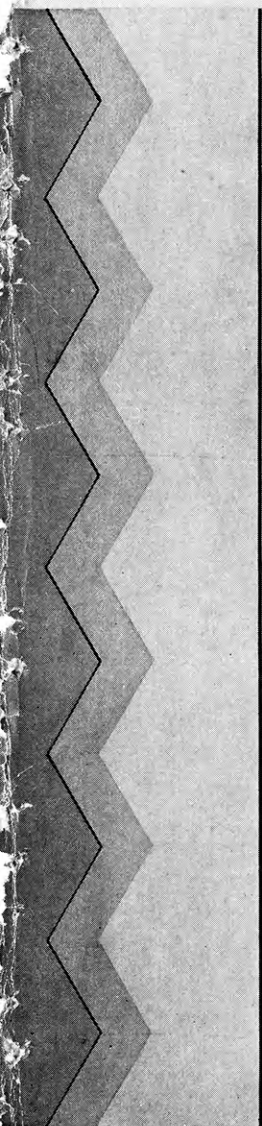


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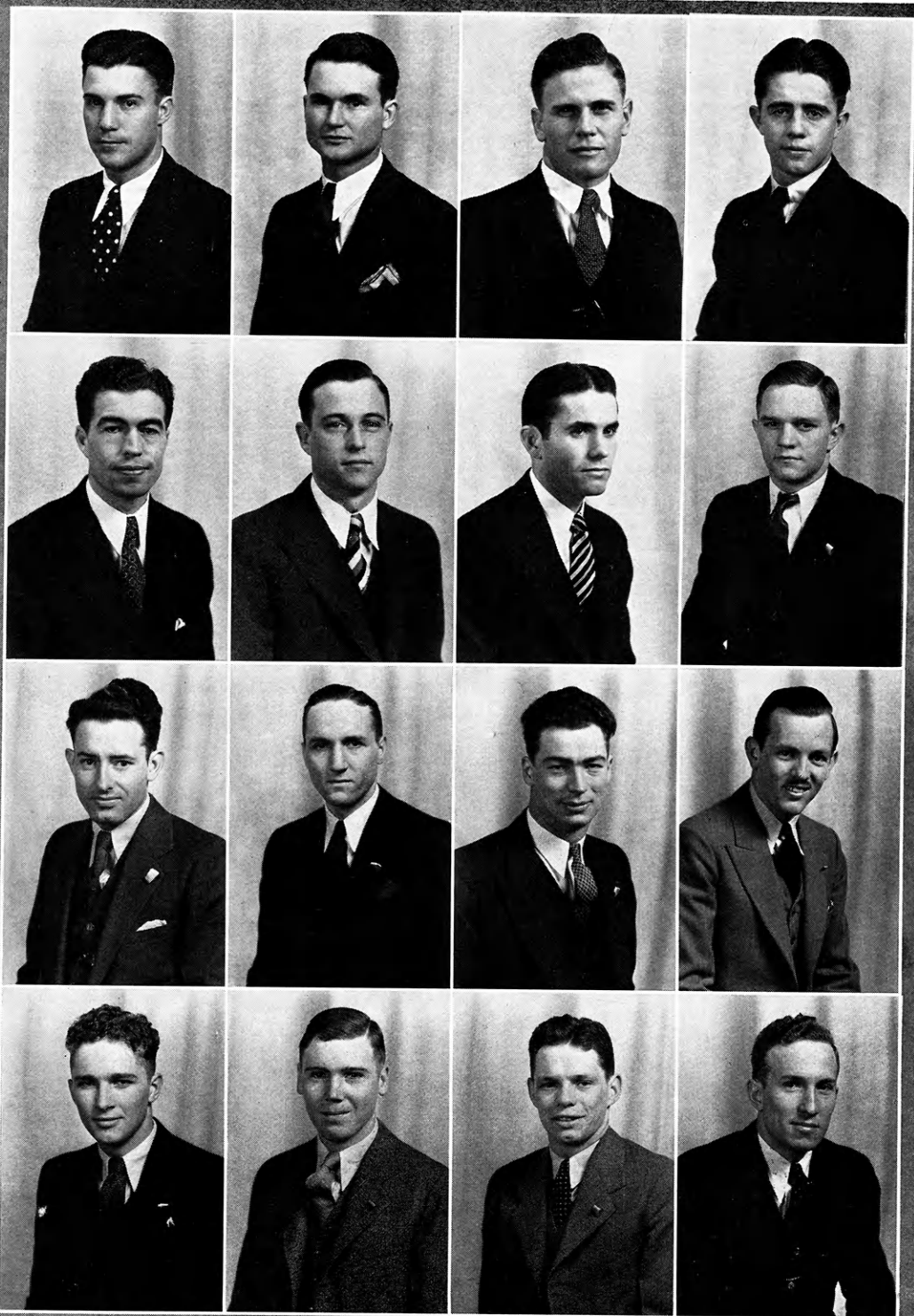
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STUDENTS ELECTED TO ALPHA ZETA, 1931-'32

Albin
Fry
Coulter
Hanson

Clutter
Miller
Daly
Latta

Davidson
Parsons
Dornberger
McNeal

Erhart
Burnet
Elson
Unruh

The Kansas Agricultural Student

VOL. XI

Manhattan, Kansas, March, 1932

No. 3

Soil and Crops Research

A Dozen New Experiment Fields Study Many Kansas Crop Production Problems

The leading problems of economic importance to Kansas agriculture are being systematically studied by the Kansas Agricultural Experiment Station. In the main these problems may be classified in three broad groups: (1) Problems of farm business or farm economics. (2) Problems in the livestock industry, including all animal production and animal products. (3) Problems in crop production and crop products. All the work is directed and coordinated and the results in the main given publicity from the central station at Manhattan.

Over a thousand acres of land are utilized at Manhattan in the study of these agricultural problems. Besides the central farm, the state of Kansas owns, or practically owns, four other farms in the western half of the state devoted to agricultural investigations. These farms are branch Agricultural Experiment Stations. They are located at Hays, Colby, Garden City, and Tribune.

Every piece of land naturally presents crop problems. Kansas, because of the variety of its soil types and climatic conditions, presents a diversity of crop problems. Probably a farm could not be located in Kansas that would be representative of a larger farming area in the state than the central farm of the Agricultural Experiment Station of Kansas at Manhattan. This central station, therefore, has a large part in the investigation of soil and crop problems for Kansas. The four branch stations present typical problems covering western Kansas, each presenting special soil and crop

problems for its section of the state.

Many local soil and crop problems, especially for southeastern, south central, and northeastern Kansas, have heretofore not been subjected to controlled and direct study by the staff of the Agricultural Experiment Station. This situation, however, is now changed by a series of experiment fields. Five of these fields were established in southeastern Kansas in 1924. Seven others have been established recently in south central and northeastern Kansas.

These fields are small tracts of land, each 10 to 30 acres in area, leased from their owners on short-time leases. They are fully controlled by the state, an integral part of its agricultural experiment station system. Each works on problems of utmost importance in its section of the state. Many of these problems are comparatively long-time problems. Brief statements of these problems follow. Some of the accomplishments of the past eight years on the southeastern Kansas group of fields will, in the opinion of the editor, give the reader some idea of the importance of the work, while the outlines of the plans for the south central and northeastern Kansas fields will make more comprehensive the possibilities of the work undertaken in the experiment field program. —Ed.

SOUTHEASTERN KANSAS EXPERIMENT FIELDS

I. K. Landon, '21

Five experiment fields were started in southeastern Kansas in 1924. Each

of these fields is on a different soil type, all but one of the principal upland soils being represented.

The principal project on each of these fields is a four- or five-year rotation including alfalfa and either red or sweet clover. Plots of each crop are treated with lime, manure, and commercial fertilizers alone and in combinations. Accurate records of the amount of fertilizer, the time and method of its application, the seedbed preparation, the cultivation, and the yields of each plot are kept. In addition to these main fertility projects there are variety tests, shorter rotation tests, and various minor though vital experiments which vary on the different fields.

COLUMBUS FIELD

The Columbus experiment field is located on the farm of W. H. Shaffer one mile west and three miles north of Columbus. This field is on Cherokee silt loam or what is locally known as white ashy land. This type of soil is formed from the decomposition of shale and is almost always too acid for the clovers to grow well. This soil type is usually so flat that there is seldom any erosion and it often requires surface drainage. The subsoil, which with the overlying claypan is encountered at from 6 to 10 inches, is so tight that the water in the soil cannot drain downward through it.

On this field, which has been cultivated for 50 years without legumes, plowing under a crop of cowpeas increased the yield of wheat from 17 to 34 bushels per acre. Sweet clover and alfalfa perish the first season unless lime is supplied, but if lime is supplied these legumes grow well, provided there is sufficient drainage. Crops of corn, oats, wheat, or flax following these legumes have made some very striking increases in yield.

In addition to variety tests of corn, sorghum, soybeans, wheat, oats, flax, cotton, and pasture grasses, a soft wheat improvement nursery is main-

tained at this field. The new wheat, Kawvale, which is relatively winter-hardy, stiff-strawed, and resistant to the attacks of Hessian fly and leaf rust, is well adapted to southeastern Kansas, as tests on this field have shown.

FORT SCOTT FIELD

The Fort Scott experiment field is on the farm of Harper Fulton three miles west and one mile north of Fort Scott, on highway No. 7. The soil type here is Summit silt loam or what is locally known as black limestone land. Shale is mixed with the limestone from which this soil is formed. The surface is dark brown to black. The subsoil changes gradually into a brownish yellow at from 8 to 12 inches deep. Drainage is not such a serious problem as at Columbus, but erosion is much worse.

Red clover and alfalfa have produced fairly good crops on this field without any soil treatment, though lime, manure, or phosphate has given profitable increases in yield. Some fields of this soil type will not grow alfalfa successfully without lime. Superphosphate has produced some remarkable increases in the yield of alfalfa, red clover, wheat, and oats, and some small increases in corn and kafir.

MORAN FIELD

The Moran experiment field is located on the farm of R. O. and J. T. Furneaux, two miles west and two miles north of Moran. The soil on this field is Oswego silt loam which has a light gray silt loam surface soil under which there is a tight, tough claypan. Beneath these lies the true subsoil of light grayish-brown.

The surface soil on this field is so deficient in lime that alfalfa or sweet clover usually perishes the first season unless lime is supplied. Such alfalfa plants as live through the second season seem to thrive as well as those on the limed plots. Apparently the subsoil supplies the necessary lime after the roots of the plants reach down to it.

The most noteworthy data obtained on this field are those from a stand of alfalfa which was seeded in the fall of 1924 and left for five seasons. During this period the average yield of the untreated alfalfa was 1.37 tons per acre. An application of lime before seeding increased the average yield to 2.23 tons. Applications of either 8 tons of manure before seeding or 150 pounds of superphosphate annually in addition to the lime increased the average annual yield another half-ton. A maximum yield of 20.2 tons for the five years or 4.04 tons average per year was obtained by applying lime, manure, and rock phosphate before seeding. On rich river bottom land this would be a good yield though not spectacular, but the land on which these yields were obtained was previously considered absolutely unfit for alfalfa production.

