 field demonstrations were conducted, 32 in 1941 but only four in 1942 as the program had fairly well told an important story of wheat improvement by use of pure seed of adapted varieties.

#### **Blue Ribbon Wheat Contest—1941**

The Wheat Improvement Association started the Blue Ribbon Wheat Contest in 1941. The contest was based upon the use of certified seed, quality of the crop, yield, and completeness of the production record sheet.

In 1942, 195 farmers participated in the contest. Awards were given by the Kansas Crop Improvement Association and the Kansas Wheat Improvement Association.

Extension Agronomy Specialists cooperated in the crop improvement work of the two Associations.

#### **Wheat Yield Chart—1941**

In 1941, L. L. Compton, Specialist in Soil Manage-

ment and Crop Production, developed a chart so that a wheat grower in western Kansas could estimate the possible yield of winter wheat at seeding time.

The estimated yield was based on the amount of moisture in the soil at seeding time and the probable amount of precipitation from October 1 to May 31.

The estimated yield of wheat was equal to .3552 times the depth of soil moisture at seeding time plus 1.1330 times the inches of rainfall from October 1 to May 31, minus 10.5.

This chart was used widely by western Kansas wheat growers who were interested in seeding according to the amount of soil moisture available at seeding time.

During the early 1940's, wheat farmers were encouraged to conserve moisture to secure maximum wheat yields for use in the war effort.

### **Identifying Wheat Mosaics—1972**

During the first three weeks of March, 1972, temperatures were in the 70's and 80's in the daytime. Wheat came out of dormancy and grew rapidly. Since soil-borne mosaic (SBM) is favored by 40°F-60°F weather, both began to appear.

Many thousands of acres were affected in the state producing a loss of about \$12 million due to streak and \$4 million due to SBM.

The Wheat Streak Mosaic in nearly all cases is worse where volunteer wheat is in an adjoining field in the fall. This year for the first time, corn served as a problem host for the streak instead of volunteer wheat.

### **Wheat Demonstrations in NW Area—1974**

Wheat is the major crop in the Northwest Area and county variety demonstration plots have traditionally been part of most Extension programs.

The release of six new winter wheat varieties last fall increased the relevance of this year's demonstrations.

Twenty-four plots were established in 14 counties for the 1974 crop year. Ten county tours attracted over 500 farmers last spring.

### **Wheat Disease Monitoring—1976**

Wheat disease distribution and severity are erratic because of temperature, moisture, resistance, and vector variables.

Because those variations can't be covered adequately by traditional research plots, wheat variety

plots established by County Extension Agricultural Agents are used for monitoring disease development.

Plots are monitored for disease incidence and variety comparisons. Information is marked on computer cards and processed into computer storage.

The information allows for more accurate estimates of disease distribution and losses. The plots were especially helpful in 1976 when barley yellow dwarf epidemic occurred.

### **Wheat Diseases—1978**

Wheat in Kansas is worth \$700 million to \$1 billion annually. Diseases cause 15 percent to 25 percent loss each year. The disease control grower educational program uses many methods.

It begins with monitoring disease development and severity gathered from many sources, county agents, county variety demonstrations, State Board of Agriculture survey, USDA, SEA-AR monitoring, and observations by Extension and research plant pathologists.

Current disease conditions, predictions of future developments and recommended controls were sent to county agents and others through a weekly newsletter and by way of a weekly telenet with area specialists.

County wheat variety plots were used to monitor disease development. When disease conditions became obvious, grower meetings were organized by agents and specialists to discuss disease control.

State specialists participated in nine of these, with a total attendance of 400.

### **Wheat Production—1979**

Kansas produced 402 million bushels of wheat in 1979. This was a record. Approximately 101 million bushels were harvested in the 22-county Extension area of Southwest Kansas and 129 million bushels in the 19 counties of the South Central area.

The use of recommended varieties, cultural practices, fertilization, and pest control coupled with excellent climatic conditions made the total Kansas record possible.

To strengthen the wheat educational program throughout the state, variety seed is supplied annually by the Extension Crops Specialists to counties upon request.

Over 100 demonstrations were available for viewing in 1979. Tours were held at demonstration sites

affording producers an opportunity to observe new varieties compared with older releases and study variety performance under local conditions.

Most of these events were held during twilight which accounted for the excellent attendance. Either State or Area Specialists were present to discuss all aspects of wheat production.

#### **Wheat Variety/Hybrid Selection—1980's**

The five-year average wheat yield in Kansas for 1973 through 1977 was 29 bushels per acre. The five-year average for 1980 through 1984 was 38 bushels per acre.

This is an increase of nine bushels per acre or about 24 percent during this period. More than 75 of the 105 Kansas counties had variety/hybrid demonstration plots.

#### **Wheat in Kansas—1981**

Wheat is the No. 1 crop in Kansas with 12 to 13 million acres planted each year. Its importance is readily apparent—when wheat harvest is underway other farm activities are postponed.

Based on new variety releases, County Extension Agricultural Agents, Area Agronomists, and State Specialists used wheat variety tours and winter

schools and prompted the most dramatic acceptance of a variety that Kansas agriculture has witnessed.

In 1978, Newton accounted for only 0.1 percent of the planted acreage, but in 1981, it had captured 34 percent of the acreage, with the 10 percent yield advantage over varieties it replaced. The monetary advantage to Kansas wheat producers for two years (1980-81) was \$125 million.

#### **Wheat Freeze Damage—1981**

The Crop Reporting Service estimated the 1981 Kansas wheat crop would surpass the previous record of 410 million bushels, but with the May freeze, hopes of a record crop faded.

The immediate producer response was to destroy suspected freeze damaged fields and plant another crop. However, Area and State Crops Specialists discouraged such drastic action through radio and newspaper interviews and advised producers to take a wait-and-see attitude.

During this period, County Extension Agricultural Agents were trained by Area and State Crops Specialists to identify freeze-damaged wheat.

Also, numerous meetings were held in several counties. Producers brought samples for specialists to determine the extent of damage.

## **Grain Sorghum**

#### **Grain Sorghum Varieties—1930's**

As additional grass land in southwest Kansas was broken and placed into crop production from 1925 to 1935, a need for adapted grain sorghum crops developed.

Crook-neck yellow milo was one of the higher yielding varieties, but harvesting was usually by hand picking.

By 1930, the Hays Branch Experiment Station had produced Wheatland Milo, a variety with a straight stalk, resistant to the sorghum root rot disease, and suitable for harvesting with a wheat combine. Seed was distributed to 40 or 50 good farmers for field trial and seed production.

In 1938, two new grain sorghum varieties, Club Kafir and Colby Milo, were released to farmers. Club Kafir was a white seeded Kafir of medium height which could be harvested with a combine in average years.

Colby Milo was a combine-type well adapted to

northwest Kansas. During the first year of the release of these two new varieties on 1,109 acres, 13,525 bushels of seed were produced.

#### **Sorghum Seed—1934**

Field selection of sorghum seed was given much attention in 1934 when a severe drought caused an almost complete crop failure, resulting in very limited supplies of sorghum seed.

Hand selection in the field gave 2,990 bushels of quite satisfactory seed. In 1935, 3,807 bushels of field selected seed were available, enough to seed 80,185 acres.

The severe drought of 1936 did not permit the completion of field demonstrations. The drought, coupled with the late, cold, wet fall of 1935 left much poor seed. The state seed laboratory was taxed to the limit.

The corn crop was a failure and sorghums were very poor. However, Southeast and Northeast Kansas did have some seed corn.

### **Forage Sorghum Varieties—1940's**

Norkan was a new forage sorghum variety released in 1941. Norkan was an early maturing, white seeded variety with stalks somewhat juicy.

Cody Milo was distributed for the first time in 1944. Cody had a waxy endosperm suitable for the manufacture of starch (and used in the manufacture of tapioca).

General Foods contracted with farmers to pay 50 cents per hundred-weight above the market price and furnished 20,000 pounds of seed for planting.

Axtel, another new variety of forage sorghum, was released in 1947.

### **Drought Resistant Sorghums—1950's**

During the drought years of the early 1950's, many corn growers in central and eastern Kansas turned to sorghums as a crop since they were more drought resistant.

In 1955, the acreage of all sorghums in Kansas was 5,637,00, the largest in the history of Kansas. The same year there was produced 44,038,000 bushels of sorghum grain.

### **100-Bushel Milo Club—1956**

In 1956, Agents and farmers in Finney County inaugurated a 100-Bushel Milo Club. The purpose was to demonstrate good production practices for milo under irrigation.

### **Hybrid Sorghums—1956-59**

Hybrid sorghums were first introduced in Kansas about 1956, by commercial seed producers. Field demonstrations during the next few years gave yields of grain about 20 percent above open pollinated varieties previously grown.

By 1958, hybrid grain sorghums were being generally accepted as a crop to grow on land retired from corn production. A large acreage was grown in Northeast Kansas.

About 1959, the Experiment Station introduced KS602, KS603, and KS701 for the first time in Kan-

sas. These were followed by KS651, and KS652 in 1961.

It was stated in the 1961 Annual Report:

A program of growing sorghum hybrids in Mexico, before the seed was to be sold to farmers as certified seed, was placed into operation this year.

Howard Wilkins, Agronomy Specialist, made field inspections in Mexico of Kansas-produced seed for the Kansas Crop Improvement Association and advised several individual companies on their problems.

The same plantings in Mexico were also made in Kansas this past year. A very high correlation was found between the two locations as to the percent of 'off-type' plants.

This program will greatly improve the quality of sorghum hybrids in Kansas.

### **Study of Grain Sorghum—1971**

A record acreage of grain sorghum lodged in Kansas in 1971. Yet, there were fewer days with temperatures over 100 degrees usually associated with lodging.

Some stalks also had charcoal rot, some Fusarium root rot, and some appeared dehydrated in lower parts of stalks.

Questionnaires were sent in 41 counties to growers and 4,250 responded. The major conclusion was that some hybrids lodged less than others.

This correlated with research results in KSU grain performance tests. However, in some cases—probably in drier soils—even the most resistant hybrids lodged severely.

### **Conservation Tillage Project—1971**

A pilot Conservation Tillage Project (minimum tillage and residue management) was planned and established for the conservation of soil and water resources, to reduce the amount and cost of field work, and to maintain yields in the production of row crops in Eastern Kansas.

## **Soybeans**

### **"Soybean Special" Train—1930**

In 1930, a "Soybean Special" train was operated by the Missouri Pacific Railroad over its lines in southeast Kansas in 17 counties.

Another "Soybean Special" was operated by the

Missouri Pacific through 22 counties from January 5-29, 1931. Soybean acreage was up 260 percent in 1930 over 1929.

A "Soybean Seed Show" on the train was designed to help farmers learn the kind of seed being offered and the amount for sale.

A State Soybean Show was held at Pittsburg, Kansas in February of 1931 coupled with a two-day educational program. Entries numbered 121.

### **Soybeans—1939**

Hong Kong, a new variety of soybeans, was certified for the first time in 1939. During 1942, flax and soybean production were encouraged to provide supplies needed for the war effort.

### **Soybean Production—1978**

Soybeans continue to be one of the practical alternatives for expanded crop production in Kansas considering high costs of fertilizers and other high energy inputs required by cereal crops.

Also, soybeans complement other Kansas crops by using the same planting, tillage, and harvesting machinery.

Greater soybean production and processing will increase the immediate supply of protein feed for the cattle feeding enterprises of the state. Also, agribusiness development of Kansas can be substantially enhanced by increasing soybean production.

Continued expansion of international sales have assured good prices for soybeans. No other important Kansas crop can anticipate such a favorable prospect.

Accordingly, efforts to expand the acreage and increase the per acre yields have been intensified by Extension Agronomy programs. The 1978 seeded acreage was over 1.4 million acres.

Educational efforts included demonstrations, tours, field days, meetings, radio, television, newspapers, farm magazines and publications.

### **Soybean Production—1979-80**

The soybean educational program has been intensified throughout Kansas in recent years. Contributing factors include:

- 1) Special weed and insect problems in corn and grain sorghum.

- 2) High cost of fertilizer for cereal crops.
- 3) Need for an alternative crop under irrigation in western Kansas.
- 4) Favorable price prospects.

The 1979-80 statewide program included update sessions for County Extension Agricultural Agents, county and area schools, demonstrations, tours, soybean production contests, soybean field day, radio and TV programs and publications. This has been an interdisciplinary effort.

Two activities were especially significant during the past year, namely, the soybean production and statewide soybean field days.

Cooperators in the soybean production contest included Agronomists, County Extension Agricultural Agents, five soybean processing plants and the Kansas Soybean Association.