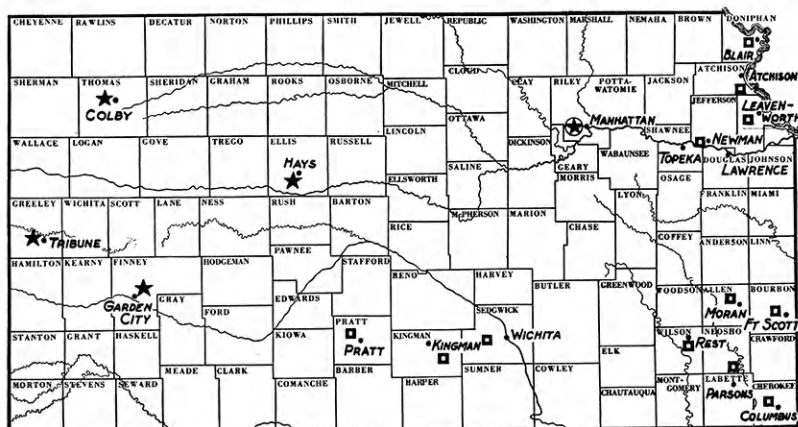
It was in the sorghum variety tests on this field and in field tests with Mr. Fур-neaux that Atlas sorgho was first proved to be so satisfactory for southeastern Kansas.

PARSONS FIELD

The Parsons experiment field is located on the farm of E. A. Volmer, two miles east and three miles north of Parsons. The soil type here is Parsons silt loam which is one of the most extensive types found in southeastern Kansas. The surface soil of this type,

like the Cherokee and Oswego, is light gray silt loam, but the Parsons is underlain by a yellowish-brown claypan which merges gradually into the sub-soil.

The particular field on which the Parsons experiment field is located is subject to sheet erosion and had not been manured for at least 30 years. As a consequence, its fertility was very low. The outstanding features on this field have been the response of clover and alfalfa to lime and the increased



★ AGRICULTURAL EXPERIMENT STATION (Central Station)
 ★ BRANCH AGR. EXPT. STA. □ EXPERIMENT FIELD

WHERE AGRICULTURAL RESEARCH IS CONDUCTED

Research work in agriculture in Kansas is carried on by the Agricultural Experiment Station of Kansas State College of Agriculture and Applied Science. A large portion of the work is done in Manhattan, representatives of 15 college departments being part- or full-time workers on the station staff. Certain types of work for certain sections of the state must be conducted locally. For such work four Branch Agricultural Experiment Stations in the western half of the state are utilized and 12 Experiment Fields for a study of special crop production problems are located in the southeastern, south central, and northeastern parts of the state. The location of these farms and fields devoted to agricultural research in Kansas is shown on this outline map.

yields of succeeding grain crops after these legumes.

In 1928 one plot was planted to corn and the rest of that series of plots to sweet clover. On those plots that were not limed the sweet clover failed and the only vegetation was weeds and watergrass. In 1929 the whole series was plowed and planted to kafir. The plot that had been in corn produced 5.4 bushels of kafir per acre. The plot

on which sweet clover was seeded but failed for lack of lime, produced 9.5 bushels of kafir per acre and a similar plot which had been manured before the kafir, produced 20 bushels. The limed plot which grew a good crop of sweet clover to be plowed under as green manure produced 36 bushels of kafir, and the plot which received manure and phosphate in addition to the green manure, produced 47.5 bushels.

This increase in yield from 5.4 to 47.5 bushels per acre in such a short distance was so striking that a commercial field adjoining the experiment field was limed and seeded to sweet clover in 1930 and produced a good crop of kafir in 1931 when most of the surrounding fields were badly burned.

REST FIELD

The Rest experiment field is located on the farm of R. W. Wing one mile south of Rest or eight miles north of Altoona, on U. S. highway No. 75. The soil here represented is one phase of the red limestone lands, the Labette silt loam, which has a chocolate brown surface and merges gradually into a brick-red subsoil. This soil is formed almost entirely from the disintegration of limestone.

Alfalfa and the clovers will grow on this field without any soil treatment, but liming has increased the yield somewhat and also has increased the life of the stand and insured greater freedom from the encroachment of grass. The results secured on this field were about the same as those secured on the Fort Scott field. Barnyard manure and superphosphate have strikingly increased the vigor and yield of alfalfa and the clovers as well as the small grains.

Flax production has been an important phase of the work on this field. Fertilizers and legumes have increased yields materially. The average yield for three years with no treatment was 9.7 bushels per acre. When grown after a legume the average yield of

flax was 11.8 bushels and when superphosphate or manure was added the average yields were 14 to 15 bushels per acre.

The data collected on these fields when used in connection with the soil survey reports that are being published will enable the farm operators to select such varieties, crop rotations, and soil treatments as have proved to be practical for their particular type of soil.

NEW SOUTH CENTRAL KANSAS EXPERIMENT FIELDS

C. E. Crews, '28

Three experiment fields have been started recently in south central Kansas, the Sedgwick, Kingman, and Pratt fields. The last two consist of about 25 acres each and the Sedgwick field of 30 acres.

SEDGWICK FIELD

The Sedgwick field is eleven miles west of Wichita on U. S. highway 54. M. W. Reece is cooperator. The soil fertility work on this field is to include a sixteen-year rotation of alfalfa, sorghum, oats, and wheat. Commercial fertilizers or manure will be used on some of the plots. Methods of handling sweet clover for soil improvement will be tried as to time of seeding, time of plowing under, and method of utilizing the crop. A few plots will be planted to wheat continuously, with various fertilizer treatments compared to the no treatment.

Grains, forage, and pasture crops will take about half the area of this field. The sorghum variety tests will be mostly on the forage type but will include a date and method test on grain sorghums. The legume work will consist of alfalfa, sweet clover, soybeans, cowpeas, and some of the less familiar legumes.

KINGMAN FIELD

The Kingman field is located nine miles southeast of Kingman on high-

(Continued on page 95)

Junior Live Stock Judging Team Wins at Denver

Gaylord R. Munson, '33

The Kansas State junior live stock judging team, coached by Prof. F. W. Bell, placed first in the intercollegiate judging contest held at the National Western Live Stock Show in Denver during the week of January 16 to 23, 1932. The Kansas team won over its nearest competitor, Nebraska, by 98 points.

The contest was divided into two sections; one for judging breeding stock and the other judging fat stock. The Aggies placed first on both of these

John I. Miller was fifth. The trophy for the best judge of breeding stock was won by Laurence R. Daniels and the one awarded to the best judge of fat stock went to Arthur C. Thomson. The team was composed of the following men:

Earl C. Coulter.....	Willis
Laurence R. Daniels.....	St. Francis
John I. Miller.....	Prescott
Carmy G. Page.....	Norton
Arthur C. Thomson.....	McCune
G. R. Munson (alt.).....	Junction City



THE JUNIOR TEAM—WINNERS AT DENVER

This picture presents the junior live stock judging team that made an outstanding record in the intercollegiate judging contest at Denver. From left to right they are Prof. F. W. Bell, coach, Laurence R. Daniels, Arthur C. Thomson, Earl C. Coulter, John I. Miller, Carmy G. Page, and Gaylord R. Munson.

sections and were high on all classes of live stock with the exception of beef cattle. In this class the University of Wyoming placed first with a two-point lead. Kansas State had three men in the first five in the judging of all classes.

Arthur C. Thomson was the highest scoring individual of the contest. Earl C. Coulter tied for second place and

The scores of the competing teams were: Kansas, 3,171; Nebraska, 3,073; Utah, 3,048; Wyoming, 2,988, and Colorado, 2,912. By winning the contest this year the Aggies gained permanent possession of the silver loving cup offered by the Denver Live Stock Exchange. To gain permanent possession of this cup it is necessary for the

(Continued on page 88)

THE KANSAS AGRICULTURAL STUDENT

KANSAS COLLEGE OF AGRICULTURE
MANHATTAN-KANSAS

VOL. XI

MARCH, 1932

No. 3

Published quarterly during the school year by the Agricultural Association of Kansas College of Agriculture. Subscription rate: One year, 75 cents; four years, in advance, \$2.00; single copies, 20 cents. Advertising rates sent on application. Address all communications to The Kansas Agricultural Student, Manhattan, Kansas.

Entered as second-class matter, May 21, 1925, at the post office at Manhattan, Kansas, under the Act of Congress of March 3, 1879.

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NEW MEN IN ALPHA ZETA

The college student of agriculture early recognizes that Alpha Zeta stands for personality, character, leadership, and scholarship. No student is considered for membership whose scholarship average doesn't place him in the upper two-fifths of his class, but scholarship standing simply admits him to consideration.

The 16 men elected this college year indicate careful placing of honors on the part of the active chapter. The group is composed of splendid individuals. For leaders with diversified interests, worthy representatives of various organizations and departments in the Division of Agriculture, these 16 men couldn't be beat. Seniors in Alpha Zeta are commissioning a worthy group to carry on the good work.

LITTLE AMERICAN ROYAL

The Little American Royal, the fitting and showing contests sponsored by the Departments of Animal Hus-

bandry and Dairy Husbandry and managed by their student departmental clubs, is one of the worth-while activities of the Division of Agriculture. This year's show was one of the best ever held. The audience was too large to be accommodated in the pavilion, but hundreds stood and endured inconvenience and crowding throughout the two-hour program.

The audience was instructed and entertained, but the more than one hundred live-stock minded young people, including half a dozen young women, who had spent hours and even days in fitting, training, and finally in showing the live stock, received the lasting benefit. They were well repaid for their efforts whether they were recognized as prize winners or not.

The picture on our cover page is an echo from the Little American Royal. Both the beautiful co-ed, Miss Wilma Cook, freshman in physical education from Larned, and the pure-bred Angus steer she is holding, were in the contest.

College Training for Commercial Work in Agriculture

L. E. Call, Dean, Division of Agriculture

THE American farmer is dependent upon others for many different kinds of commercial service. He is no longer an isolated individualist conducting a self-sufficient industry independent of all other groups of society. He is a business man conducting a most essential business in a business-like manner. He recognizes that many services that he requires are of a specialized character that should be performed by those who have had special training in preparation for such service. The specific kinds of commercial service the American farmer needs may be grouped into three broad groups as follows:

1. The service of manufacturing and distributing products useful to agriculture. Some of the largest industries in America are engaged in the manufacture and distribution of products used in farming. Such industries as the fertilizer, farm machinery, live-stock feed, and seed industries are examples. These industries are highly specialized. They require in their employ as service men and as directors those who are intimately acquainted with agricultural practice. They are the most useful when they are manned and directed by those who understand agricultural as well as business practices.

2. The service of marketing farm products. The successful marketing of farm products is as essential for a prosperous agriculture as the successful production of these products. The service of marketing extends far beyond the mere delivery of the products of the farm to a nearby market. It embraces the proper processing and distribution of these products. Most of the large industries in Kansas are those engaged in the processing of farm products. The service of marketing, if it is to be the most helpful to agriculture, must be performed by those who are not only thoroughly trained in the technical phases of the business of marketing, but who also have a knowledge of the production of the products to be marketed and an intelligent sympathy in serving the industry of agriculture in the most helpful way.

3. The rendering of professional service of a private commercial character. This type of service differs from public professional agricultural service in that it is contracted and paid for by the farmer individually. Some examples of this type of service are veterinary, financial, and legal service. Such service is required in all farm communities and is rendered the most effectively by those who have a background of agricultural knowledge in addition to thorough professional training.

The three general types of service described above can be rendered most effectively by those most adequately trained to render these services. This training will consist of the best technical knowledge and practical experience preceded by training in the science and business practices of agriculture. There will be an opportunity for a number of young men raised on Kansas farms to serve in commercial work in agriculture provided they secure proper training for work of this character. The agricultural curricula of Kansas State College are organized to provide the agricultural training for those who wish to prepare for commercial service to agriculture.

The 1932 Ag Fair

Earl H. Regnier, '32

Saturday, April 30, 1932, promises the greatest student event of the year, the 1932 Ag Fair, sponsored by the Division of Agriculture. After a year of dormancy the Ag Fair spirit has burst forth with new "vim, vigor, and vitality." The product of this enthusiasm and persevering hard work will be presented in the Ag Fair for 1932.

Recent Ag Seminars have rung with enthusiasm for the coming event. Undoubtedly the leaders—the Ag Fair Board—have the united support of the Ag student body. The members of the board are:

Earl H. Regnier, Manager

Stephen Vesecky, Assistant Manager

Robert O. Blair, Treasurer

Francis W. Castello, Assistant Treasurer

The following are a few high points on the program planned:

The fair will be held down at the East Stadium in the afternoon and evening of Saturday, April 30. The pushball game between the Ags and Engineers at three o'clock promises to be a real battle. The players are required to wear soft shoes and kid gloves to prevent eye gouging, broken masticators, and cut up facial features, according to Tom D. Dicken, manager of the affair. The Ags are proud to announce the appointment of Walter W. Zeckser, 1932 Aggie football captain, as captain of their pushball team.

The old Ford race (barring everything but 4-cylinder model T's) has given owners of discarded cars an opening.

A new feature of the fair this year is the hayseed contest in charge of Charles W. Nauheim. For the most typical or original costume portraying the backwoods farmer of the Middle West, a decade ago (or even today), worn on the Ag Fair grounds, a prize valued at approximately \$5 will be awarded. This is a chance to capitalize on both experience and originality.

Why not jump into those depression overalls, don other necessary trimmings, and win the prize?

L. Albert Wilhelm, who has had a big part in the plays presented by the Manhattan Theater this year, is manager of the Ag Follies. His outline as presented to the Ag Fair Board gives us the privilege of saying that Flo Ziegfeld and Earl Carroll will soon have a new competitor in the "Vani-ties" racket. Wilhelm has chosen the sweet, young, boyish-figured Glenn Fox as the leading lady of his show. And as the 12 or 14 other girls of his review are the pick of the campus, it might be well for you and your friends, dear reader, to see what the 1932 IT girl has—and is wearing.

A Negro religious camp meeting, imported from—? will present cooling and soothing melodies, such as "River Get Away from My Door," accompanied by an eight-piece band. "Come all ye sinners and be revived (give yourselves up)." This revival meeting is open to everyone, according to Edwin J. Krasny, director of the minstrels.

Yes, every Ag Fair leader reports he is going to have something for you to come and see, something that fits the depression and won't put you out. There are things to see that won't cost anything—educational exhibits, concessions, various contests, turpin races, greased pigs.

Last, but not least, how would you like to dance to the soothing music of Al Sky and his 12 stars, or Fordham's WHF orchestra, on a floor that will not have ripples or knotholes to fall through? The big Ag Fair dance will start in the Gym at 9 p. m. Eddie Sullivan is in charge and promises an orchestra such as mentioned above, the gymnasium to dance in and the moon room to moon in. The Ags say everybody is invited to help them celebrate and make the Ag Fair a tradition.

Ag Calendar of Spring Activities

April and May events sponsored primarily by the Division of Agriculture that might be said to make up the Ag spring activity calendar are:

Saturday, April 2

Sheep Day

Saturday, April 9

Students' Dairy Judging Contest

Thursday P. M. and Friday A. M., April 14 and 15
Conference of Kansas Cooperatives and Farm Organizations

Saturday, April 23

Students' Crop Judging Contest

Saturday, April 30

Ag Fair

Monday and Tuesday, May 2 and 3

State High School Judging Contests

1. In Judging Farm Products

2. In Farm Mechanics

Fourth Annual Meeting Kansas Association
Future Farmers of America

Saturday, May 14

Students' Live Stock Judging Contest

Monday to Saturday, May 16 to 21

Agronomy Field Days

Saturday, May 28

Cattle Feeders' Day

Influence of Alpha Zeta

Jay R. Bentley, '32

The Kansas chapter of Alpha Zeta was installed in 1908. Since that time its influence among undergraduates in the Division of Agriculture has been outstanding. This influence has not been shown so much by activities Alpha Zeta has sponsored directly as by the stimulus to better work it has imparted to the division.

In 1921 the Kansas chapter instituted a practice of encouraging good scholarship by giving a medal each year to the sophomore in the Division of Agriculture who made the highest

grades in his class while a freshman. This award has been responsible directly for better class work on the part of many freshmen; and the ambition of students to make grades placing them among those eligible for Alpha Zeta has had its effect on the class work of a large per cent of undergraduates.

Probably the greatest influence that Alpha Zeta has had is that of encouraging more participation in extra-curricular activities not only in the Division of Agriculture but also on the whole campus. Students who have been elected to membership in Alpha Zeta have been challenged to show their leadership in the activities on the campus. The result of this challenge has been that members of the fraternity have been prominent in the Barn-warmer, in the Ag Fair, among Ag Association officers and other leaders, on judging teams, and in other activities worth while in the Division of Agriculture and in the student body as a whole.

To be eligible from the point of view of scholarship for election to Alpha Zeta, the student's scholarship rating must place him in the upper two-fifths of his class. Personality, character, leadership, especially potential leadership along agricultural lines, are also given careful consideration.

Each spring all students of the division who have been in college at least three full semesters and who have the required scholarship rating for membership in Alpha Zeta are invited to join the members of the active chapter and the faculty members of the fraternity in a smoker. The purpose of this informal social meeting is to help these students become better acquainted among themselves as well as with the active and faculty members of the honorary fraternity of Alpha Zeta.

The active chapter elects new members once each semester. A banquet is given after each group has been initiated, to honor the new members. This spring a new practice of announcing

Alpha Zeta pledges at the Ag Seminar before the whole student body of the division was inaugurated. The following men were pledged at the seminar held March 10, and initiated Friday, March 18: Duane H. Daly, Andrew C. Elson, Earl C. Coulter, Calvin E. Dornberger, John R. Latta, Virgil A. Unruh, Vernon E. Burnet, Louis B. Hanson, and C. Dean McNeal.

Duane H. Daly is a senior majoring in soil bacteriology. This is his second year in K. S. C., having come here with advanced credit from Blackburn College, Armstrong, Ill.

Andrew C. Elson is a first-semester senior in landscape gardening. This is his second year in K. S. C., having entered in September, 1930, from Kansas City, Kan., Junior College.

Earl C. Coulter is a junior majoring in animal husbandry. His home is in Willis, Brown county. In February, 1930, as a freshman, he was named as grand champion showman in the Little American Royal. He was a member of the Dairy Cattle Judging team last fall and a member of the champion Junior Live Stock Judging team last January.

Calvin E. Dornberger is a junior majoring in agronomy. His home address is Talmage. He spent the summers of 1930 and 1931 and the first semester of the present college year in soil survey work.

John R. Latta is a junior majoring in agronomy. He comes from Holton, Jackson county.

Virgil A. Unruh is a junior in agricultural administration. He comes from Pawnee Rock, Barton county. He was a member of the Aggie poultry judging team which competed at the Mid-West Intercollegiate Poultry Judging contest held at Chicago in December, 1931.

Vernon E. Burnet, Manchester, Okla., Louis B. Hanson, Jamestown, Republic county, and C. Dean McNeal, Boyle, Jefferson county, are all sophomores. They were among the upper 10 per cent of the freshman class last year recognized for their scholarship standing by Phi Kappa Phi last fall.

In the first-semester election this year the following students were elected to membership in Alpha Zeta: Ervil S. Fry, John I. Miller, Franklin L. Parsons, Andrew B. Erhart, Lee H. Albin, Herbert W. Clutter, and Floyd E. Davidson. The pictures of these seven men elected the first semester and the nine elected the second semester, are shown on the frontispiece.

Producing Battery Broilers

R. T. Harper, '33

The comparatively recent introduction of the battery brooder into the poultry business has caused a great deal of attention to be centered on this method of producing broilers. Because poultry has been one of the most profitable of agricultural products in the past few years and because some people have made good profits from battery broilers, many inexperienced people have looked toward battery broiler production as a good side line or a good business to get into.

An established producer of battery broilers can sometimes find a good demand for his product from high-class restaurants and hotels. His supply must be large and constant. He must also have a market for the less desirable broilers the restaurant or hotel cannot use. In order to supply this trade a large amount of capital and proximity to a large city is necessary. Very few small towns will support even a small broiler plant.

The battery brooder affords a method of strict sanitation. Soil-borne organisms can be entirely prevented and the infection from any organism can be greatly reduced. A large number of birds can be handled in a small space by this method and it makes the raising of chicks a more pleasant task. By careful attention to heating, ventilation, humidity, and feeds, experienced producers who have a reliable market for their broilers, have been able to establish a paying business from battery broilers.

A well insulated room must be used for battery brooders. Forced circulation of air and artificial lighting is necessary for efficient operation. Cannibalism seems to be aggravated by housing chicks in batteries. This can be controlled successfully by dimming the lights to such an extent that the

(Continued on page 85)

Ninth Annual Little American Royal

Robert O. Blair, '32, and Chester G. Thompson, '32

The ninth annual Little American Royal Live Stock Show was held in the live stock judging pavilion February 11 before a capacity crowd. This show is sponsored by the Block and Bridle and the Dairy Clubs as their contribution toward the entertainment of Farm and Home Week visitors. The Block and Bridle Club directs the fitting and showing of the animal husbandry entries in the show.

A. M. Paterson, formerly professor of animal husbandry in K. S. C., was head judge of the animal husbandry section of the contest. Those responsible for the arrangements and management were: Prof. D. L. Mackintosh, faculty adviser; Robert O. Blair, master of ceremonies; George Washington, entries; Fred V. Bowles, publicity; Ralph C. Munson, decorations; Lewis S. Perkins, eats; Will M. Myers, ushers; and Lawrence D. Morgan, entertainment.

The show was opened by a few words of welcome from the ringmaster, Robert O. Blair, who then called on President F. D. Farrell to introduce the animal husbandry intercollegiate judging teams that represented the college in the various animal husbandry judging contests this year. Dean Umberger then presented the winners in the Farm and Home Week live stock judging contest and the winners in the Kansas beef production contest.