The 70 producers who completed the contest in 1979 implemented the best known agronomic practices. The winner achieved a yield of 80.2 bushels per acre under irrigation.

Publicity concerning his production techniques has stimulated many others to achieve high yield goals.

### **Soybean Production—1981**

Kansas State University has recognized for many years the potential for soybeans in Kansas. Research at numerous locations in the State has indicated that this crop can be grown successfully.

Accordingly, state and area Agronomists in cooperation with other disciplines and County Extension Agricultural Agents have intensified educational efforts in soybean production.

Highlights for the year were the corn-soybean field day held at the Kansas River Valley Experiment Field near Rossville. Over 800 persons attended the field day.

## **Corn**

### **Improvement Program—1922**

The Corn Improvement Program was initiated in 1922 to encourage better seed selection and use of adapted varieties.

The 1922 report states that Pride of Saline (a white variety) was giving outstanding yields but little was used. It yielded five bushels per acre above the

next best variety.

By 1926, one million acres of Pride of Saline were being grown. The 1926 report gave 10-year average yields as follows: Pride of Saline, 36.2 bu. per acre; Reid's Yellow Dent, 30.5 bu.; Boone County White, 31.4 bu.

Extension Specialists emphasized selecting

medium, deep, glossy kernels over the deep, rough, starch type formerly favored. Estimates of the value of this program to Kansas was \$4 million.

Starting in 1923, Luther Willoughby, Extension Crops Specialist in charge of the corn improvement program, superintended a State Corn Show at the Kansas Free Fair at Topeka in September. C. C. Cunningham was the judge.

In 1926, the Kansas City Chamber of Commerce sponsored a Five-Acre Corn Contest. Thirty-one counties entered with 780 contestants. Forty counties were eligible.

Two pure-bred gilts or boars were offered as county prizes. This contest continued for several years with keen interest.

The winter of 1926 left seed corn rather weak; therefore seed corn testing was emphasized. In 1926, reports indicate that 3,346 farmers planted 293,000 acres of corn with tested seed.

In 1929, a Five-Acre Corn Contest added a feature to the 100-bushel Club. Farmers who produced 100 bushels per acre were eligible.

A state Champion Corn Grower was also selected. Thirteen counties participated in the contest with 243 farmers striving for honors.

In 1931, the recommended varieties of corn were: Pride of Saline (white), Midland Yellow Dent, Reid's Yellow Dent, Free's White, and Hays Golden.

There were 2,071 farmers in the field-selecting seed corn contest. During the six years, 2,138 farmers had participated from 35 counties.

### **Demonstrations—1926-31**

Demonstrations in corn improvement included: field selection of ear corn, culling selected seed, using adapted varieties, use of legumes in the rotation, use of fertilizers, and preparation of an early seed bed.

Forty-seven farmers had become members of the 100-bushel club.

The Free Fair Corn Show (Topeka) was the largest corn show in Kansas.

A Blue Ribbon Corn Show was inaugurated at Manhattan in connection with the Farm and Home Week program.

Any person who had won a blue ribbon on his corn in any show was eligible to enter.

In 1931, there were 44 cooperative corn variety tests conducted in the corn counties.

The corn improvement program began in 1923. A comparative study made in 1933 showed that corn yields, in the counties where the corn improvement program had been conducted, were 3.6 bushels per acre greater than in adjoining counties where the educational program had not been conducted.

That was an increase of \$70,831 per county.

### **Corn Production Radio Schools—1932**

An innovation during 1932 was a Corn Production Radio School which was placed on the air December 30, 1932. A film strip had been prepared and distributed to 14 County Agents.

Those 14 counties held meetings with 529 corn producers attending. They showed the film strip as the audience listened to the radio program broadcast from Station KSAC, Manhattan.

With the inauguration of the Agricultural Adjustment Administration program to decrease corn acreage, emphasis in the Extension program was shifted to efficient production.

In 1936, planning committees recommended that the corn acreage be decreased 1,811,000 acres and sorghum acreage increased 1,106,000 acres.

From 1900 to 1936, corn acreage decreased from 7,369,020 acres to 5,018,876 acres, and sorghum acreage increased from 852,667 to 1,734,297.

Good seed corn was readily available in 1936. There were 46,150 bushels on a published seed list.

The Corn Improvement sub-project was discontinued in 1937, and the work included in the Crop Improvement sub-project.

Hybrid corn was first mentioned in the 1942 reports. Experiment Station research showed corn hybrids had from 10 to 20 percent higher yields, but some unadapted and inferior varieties were also being grown.

### **Hybrid Corn—1942**

The Department of Agronomy conducted field tests, and held field days in 12 counties to study the performance of the corn hybrids. By 1944, the seed of three good Kansas corn hybrids was distributed.

Because of the increased yields, corn growers began to save seed from the hybrid corn fields believing they could continue the higher yields with good field selection.



### **Hybrid Corn Training Schools—1946**

The Extension Agronomy Specialists organized training schools in hybrid seed corn production to teach farm leaders how crossing was used to develop the hybrid seed, and why seed selection from hybrid corn fields was not feasible.

The average yield of hybrid corn in Douglas County in 1944 was 54 bushels per acre, compared to 43.5 for the open pollinated varieties being grown.

The total acreage of hybrid corn increased from five percent in 1939 to 63 percent in 1945. Farmers then developed an interest in production of hybrid seed corn.

In 1946, Extension Specialists organized a two-year training program for 20 hybrid seed corn growers. Training was given on how to plant, detassel, and process hybrid seed corn. The Kansas Hybrid Association was organized.

The Kansas Experiment Station had three new corn hybrids — K 1636, K 1783, and K 1784 — on which adaptation information was desired. One hundred thirteen cooperators were selected from east and north-central Kansas to grow and make comparisons on the three new hybrids.

Twenty-nine corn field days were held in 10 counties with 448 persons attending during 1946.

### **Switch To Hybrid Corn—1946-60**

During the next 15 years, practically all corn grown in Kansas was hybrid corn. An occasional new variety or strain would be produced and proven superior to older ones for certain soil or climatic conditions.

The Experiment Station certified K4003 for the first time in 1961. Only eight acres were grown that year.

Furthermore, many individuals and organizations gained the experience of working together on a common objective. The cooperative spirit continued after the program was ended.

### **Corn Diseases—1978**

Stalk and root rots, virus diseases, insect pests,

and nematodes are serious and limiting entities in certain corn production areas of Kansas. The average estimated crop loss in 1978 was 11.2 percent stalk rot, 5.0 percent nematodes, and 0.6 percent viruses.

It is certain that radical changes in cultural practices, e.g., continuous monoculture, large acreages devoted to hybrids possessing a narrow gene pool, limited or no tillage, and/or water management programs, have contributed to increased losses due to insects and diseases.

Four soil moisture depletion levels were used to determine the effect of irrigation on stalk and root incidence and nematode numbers in a continuous corn production sequence at the North Central Irrigation Station, Scandia.

Other parameters included two different hybrids, two rates of Furidan (10 and 20 lbs. per acre), and one plot inoculated with Maize Dwarf Mosaic virus.

The soil moisture levels included:

- 1) Dryland (no irrigation).
- 2) 50 percent available moisture.
- 3) 65 percent depletion until tasseling then maintained at 35 percent depletion.
- 4) 50 percent depletion as determined by computer scheduling.

In general, corn yields differed considerably between various irrigation schedules. For example, a high yield of 152 bu./acre and a low of 12 bu./acre were obtained with 505 moisture by computer scheduling and dryland, respectively.

The number of nematodes and fusarium propagules were highest on dryland. In contrast, the nematode numbers were less in the 65 per-cent available moisture regime and the fusarium propagules were lowest in the 50 percent available moisture schedule.

In irrigated plots, the 20-pound rate of Furadan appeared to reduce fungal and nematode populations. Only a few corn plants showed signs of lodging (which indicates a severe incidence of stalk and root rot or problems with insects).

## **Legume/Hay Production**

### **Early Legume Emphasis**

During the Institute years, Kansas farmers realized they should grow more legumes, thus special emphasis was placed on the production of legumes.

The immediate goal was to increase the acreage of sweet clover, alfalfa, and soybeans in Kansas. Not until 1928 was a sub-project on Legume Production organized.

In 1921, a sub-project on Soil Improvement was outlined. An educational program involving the use of lime and commercial fertilizers was being conducted in southeast Kansas.

It was an endeavor to improve or maintain soil fertility by educational work about soil treatment and soil management, involving the use of lime and phosphate, and the growing of legumes.

In 1932, the sub-projects "Legume Production" and "Soil Improvement" were combined into one—Legume Production and Soil Improvement.

Under the leadership of Luther Willoughby, Extension Specialist in Agronomy, demonstration plots were established throughout eastern Kansas to show the value of using lime and phosphate for the improvement of soil fertility, and the production of legumes.

Fertilizer and lime spreaders were not available commercially in 1921. Extension Specialists made a small spreader suitable for establishing the demonstrations; first an agitation type and later a small broadcast drill type.

Those were followed by the use of a small one-horse drill. Small farmer-owned drills soon became available and were used in every community to establish demonstrations on the use of lime and phosphate.

The people of southeast Kansas, after seeing the results of the lime and fertilizer demonstrations, began to request further information on soil improvement to help increase their relatively low crop yields.

### **Alfalfa Emphasis—1915**

In 1915 there were 1,359,498 acres of alfalfa in Kansas. By 1924, the acreage had dropped to 884,126. Extension efforts brought acreage up to 902,380 in 1925 and one million acres in 1926.

In 1927 the supply of alfalfa seed was inadequate and it was necessary to import seed, 50 percent of which was unadapted and short-lived.

Five alfalfa variety demonstrations were started per county. Thirty-one demonstrations, showing the value of lime and fertilizers, were started in 1927.

Volunteer alfalfa leaders were selected and given training. An eight-state alfalfa promotion contest was initiated.

### **Legumes in Potato Production—1920's**

The Kaw Valley potato growers used legumes and green manure to improve the fertility of their soils.

### **Sweet Clover Emphasis—1922**

The sweet clover acreage in Kansas in 1922 was 29,967. This was increased to 190,014 by 1926. It was demonstrated that corn following sweet clover increased the corn yield as much as 33 bushels per acre.

### **Legume Problems—1926**

The 1926 Agronomy annual report listed the following needs in the legume production and soil improvement sub-project:

- 1) To test soils for acidity.
- 2) To test limestone for purity.
- 3) To make arrangements for shipping limestone.
- 4) To promote the use of small, portable lime crushers where shipping was not practical.
- 5) To conduct lime-legume demonstrations.
- 6) To demonstrate the value of barnyard and green manure.
- 7) To teach the value of high-grade fertilizer.

The goals included: Increase each year the acreage of: alfalfa by 100,000 acres, sweet clover, 100,000 acres, and other legumes, 40,000 acres.

In 1926, 1,000 samples of soil were tested for acidity and 200 samples of lime were tested for purity. Farmers used 25,000 tons of limestone. There were eight portable lime pulverizers, 18 in 1927.

### **County Lime and Legume Contest—1927**

A County Lime and Legume Contest was started in 1927, based upon the amount of lime used and the kinds and acreage of legumes seeded. Twenty counties enrolled and 14 finished in this order: Allen, Johnson, Franklin, Coffey, Miami, Anderson and Linn.

By 1931, the Soil Improvement Program developed by E. B. Wells in 1926 had reached its fifth year. The emphasis continued on lime, legumes and fertilizers.

By 1931, 95 percent of all fertilizers being used were of high grade, an advantage continually emphasized by Mr. Wells; and 14,443 tons of lime were used.

### **Legume Leaders—1931**

The training of legume leaders on the advantages of raising legumes for all kinds of livestock continued in 1931.

County Agents and Specialists held correlated meetings in 56 counties, with 3,156 persons at-

tending. The leaders followed up with community meetings.

During the summer, 121 tours were conducted with 7,768 persons attending. By 1933, 576 leaders assisted with meetings and conducted 856 legume production demonstrations.

During 1935, farmers were using 4,486 tons of fertilizer on Kansas farms. Inoculation of legumes was emphasized and 6,761 bushels were treated.

In the fall of 1935, County Agents reported the following acreages of legumes being seeded during the year:

alfalfa	992,289
sweet clover	247,819
red clover	65,000
lespedeza	100,957
soybeans	58,660
miscellaneous	20,000

The Agricultural Adjustment Administration encouraged the use of legumes on the acreage taken out of wheat or corn production.

Legume, lime and fertilizer demonstrations continued to have an important place in the educational program of legume production and soil improvement.

**Wilt Resistant Alfalfa—1941**

The use of legumes as soil improving crops continued to be emphasized. Alfalfa wilt became a problem in maintaining stands.