The show was then on and the first class of the Fitting and Showing contest was called. A class of horses with nine entries paraded into the ring, with Mr. Paterson assisted by George Parrott, the college groom, judging the class. W. Newell Page, Detroit, won first in this class; Wilfred H. Pine, Lawrence, second; Charles E. Murphey, Leoti, third; Laurence R. Daniels, St. Francis, fourth; and George Garrison, Jr., Goodland, fifth.

The second class, a class of hogs,

judged by Mr. Paterson assisted by W. W. Bales, college swine herdsman, was won by Morris C. Humes, Glen Elder; Raymond B. Wagner, Richmond, placed second; Herbert T. Niles, Olivet, third; J. Willis Jordan, Claflin, fourth; and Robert J. Oman, Leonardville, fifth.

The sheep class, in which Tom Dean, college shepherd, assisted the judge, was won by John I. Miller, Prescott; second, E. Wayne Bratton, Luray; third, Harold A. Daily, Waverly; fourth, Gaylord R. Munson, Junction City; and fifth, Albert A. Pease, Fort Scott.

The cattle class, which included 25 entries, was won by E. Wayne Bratton, Luray; Walter M. Lewis, Larned, placed second; Vernon E. Burnet, Manchester, Okla., third; Fred V. Bowles, Walnut, fourth; and Robert R. Teagarden, La Cygne, fifth. Tom Greer, college cattle herdsman, was the assistant judge of this class.

The first-place winners of the four classes then showed for the grand championship of the show. Morris C. Humes, Glen Elder, was named the champion showman and winner of the silver loving cup given by the Kansas City Union Stockyards Company. The champion and first-place awards were presented to the winners by Dean Call, and with this the Block and Bridle Club concluded its part of the program and turned the remainder of the show over to the Dairy Club. —R. O. B., '32.

The preliminary showing for the Aggie Dairy Show, sponsored by the Dairy Club, was made on Wednesday afternoon, February 10. The final placing for grand champion and reserve champion was made on Thursday evening immediately following the animal husbandry contest. The breed champions, picked in the preliminary contest, were: Elsworth O. Brown, Wich-

(Continued on page 93)

A Master Breeder of Kansas

Howard Bertsch, M. S., '32

Kansas is rapidly emerging from the pioneer stage of dairying and is now claiming no small amount of attention throughout the country for the splendid herds of dairy cows bred and developed here. Like any other pioneering venture, it must have leaders, and one of the leaders in Kansas dairy circles is Mr. H. A. Dressler of Lebo, Coffey county.

In 1917 Mr. Dressler decided that sometime, in the not too distant future, dairying would be the most profit-

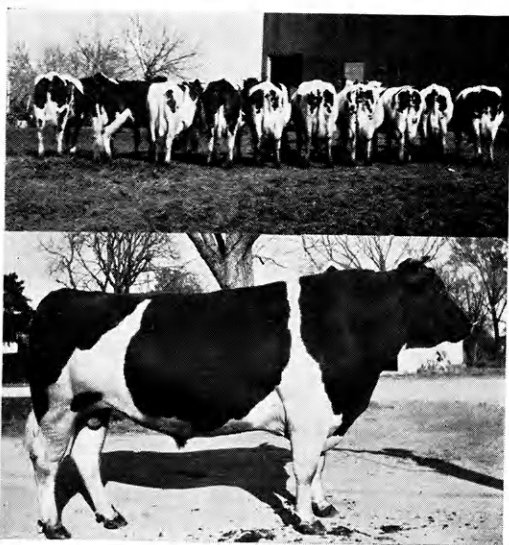
declared the highest-producing herd in the United States by virtue of a National Dairy Herd Improvement Test average of 658 pounds of butter fat and 17,883 pounds of milk. It has also been the home of the highest-producing individual cow ever developed in Kansas—Dora Pearl Veeman 631969, who has the remarkable record of 1,018 pounds of butter fat and is the first 1,000-pound Kansas cow. There are now four daughters and four granddaughters of this great cow in the Dressler herd.

Nora Pearl Veeman 631970, a twin sister to "Dora," has a record of 792 pounds of butter fat and her two tested daughters have records of 795 pounds as a junior-four-year-old and 530 pounds as a senior yearling, respectively. This second record is the Kansas state record for yearlings. There are three daughters and a granddaughter of this cow in the herd.

Carmen Pearl Veeman 461678, another full sister to "Dora" and "Nora," produced 705 pounds of butter fat at 10 years of age, and these three full sisters with their combined production of 2,515 pounds of butter fat are the tenth highest such group of the breed. "Carmen" has three daughters and three granddaughters in the herd.

King Korndyke Veeman 7th 222103 was the first herd sire used and of his eight daughters, six had an average production of 782 pounds of butter fat. On the strength of these records, "King" is now the highest sire listed in the Red Book of the Holstein-Friesian Association of America which is the official record of herds on the Holstein Improvement Test.

Sir Bess Inka Ormsby 433536 followed "King" and of his eight daughters, seven have an average of 620 pounds of butter fat with all their records being made in immature form.



REPRESENTATIVES OF A HOLSTEIN HERD OF WHICH KANSAS CAN BE PROUD

Upper: Ten Dressler cows with an average production of 750 pounds of butter fat. The three cows on the right are Nora, Dora, and Carmen Pearl Veeman with a combined production of 2,515 pounds of butter fat in one year. Lower: Dean Colantha Homestead Ormsby 503414, sire of 28 daughters in the Dressler herd, including the two highest-producing senior yearlings in the state of Kansas.

able agricultural project in his community. He followed out his "hunch" by going into Wisconsin and purchasing a registered Holstein bull and four young cows, all from dams with good official records. His herd now numbers about sixty head, and in 1929 it was

"Sir Bess" is the second highest bull listed in the Red Book.

Twenty-eight heifers now in this great herd claim as their sire Dean Colantha Homestead Ormsby 503414. The first two of his daughters to complete tests produced 530 pounds and 486 pounds, respectively, as senior yearlings. These are the two highest records in the state for this age. "Dean" is siring not only production but type as well, being grand champion himself at the Nebraska State Fair and the Topeka Free Fair the past season. A son of his was junior champion at Topeka, while another son stood second in a class of 24 at Topeka in 1929.

Mr. Dressler says that when he journeyed to Wisconsin in search of foundation stock, he had but four things in mind. They were: Production, size, type, and blood lines. He continues, "I was just a young farmer who wished to improve his farming methods. I

knew nothing of blood lines and very little about show type, but I did know the difference between one gallon of milk and five gallons of milk." With this knowledge he selected his foundation stock, and after 10 years of Holstein breeding began testing his cows on a yearly basis. In four years of such testing he has gained much prominence in dairy circles as a "master breeder" of Holsteins.

Although operating a 240-acre farm, raising his own feed, and caring for his own cows, some of which are milked four times daily, Mr. Dressler is always ready to entertain visitors by showing them this splendid herd, and anyone interested in dairy cows or dairy farming may expect a royal welcome should he pay the Dresslers a visit.

Jesse B. Myers, '20, is engaged in general farming near Norwich.



AG FAIR



"THE BIGGEST STUDENT STUNT IN KANSAS"

K. S. C. Stadium Saturday, April 30, 1932

Pike Open 2 to 9 P. M.

Big Afternoon Performance

PUSH BALL GAME

Ags Versus Engineers

CONTESTS—CONCESSIONS—EATS

Bigger and Better Follies and Minstrels

DANCE

Gymnasium 9:00 P. M.

The Sour Cherry in Kansas

Carl E. Elling, '32

The production of the sour cherry in Kansas has been decreasing considerably during the last few years in spite of the fact that it probably has the greatest possibilities in the home orchard of any of the tree fruits grown in Kansas.

In 1926 there were 376,341 bearing and 139,184 non-bearing sour cherry trees in Kansas. In 1929 there were 297,634 bearing and 132,772 non-bearing trees in the state. These figures give some idea of the number of cherry trees going out of production each year and the few that are being planted to replace them. If Kansas had to depend wholly on cherries produced within the state there would be approximately enough cherries for one pie per person each year. How many people would be satisfied with one pie each year? Very few! This is verified by the situation at the college orchard each year at harvest time. Many people call for cherries and, as there are very few other cherry orchards near, the demand far exceeds the supply. The same situation is to be noted throughout the state. When a cherry grower advertises that cherry harvest will begin on a certain date, people will come considerable distances and come early hoping to get cherries to can and make pies.

The sour cherry is well adapted to all regions of the state. It withstands the dry area of western Kansas and does well in the more humid climate of the eastern section of the state. The above fact linked with others, such as the cherry trees' coming into bearing at a young age and being one of the surest fruit crops year after year, makes the cherry more desirable for the home orchard than even the apple or peach.

A site on the higher areas usually gives the best results for a cherry orchard. Cherries blossom early and un-

less they have good air drainage the buds may be killed by frost. Also the soil of the higher areas is usually better drained and as the cherry is sensitive to free water the higher ground is more desirable. Cherry trees will thrive on a wide range of soil types provided the soil is well drained. Moderately fertile soils give better results than those which represent either extreme in fertility.

Selecting trees for planting is of major importance. If a weak tree is planted an undersized and nonproductive tree will usually result. It will be to the grower's advantage financially in the end to pay more for good trees rather than to buy poor ones. Real economy in buying fruit trees consists of paying reasonable prices for highest-grade trees. Only one-year-old cherry trees should be planted. They are light to handle, the root systems are but little reduced in transplanting from the nursery, they start into growth readily, the tops can be formed in accordance with the grower's own ideals rather than the nurseryman's, and the cost is usually less.

Late February or early March is a good time to plant cherry trees if the ground is in good tilth. The most desirable distance for planting sour cherries is 25 feet on the square. The holes should be deep enough to set the tree 2 or 3 inches deeper than it was growing in the nursery and wide enough to receive the roots in their natural position. After the tree is set in the hole fertile top soil should be packed tightly around the roots.

Pruning at the time of setting consists of leaving three branches on a central leader and pointing in different directions. The central leader is headed back to a height of about 36 inches and the other branches about 6 inches shorter.

While the orchard is young inter-

planted crops may be grown, but they must be ones which require clean tillage throughout the growing season. When the trees start producing fruit, clean cultivation or cover cropping systems should be practiced. Winter vetch and rye have proved good cover crops to use.

Cherry trees do not require so much pruning as most of the other fruit trees but this does not mean that pruning should be neglected. If the trees are not pruned the fruit will be small in size and uneven in ripening. One should thin out the tops so the sunlight can get through the branches to keep the wood in the center of the tree alive, and the limbs from interfering with each other.

The major pest of cherry trees in Kansas is cherry leaf spot. It has had much to do with the decreased production of this fruit. It is a fungous disease and attacks the leaves. It appears as small, circular, purplish dots which later turn brown. After a time the diseased areas may drop out and leave a shot-hole effect in the leaves. Badly infected leaves turn yellow and fall. This disease can be controlled by using Bordeaux mixture at the rate of 3 pounds of copper sulphate and 4 pounds of lime to 50 gallons of water, or lime sulfur at the rate of 1½ gallons of concentrate to 50 gallons of water. Three applications are usually necessary, one as soon as the petals fall, one about 3 weeks later, and the third directly after the fruit has been picked. Cherry leaf spot has made cherry growing profitable for the prepared grower because it has been eliminating growers who do not spray.

Other pests that attack cherries in Kansas are brown rot, which is controlled by the leaf spot sprays, and curculio, which can be controlled by adding 1 pound of lead arsenate to each 50 gallons of spray material.

Cherries are usually harvested with the stems on because if they are transported any distance or stand for a

while after picking, the juice will run out if the fruit is pulled from the stem. Ladders should be used to pick the fruit at the tops of the trees because if one climbs around on the limbs, some of them probably will be broken off or bruised, which leads to the disease known as gummosis.

Growing a cherry orchard in Kansas should now be a profitable investment but the grower must understand how to handle the orchard and be able to give it the care and attention it requires.

Bantams for the Fancier

L. A. Wilhelm, '32

The poultry fancier is not dead! In spite of all the comment on the fancier it has been shown at the large poultry shows this winter that he is not dead. He is, however, ruining a good many strains of standard poultry.

A large per cent of the graduates of the Division of Agriculture do not return to farms. A great number go into county agricultural agent work, Smith-Hughes work, or other types of agricultural education. Most of these men have time for an enjoyable hobby. The great interest shown in bantams this winter caused Professor Payne, head of the Department of Poultry Husbandry of K. S. C., to make the statement, "Bantams are the logical birds for the poultry fancier."

Bantams are to be had in all the types and breeds of the standard breeds. Black Leghorns, Cochins, Brahmas, Sebrights, and Games are among the more popular breeds. In a small back yard, fifteen or twenty bantams may easily be kept. Bantams are prolific layers, easy breeders, small feeders, and form an interesting hobby for the "stock-minded" townsman. They are gaining in popularity rapidly.

H. B. Harper, '32, is county agricultural agent of Pratt county.

The Kaw Valley Potato Situation¹

Wilfred H. Pine, '34

Potato production is unlike the production of many other commodities in that it may change from high to low in only one year's time. It is these ups and downs that have caused many good growers to meet with disaster. The changes are brought about by factors controlling the acreage and the yield per acre.

Of the factors controlling acreage, the success of the previous year is important. It is only logical to figure that if in one year potatoes return large profits, the next year there will be an increase in acreage. Management on the part of the grower will determine to a large extent the profit made in any one year. But, of course, the general success of the entire valley must be considered; for, as a rule, the good grower who is relatively successful in one year will not allow that one good year to be the reason for an increase in acreage.

Just what determines a successful year would include the following most important factors: Price per bushel, yield per acre, and the relative cost to grow and harvest the potatoes. These factors have to be considered either separately or together in determining in what ways the year was successful, and which are most likely to affect the acreage the following year.

The cost of seed the preceding fall is a factor considered by the grower. Naturally high-priced seed and scarcity of seed will tend to limit the acreage that will be planted; but many growers will buy the usual amount of seed regardless of price. These growers purchase a large part of their seed in the fall. The small or inconsistent growers do not buy until spring, then if the seed is high, this type of grower will not plant as usual. To a certain extent

it is this type of grower that causes the change in acreage.

The kind of weather during the planting season, which is from March 10 to April 10, affects the acreage. If the weather is favorable for potato planting throughout the planting season, all of the planned acreage will be planted and perhaps more. On the other hand, if the weather is bad, it will cause a delay in planting. As it gets late in the planting season seed will be going into the ground in poor condition, other work will need to be done, and seed, if high, may be sold for table use. This may materially decrease the acreage.

There are other factors such as cost of labor, harvesting expense, rotation of crops, and relative value of other farm products to potatoes, that play a minor role in affecting potato acreage.

The weather is about the only factor that can be considered in changing the yield per acre from year to year. The weather may be divided into the precipitation and temperature. The precipitation includes the rainfall and snowfall. Data have shown that there is a close correlation between yield and these weather factors at different times of the growing season. The average amount of rainfall seems to be the best for potato growing. It is the extremes, either wet or dry, that cause a variation in yield. Since it is impossible to predict the weather, it is also impossible to predict the yield per acre. The yield has been doubled or cut in half from one year to the next. The change in soil fertility would cause some change in yield, but not great variations from one year to the next.

There have been considerable data gathered in respect to the potato situation in the Kaw valley. Some of these data show very interesting results. There was a gradual increase in production from 1922 to 1928, then in 1929

1. The author is indebted to Prof. George Montgomery of the Department of Agricultural Economics for aid in preparing this article.

the production was cut to less than half of that of 1928. This decrease can be easily explained by the extreme heavy production and the extreme low prices per bushel in 1928. Production increased in 1930 but decreased in 1931.

The yield controls about two-thirds of the changes in production and the acreage about one-third, so yield should be given careful consideration. The trend for the last 10 years shows an average annual increase of four bushels per acre. This trend probably can be explained by better management by the grower in rotating crops, in fertilizing, in better cultivation practices, in securing better seed, and in controlling pests. Of course there are some years that vary a great deal. In 1926 the yield was only 91 bushels per acre, while the average for 1922 to 1931 was 128 bushels per acre. This low yield probably was due to the 15 to 20 inches of snow that fell throughout the valley on March 30, 31, and April 1. The damage was largely due to the poor stand of potatoes, but it was also due to the long dry period that followed the snow. When the snow fell there was potato ground to be planted, which was never planted. This resulted in a decrease in acreage.

The acreage has followed about the same line as production, increasing each year until 1928. Following the low price of 1928, the 1929 acreage decreased about 4,000 acres. The acreage increased in 1930 and again in 1931, the 1931 acreage being 1,000 acres less than the average of 1923 to 1928. A low price per bushel accompanied the heavy production of 1928. The actual price was only 25 cents a bushel. In 1929 potatoes sold for \$1.08 a bushel. The average price for the last 10 years is only 80 cents a bushel. The heavy cut in acreage and a decrease in yield in all potato sections explained the 1929 price. Prices for potatoes are in most cases in inverse ratio to the production. The year 1920 has been al-

(Continued on page 88)

"WE SCOUR WOOL—WE DON'T WASH IT"

You know how a flock of sheep looks in a field, or in the judging arena. Pretty dirty, aren't they, and their wool feels very greasy.

Before this wool is made into cloth it must be clean and entirely free from grease. But don't ask a textile man how he washes this wool. For he would tell you just a bit indignantly, "We scour wool, we don't wash it."

Call it scouring or washing, as you like, the use of Wyandotte Textile Alkalies plays an important part in this, and other textile processes. In fact, each of the more than 30 Wyandotte Products do their particular jobs just as effectively as Wyandotte Textile Soda helps the mill man to scour wool.

It matters not if your life work proves to be managing a dairy plant, an office building, a cannery, a public laundry, a hotel, or a textile mill, some part of your duties will involve the superintending of cleaning operations.

For doing every known kind of cleaning there is a Wyandotte product which works economically and well for that particular purpose.



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THE J. B. FORD COMPANY
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Feeding Sorghum Grain

Claude L. King, '32

The feeding of sorghum grain to live stock is of great importance in the southern part of the Great Plains region, east of the Rocky mountains and from southwestern Nebraska to northwestern Texas. Wheat and corn are its chief competitors as a fattening feed for live stock in this section. Except for the years 1874, 1896, 1910, 1930, and 1931, however, wheat has been too high in price to compete with other grains as a feed. Wheat is also unpalatable to cattle and sheep unless mixed with another carbohydrate concentrate. Corn is a competitor of sorghum grain in the outer portion of the grain-sorghum belt where it approaches sorghum in yield, and in the inner portion when shipped in.

Throughout most of the western portion of the grain-sorghum belt, grain sorghums are more dependable crops than corn, due to their drought-resistant qualities, and even on good soil usually give larger yields. In central and eastern Kansas and Oklahoma, the sorghums are superior to corn on poor, thin uplands. Even on the better lands in the eastern part of the grain-sorghum belt, it is advisable to replace some of the corn acreage with grain sorghums as an insurance against severe drought.

Sorghum grain is a fattening grain for live stock because of its high content of digestible carbohydrates. Ground shelled corn is only slightly higher in digestible carbohydrates than sorghum grain, the per cent being approximately 67 for corn and 66 for kafir and milo. Ground shelled corn is higher in fat, the approximate per cent being 4.6 for corn and 2.3 for sorghum grain. Both sorghum grain and corn are deficient in digestible protein, corn containing slightly less, 7.4 per cent, as compared with 9.3 per cent for sorghum grain.

Numerous tests at the various agri-

cultural experiment stations in the sorghum belt closely correlated with the above values given the sorghum grains and corn. Henry and Morrison in "Feeds and Feeding" report an experiment in which steers fed ground corn plus alfalfa hay and kafir plus alfalfa hay made an average daily gain of 2.5 pounds and 2.4 pounds, respectively. Cunningham and Kenney at the Kansas station found that when the whole grains of corn and kafir were fed to calves, those fed kafir made an average daily gain of 1.74 pounds as compared with 1.96 pounds gained by those fed corn.

In two trials at the Texas agricultural Experiment Station Jones, Brewer, and Dickson found that lambs fed ground threshed milo with alfalfa hay and a small allowance of cottonseed meal, made just as large and economical gains as others fed ground corn. To equal 100 pounds of ground corn in feeding value, there were required 103 pounds of ground threshed kafir, or 107 pounds of ground threshed feterita. Burns at the Texas station in 1919 found that when properly supplemented with alfalfa hay and cottonseed meal, lambs fed ground shelled corn gained 0.393 of a pound per head daily, those fed ground threshed milo gained 0.394 of a pound, and those fed ground threshed kafir gained 0.37 of a pound. From a summary of three years' work at the Texas station in which cottonseed meal and alfalfa hay were fed with corn chop to fattening lambs, an average daily gain of 0.353 of a pound was made. Under the same conditions ground threshed milo produced 0.353 of a pound gain, ground threshed kafir produced 0.349 of a pound, ground threshed feterita 0.335 of a pound, and ground threshed darso 0.334 of a pound.

Cunningham and Kenney at the Kansas Agricultural Experiment Station

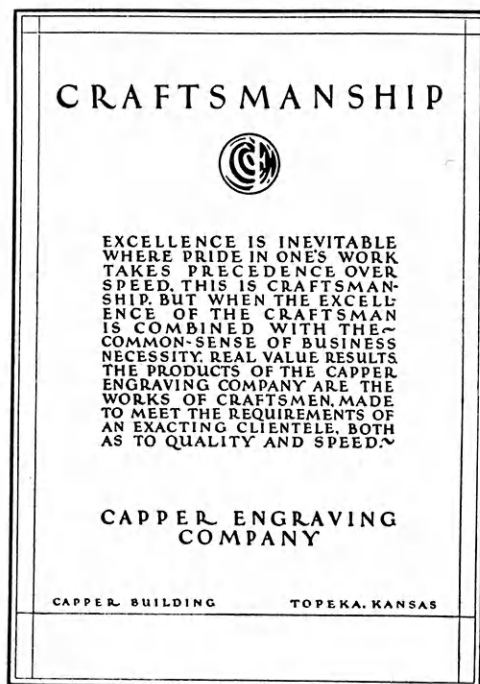
found that when ground corn was properly supplemented with shorts and tankage, fattening pigs made an average daily gain of 1.46 pounds. In comparison ground milo produced an average daily gain of 1.43 pounds, ground kafir, 1.4 pounds, ground feterita, 1.36 pounds, and ground kaoliang, 1.31 pounds. Cochel at the Kansas station found that pigs fed ground kafir required 32 pounds more grain, 1 pound more tankage, and 5 pounds more shorts or alfalfa hay for 100 pounds gain than those fed ground corn.