In 1941, Buffalo Alfalfa, a selection made by the Bureau of Plant Industry at Manhattan and Hays, was released to selected farmers for seed increase. Buffalo was highly resistant to alfalfa wilt disease.

In 1945, all legumes grown reached 1,755,129 acres, and by 1960, 2,443,596 acres. In 1954, there were 1,934,312 acres of alfalfa, and 15,065,000 pounds of seed produced. The alfalfa 4-H project

was available to members.

**Legume/Fertilizer Schools—1945**

In 1945, a series of training schools on the production of legumes and use of fertilizers were held for Agricultural Adjustment Administration committeemen, leaders and County Agents so that all would be making the same recommendations on legume production and fertilizer practices.

In 1946, production of sweet clover was emphasized due to the need in southeast Kansas. During the year, 231,473 acres of sweet clover were seeded—the largest amount for a number of years; and 47,522 acres of red clover were seeded.

**Hay-Making Field Day in SE Kansas—1974**

Due to recent developments in hay-making equipment and limited chances for individual farmers to see and compare systems, a Southeast Area Hay Field Day was held in Wilson County which attracted 400 participants.

Sessions consisted of presentations by KSU Extension Specialists relating to quality hay production and area dealers demonstrated 20 pieces of equipment in the field.

**Alfalfa Production—1978**

Interest in the production of alfalfa continues strong in Kansas. Alfalfa processing plants and/or commercial feedlots provide many producers a ready market, while the traditional sale of baled hay remains an important market in other areas.

During the past year, production management information was disseminated by educational meetings in six counties with a total attendance of 185.

Also, a demonstration concerning the role of various preplant herbicides in establishing spring seeded alfalfa was reviewed at a field day attended by 160 producers. An Extension bulletin, "Alfalfa Production in Kansas" was revised for growers.

**Soil Improvement/Fertility**

**3-L Program Slogan—1920's**

An early attempt to attract maximum attention to the Extension program in Agronomy was the adoption of the 3-L program with this slogan:

	LIME
3-L's for	LEGUMES
	LIVESTOCK
	FOR PROSPERITY

Later a fourth "L" was added which symbolized LIVING.

**Agronomy Truck Tours—1924-28**

In an endeavor to reach large numbers of people with the 3-L program, a truck tour was organized for three counties in 1924.

Educational material in the form of charts, plant and soil specimens, samples of machinery and other

exhibit material was mounted on a truck.

The Specialists and County Agents drove the truck from community to community in the three counties on a schedule prepared by the County Agents.

Information on legume production and soil improvement was carried to more than 600 farmers.

During 1925, a similar truck tour was used in nine counties and reached more than 15,000 persons.

The truck idea was further expanded in 1926 when the Missouri Pacific Railroad operated the "Missouri Pacific Soil Improvement Special." It made 28 stops in 18 counties and was visited by 32,618 persons.

During 1928, the Santa Fe Railroad operated the "Santa Fe Lime Special" over the Santa Fe lines in eastern Kansas, making 37 stops and reaching 96,287 persons.

Those trains were staffed by Specialists and research persons who discussed soil improvement and legume production at each stop.

#### **Tests for Acidity—1929**

The number of soil samples tested for acidity reached 8,897 in 1929. Coffey County was the first to ship in a train load of agricultural lime.

The lime went to the farmers in the Gridley community. The event was celebrated with a picnic.

Four special Agricultural Lime Trains, with from 10 to 14 cars each, unloaded at points between stations; three on the Missouri Pacific and one on the Santa Fe, in Coffey, Wilson and Miami counties.

In 1931, the program planning committee reviewed agriculture in Kansas and the committee recommended that Kansas increase its 716,682 acres of alfalfa to two million acres.

While 230,537 acres of sweet clover were being grown the committee believed that 1.5 million acres were needed. There were 143,000 acres of soybeans and 100,000 acres of red clover being grown.

During 1931, 347 alfalfa field demonstrations were conducted and 112,850 acres of new alfalfa seeded; 431 sweet clover demonstrations were conducted and 123,676 acres seeded; 143,000 acres of soybeans were seeded. There were 51,392 farmers growing legumes of some kind.

#### **Fertilizer Drills—1933**

In 1933, the Extension Specialist leased a small fertilizer drill from the John Deere Plow Company to apply fertilizers on the demonstration plots. He transported it from county to county on a small trailer pulled by his car. In 1937, 18 counties purchased small drills for use in seeding demonstration plots.

During the severe drought year of 1936, the use of lime was restricted to 26,762 tons and fertilizers to 10,083 tons. In 1937, lime use increased to 55,067 tons and fertilizers to 15,841 tons.

Research and demonstration work showed that \$1.25 worth of fertilizer on wheat increased the yield 10.5 bushels on the average.

The same amount of fertilizer on oats gave an increase of 7.8 bushels. In 1960, 479,549 tons of lime and 339,379 tons of commercial fertilizers were used.

A large potential for the use of lime still existed in the 1950's.

In their report for 1958, the Extension Specialists in Agronomy said:

There are 15 counties in extreme southeast Kansas where acid soils represent the major soil improvement and soil management problem.

Ninety percent of the soils in this area are extremely acidic or were extremely acidic before liming.

Many fields have had some lime applied, but are still too acidic for maximum economic production.

Very few fields have been limed sufficiently to produce maximum yields. Many fields have received no lime and are still extremely acidic.

The soils of Southeast Kansas can be limed economically as shown by the data from the Southeast Kansas Experimental Field.

#### **TVA Fertilizer Materials—1938**

The Tennessee Valley Authority (TVA) began to furnish fertilizer materials for demonstration work in eastern Kansas in 1938. Cooperation with TVA continued for many years.

In 1939, TVA provided 79 tons of Meta-phosphate fertilizer (60 P205) which was used on 17 demonstrations in Neosho County, 21 in Coffey County, and 19 in Jefferson County.

TVA fertilizer materials were used only on demonstration farms. Tours were made of the demonstration farms, with more than 1,500 people visiting and studying the results each year.

A special two-day training school on the use of fertilizers was conducted in Southeast Kansas for County Agents, Farm Security Supervisors and Soil Conservation Service technicians in 1939.

#### **Fertilizer Demonstrations—1945**

In 1945, a fairly elaborate corn fertilizer demonstration program was launched, and continued for several years. Each demonstration consisted of 18 plots each, with varying amounts and kinds of fertilizer.

Several counties secured a cooperator for such demonstrations. In 1946, 98 fertilizer demonstrations of all kinds were conducted in the state.

Fertilizer demonstrations were started on wheat on irrigated land in western Kansas. As the high supply of plant food in the virgin soils was used or lost, the use of fertilizer became economical.

#### **Soil Testing Labs—1947**

A State Soil Testing Laboratory was established by the Experiment Station in 1947. By 1949, county laboratories were established in Brown, Bourbon, Labette and Crawford counties, in addition to the one already in Cowley County.

That year, 12,641 soil samples were tested for acidity and 4,522 samples for fertilizer requirements. By 1952, 45 counties had soil testing laboratories which tested 23,000 samples for fertilizer needs during the year.

A laboratory was also established at the Experiment Station at Garden City in 1953.

At that time the value of a county soil testing laboratory in western Kansas was doubtful because the test as then run did not always give the true fertilizer needs of a soil sample.

During 1953, however, the adoption of a different extracting solution for determining phosphorus content gave a closer correlation between the test and the actual plant food needs.

In 1955, 60 county laboratories were equipped and operating. State and county laboratories tested 31,612 soil samples in 1954 and 24,462 samples in 1955.

#### **Nitrogen Deficiency in Wheat—1949**

In 1949, Extension Specialists and research workers concluded that nitrogen deficiency in non-fallowed wheat land was a limiting factor in wheat production in western Kansas.

The recommendation was to use from 25 to 50 pounds of nitrogen (N) on hard land and up to 50 pounds on sandy land.

The northwest counties of Kansas could use from 30 to 40 pounds of nitrogen when three feet of soil moisture was present. The use of fertilizers also increased the protein content of the wheat as well as the yield.

#### **Soil Testing Specialist—1953**

Robert Bohannon was employed as Extension Specialist in Soil Testing, July 15, 1953, working half-time for Extension and half-time for the Experiment Station.

Bohannon trained all County Agents who had soil testing laboratories, visited the county laboratories at least once each year.

He held regional or state training schools for the County Extension Agents to provide them with the latest information on soil testing, to make fertilizer use recommendations based upon the test, and to keep the Agents familiar with new developments in the kinds of fertilizers being offered on the market.

#### **Limestone Survey—1958**

A limestone survey was conducted in Crawford County in 1958. Eighty percent of the farmers believed that more field demonstrations on the use of lime should be made, and 52 percent had never seen a field demonstration showing the value of the application of lime.

That survey created increased interest in the use of lime. The amount used in Crawford County increased from 11,859 tons in 1957 to more than 20,000 tons in 1958.

By 1941, 70,347 tons of lime and 142,215 tons of fertilizers were used. It increased to 615,480 tons of lime and 67,408 tons of fertilizer four years later, 1945.

In 1938, 107 demonstrations on the production of sweet clover, and 318 on alfalfa production were conducted using comparisons of the application of lime, lime and phosphorus, and phosphate alone.

There were 182 demonstrations on the value of using phosphate on small grains. Special attention was given to the use of legumes on the acreage retired from wheat and corn production under the Agricultural Adjustment program.

#### **County Soil Surveys—1959**

After a 20-year lapse in doing soil survey work because of the shortage of funds, new county soil surveys became available in 1959. That year the Saline County Soil Survey was completed.

Extension Specialists, working with soil survey technicians from the Experiment Station, believed that if it was to have meaning for them, farmers should be given information about the survey in their area.

With that thought in mind, representatives of Extension, the Soil Conservation Service, and the Experiment Station planned a training school for leaders in Saline County.

After the survey was presented to the leaders, they suggested a series of evening community meetings to reach as many farmers as possible with the soil survey information.

Five community meetings were held. The farmers present were given a copy of the survey report, each was asked to locate his farm on the map and to read and study the portion of the report that dealt with his type of soil. Some professional men who owned farms in the county also participated in the community meetings.

One follow-up of the Saline County soil survey presentation was that future demonstrations on varieties and use of fertilizers would be by soil types.

In 1960, the Geary County soil survey was presented to the farmers of the county in a manner similar to that used in Saline County; Brown County in 1961; and Hamilton, Stevens, Greeley and Stanton Counties in 1962.

### **Jefferson County Fertility—1961**

An Intensified Soil Fertility Program was initiated in Jefferson County in 1961, including demonstrations on the major crops, coupled with soil testing.

Six demonstrations with varying amounts of fertilizer were established on brome grass, after testing the soil.

The results gave the no-treatment plots 2.2 tons compared to 7.6 tons (green weight) of grass per acre with the application of 60 pounds of nitrogen per acre, plus an actual protein increase from 131 pounds to 564 pounds per acre in the same plots.

If all brome grass in Jefferson County had been given similar testing and fertilizer treatment the increased gross income to the county would have been one half-million dollars.

Eight fertility demonstrations were established on corn and grain sorghums in Jefferson County, in cooperation with the local fertilizer dealers. In general, the application of fertilizers based on the soil tests,

increased corn yields from 45 to 60 bushels.

Although the county grew only about 60,000 acres of corn, this increase meant about \$260,000 increased income for farmers.

The Soil Fertility Advisory Committee in Jefferson County set a goal of 1,000 soil samples to be tested during a special Soil Testing Week.

The committee selected 33 places over the county where farmers could leave soil samples.

Bumper signs which read, "Don't Guess—Soil Test," were distributed to 1,000 farmers. Large placards gave instructions for taking a soil test.

Six township meetings were held in October to further explain the objectives of the soil testing program.

A kick-off dinner was held November 9; the testing week was November 13-17, 1961.

Heavy rains started just before the week and continued throughout, making it nearly impossible to take soil samples.

However, the county laboratory tested 300 more samples than during the previous year.

The campaign was considered successful. Brome grass gained a larger place in Jefferson County, corn production was made more stable, and the control of corn insects became a side benefit which was not in the plans.

A further benefit was the close cooperation of fertilizer dealers with the Cooperative Extension Service, and their familiarity with the use of the soil testing and fertilizer recommendations.

### **Fertilizer Results—1962**

Extension Agronomy Specialists stated in 1962 that ten percent of the gross farm income in Kansas was due to the response from the use of fertilizers.

Further, from three to six dollars were realized from each dollar invested in fertilizers. Approximately 50 percent of all fertilizers applied were used on wheat.