From the above tests in which corn and the important grain sorghums were fed to the three major classes of live stock, it can be seen that corn is slightly higher in feeding value, milo is second, kafir third, and feterita fourth. Darso and kaoliang are lowest.

In all experiments where the grain of corn, milo, kafir, and feterita were ground, no difference in palatability was reported. When sorghum grain was fed whole, however, it was not eaten so readily, probably owing to the hard outer layer and smaller size of the grain. It has been found unnecessary to grind the grain for sheep. It is recommended to feed the whole head to cattle and hogs in preference to the whole grain because the animals are forced to chew more, thus crushing the grain and making it more digestible. Usually when ground heads are fed more economical gains are obtained, especially if roughage is relatively high in price.

In the literature reviewed, no difference in quality of carcass produced from sorghum grain or from corn was reported.

As a summary it can be said that where ground milo, kafir, or feterita can be obtained at 47½ cents per bushel, it is equal in production of pork, mutton, and beef to ground corn at 50 cents per bushel. Usually slightly more can be paid for milo than kafir and slightly more for kafir than feterita.



PRODUCING BATTERY BROILERS

(Continued from page 76)

centers of the trays are dark. Bare-backed broilers have meant the difference between profit and loss to many broiler producers. Bare backs can be prevented if the room has a relative humidity of 55 to 60 per cent and the ration contains an adequate amount of cystine, or protein containing sulphur. Only two common proteins contain sulphur, so care must be exercised in compounding the ration. The ration should contain ½ to 1 per cent phosphorus and twice that amount of calcium.

Crossbred poultry is well adapted to broiler production. Crossbred chicks make quicker and more economical gains with less mortality. A broiler that weighs 1.5 pounds at 8 weeks has made an excellent growth, and broilers that weigh 2 to 2.5 pounds are in the greatest demand.

"Take-All," a Serious Foot Rot of Wheat¹

C. A. Wismer, '31

Foot rot of wheat designates a number of diseases caused by distinct organisms which individually or several in association with each other injure the root system and crown of the host plant. Take-all is one of the most destructive of the foot rot diseases.

Take-all is economically more important as a disease on wheat than on its other hosts. It is caused by a soil-inhabiting fungous parasite called *Ophiobolus graminis* Sacc. which attacks and destroys the roots and basal parts of the stem of the plants attacked. The take-all fungus also occurs on barley, rye, and a number of wild and cultivated grasses, but even though environmental conditions are similar it does not injure these crops so severely as it does wheat.

The foot rot diseases of wheat are practically world wide with the wheat crop. Take-all was first found in the United States in 1919 near Roanoke, Va. Since 1919 it has been found in several other localities until now it is known to occur in most of the humid winter wheat areas in this country. It is not found in the semi-arid wheat regions. It seems to have a firm hold in the center of the hard winter wheat belt and reports show that it is gaining in prevalence.

Take-all is capable of causing great losses in the United States by killing the plants outright or by producing badly shriveled grain. In some regions it has not been uncommon to find fields where it caused a decrease of 50 to 60 per cent of the grain crop and greater losses frequently occur. It has been observed, however, that many of the infested fields have shown a relatively small amount of infection and that

seasonal conditions cause the severity of the disease to vary. It has also been found that where wheat follows wheat repeatedly on infested land, the take-all spots increase in size slowly but steadily and other infested areas appear.

In the past the disease has been of much greater economic importance in foreign countries than in the United States. Apparently *Ophiobolus graminis* has not occurred in the United States long enough to cause such large losses as it does in foreign countries. It is apparently an elusive type of parasite which when once established probably cannot be eradicated. It has increased steadily in this country in recent years and now causes as great losses here as abroad.

The fungus causing the take-all disease attacks all of the under-ground parts of the plant and parts near the soil line, but there is no evidence that indicates it attacks the leaves, heads, or parts of the stem except that portion of the stem immediately above the soil line. The symptoms manifested in the upper parts of the diseased plants are a result of the destruction of the root system and basal portion of the affected plants.

There seems to be no conspicuous indication of take-all during the fall in fields of winter wheat. Occasionally a plant will show visible signs of attack at this time, but there is no outstanding manifestation of the disease even in areas known to be infested by the causal organism.

In the spring the disease may appear in large or small areas and it frequently causes a spotting in fields. Often many small spots are scattered throughout infested fields giving them a very ragged appearance. The diseased patches are more or less circular in outline and vary from a few feet to

1. The author wishes to acknowledge his indebtedness to Dr. Hurley Fellows, associate pathologist in charge of wheat foot-rot investigations, Division of Cereal Crops and Diseases, United States Department of Agriculture, for assistance in the preparation of this article and for much of the data herewith presented.

(Continued on page 94)

Preventing Erosion by the Use of a New Tillage Tool¹

Alvin E. Lowe, '33

A new type of tillage tool designed to reduce the amount of run-off and soil erosion has been developed recently at the Fort Hays Agricultural Experiment Station, Hays, Kan. This tool was developed by Mr. Raymond H. Davis, an alumnus of the Kansas State College of Agriculture and Applied Science, now soil scientist in charge of the soil erosion investigations of the United States Bureau of Chemistry and Soils at the Fort Hays station.

Erosion by water is possible only when water runs off the land. This water runs off, not necessarily because the soil lacks the capacity for absorbing it, but usually because the soil offers less resistance toward run-off than toward absorption. Before the land was put into cultivation nature provided for this resistance by keeping the ground covered with trees and grass. This very materially reduced the amount of run-off and allowed very little erosion. Man has failed to provide adequate artificial means of preventing run-off and hence erosion has been severe in some instances with a resulting decrease in fertility and production.

Some of the methods formerly used to prevent erosion are terracing, contour farming, strip cropping, keeping the ground as rough as practical, and growing permanent sod-forming crops on land subject to serious washing. These methods of prevention are not practical in all cases and serious erosion occurs from the practice of using furrow-forming tillage tools such as the lister and ordinary cultivator and from the practice of using tools that produce a smooth surface such as the disc-harrow, tandem disc, one-way plow, and spike-tooth harrow.

The new-type erosion tillage tool developed by Mr. Davis with the able assistance of the shopman, Mr. E. N. Canaday, leaves the surface of the ground covered with small depressions giving a pock-marked effect. There are approximately 10,000 of these holes per acre with each hole acting as a miniature reservoir, holding from two to three gallons of water. These holes are produced by shovels—similar to those on a corn cultivator—which work up and down and with the forward mo-



LAND CULTIVATED BY A TILLAGE TOOL
DESIGNED TO PREVENT EROSION

tion of the machine scoop out the soil. The shovels alternate giving a check-board effect with the soil piled between the holes. (See accompanying illustration.) This gives the same surface condition regardless of the direction of the slope in relation to the line of travel.

With 10,000 three-gallon holes per acre an ordinary rain may be entirely held on the soil. In case of very heavy rains the run-off will be retarded so much that the amount of absorption

1. The author is indebted to Mr. Raymond H. Davis for the accompanying photograph and for a large part of the material in this article.

will be greatly increased. A large amount of water is not only held in the holes but it is held motionless, thus giving the soil an opportunity to absorb it. Furthermore, as the bottom of the holes is relatively close to the subsoil, the holes act as funnels to direct the water into the subsoil. This decreases loss by evaporation and enhances the value of the machine as it can be used on land with very little or no slope to direct the moisture into the subsoil and to prevent run-off which usually results from the torrential Kansas rains.

The condition of the ground produced by this machine will prove effective in decreasing the seriousness of soil erosion by wind. As the ground is roughened in all directions, it prevents blowing regardless of the direction from which the wind is coming.

During the past season a second machine of this type was built at the Fort Hays station and shipped to the soil erosion station at Pullman, Wash. It is believed that the machine will be very effective in decreasing run-off and erosion losses which result from the rather heavy winter rainfall and steep slopes of the Palouse region.

The United States Department of Agriculture has applied for a public service patent on the principle of this machine which has not as yet been granted. The attorneys in the office of the solicitor of the United States Department of Agriculture feel, however, the idea is patentable and are now working up claims to be presented to the patent office. In the meantime, extensive tests are being carried on with the machine at the Fort Hays station.

KAW VALLEY POTATO SITUATION

(Continued from page 83)

most the only exception to this rule. The variation in 1920 probably was due to the effects of the war. For the past two years potato prices, like other prices, have been greatly reduced.

Of course changes are brought about

not only by factors in the Kaw valley, but by those in potato sections other than the Kaw valley; for it is those things that happen throughout the potato country that have the greatest effect on potatoes. As a rule, the changes that take place in the Kaw valley also take place elsewhere. This is true for prices especially. The acreage and yield may vary somewhat. There are four main potato sections in the United States: The early section, which includes the extreme southern states; the second early, which includes Oklahoma, Arkansas, etc.; the intermediate section, which includes Kansas, Missouri, Virginia, and others; and the late section, which includes the northern states.

The outlook for Kaw valley potato growers this year is rather difficult to determine. Since the present acreage is below normal, it is very likely to increase this year. Also the potato man was no worse off last year than other crop growers, so he is likely to continue to grow potatoes. The price is low, but 49 cents a bushel in 1931 is not so low compared to other farm products. Other farm crops are at a low ebb. So with normal weather conditions there is likely to be an increased acreage of potatoes planted in the Kaw valley.

JUNIOR JUDGING TEAM WINS

(Continued from page 71)

same college to win the contest three years.

Prior to the Denver contest the team visited the State Agricultural College of Colorado at Fort Collins and worked out on their fine live stock. The Denver contest is recognized as one of the best organized and smoothest running contests in college competition in live stock judging.

R. E. Hodgson, M. S., '30, is dairyman at the Agricultural Experiment Station, Puyallup, Wash.

Dairying in Washington

R. E. Hodgson, M. S., '30

The dairy industry of the state of Washington is built on a stable and sound foundation. It is not subject to sudden, permanent expansion in times of high prices, nor to serious curtailment in times of depression. It takes time to breed and develop cows and any progress in development is bound to take place over a period of years.

Washington is vitally interested in the price trends of dairy products, because dairying is and shall continue to be one of its major industries. In 1930,

The predominating breeds of dairy cattle in the state, mentioned in order of importance, are: Holstein, Jersey, and Guernsey. The Holstein breeders boast of the fact that 29 of the 117 cows in the United States that have produced thirty thousand pounds of milk in a year, and 19 of the 157 cows that have produced one thousand pounds of butter fat have made their records in Washington. They further take pride in stating that five of the 14 world's record butter fat cows on long-time



THE CONSOLIDATED DAIRY PRODUCTS COMPANY BUILDING

This dairy products plant located in Seattle, Wash., functions in converting much of the surplus market milk produced in the surrounding communities into butter, condensed milk, and other dairy products, thereby aiding in reducing the supply of market milk.

according to the report of the United States Department of Agriculture Year-book, there was produced in the state of Washington 1,800,000,000 pounds of milk from 301,000 cows. This milk was sold for \$1,840,000. If the value of the dairy cattle, amounting to approximately \$28,000,000, were added, plus the value of the equipment for the production and processing of this product, the total value would be over \$100,000,000. There was an increase of 10,000 head of dairy cattle and an increase in the volume of dairy products of over 7 per cent in the last year.

test have been developed by breeders in Washington. The Guernsey breed has also made rapid progress in the last ten years.