### **Soil Fertility Study—1971**

A rapid increase in the use of commercial fertilizers during the 1960's and increased interest in soil tests and soil survey information suggested the need for a stepped-up Extension education program.

This led to the initiation of the soil testing by soil type demonstration program in the fall of 1971.

County Agents, with the assistance of SCS district conservationists, selected sites to be sampled and secured cooperation of the farmers for the use of their farms.

#### **Soil Survey Educational Meetings—1974**

Educational meetings to help farmers understand and use soil survey reports, prepared cooperatively by the Soil Conservation Service and the Kansas Agricultural Experiment Station, were held in four Kansas counties in FY 1974.

About 800 persons, representing about half of the farms in these counties, attended meetings and tours which emphasized an explanation of the survey information.

#### **Soil Testing—1978**

Soil tests are a valuable aid to farmers in making fertilizer and lime decisions when samples are properly taken and the results are interpreted correctly. With several soil test services available, soil test results exist.

Demonstrations have been conducted comparing soil test recommendations by various laboratories. The objective was to make farmers aware of the variability in soil test recommendations and to encourage critical evaluations.

The results have shown greater than three-fold difference in fertilizer costs with no difference in yields. The results of these demonstrations have been used extensively by Extension Agronomists and county agents in presentations to farmers to illustrate the proper use of soil tests.

#### **Soil Fertility and Management—1979**

Increasing costs of energy and consequently higher fertilizer costs and tillage costs have resulted in an increased interest in efficient use of fertilizer and alternative tillage systems.

The primary thrust of the soil fertility and management program is to assist agricultural producers, agricultural industries and Extension professionals (county agents, etc.) in the understanding and utilization of recommended soil fertility and soil management practices.

State and Area Specialists serve as resource persons to assist with educational programs, schools, workshops, conferences, field days and field demonstrations throughout the state.

There have been 49 counties that have requested the "In-Depth Soil Fertility School" since 1974. Approximately 1500 farm leaders and agribusiness personnel have attended these schools during this period of time.

The schools average about 30 people in attendance. This size class allows for an information setting and the capability of concentrating on answering individual questions.

#### **Soil Testing—1980**

In 1979-80, there was a modest increase of about 10 percent in the number of soil samples tested for producers.

This increase in sample volume is probably a reflection of several factors— increased fertilizer prices, tight economic situation for producers and soil test promotion.

With roughly 1.5 million tons of fertilizer used in the 1980 crop year a small increase in efficient use is very important to the farm economy.

#### **Liming Needs in Central Kansas—1981**

Liming of acid soils is a well established production practice in the eastern part of Kansas. In the Central and Western areas of the state, soils that are typically high pH to only slightly acid have not shown in the past economic responses to lime for crop production.

However, recent soil test results have shown some extremely low pH soils in wheat fields that have been reported not producing as expected. Several causes for the poor production of these fields have been suggested with some reluctance by producers to accept the need for liming.

Although the problem affects no more than 5% of the acreage (based on percent of soil test results with pH of 5.5 or less), the wheat yield reduction can be as much as 50 percent or more on extremely acidic acres (pH 5 or less).

#### **Efficient Use of Lime/Fertilizer—1987**

Kansas farmers are using 1.5 million tons of fertilizer and .5 million tons of lime annually. Of the fertilizer used, 460 thousand tons contained phosphorus.

With up to 35 percent of variable production costs per acre accounting for fertilizer and lime, efficient use of these inputs is essential for optimizing producer returns and maintaining environmental quality.

Soil losses due to water and wind erosion continue to be above the acceptable level of "T" value in much of Kansas. Kansas has an estimated 10.5 million acres of highly erodible cropland.

Conservation tillage is a practice that could help reduce soil losses to acceptable levels, maintain eligibility of USDA farm programs, and lower production costs.

## Pasture Improvement Program

The Pasture Improvement sub-project was organized in 1933. The problem areas identified were:

- 1) Elimination of over-grazing.
- 2) Use of supplemental crops.
- 3) Reseeding pastures.
- 4) Use of fertilizers on pastures.
- 5) Clearing land.
- 6) Eradication of weeds and brush.
- 7) Deferred grazing.
- 8) Rotation grazing.

In 1933, 56 demonstrations were established in 46 counties to show methods of reseeding, fertilizing and weed control.

In the 46 counties of eastern Kansas, 459 leaders were trained in the pasture improvement program.

### **Pasture Improvement Contest—1933**

A "Pasture Improvement Contest" was initiated with the Kansas City, Missouri, Chamber of Commerce sponsoring it and making recognition awards.

Forty-five men in seven counties completed the requirements of the contest. Bourbon County trained four 4-H Club demonstration teams on pasture improvement.

### **Brome Grass—1935**

Brome grass received special attention in 1935 when the Kansas Crop Improvement Association certified a hardy strain developed by John Achenbach in Washington County.

More than 100,000 pounds of seed were available from Achenbach and other growers. The Extension Agronomy Specialists developed suggestions for growing and harvesting brome grass.

In 1938, a Certified Seed Show was conducted in connection with the Blue Ribbon Corn Show held during Farm and Home Week.

In 1947, 3,678,847 pounds of grass seed were produced in Kansas, most of it brome grass.

### **Reseeding Native Pastures—1936**

The drought of 1934 and the payments offered by the Agricultural Adjustment Administration for seeding grasses on land left out of wheat or corn production created an increased interest in pasture improvement.

Reseeding of native pastures damaged by drought was encouraged. Interest developed in the production of grass seed and harvesting seed from the native grasses.

In 1936, 101 Extension schools were conducted, and 1,208 demonstrations established on pasture improvement.

### **Pasture Improvement Contest—1936**

The Capper Publication of Topeka agreed to sponsor a pasture improvement contest for 62 central and western Kansas counties, with emphasis on pasture rotation and other improvement practices.

### **Pasture Improvements in the 1930's**

By 1937, 1,196 new pastures comprising 13,456 acres, were seeded. The Agricultural Conservation Program was offering an incentive payment of \$3.50 per acre for seeding native grasses.

Deferred grazing was being practiced on 484,418 acres and 70,644 acres were mowed to control weeds.

There were 131 demonstrations established to show methods and results of reseeding pastures depleted by the droughts of 1934 and 1936, and 1,196 demonstrations were conducted on seeding native grasses on crop land.

Demonstrations to show the effect of mowing weeds in pastures were conducted on 244 farms.

In 1938, 68 demonstrations on seeding of tame grasses were conducted. These included six plot treatments—check, lime, lime with nitrogen and phosphorus, lime with phosphorus, nitrogen and phosphorus, and phosphorus alone.

The interest in eastern Kansas was high due to the loss of stands of tame grasses during the drought years of 1934 and 1936.

Fifteen demonstrations on seeding of big bluestem and side oats gramma grasses were conducted in the bluestem region of the state.

Farmers were encouraged to establish fields on which grass seed could be produced.

In 1937, 17 such fields were established and 134 in 1938. Each county in the bluestem region established at least one demonstration to show how pastures, depleted from drought or over-grazing, could be brought back to normal.

The demonstration areas were fenced to protect them from over-pasturing. The areas were



later to be grazed judiciously according to recommended practices.

In 1939, 658 demonstrations on pasture seeding and management were conducted throughout the state. This number was 723 in 1940.

**Pasture Improvement Banquet—1937**

A pasture improvement banquet was held for the first time in 1937 at Iola on December 17, to present the 1937 awards in the Pasture Improvement Contest sponsored by the Kansas City Chamber of Commerce.

**Bromegrass—1942**

In 1942, the reports stated that brome grass had been proven to be one of the best tame grasses for pasture.

**Balbo Rye Pastures—1942**

Balbo rye was proving its worth as a cereal pasture. It was seeded early in the fall and made excellent winter growth.

A seed list of Balbo rye seed growers was prepared and distributed. Apparently, the Western Kansas Pasture Improvement Contest sponsored by the Capper Publications was discontinued in 1942.

**Native Grass Seed—1944**

During 1944, the Experiment Station released seed of a selection of side oats grama, later named El Reno Grass, and seed of a selection known as Blackwell Switch Grass.

In 1949, Extension Specialists distributed 475 pounds of foundation Blackwell Switch Grass to 17 growers for seed increase.

Native grass seed was harvested in substantial amounts during the 1940's and later; 1,755,357 pounds in 1948, to 3,353,225 pounds in 1959.

In 1945 Extension Specialists related that progress in selection of strains of native grasses, methods of seed harvesting, and perfecting of planting methods had progressed to the point where any land in Kansas could be reseeded to some kind of native grass.

The Specialists further stated: "Kansas needs better grass, not more acres. However, there are 3,671,000 acres of land that should be returned to grass."

The recommended varieties of native grasses were: Blackwell Switch Grass, El Reno Side Oats Grama, Hays Buffalo Grass, Big Bluestem and Little Bluestem. Brome grass, in 1945, was seeded on 70,895 acres.

The acreage of land seeded to native grasses was about 100,000 acres each year but in 1959, 347,921 acres were seeded.

**Native Grass Growers Contest—1944**

In 1944, a Kansas Grass Growers Contest was inaugurated. It was sponsored by the Kansas City, Missouri, Chamber of Commerce and Kansas State University. The contest was designed to promote effective methods of securing stands of native grasses.

County entries consisted of five or more grass growers with 10 acres or more of adapted grasses. Seven counties participated in 1944, the first year of the contest.

**Pasture Weed Brush Control—1947**

Over-grazing and drought had brought about an encroachment of weeds and brush in many native pastures so that in 1947, 525 pasture mowing demonstrations were established with much success.

During the year, 5,788 ranchers mowed 159,899 acres of native pasture. Although the use of chemicals was still in the experimental stage, some counties established spray demonstrations to control weeds and brush.

**Deferred Spring Grazing—Late 1940's**

Deferred spring grazing was also recommended practice to give the grass a chance to get started before heavy grazing. That practice was followed by 24,918 ranchers on 661,477 acres in 1947. Brome grass was also used as a supplemental spring pasture.

In 1951, 245,695 acres of pastures that were infested with weeds and brush were sprayed. Similar acreages were sprayed during the next several years. In 1954, 265,780 acres were mowed.

**Pasture Improvement—1956-60**

An indication of the progress in the pasture improvement program was shown in the 1960 annual report made by the Extension Agronomists. Comparative data for 1956 and 1960 were given, including:

	1956	1960 (in acres)
New pasture established	70,256	376,691
Sprayed for weed and brush control	178,550	330,972
Mowed to control weeds	192,292	319,297
Brome grass in the state	548,512	762,350
Native grass seed harvested	235,146	2,519,270
Brome grass seed harvested	1,992,850	2,354,235

The Pasture Improvement Program progressed with cooperation and coordinated programs with representatives of the Soil Conservation Service, Agricultural Stabilization and Conservation Service, teachers, G.I. instructors, and Extension Specialists in Livestock Production.

### **Southeast GRO Program—1970's**

There are approximately 45,000 acres of land in Southeast Kansas which were strip mined for coal prior to January 1, 1969. They did not come under the Kansas Mined Land Conservation and Reclamation Act which required the mined land to be returned to productive use.

The land is composed of large dumps of mine spoils that support low value weeds, brush, and trees.

The Extension Service requested, and received, a grant of \$16,782 from the Ozark Regional Commission to be used for cost sharing in establishing four 40-acre research-demonstration sites on individual farmers' land. The land at all sites was shaped and seedbeds prepared.

Grass Resource Opportunities (GRO) was developed as part of the Extension "Thrusts for the 70's." Livestock producers were extremely interested in increasing tame pasture acreage and improving management.

GRO was designed to:

- 1) Increase interest in proper tame pasture management.
- 2) Demonstrate pasture renovation and establishment.
- 3) Obtain cost and return information based on weigh-in, weigh-out results from different management treatments.
- 4) Suggest pasture improvement practices, including proper grass species selection, weed, brush, and tree control, proper pasture fertility, proper grazing management, and sound livestock programs.

### **Bromegrass Fertility Demonstrations—1972**

Jackson County had over 180,000 acres of grassland. A part of these acres needed renovation or improved management. A program was set up to show the net income possible from well managed, fertilized bromegrass.

The program was set up to:

- 1) Demonstrate the efforts of fertilization on bromegrass growth, seed production, beef gains, and stocking rates.
- 2) Provide results for use at winter meetings.

Results of fertility demonstrations support the recommended rate of 90 pounds of actual N and 30 pounds P annually to produce net returns of up to \$30 per acre.

### **Labette County Pasture Demon.—1974**

Research dealing with native grass management in Southeast Kansas has led the Labette County Agent to develop research demonstrations to improve grass management and existing stands of grasses.

More than 200 individual fertilizer and herbicide plots throughout the county have been established with the aid of the Area Extension Agronomist and the Area Soil Conservation Service Range Specialist.

The goal of the Labette county program was to establish management techniques necessary to develop year-round pasture utilization programs.

### **Pasture Management—1976**

The Extension pasture management program relied on demonstrations and tours to show eastern Kansas stockmen how to improve tame pastures.

In 1976, demonstrations in 23 counties on bromegrass, tall fescue, and bermuda grass included 16 counties focusing on weed and brush control, 5 on grazing management, and 19 on fertility.

Tours allowed neighbors to see results of the demonstrations. Kansas stockmen then had the opportunity to apply the same practice to their own operations.

The tame pasture management work was done by County Extension Agricultural Agents and the Extension Range Management Specialist. Guidance from Area Agronomists helped to guarantee success of the program.

Kansas stockmen and ranchers asked for help in improving rangeland production, and weed and brush control as the needs were identified.

### **Range & Pasture Management—1978**

Range and pasture management in Kansas has faced a new direction in recent years. Increased costs, low livestock prices and other financial constraints have combined to change the picture.

The result has been a change in the management philosophy in the industry. To meet this need, a new set of program guidelines was developed for County Agents' use in developing the local program.

These guidelines are known as Unlimited Grass Resource Opportunities (UGRO). They have a

rangeland and pasture land part. Both involve the same four goals:

- 1) Improved utilization.
- 2) Increased production.
- 3) Weed and brush control.
- 4) Integrate all forage sources.

Using a county-by-county approach, the local as well as the state-wide needs were addressed.

Tours and demonstrations were the heart of this program since the goal was to reach the producer who could put the ideas of research and their neighbors to use. Tours in over 30 counties and demonstrations in over 25 counties together with public meetings helped reach over 2,000 producers.

The main emphasis was on brush control. In Southeast Kansas, the ability to convert brush and non-commercial timber to tame pasture was demonstrated and gained acceptance.

#### **Bromegrass for NE Kansas—1979**

Bromegrass is used extensively in Northeast Kansas for grazing, seed production, hay and waterways. Accordingly, fertilizer demonstrations have been established throughout the area for many years by the area agronomist to show the proper nutrients, time, and rate of application.

Brome demonstrations are used to illustrate, also, that a good seed crop will more than pay for the fertilizer and other costs. Hay harvested immediately after seed combining is an extra bonus.

Many of the demonstrations are on waterways to stress that these areas can be as productive as hay meadows and are not wasteland.

#### **Rangeland Management Program—1981**

The goal of the Extension Rangeland Management program is the wise, effective and efficient use of the 16.5 million acres of rangeland in Kansas.

Beginning October 1, 1982, a part-time Extension Assistant (.4 FTE) was hired to help revise and develop publications. The result was six new leaflets, one major revision and two minor revisions.

#### **Fescue Toxicosis in Southeast—1985**

Southeast Kansas utilizes over 700 thousand acres of tall fescue as forage for cattle. Recent research has determined that a seed-borne fungal endophyte in the grass greatly diminishes the rate of gain for grazing cattle, especially when air temperatures exceed 83°F.

Preliminary surveys show that 94 percent of pastures in the area are infected and that the average infection level is 63 percent. The loss in rate of gain is estimated at \$50 million annually.

## **Soil Management**

Although the sub-project, Soil Management, was developed in 1927, an active program was not started until Specialist E. B. Wells began work in western Kansas in 1931.

The 1931 Extension reports point out that 57 percent of the wheat land had been worked by August 1.

There were 6,529 farmers using summer fallow, 2,169 using wide-spacing of corn, 45,201 using a crop rotation and 27 percent using shovel-type tillage implements.

Burning wheat stubble was discouraged. Two hundred and forty-two soil moisture tests were reported.

Demonstrations showed that wheat after sweet clover was yielding 6.5 bushels more than wheat after wheat.

Local leaders held community meetings and conducted demonstrations in 1931, after being trained by Extension Specialists.

#### **Erosion Control With Fallow—1930's**

Early tillage for fallow was most beneficial because it held the soil moisture.

Although large areas of soil were blowing and drifting in 1935, there were cases where the soil was under control because of careful summer fallowing the previous year.

In Logan County, Fred Lowe of Winona fallowed in 1934 and planted the acreage to sorghum in 1935. He obtained 10 bushels of grain and four tons of forage per acre on the fallowed land as compared to no grain and one-half ton of forage on non-fallowed land.

Some effort was made to control soil blowing by planting corn or sorghums every third or fifth row.

#### **Wind Erosion of Soil—1935**

In 1935, soil was blowing on a large scale in the western counties, as a result of the severe drought

in 1934. Demonstrations were established by the Extension Service to show methods of controlling wind erosion.

The state legislature passed the "Soil Drifting Law" authorizing County Commissioners to list land that was drifting and becoming a hazard to neighbors.

On April 27, 1935, Congress passed an appropriation act containing \$2 million for wind erosion control in what had become known as the "dust bowl," including parts of Colorado, New Mexico, Texas, Kansas, and Oklahoma.

The fund was allotted to the states as equitably as possible based on the need for tillage to control wind erosion. The Kansas allocation was \$500,000.

The funds were turned over to a state committee. The Director of Extension was the administrative chairman in charge, on much the same basis as for Smith-Lever and other Extension funds that were allocated to the state.

The Federal wind erosion funds were allocated to 42 counties in western Kansas on the basis of the need for tillage to prevent wind erosion, as indicated by two surveys made by County Agents, one early in the season and a second in March.

Execution of the wind erosion program in each county became the responsibility of a county committee. Its members determined the need for tillage on lands for which application for funds for tillage had been made.

The committee ordered payment, through the treasurer, upon proper certification that the required tillage had been completed.

In 1935, the Federal funds were used as follows:

Listing 1,791,469 acres @ 20¢	\$358,292.40
39,322 acres @ 40¢	15,728.80
Committee expenses	7,839.91
Clerical expenses	3,542.52
Other expenses	<u>2,861.03</u>
Total	\$388,264.66

The balance of the \$500,000 was used for similar purposes in 1936. When equipment was available on the farm, the rate paid was not in exceed 20 cents per acre.

The Interstate Committee agreed that if a farmer did not have the equipment to do the required tillage, the county committee might contract someone who did, and pay for such tillage, not to exceed 40 cents an acre.

Comparatively little land was tilled at the 40-cent rate. Of the applications, 16,515 were approved for tillage of 1,830,791 acres to protect 3,079,923 other acres of crop or pasture land.

It was generally agreed by the committees that if funds had been available at the beginning of the year, considerably better control could have been provided with a great deal less tillage.

On the whole, however, the program seemed to work out satisfactorily in 1935, and was quite effective in preventing soil from drifting.

### **Moisture and Wheat Production—1936**

L. L. Compton, former County Agent in Butler County, became Crops Specialist for western Kansas on July 1, 1935. Compton's study of the drought situation convinced him that there must be a relationship between the amount of moisture in the soil at the time of seeding wheat and the yields to be expected next harvest.

In 1936, Compton secured the cooperation of the County Extension Agents to establish 179 soil moisture demonstrations in 20 counties.

They found that 69 percent of the wheat seed-ed in soil that was wet to the depth of six inches or less produced five bushels or less per acre.

Fields wet from 19 to 30 inches deep produced 10.2 bushels on the average, and the fields with moisture deeper than 30 inches averaged 19.3 bushels per acre.

From this soil demonstration work, and similar work in 1937, Compton worked out a table of "chances" so a farmer could foresee his chances of getting a wheat crop, based on the amount of soil moisture at seeding time.

A further conclusion was that each inch of water in the soil was worth 2.64 bushels of wheat.

Practices that would help to conserve soil moisture were weed control, shovel-type tillage implements, contour tillage, and basin listing.

In 1937, County Agents conducted 334 soil moisture demonstrations in 39 counties of western Kansas.

There were 2,975,241 acres of wheat produced on fallowed land and 8,810,416 acres of wheat land worked by August 1.

In 1938, 752 cooperators conducted demonstrations comparing wheat on fallow and non-fallowed land. The average yield on fallowed land was 12.46 bushels of wheat per acre compared to only 9.47 bushels on non-fallowed land.

### **Grazing on Fallowed Land—Late 1930's**

The growing of sorghums on fallowed land was demonstrated by 191 cooperators, who grew 249,306 acres of sorghums on fallowed land.

During 1939, emphasis was placed on the use of fallowed land for feed crops as an aid in stabilizing agricultural income.

The feed crops, fed to livestock, provided another source of income. Sorghum was also a good soil stabilizer for control of wind erosion.

In 1940, 54 southwest Kansas counties grew 3,315,827 acres of sorghum—double that of the previous year.

### **Soil Management During WW II**

During World War II, the problem of soil management in western Kansas was how to get maximum production with a minimum of labor.

To help solve that problem, farmers were encouraged to conserve soil moisture, an important contributing factor to maximum production for the war effort.

Recommendations to obtain maximum storage of soil moisture were:

- 1) Start tillage of the land to be fallowed as early as possible but not later than May 1.
- 2) Use tillage implements that would leave the crop residue on the surface and not pulverize the soil.
- 3) Work the land whenever necessary to keep down weed growth.

Coupled with production of wheat and sorghum crops was the use of livestock to consume the feed crops and further help stabilize the farm income. Fallow for sorghums was recommended through the 1940's.

In 1946 there were 135 field demonstrations on growing sorghums on fallowed land. The acreage of sorghums on fallow was 372,485 in 1949, 478,075 in 1953, 1,079,747 in 1955, and 2,704,432 in 1957.

Summer fallowing of the land for wheat became the usual practice after the extreme drought of the early 1930's.

During the 1940's, the emphasis was placed on "good fallow," starting early, keeping down weed growth, and leaving stubble of the previous crop on the surface to protect the soil from wind erosion, increase moisture absorption, and reduce run-off.

In 1946, 664 fallow for wheat demonstrations were

used to show the value of good fallow. A 25-year study at the Colby Experiment Station revealed that only about 16 percent of the precipitation received was conserved in the soil for crop use.

Only a very small amount of precipitation was stored during the summer, but during the winter conservation of precipitation was more efficient because evaporation was low.

### **Stubble Mulch Tillage—1958**

Stubble mulch tillage became the recommended method of conserving moisture and keeping the crop residue on the surface of the soil. In 1958, there were tours of 49 stubble mulch demonstrations. In 1959, 2,269,073 acres were tilled for fallow by the stubble mulch method.

The conservation of soil moisture was correlated with the expansion of irrigation in those sections of western Kansas where water was available. Winter irrigation to thoroughly soak the soil was recommended in addition to irrigation of the growing crops.

In 1961, the following acreages were under irrigation, according to the County Agents' reports:

Wheat	253,782
Corn	165,604
Alfalfa	62,078
Grain sorghum	47,275
Forage sorghum	130,919
Pasture grass	5,768
Sugar beets	9,643
Vegetables	6,081
Castor beans	4,089
Dry beans	33,653

### **Managing Water in SE Kansas—1872**

Although Southeast Kansas areas receive more average rainfall than any other area in the state, the distribution of precipitation during the months of July and August is often such that crop production is reduced substantially.

The annual "run-off" amounts to 13 to 15 inches per year. If this could be collected and stored during periods of high precipitation and redistributed to the land, greater economic benefits would accrue to the producer and the community.

An educational program in water management was initiated in nine counties. The major objective of the program is to demonstrate the best known

practices, procedures, and methods for managing the land and water resources.

#### **Stubble Mulch Demonstrations—1974**

Interest in conserving energy has brought renewed emphasis on stubble mulch demonstrations especially in the South Central Area.

In continuous wheat operations, stubble mulch offers the additional advantages of moisture conservation and erosion resistance.

#### **Reduced Tillage Cropping Systems—1978**

Growers are under continuing economic pressure from high expenses and low prices. In addition, non-point source pollution control is planning for reduction of agricultural non-point pollution in future years.

Demonstrations of crop production with reduced tillage were conducted in 1978 at six sites in six counties in Northwest Kansas. Present Extension recommendations were followed for input to the system except tillage for which there is no recommendation.

All sites were planted with a buffalo slot-planter without prior tillage. Weeds were controlled with herbicides and one plot was also cultivated.

The demonstrations are being used to gain first-hand practical experience in reduced tillage cropping under farm conditions. It has been a focal point for discussion of merits and shortcomings as well as the need for further research.

A reduced tillage workshop between research and Extension faculty was held in October, 1978. Another workshop between Kansas and Colorado was scheduled for February 1979.

#### **Drought Schools in SE Kansas—1980**

The summer of 1980 was extremely dry. Rainfall was about 50 percent of normal throughout the growing season. Farmers suffered severe losses on soybeans, corn, grain sorghum and forage crops.