Dairymen in the state of Washington divide themselves into three distinct types. The general grain farmer who is satisfied to produce milk at actual cost in order to secure a financial return from labor that otherwise would not be utilized, is one type. There are many such farmers in the wheat regions of eastern Washington. They spend no money for the purchase of feed, but utilize the waste of the farm

that cannot be otherwise marketed. Such farmers have only a few cows of no particular breeding. The average production of these animals is low, but they contribute a considerable proportion to the total yield of dairy products in the state. Most of their product is marketed as sour cream and is made into butter.

The second type interested is that group of general farmers who are dairy-minded. These men are anxious to build up a small herd of pure-bred or grade dairy cattle. They are not specialized dairymen but keep dairy cattle to utilize large amounts of alfalfa hay and grain that are grown on their farms. This class of dairymen is usually found in the irrigated regions, such as the Yakima valley, where alfalfa is grown extensively.

The third type consists of the specialized dairymen who are putting their entire energy into dairying, marketing dairy animals and dairy products. This type of dairyman is specifically located in a rather narrow strip of country east of Puget Sound and west of the Cascade mountains. Over 54 per cent of all the producing cattle in the state are found in this small area. The reason for such a concentration of dairy cattle in this region is that it possesses an abundance of available feed, a moderate climate permitting a long pasture season, and a large market in the immediate vicinity. Also an efficient cooperative marketing organization has been established.

These dairymen are specializing in producing a large amount of fluid milk of high quality. Much of this product is utilized by the larger cities on the northwest coast. The population of Seattle, Tacoma, and Portland consume great amounts of the fluid milk produced in their respective vicinities. The surplus milk is made into butter, cheese, condensed milk, or various forms of powdered milk.

A relatively high price for dairy

products is maintained as a result of the ability of the large cooperative marketing organization—The United Dairymen's Association—to regulate the flow of surplus milk into various forms of processed dairy products. The United Dairymen's Association, one of the largest cooperative dairy organizations in the country, has been in active operation in the state of Washington during the past few years. This organization is made up of a number of smaller county cooperatives which have a total membership of over 10,000 farmers. During the past year, this association marketed over \$11,000,000 worth of dairy products.

The methods employed in the production of milk are interesting and characteristic of this particular region. Climatic conditions are such that a long pasture season is obtained. It is not uncommon to receive eight months' pasturage during the year on improved bottom land pastures. The abundance of rainfall and moderate temperature throughout the year make favorable conditions for a rank forage growth. Many good bottom land pastures are capable of producing four tons of dry matter per acre per season or of maintaining two cows per acre during the summer. A system of rotational grazing is employed by many dairymen.

It is the practice to seed down the best available land to permanent pastures because every farmer realizes that pasturage is his cheapest source of feed. His poorer land is generally utilized in growing succulent feeds for winter consumption. Various kinds of root crops and kale are grown extensively. The making of ensilage is not so popular with coast dairymen as with middle-west farmers. Small grain crops that are utilized in the winter ration are grown on the poorer upland soils.

In certain sections on the coast, alfalfa is grown extensively. This, however, is not the general practice as it is somewhat difficult to cure the hay

(Continued on page 93)

QUESTIONS & ANSWERS

FARM & COLLEGE

Q. What are the chances of wheat prices advancing some more this spring?

A. After an upturn in wheat prices as large as that made last fall, wheat prices, except for temporary set-backs, go on up to a peak either in the winter months of December, January, or February, or in the spring months of April, May, or June. Never since 1894 has the extreme peak price finally reached, been reached in any other period than from January to June. When the European wheat crop is poor as in 1924 and export business for the United States is good, the peak price is generally reached in the December to February period. When there is no such stimulus for the fall and winter market, as is the case this year, then the peak is more likely to be reached in the April to June period, due to uncertainty over the growing crop. Because of adverse business conditions there is still some doubt as to whether wheat prices will exceed last fall's highs. Only severe damage to growing wheat can bring this about. —R. M. Green, Professor of Agricultural Economics.

Q. If wheat prices advance, will that help the corn market?

A. For short periods of a few months, say from April to August, yes. That does not mean, however, that new lows for corn prices will not be reached when the new 1932 corn crop comes to market if it happens to be a large one. With only a few exceptions, the extreme lows in corn prices are made six months to 12 months after lows have been reached in wheat and there is some reason for believing that a low in wheat was made August to October,

1931. —R. M. Green, Professor of Agricultural Economics.

Q. What is the Reconstruction Finance Corporation?

A. The Reconstruction Finance Corporation is a federal agency, recently instituted, to furnish necessary credit to agriculture, commerce, and industry. It is designed as an emergency measure to furnish credit which, under recent conditions, has been unobtainable. The principal office of the corporation is in Washington, D. C., with branches and agencies established throughout the United States. The capital stock of one-half billion dollars is subscribed by the federal government. Debentures, notes, and bonds of the corporation may be issued in amounts not to exceed three times the corporation's subscribed capital. The corporation is empowered to make loans to all forms of banking institutions, including loans secured by the assets of any bank that is closed or in process of liquidation. Loans may also be made to railroads and for the purpose of facilitating the exportation of agricultural and other products. —Harold Howe, Associate Professor of Agricultural Economics.

Q. Does the Reconstruction Finance Corporation specifically aid agriculture?

A. In addition to making loans to institutions that serve agriculture, the Reconstruction Finance Corporation makes available for the Secretary of Agriculture, \$50,000,000 of its subscribed capital for the purpose of making loans to farmers in cases where an emergency exists. Securities, equiva-

lent to three times this amount may be issued, thus expanding the volume of credit specifically set aside for agricultural loans. In making these loans, preference is to be given to farmers who suffered crop failures in 1931.

These loans are made to individuals who are without means to purchase the supplies necessary for crop production during the year 1932. No loans are to be made to any applicant in excess of \$400. Anyone desiring a loan is directed to make out an application on forms furnished by the county advisory seed loan committee which organization is to be set up in each county. Anyone in doubt regarding the personnel of this loan committee in his county should consult the county agricultural agent. Applications for loans must be made before April 30, 1932. Loans bear an interest rate of $5\frac{1}{2}$ per cent and are payable on or before November 30, 1932. —Harold Howe, Associate Professor of Agricultural Economics.

Q. What role do honey-bees play in the set of an apple crop?

A. It has been found that "of 89 varieties of apples tested, 59 were self-sterile, 13 were partly self-fertile, and 15 were entirely self-fertile." It may be seen from this that in the majority of cases cross-pollination is essential to the setting of an apple crop.

Fruit pollen is moist and is seldom, if ever, carried from blossom to blossom by wind, but is transferred almost entirely by insects, especially honey-bees, bumble-bees, and to some extent other bee-like insects. Honey-bees are best suited as pollen carriers for several reasons: (1) They are structurally adapted for gathering and carrying pollen. (2) They winter over in the hive in large numbers and have begun to build up in numbers by fruit-bloom time while most other insects are dormant during the winter and come out in spring only in small numbers. (3) They seldom visit more than one kind of blossom at a time. (4) They are the

only insects that can be distributed through the commercial orchard at the will of the owner. —E. J. M., '33.

Q. What does the farmer think of Wheatland milo as a combine grain sorghum?

A. Wheatland is a new variety of grain sorghum that has all the desirable characteristics of a typical combine grain sorghum. Thirty-seven farmers in the western half of the state gave detailed reports on Wheatland grown on their farms in 1931. The average yield was 24.6 bushels per acre and the time of harvesting with the combine was one bushel per minute. Its average height was 28.2 inches. A typical report on Wheatland reads: "As a grain variety Wheatland milo stands in the lead in my opinion."

A few of the advantages of this variety as listed by the farmers are: (1) It is easy to cultivate and handle. (2) It stands up well. (3) It has loose heads that dry out quickly. —C. W. N., '32.

Q. Is seed corn treatment a necessary practice in Kansas?

A. Under Kansas conditions no consistent or outstanding difference in stand, vigor of plants, yield, or quality of the crop is obtained from treated as compared with nontreated seed. Corn smut cannot be controlled by any known seed treatment, because the organism is carried over in the soil. The best practice for the control of corn diseases and increased yields in Kansas consists of selecting good bright seed ears in the field from healthy standing stalks. Strong vitality should be assured by germination tests, and the seed should be planted in the usual manner. —C. A. W., '31.

Fulton G. Ackerman, '31, is now foreman of the Agronomy Farm, Manhattan, having succeeded C. E. Crews, '28, who was transferred on February 1 to the south central Kansas experiment fields recently established.

Harlan B. Stephenson, '31, is landscape gardener for the National Park Commission. He is located in San Francisco, Calif., his residence address being 979 Sutter St. Harlan took the civil service examination in landscape architecture last summer and ranked third highest in the United States.

W. H. Metzger, M. S., '27, has been elected assistant professor of soils to report for work April 1. Doctor Metzger received his bachelor's degree from the University of Illinois and his doctor's degree from Ohio State University.

Dale E. Halbert, '32, is manager of Bajillos Poultry Farm for Rancho El Aguadero, Inc. This farm is located at an elevation of 5,500 to 5,600 feet, about three-fourths of a mile from the top of one of the smaller mountains in the west end of the Sacramento range. Flocks of both single-comb Rhode Island Reds and single-comb White Leghorns are maintained on the farm.

The following excerpts are taken from a recent letter postmarked Alamogordo, N. Mex.:

"All of the cultivated land here is under irrigation. Fruit and vegetables are the main crops. Wheat and rye are grown as catch crops only. The coloring on the apples grown here is great. In the early fall the cold nights and bright days bring out a lot of color. Grimes Golden are almost brown, and Rome Beauties are truly beauties. Last Sunday afternoon I walked to the top of the mountain on which I live. Only desert flora exist there. Most of the people in this section of New Mexico are a good type of Mexicans, that is they are clean, industrious, and friendly. Most of them speak English. It gets cold here every night but the temperature rarely falls below 24 or 26 degrees F., and snow rarely remains on the ground more than 24 hours."

DAIRYING IN WASHINGTON

(Continued from page 90)

properly. Most dairymen depend on obtaining their hay from the irrigated alfalfa regions on the east side of the mountains. From these regions excellent quality of alfalfa can be obtained at a reasonable figure. It is readily seen that dairymen in this area depend upon roughage feeds, both hay and succulent, for the major part of the dairy ration and that little grain feeding is done during the pasture season. In winter roughage feeds are balanced with a small amount of protein-rich concentrates.

The dairymen in this particular section feel that by marketing their home-grown feeds in the form of milk greater returns can be had. Their particular interests lie in developing high-producing herds and the economical production of a high quality of market milk.