Accordingly, they were concerned about livestock feed supplies, the effects of prussic acid and nitrate content in forages, and herbicide and fertilizer carryover in the soil.

Three county meetings were held in mid-August. Topics included both agronomy and animal science subjects. The events were conducted by the local

County Extension Agricultural Agent with the Area Agronomist and Animal Science Specialist presenting the educational material.

The programs were well received and the response was very positive from over 700 persons who participated.

#### **Chemical Fallow Tillage in NW—1980**

Recognizing the potential for chemical fallow, Extension efforts have been intensified. Four demonstrations were established in 1980. At one location, cooperation was with the vocational agriculture instructor and his students.

This provided a learning experience for future young farmers to monitor the effectiveness of chemicals and their application, weed control through the growing season and harvesting for yield checks.

Tours at demonstration sites attracted 200 growers in 1980. During the past season of limited rainfall, several growers have indicated that this practice increased grain sorghum yields 30 to 40 bushels per acre over conventional tillage.

#### **Conservation Tillage Councils—1982**

The first Conservation Tillage Committee was organized in Saline County in 1982. Saline County Extension Director and the SCS District Conservationist met with University Specialists and 20 farmers to organize that committee.

Soon thereafter, each County Extension Agent was encouraged by a statewide Extension Soil and Water Conservation Task Force to consider forming a committee.

As of 1988, 22 County Conservation Tillage committees have been formed.

The primary reasons for this interest in conservation tillage include potential increases in farm profit, reductions of soil erosion and compliance with the conservation provisions of the 1985 Farm Bill.

Local conservation tillage committees serve the needs of many different clientele groups in a single, coordinated effort.

Farmers are given an opportunity to operate conservation tillage drills, an experience they would not likely gain on their own farms unless implement dealers leased drills or conservation districts purchased drills.

# Weed Control

## Field Bindweed—1922

The first work in weed control was with field bindweed. A program of identification and eradication was started in 1922. Field bindweed was presumed to have been introduced into this country in seed wheat imported from Russia.

The first field bindweed found in the state was in Marion, Harvey and McPherson counties where immigrants from Russia first settled. George Stenzel, Marion County, admitted that bindweed got started on his farm from imported seed wheat.

## Clean Cultivation—1926

By 1926, experimental work indicated that clean cultivation for two years, or the use of a smother crop for two years, followed by clean cultivation for one year, would eradicate bindweed almost one hundred percent.

Demonstrations using these control measures were established:

17 with 23 acres in 1923.

59 with 1,650 acres in 1924.

130 with 1,844 acres in 1925.

132 with 2,467 acres in 1926.

It was estimated that the value of the farm land was decreased about fifty percent by an infestation of bindweed and that approximately 100,000 acres were infested. Mortgage companies started refusing loans on infested land.

## Salt Use—1926

Other control measures included the application of 20 tons of salt per acre. Such an application ruined the land for ten to twelve years.

## Chemical Applications—1926

Some chemicals had been tried, by 1926, with limited success. They were expensive and less effective than cultivation.

By 1927, however, some success was achieved with the use of sodium chlorate. Willet Taylor of Chapman sprayed an area with sodium chlorate and obtained perfect control and eradication.

In 1928, 21 counties established demonstrations using sodium chlorate. On January 10, 1929, E. H. Teagarden was employed as an Extension Specialist in Weed Control. The budget for the next fiscal year included a request for funds to establish an Extension Weed Control Specialist position but, due to economic conditions, the funds were not appropriated.

Earl Teagarden transferred to a County Agricultural Agent position in Stafford County effective May 15, 1929.

## Bindweed Demonstrations—1929

In 1929, almost every county that had bindweed established one or more demonstrations for eradication, a total of 462 demonstrations. Seventeen counties purchased power sprayers for demonstrational purposes. Thirty cultivation demonstrations were also continued.

## Truck Tour on Bindweed Control—1931

In 1931, the Chipman Chemical Engineering Company, Inc. conducted a truck tour, June 29 to July 8, and demonstrated bindweed control by spraying in 17 counties with 260 persons attending. Professor J. W. Zahnley of the Department of Agronomy cooperated in organizing the tour and attended some of the demonstrations.

County Extension Agents were carrying on the weed control program with some supervision and suggestions from the Specialists, Luther Willoughby and Professor Zahnley.

## Other Problem Weeds—1931

In 1931, it was estimated that half of the farmers could identify bindweed; 1,517 spraying demonstrations and 50 cultivation demonstrations were conducted.

By 1933, interest had developed in the control of a number of other troublesome weeds including Johnson grass, Canadian thistle, bur ragweed, and knapweed. Fifty-one demonstrations were conducted on the control of those other weeds.

Interest was also developing in the need for a state law that would define the responsibility of a land owner who had noxious weeds that might spread to neighboring land if not controlled or eradicated. A bill to this effect was introduced in the 1935 legislature but failed to pass.

The bindweed program continued with County Extension Agents carrying the major responsibility. Research was continuing in an endeavor to find chemicals that would be one hundred percent effective on bindweed and other noxious weeds.

In 1935, for example, 706 demonstrations were conducted, 5,398 acres of bindweed sprayed, 10,147 acres clean cultivated, and 4,982 acres cleaned of bindweed by the recommended methods.

The reported number of infested acres was 238,969 and the estimated decrease in the value of the infested land was \$12,000,000. The Agricultural Adjustment Administration made some payments for controlling weeds on land out of production.

### **Kansas Noxious Weed Law—1937**

In 1937, the Kansas legislature passed the Kansas Noxious Weed Law. The law provided that the Boards of County Commissioners were authorized to make a levy on the tangible property in a county, for funds to conduct a program for the control and eradication of noxious weeds.

Field bindweed was named as a noxious weed. The weed control program was to be administered by the State Board of Agriculture. Counties were authorized to employ a County Weed Supervisor, and to pay one-half of the cost of applying eradication methods recommended by the State Weed Supervisor, employed by the State Board of Agriculture.

Cities were also authorized to make a levy to provide funds to control noxious weeds within the city limits.

Previous to 1937, the usual seed control program in a county was:

- 1) The county to purchase a power sprayer.
- 2) The County Agent would schedule the sprayer among interested farmers and supervise its use.
- 3) The farmer would pay for the operation of the sprayer and for the chemicals used.

About 10,000 acres of infested land were cleared each year under that program but bindweed was spreading each year from infested areas not being controlled.

The railroads and highway authorities were initiating programs to clean the weeds from rights of way.

During the 1940's and 1950's, or from the time of the passage of the state noxious weed law in 1937, the noxious weed control program was the primary responsibility of the County Weed Supervisors. County Agents carried out an educational program as they worked with the County Weed Supervisors.

During the 1940's and 1950's, the Agronomy Specialists did much work in acquainting farmers and County Agents with identification and control measures for many common weeds not classed as noxious. Those included the common annual weed,

sage brush and other pasture weeds which could be controlled by chemicals or by mowing.

During the late 1950's, Robert Bohannon, Agronomy Specialist, cooperated closely with Dr. L. E. Anderson, in charge of weed research in the experiment station. The research work dealt largely with weed control by pre-emergence treatment.

Commercial companies were very cooperative in furnishing chemicals for research and demonstrations. Chemicals furnished were:

- 1) For corn—2,4-D, Simazine, Atrazine, and Dinitro.
- 2) For grain sorghum—2,4-D, Simazine, Atrazine, Dinitro, and Propazine;
- 3) For soybeans— Amiben, Alanap-3, and Butyrac 118.

The booklet, Procedure for Conducting Pre-emergence Weed Control Plots, was first used in 1959, and again in 1960, with some modifications. The booklet contained detailed instructions concerning how the plots should be laid out and the chemicals applied.

### **Noxious Weeds—1937**

The 1937 law designated field bindweed as a noxious weed. Other weeds later included as noxious were:

- 1945—hoary cress, Russian knapweed and Johnson grass on an optional basis by county commissioner resolution;
- 1961—leafy spurge, Canada thistle, Johnson grass (state-wide), bur ragweed, quackgrass, pignut (Indian rush pea), and goatgrass.
- 1963—musk thistle (nodding).

### **Weed Control Programs—1937-41**

Demonstrations were continued on weeds other than field bindweed. In 1937, dry sodium chlorate was used in some demonstrations at the rate of five pounds per square rod of land. This application gave 100 percent kill. A fertilizer spreader was used to apply the dry chlorate.

In 1938, 34,169 acres of bindweed infested land was treated by clean cultivation or sodium chlorate.

In 1939, 1,473 chemical treatment demonstrations were conducted and 2,799 clean cultivation demonstrations. The cost for clean cultivation ranged from \$6.50 to \$10.00 per acre. County Extension Agents and County Weed Supervisors accumulated data on the effect of bindweed infestation on the yield of small grains. They found that the average decrease in



wheat yields was 5.7 bushels per acre and for oats 13.9 bushels per acre, over a five year period.

### **Marijuana—1939**

Marijuana weed was found in many areas by the County Weed Supervisors, in 1939. One hundred thirty-two demonstrations were conducted on weeds other than bindweed, including prickly pear, perennial pepper grass, Russian knapweed, Canada thistle, wild gourd vine and a few others.

In 1940, the Agricultural Conservation Program (ACP) made incentive payments for the control of bindweed, hoary cress, Russian knapweed and climbing milkweed.

By 1941, 29,461 farmers were using one or more of the recommended practices to control and eradicate noxious weeds. There were 223,420 acres of field bindweed reported by the county weed supervisors.

### **Extension Weed Specialist—1959**

In 1959, Harold Harper, Extension Soil Conservationist, was assigned the responsibility of correlating the work of the Experiment Station on weed control with an educational program for the County Extension Agents and the County Weed Supervisors.

The program was in cooperation with the Weed Control Division of the State Board of Agriculture represented by Warren Teel, director of the Weed Control Division.

### **Weed Publications—1960's**

The following publications, by Harold Harper and Howard Wilkins, were prepared and made available to County Agents and Weed Supervisors: **Weed Identification in Kansas; Weed Identification Multiple Choice Card; Noxious Weed Educational Program Plan.**

**Summary of Research Findings**, by North Central Weed Control Committee; **The Kansas Seed Law**, as amended by the 1961 legislature;

**Field Bindweed and Its Control**, USDA Leaflet No. 496; **Slides of Weed Identification; Weeds, Extension and Farm Youth**, slide set and talk by Harold Harper.

### **Weed Feature Stories—1962**

Harold Shankland, Assistant Extension Editor, Department of Information, Kansas Extension Service, wrote a series of feature stories on weed control which were released during 1960.

The series was published in the *Star Farmer*

which was reaching approximately 90 percent of the farm homes in Kansas.

### **Weed Control Workshops—1962**

During 1962, two-day weed control workshops were held on a district basis at Hays Station and Manhattan. Those schools promoted closer cooperation between County Extension Agents and County Weed Supervisors in conducting an aggressive weed control program. A total of 173 people attended those workshops.

Harold Harper organized a District training school in each of the five Extension Administrative Districts with 214 Agents and Weed Supervisors participating.

### **Weed Award Program—1962**

Recognition was given for the first time in 1962 to a farm boy for his essay on "How We Control Weeds On Our Farm." The honor went to Bryce Fowles, R 5, Clay Center.

In 1962, control and eradication practices were being used on the following acreage of noxious weeds: field bindweed, 32,805; Johnson grass, 9,969; Hoary cress, 1,186; Russian Knapweed, 1,135; Bur ragweed, 1,211; Leafy spurge, 3; Canada thistle, 34; Quackgrass, 52; Goatgrass, 2,772; and Indian rush pea, 3.

### **Weed Control—1965-88**

The educational weed control program, prior to June, 1965, was conducted by several Extension Agronomists.

Harold Harper, Extension Soil Conservationist, was responsible for cooperation with the Weed Control Division, Kansas State Board of Agriculture, in providing an educational program on control of noxious weeds for County Agents, weed supervisors, and the public.

### **Weed Control Specialist—1965**

The first position for an Extension Weed Control Specialist was funded at Kansas State University in 1965.

Dr. Erick Nilson was appointed as Extension Specialist, Herbicides (Pesticidal Safety), and has implemented an on-going weed control program from that date through 1988.

### **Herbicide Use Emphasis—1965-88**

Proper use of herbicides has been a major educational thrust of the educational program from 1965-88.

- 1) Identification of target weeds in a crop or non-crop area.

- 2) Selection of intended use for cropland and non-cropland.
- 3) Application of the herbicide(s) according to all directions, warnings, and precautions on the product label(s).