LITTLE AMERICAN ROYAL

(Continued from page 77)

ita, showing C. P. Vale IIa, a Holstein; Raymond J. Cohorst, Marysville, showing Elmbar Bactris, an Ayrshire; Wayne W. Jacobs, Harper, showing Ventures Dahlia, a Guernsey; Henry M. Brown, Fall River, showing Manora's Tessie, a Jersey; Stella Johnson, Savonburg, showing Veronica, a Holstein calf; and Pius H. Hostetler, Harper, showing Rob Roy of Edgemoor, a Guernsey bull. The grand champion award was given to Wayne W. Jacobs on his superior showmanship. Reserve champion was won by Henry M. Brown. With the grand championship went a watch.

The judges for the dairy contest were Max Morehouse, manager of Jo-Mar Farms, Salina, and C. O. Bigford, college dairy herdsman. The contest this year was under the management of Chester G. Thompson, Randolph, with Francis W. Castello of McCune as assistant manager. Thompson is a se-

nior and Castello a junior, both majoring in dairy husbandry.

An added feature sponsored by the Dairy Club was the co-ed milking contest in which three were entered. Miss Wilma Byers, Hepler, proved to be the best of the three and by milking 3.5 pounds of milk in the allotted two minutes won first prize, but was closely followed by Miss Aileen Rundle of Clay Center with 3.3 pounds. Miss Stella Johnson of Savonburg was the third entry. —C. G. T., '32.

"TAKE-ALL" OF WHEAT

(Continued from page 86)

several yards in diameter. Usually most of the plants in a patch are more or less stunted and bleached. The diseased plants may die at any time from about the middle of April to maturity.

The appearance of the individual plants in typical cases of infection is sufficient to identify take-all. This is especially true when plants have been killed late in the growing season. In such cases the stems, leaves, and heads of the plants are bleached; the heads are empty or contain only shrunkened kernels; the base of the stems and roots are a coal-black color. This latter characteristic is the most important in the identification of the disease. The roots are decayed badly and as a result such a plant can be easily pulled out of the ground. The fact that the roots are diseased may also be used as a method of distinguishing take-all from chinch bug injury in which the roots of the plants are not affected.

Greenhouse experiments performed by Doctor Fellows indicate that the soil temperature does not have much effect on the severity of the disease. At all temperatures, however, at which the wheat grew, the disease was favored by the higher soil moisture.

The exact influences of soil type and fertility on the development of take-all are not definitely known. Take-all apparently is not restricted to any soil type or to soils showing any particular degree of fertility.

Take-all, as was previously noted, is a soil-inhabiting parasite, hence the problem of its control becomes immediately centered on agronomic practices or in the discovery of a variety resistant to the disease. Work has been carried on by the United States Department of Agriculture in cooperation with agricultural experiment stations of various states with this in mind. These stations have found measures which can safely be recommended for its control. They are as follows:

1. If possible avoid the use of seed from take-all infested fields. This seed is shriveled and may not germinate well. If absolutely necessary to use such seed it should be cleaned thoroughly to remove the small seed and bits of infested straw.

2. Avoid the continuous cropping of take-all infested land with wheat, barley, rye, or any of the other grass crops which may be severely attacked by *Ophiobolus graminis*.

3. Use nitrogen fertilizers with caution.

4. Rotate with oats, root crops, or other crops which are known to be immune from the attack of the take-all parasite. None of the maize or sorghum species, or the legumes have yet been found to be attacked by the disease.

5. In localities where summer fallowing is practiced it may be included in a part of the rotation. Fallowed land should be free from wild or weed grasses. When practicable, such fallowed land should be cropped at least one year with a nonsusceptible crop. Such a crop as oats, corn, the sorghums, or a legume should be grown before wheat is again sown.

Doctor Fellows found that one year out of wheat brings about fairly good control, but the prevalence of take-all is noticeable in the first crop and very bad in the second. Two years out of wheat secures nearly perfect control for the first year of wheat when the first crop follows either oats, kafir, or corn. Three years out of wheat will

secure nearly perfect control for two years under a similar cropping system. Of hundreds of varieties of wheat tested by Doctor Fellows for resistance to take-all in the last six years, all have proved susceptible to the disease.

The story of take-all in the country for the last decade indicates it may become a serious menace. The recommendations listed will give very good control for those farmers situated so they can use such a system of rotation. For those situated in a locality in which wheat only can be grown successfully, it is hoped that a variety will be found in the future which will be sufficiently resistant to control the disease.

SOIL AND CROPS RESEARCH

Continued from page 70)

way No. 14. The farm belongs to J. F. Birkenbaugh but Claude Brand is the cooperator. The soil fertility work on this field will contain four rotations as follows: (1) Sorghum, sweet clover, sweet clover (pasture), wheat, wheat. (2) Continuous wheat. (3) Sorghum, oats, wheat, wheat. (4) Sorghum, oats, wheat, forage (alfalfa, sweet clover, Sudan). Some of the plots in each test will be treated with commercial fertilizer or manure.

There will be some pasture and legume experiments here but on a smaller scale than at the Sedgwick field. Sorghum varieties of the standard grain type, with a few forage varieties, will be used here. Numerous wheat varieties and some oats, barley, and flax varieties will be tested.

PRATT FIELD

The Pratt field is located two and one-half miles northwest of Pratt on the Frank Schaffer farm. The soil fertility project on this farm will have seven rotations as follows: (1) Sorghum, barley, wheat, wheat. (2) Sorghum, fallow, wheat, wheat. (3) Corn, sweet clover, sweet clover, wheat, wheat. (4) Corn, sweet clover, sweet clover, sorghum, sorghum. (5) Wheat

continuously. (6) Sorghum continuously. (7) Corn continuously. The last three are for comparing the one-crop practice sometimes followed in this section with the above rotations.

Some of the plots in all of these rotations will be treated with manure or commercial fertilizer. Only a small number of legume and pasture crops will be planted here. Sixteen of the leading combine varieties of sorghum are to be tested on the Pratt field this year. There will be a date- and method-of-planting experiment on some of the standard grain sorghums. There will be eight varieties of corn planted, including rate- and date-of-planting tests on four of them. Six varieties of barley will be tested and some oats and flax varieties.

NEW NORTHEASTERN KANSAS EXPERIMENT FIELDS

T. R. Reitz, '27

The northeastern Kansas experiment fields have for their chief purpose the testing of practices necessary for producing special crops. The work will include variety adaptations, cultural practices, fertilizer treatments, rotations, and, in the case of the orchards, pruning, spraying, and soil management studies. The fields are being planned to contribute to available knowledge on various problems and practices of special interest to farmers in northeastern Kansas. In doing this they should have considerable value as demonstration fields and it is hoped county agricultural agents in the district can use these fields to advantage in teaching better practices of crop production. Four fields have been located to carry the work in 1932; namely, an old orchard, a field on which a young orchard is to be planted, a general farming field, and a potato field.

BLAIR EXPERIMENT ORCHARD

The Blair orchard, owned by John Muench, is now about fifteen years old. It is located on the windblown loess

soil of Doniphan county, on U. S. highway 36, one-fourth of a mile west of Blair. Four hundred and thirty trees have been secured here, the varieties being Winesap, Delicious, York, and Jonathan. Soil management studies, including sod culture with and without commercial fertilizer, clean cultivation plus cover crop with and without commercial fertilizer, and manure and straw mulch will be made on this orchard. Measurements will be made in yield of the trees so treated and in the increase in circumference of the trunk of the tree each year. The Department of Entomology has scheduled a full-time man in this region to study hibernation of the apple curculio. Later in the season in cooperation with the plant pathologist, he will carry on studies on black rot of the apple.

ATCHISON EXPERIMENT ORCHARD

A young orchard is to be set this spring on land owned by Mat Ernzen, ten miles south of Atchison on U. S. highway 73E. The area of the field is approximately ten acres. A windbreak of pine and arbor vitae will be constructed on the south side of this orchard. Jonathan, Winesap, Richared Delicious, and Grimes Golden apples will be planted and Montmorency and Early Richmond cherries. Pruning studies will be made to determine if it is best to have two, three, or four scaffold branches on apple trees and to see if cherry trees can be grown according to the modified leader type. Soil management studies will be made of clean cultivation plus various cover crops, straw mulch, red clover, and various fertilizer treatments.

McLOUTH EXPERIMENT FIELD

This field is located on the farm of J. R. Tullis, about fifteen miles west of Leavenworth on Kansas highway 92. It has an area of about thirty acres. The soil is of the Shelby series and represents an extensive acreage of this soil in the northeastern part of Kansas. The outline of studies to be made

on this field includes the general crops, corn, oats, alfalfa, sweet clover, forage crops, and grasses. Erosion control, rotations, pasture management, adapted varieties, and fertilizer treatments will receive prominent attention.

NEWMAN POTATO EXPERIMENT FIELD

Ten acres on the farm of R. Shirley, about two miles west and one mile south of Newman, will be used in the study of potato culture. (The field is located about one mile south of a point on Kansas highway 10 about 10 miles east of Topeka and 17 miles west of Lawrence.) A small plot of this land will be devoted to intensive studies in potato diseases. The major portion will be used for experiments in the effect of size of seed piece, depth and time of planting, and crop rotations on yield. Various crops such as sweet clover, alfalfa, oats, and corn will be used in the rotations. Vetch, rye, turnips, and other crops will be used for green manure. A rotation designed to give higher returns per acre from this rather high-priced bottom land will be arranged including vegetables, such as tomatoes, canning peas, and carrots. Potatoes on the same land continuously will be grown on a few plots and a straw mulch will be applied to two plots. Variety work will be started next year.

It is the purpose of those in charge to later add to the four experiment fields already located, and briefly described above, a fifth field to be devoted to small fruit culture, which represents a large industry in the northeastern part of Kansas, especially in Doniphan county. Strawberries and raspberries will be the principal fruits to be studied. Growers are having a hard time to produce such crops as they once did owing to increases in diseases, decreased fertility of the soil, and lack of definite knowledge regarding the best way to prune and spray. It is hoped that this field can be started in the spring of 1933.

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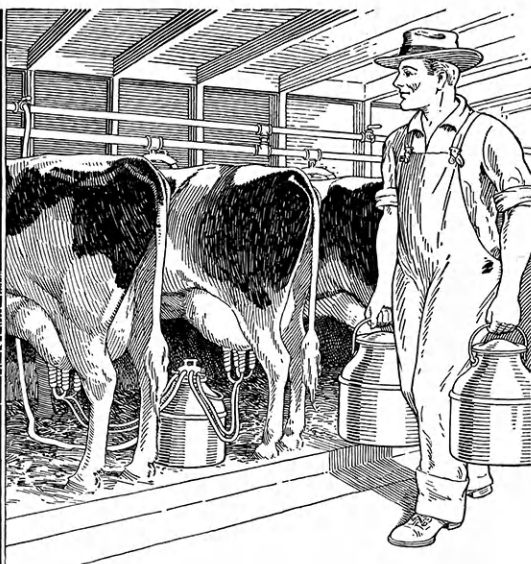
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