#### **Weed Publication—1965**

In 1965, a chemical weed control publication for agronomic and horticultural crops suggested only 2,4-D for weed control in wheat; atrazine, 2, 4-D, linuron, and CDAA+TCB for corn; propazine, 2,4-D, and atrazine for grain sorghum, and amiben, CDAA, or NPA for soybeans; and 2,4-D, 2,4,5-T, or Silvex for pasture weeds.

#### **Weed Science Personnel—1965-88**

In 1977, the Kansas Legislature provided funding for a second Extension Weed Science Specialist position at Kansas State University.

Other personnel who have served as Extension Weed Science Specialists during the period of 1965-1988 were: Dr. Leslie Reinhardt (1978-81), Dr. David Regehr (1981-83), Jack Brotemarkle (1983-87), and David Regehr (1987-to date).

#### **Weed Control Demonstration—1966**

Weed control demonstrations, field trials, and weed science research practices were frequently used to share information with farmers and the public.

Herbicides were prepared and sent to County Agents for 91 corn, 78 soybean, and 126 grain sorghum county herbicide demonstrations.

#### **Alternate Herbicide Recommend.—1967**

In 1967, the publication, Chemical Weed Control in Field Crops, was first developed to provide information on use of alternative herbicides for crops, and later for non-cropland.

This publication has been revised annually by Extension and research weed science personnel.

In 1988, the publication, Report of Progress 557, Chemical Weed Control for Field Crops, Pastures, Rangeland, and Non-Cropland, contained the common names of more than 50 different herbicides for use on cropland.

#### **Pesticide Use Law—1970**

The Kansas Legislature enacted the Kansas Pesticide Use Law and the title for this law was changed to the Kansas Pesticide Law in 1977.

Kansas State University, in cooperation with the Kansas State Board of Agriculture, has the on-going responsibility and has provided training for certification and recertification of commercial pesticide

applicators and farmers who apply restricted use pesticides.

#### **Herbicide Training**

The Federal Insecticide, Fungicide and Rodenticide Act and the Kansas Pesticide Law require commercial applicators be certified if they use "restricted use" herbicides and other pesticides. Accordingly efforts have involved herbicide training sessions on:

- 1) Principles and practices of weed control.
- 2) Information on herbicides, their properties and uses.

#### **Brush/Weed Control—1971**

The wide distribution of the bulletin, Chemical Weed Control in Field Crops, and other weed control publications indicates the acceptance of these publications for information on herbicides and proper use of pesticides.

Labette County reports many farmers are using herbicides as a production tool and there is no better way to sell the idea of chemical weed control than through a well located demonstration plot.

A County Agent in Northwest Kansas reports that the increased use of herbicides can be largely related to a substitution of costs of herbicides for additional labor that would be required for cultivation.

The Herbicide Specialist assisted the SE Kansas Area Agronomist and Bourbon County Extension Agent in the Grass Resource Opportunities Program in Southeast Kansas by development and assistance in establishment of a buckbrush control demonstration.

Varying rates of 2,4-D were applied on the different plots in 1970, with additional treatments being applied to some plots in 1971.

The farmers reported that spraying had increased the grazing capacity by at least 25 percent with \$5 return/A for \$1.50 to \$2 investment, which includes all the cost of herbicides, tractor, and labor.

The distribution of 3,800 leaflets, Wild Cane and Its Control, and the sale of 3,500 leaflets to Stauffer Chemical Co., indicates the continued demand and use of this publication for information on control of wild cane. This information about weed control was used at educational meetings in areas of the state where needed.

#### **Wild Hemp Control Program—1971**

In 1971, Kansas was one of the nation's test

sites for the Wild Hemp Elimination Program. Marshall County and selected counties in nine other states were picked to test control measures for marijuana.

This program was a follow-up of the pilot project on volunteer marijuana control in 1970. The 1970 program by Extension and the Bureau of Narcotics indicated there was a need for cost sharing in bringing about more complete control programs.

#### **Herbicide Performance Bulletins—1972-88**

Since 1972, annual reports of the herbicide performance studies were provided by Professor Oliver Russ, Weed Science Researcher, to County Agents for use in their educational weed control programs.

Educational programs have consisted of information on:

- 1) Changing the cropping sequence (crop rotation).
- 2) Use of cost-effective herbicides.
- 3) Use of tillage as needed for use in developing integrated weed control management systems for problem weeds in cropland.

#### **Chemical Control of Musk Thistle—1978**

Musk or nodding thistle is one of the designated noxious weeds in the State of Kansas. This plant pest is currently found in approximately 70 of the 105 counties in the state, with heavy infestations in North Central and Northeast Kansas.

Thistle infestations usually occur in pastures and rangeland, along roads, in waste areas, and sometimes around abandoned farmsteads.

Demonstrations involving various chemical treatments specifically for the control of musk thistle were established in seven counties in North Central and Northeast Kansas during the spring of 1978.

The purpose of these county demonstrations was to show the importance of timeliness with regard to the recommended rates of 2,4-D.

Certain other herbicides were also included in order to evaluate the potential of alternative herbicides relative to control of musk thistle.

#### **Weed Control in Field Crops—1979**

One of the thrusts of the Weed Science Educational Program is to inform producers concerning effective weed control practices and safe herbicide usage in corn, soybeans and grain sorghum. Efforts are conducted at the state and area levels.

Agronomists in Southeast, Northeast, and Northwest Kansas establish a large number of demonstrations annually in cooperation with County Extension Agricultural Agents.

Special attention is given to specific problem weeds, such as Johnson grass and wild cane which seriously reduce crop production and to demonstrations with new equipment such as the recirculating sprayer. However, efforts are also concentrated on other problem species.

Recognizing that demonstrations are only a part of a total program, State and Area Specialists and County Extension Agricultural Agents conduct tours to demonstration sites.

Field teaching is one of the most effective tools to educate producers and dealers, but several other methods are used extensively by state and area Specialists to disseminate information.

These include update sessions for County Extension Agricultural Agents, meetings for producers and dealers, mass media, and farm visits.

#### **Pesticide Use Survey—1979**

In 1979, Kansas State University and the Kansas Crop and Livestock Reporting Service conducted a survey of pesticide use by Kansas farmers.

Herbicide use in percentage of crops in 1978 were:

- Corn—86 percent.
- Sorghum—9 percent.
- Soybeans—78 percent.
- Wheat—10 percent.
- Alfalfa—6 percent.
- Pasture and Rangeland—12 percent.

#### **Weed Control in Cropland—1980**

During the past year, State and Area Specialists conducted an aggressive educational program on weed control throughout the state in cooperation with County Extension Agricultural Agents.

Crops included corn, grain sorghum, soybeans, wheat, alfalfa and pinto beans.

Special emphasis was placed on problem weeds such as mustards and winter annual grasses in wheat and shattercane and rhizome Johnsongrass in corn and soybeans.

Education efforts included in-depth herbicide schools, update sessions for County Extension Agricultural Agents, training for applicators, demonstrations, tours, county and area meetings and mass media.

Demonstrations and tours are recognized as very effective in making producers and dealers knowledgeable.

#### **Weedrec Computer Program—1980-87**

Weedrec, a computer Weed Control Recommendation Program, was developed with computer programmer assistance in 1980, for weed control information about alternative herbicides for corn, grain sorghum, soybeans, and alfalfa.

During the 1983-87 period, interactive software was developed from Weedrec software, and with programmer assistance for cost effective control of weeds in corn for the Corn Management Systems.

#### **Weed Control in Cropland—1981**

Weeds cause significant reduction in crop yield and farm income. In a 22-county area of Southwest Area during 1981, County Agents estimated that losses from field bindweed, Johnsongrass and shattercane totaled \$42 million. This indicates the magnitude of the problem for the entire state.

#### **Weed Identification Slides—1986**

In 1986, an indexed set of 80 slides on weed identification with common identification characteristics was developed by Jack Brotemarkle, Loren Moshier, and Gerry Posler for 4-H, FFA, and other audiences.

## **Soil Conservation**

Soil conservation was included with the Soil Management and Crop Production project by a revision made in 1936, with the designation as Subproject F.

The first reference to Soil Conservation work in the Agronomy program was in the 1935 annual report which said

#### **SOIL EROSION CONTROL ACTIVITIES**

##### **(In Cooperation with the U. S. Forest Service)**

Early in 1935, a representative of the United States Forestry Service at Denver, Colorado, invited the cooperation of the Kansas Extension Service in conducting a Soil Erosion Program with Emergency Conservation work camps in Kansas.

This arrangement was made and an Extension Agricultural Engineer and an Extension Agronomist were detailed to cooperate with the United States Forest Service, and to supervise and direct the soil erosion work around such Emergency Conservation Work camps as were designated for erosion projects.

Such camps were located at Neodesha and Cawker City; and additional camps to be established April 1 were planned for Washington, Marshall, Jackson, Norton, and Coffey or Greenwood Counties.

In addition, camps then located on lake and park projects were to become available for erosion control work as soon as possible.

The specialists began work on this program early in March and organizations for the utilization of erosion camps were planned and started in Washington, Marshall, Jackson and Norton Counties.

It was the plan to organize Soil Improvement Associations, consisting of 200 to 300 bona fide farmers in each county who would make possible sufficient work to employ camp labor for at least two years.

A membership fee of \$2 was collected from each cooperating farmer. The members were to elect their own officers and board of directors who would plan with the representatives of the Extension Division and the camp officials the kinds and types of work to be conducted on each farm.

In addition to the organization of these four Soil Improvement Associations, some preliminary work was done with camps already organized at Neodesha and Cawker City. All other camps in Kansas were visited in order to plan erosion control work that might be necessary in their vicinity.

Agronomic recommendations were made and used regarding the seeding of campsites at Seneca and Garnett. Agronomic recommendations were made and used regarding the protection of exposed dam slopes at Reading and Kalvesta.

The Forestry Service supervised camps in southeast Kansas who were employed in leveling strip mines near West Mineral, Scammon, and Pittsburg. Agronomic recommendations were made regarding the seeding of lespedeza on these areas. Fourteen thousand pounds of Korean lespedeza seed were purchased and seeded on those leveled areas.

About April 1, (1935) soil erosion control work was recognized at Washington, D. C. and the cooperative work with the Forest Service terminated May 1, (1935). The Extension specialists resumed their work on regular Extension programs.

During the reorganization at Washington, the Soil Erosion Service formerly under the Department of the Interior was transferred to the Department of Agriculture.

It assumed control of all soil erosion control activities and developed new plans of operation. Those plans did not include the plans formerly developed with the Forest Service.

New plans are in process of development for Soil Erosion activities in Kansas.

### **Conservation Work Camps (CCC)—1930's**

The Emergency Conservation Work camps referred to in the quotation were Civilian Conservation Corps (CCC) camps created during the depression years of the early 1930's to provide employment for young men who were unable to obtain regular employment in civilian life.

The camps were organized much as a military unit, usually under Army Reserve officers. They were established in areas where some public work was needed and where a sponsor agreed to furnish materials needed in construction of dams or similar projects.

### **Soil Conservation Service—1935**

The Soil Conservation Service was created in 1935 by an act of Congress and placed in the Department of Agriculture.

The Agronomy Annual Report for 1936 said:

#### **Soil Conservation Program Cooperating Agencies in Kansas**

- County Soil Conservation Associations
- County Farm Bureaus
- Kansas State College, Extension Service
- Soil Conservation Service
- United States Department of Agriculture

The Kansas State College Extension Service and the United States Department of Agriculture Soil Conservation Service developed a memorandum of understanding late in 1935. A part of this memorandum provided for the cooperative employment of two Extension Specialists.

Hal F. Eier, Specialist in Rural Engineering, and L. E. Willoughby, Specialist in Agronomy at the Kansas State College, were assigned to this program beginning March 1, 1936.

#### **Soil Conservation Associations**

Five County Soil Conservation Associations were organized in Kansas during the winter of 1935-36. These Associations were located in Morris, Coffey, Kingman, Jefferson and Wilson Counties.

Each Association consisted of 100 farmers in

a county who had agreed to support and sponsor Soil Conservation work in their county. The members of the Association established a membership fee sufficient to pay the local expenses of the association.

In Morris County where a \$2 fee was established, the local Farm Bureau agreed to pay \$300 toward the expenses of the Association. (The membership fee ranged from \$2 to \$5 per year.)

In all other counties a \$5 fee was established which it was estimated would provide \$500 per year and make the association self-supporting.

According to the memorandum of understanding with the Soil Conservation Association, whenever such County Association was organized in mutually designated counties, the Extension Service would employ an assistant County Agent to work with each such Association.

The Extension Specialists in Engineering and Agronomy were to encourage and supervise a Soil Conservation educational program in all such Association counties.

The following Assistant County Agents were assigned to this program:

H. C. Stevens, Coffey Co., Burlington; Richard Campbell, Jefferson Co., Oskaloosa; Fred Cromer and George Gerber, Kingman Co., Kingman; Dale Allen, Morris Co., Council Grove; William Wishart, Wilson Co., Fredonia.

#### **Plan of Work**

A plan of work was adopted in a joint meeting of a committee from each Association and representatives of the Kansas Extension Service and the Soil Conservation Service.

After being approved by the State Advisory Committee, the plans of work established the details of Soil Conservation work in each county. It contained the recommendations which were to be made to conserve soil on cooperators' farms.

#### **Extension Program of Work**

The Extension Specialists met with each Assistant Agent and the County Agent and developed a program of work to be followed in 1936. This plan of work outlined the manner and means by which an educational program was to be conducted in each county. This became the guide for each Agent and was the basis for his monthly report of educational work accomplished.

By the end of 1936, 228 farms were under agreement with 55,994 acres in the five counties.

### **Contour Tillage Demonstrations—1930's**

Contour tillage demonstrations were held in all Association counties and in Wallace, Logan and

Gove counties. The total acreage contour tilled in the association counties was 8,493 during 1936.

#### **Area Conservation Demonstrations—1936**

During 1936, the Soil Conservation Service established area demonstrations in Jewell, Franklin-Douglas, Allen and Seward counties. Those demonstrations were used for field days during the next few years.

In those demonstration areas, the Soil Conservation Service provided technicians and equipment to build terraces and do other Soil Conservation practices as provided in a farm plan agreement made with individual farmers in the area.

#### **Other Soil Conservation Associations—1936**

During 1936, the Extension Specialists did preliminary work toward organizing Soil Conservation associations in Clark, Crawford, Anderson, Brown, Jackson and Nemaha counties. Early in 1937, Marshall organized an Association.

The six Associations had 532 members. Ninety farms, with a total of 21,901 acres, were under agreement; 16,128 acres were contour tilled, and 232 miles of terraces were constructed, protecting 7,728 acres.

The Assistant County Extension Agents assigned to counties with Soil Conservation Associations, and their terms of service, are listed at the end of the Agronomy personnel record.

The Extension Assistant Agents' service extended from mid-1936 to mid-1942. In 1942, the Specialists stated in their annual report:

Due to war conditions, the need for Assistant County Agents to fill County Agricultural Agent positions, and difficulties in recruiting, no effort has been made since July 1, 1942, to employ Assistant County Agents for Soil Conservation positions.

#### **Soil Conservation District Law—1937**

In 1937, the Kansas legislature passed the standard Soil Conservation District Law. That law provided a procedure for organization of a Soil Conservation District, under the administration of a State Soil Conservation Committee composed of the Director of Extension, the Director of the Agricultural Experiment Station, the Secretary of the State Board of Agriculture, the State Conservationist of the Soil Conservation Service, and five farmers elected by the Soil Conservation District supervisors from among their number.

During 1937, petitions for organizing Soil Conservation District were received by the State Soil

Conservation Committee from 21 counties: Allen, Clark, Ellsworth, Finney, Franklin, Grant, Greeley, Hamilton, Haskell, Kearny, Labette, Marion, Montgomery, Morton, Osage, Seward, Shawnee, Smith, Stanton, Stevens and Wichita.

Hearings were held in each of those counties: Shawnee, Seward and Wichita were considered not favorable; Clark and Montgomery, only slightly favorable; and all others were interested enough to justify holding a referendum.

#### **Extension-SCS Memorandum—1937**

In 1937, a memorandum of understanding and a cooperative project agreement were developed between the Soil Conservation Service and the Extension Service.

A Plan of Work was developed by the Extension Conservationist outlining the work to be done in promoting Soil Conservation work in Kansas for 1937 and 1938.

#### **Soil Conservation Districts—1938**

During 1938, petitions were received from 36 counties by the State Committee for the formation of Soil Conservation Districts. Twenty-six hearings were held, with 2,693 persons attending, and 20 referenda conducted with only two having the required 75 percent favorable vote.

The first Soil Conservation District was organized in Labette County. Six Soil Conservation Associations were maintained with 503 members.

The six Assistant County Agents working with the Associations held 86 demonstration meetings attended by 10,670 persons. Twenty-two tours were conducted, visiting 152 farms with 2,854 persons participating.

In 34 counties, 127 Soil Conservation Demonstration Farms were established.

Lyon and Osage counties organized Soil Conservation Districts in 1939. New Soil Conservation Associations were formed in Sumner, Nemaha, Atchison and Cloud counties.

The Associations had 163 farm agreements or farm plans involving 52,950 acres. A copy of the Soil Conservation Assn. constitution, and the farm agreement, were in the 1939 Soil Management and Crop Production annual report.

During 1939, 14 petitions were received and five hearings held. In 1940, Soil Conservation Districts were organized in Allen, Brown, Coffey, Geary, Grant, Marshall, Morris, Pawnee and Wilson counties.

There were 357 farms under agreement with

77,457 acres; 186 miles of terraces were constructed, 579 miles of contour pasture furrowing, 272 acres of trees planted, and demonstration farms in 53 counties.

**All-State Conservation Field Day—1938**

A state-wide Soil Conservation Field Day was conducted on June 3, 1938, with activities at the Mankato, Ottawa, and Iola demonstration areas. Liberal conducted a similar event on October 3, 1938.

On June 2, 1939, another state-wide Soil Conservation Field Day was held with activities at each of the four Soil Conservation demonstration areas, in each Association county, in the CCC camp areas and at the Hays Experiment Station.

The third All-State Soil Conservation Field Day was held on May 31, 1940, at 13 locations with 1,433 persons attending from 99 counties.

**Memorandum Revised—1941**

In 1941, the memoranda between the Soil Conservation Service and the Extension Service were revised to give more complete understanding of the operational procedures to organize a Soil Conservation District and plan its program.

The four Soil Conservation Service demonstration areas were closed as the farm agreements were completed.

Four of the Soil Conservation Associations had been organized as Districts; namely, Coffey, Marshall, Morris and Wilson.

Two, Jefferson and Kingman, were in the process of organizing Districts, and four continued to operate as associations; namely, Atchison, Cloud, Nemaha and Sumner. The status of each Association is given in the annual report for 1941, page 150.

The existing Districts had 1,009 farm plans involving 272,268 acres. Farm plans were also developed under other than District programs. These were the Associations, the Water Facilities program, Farm Security Administration, and the Extension Demonstration Farms. The grand total number of farm plans was 3,690.

By the end of 1941, 18 Soil Conservation Districts had been organized. No Districts were organized during 1942.

**4-H Soil Conservation Tour—1941**

Nemaha County conducted the first Soil Conservation tour for 4-H Club members.

**Combine Soil/Water Programs—1942**

An intensified educational program in Soil Conservation was developed during 1942 in an effort to overcome a passive attitude toward Soil Conservation practices and the organization of Soil Conservation Districts.

"Water Conservation" was combined with "Soil Conservation" and the correlation of the two emphasized in the educational program. The Forest Service Shelterbelt Program was transferred to the Soil Conservation Service during 1942. Future shelterbelt plantings could be only in Soil Conservation Districts.

**Change District Procedures—1943-50**

The State Committee modified and simplified the procedures for organizing Soil Conservation Districts. Those changes included:

- 1) The County Agents were given more training.
- 2) The educational program was strengthened.
- 3) More than one hearing could be held in a county, thus making attendance more convenient for the people.
- 4) A referendum could be conducted for a period longer than one day thus escaping the hazards of storms, etc.
- 5) A suggested change in the law to provide that only a majority favorable vote be necessary to organize a District rather than the required 75 percent.
- 6) Proposal to develop an educational program with an appeal to women.
- 7) A new circular, **Soil Conservation Districts in Kansas**, was published.

Most of the Soil Conservation Districts were organized from 1943 to 1950. The last of the 105 Districts, Shawnee, was organized in 1954. The year in which each District was organized was as follows:

1938 Labette <sup>1</sup>	1940 Coffey	1940 Pawnee
1939 Lyon	1940 Geary	1940 Wilson
1939 Osage	1940 Grant	1940 Doniphan
1940 Allen	1940 Marshall	1940 Franklin
1940 Brown	1940 Morris	1940 Ness
1941 Trego	1943 Neosho	1943 Thomas
1943 Atchison	1943 Rice	1944 Anderson
1943 Edwards	1943 Sherman	1944 Chase
1943 Jewell	1943 Stafford	1944 Cherokee
1943 Nemaha	1943 Sumner	1944 Decatur

1944 Ellsworth	1944 Pratt	1945 Bourbon
1944 Graham	1944 Salina	1945 Butler
1944 Lane	1944 Scott	1945 Cowley
1944 Osage	1944 Sheridan	1945 Cloud
1944 Phillips	1944 Woodson	1945 Dickinson
1945 Douglas	1945 Marion	1945 Rush
1945 Ellis	1945 Miami	1945 Sedgwick
1945 Harper	1945 Norton	1945 Barton
1945 Kiowa	1945 Pottawat.	1945 Clay
1945 McPherson	1945 Republic	1945 Crawford
1946 Elk	1946 Johnson	1946 Rooks
1946 Finney	1946 Mitchell	1946 Russell
1946 Ford	1946 Montgom.	1947 Clark
1946 Hamilton	1946 Rawlins	1947 Gray
1946 Jefferson	1946 Reno	1947 Harvey
1947 Jackson	1948 Kearny	1948 Gove
1947 Logan	1948 Linn	1948 Meade
1947 Ottawa	1948 Riley	1948 Greeley
1947 Wichita	1948 Leavenwo.	1948 Comanche
1948 Lincoln	1948 Morton	1948 Haskell
1948 Seward	1949 Stanton	1950 Greenwood
1948 Barber	1949 Stevens	1950 Kingman
1949 Cheyenne	1949 Wabaunsee	1950 Wallace
1949 Hodgeman	1949 Washingto.	1953 Wyandotte
1949 Smith	1950 Chautauqu.	1954 Shawnee <sup>105</sup>

#### **State Soil Conservation Committee—1945**

Each Soil Conservation District was governed by a Board of Supervisors composed of five men elected by the cooperators within the District. In 1945, a state meeting of the District Supervisors was held at which time they formed a state organization.

The groups met annually. The state was divided into five Districts. Supervisors from each District elected one of their number to serve on the State Soil Conservation Committee.

#### **Outstanding Conservation District—1953**

One of the highlights of the Supervisors' annual meetings was the announcement of the District to receive recognition for outstanding work during the year. An award was given by the Goodyear Tire and Rubber Company. The first award was given in 1953.

The award consisted of a trip to the Goodyear research and demonstration farm at Litchfield Park, Arizona. The five supervisors and three other men from the selected District were paid their expenses

to Litchfield Park.

In 1954, the award was modified since a larger number of Districts were to be eligible. From 1954, and during the following years, the award consisted of a trip for one supervisor and one additional man from the District selected for recognition. Kansas, however, was divided into two areas, western and eastern, and each area selected a District for the award.

#### **Soil Survey Educational Program—1980**

Newly published soil surveys have been published for 64 Kansas counties. During the 1979-80 program year, educational meetings have been held in Mitchell, Johnson, Smith, Pawnee, Sedgwick, Sumner and Jackson counties.

Preliminary planning for educational meetings is in progress for Thomas, Rush, Marshall, Doniphan, Ottawa, Lyon, Montgomery and Bourbon counties.

County-wide educational meetings are held in each county. Attendance at the meetings ranges from 100 to 500 citizens.

Agriculturally, the introduction of a county soil survey report enables all agriculturists to more precisely manage their crop and range production enterprise.

Additionally, it leads toward management of every acre according to its best usage—thus lessening the adverse affects of soil and water erosion.

#### **Soil Conservation Bankers Awards—1980**

The bankers award program is jointly sponsored by the Kansas Bankers Association, the Soil Conservation Service, the 105 County Soil Conservation Districts, and 105 County Extension Councils.

Each year a county committee, headed by the county key banker, reviews candidates for award recognition. A maximum of five awards are presented each year—usually when the County Soil Conservation district Annual Meeting is held.

Each year a maximum of 525 awards are made. To date, 18,350 Kansas farm operators have been recognized for outstanding soil and water conservation work.

**Contributing Author.** *The primary contributing author on educational programs and activities in Extension Agronomy (Crops & Soils), from 1965 through 1988, was Gary Kilgore, Extension Specialist, Crops and Soils, Southeast Area.*

**A complete list of personnel in Extension Agronomy is included in Volume II, Chapter 6, Extension Personnel, pp. 34-38.**