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MANHATTAN, KANSAS

CONTENTS

COLLEGE CAFETERIA—A POPULAR RESORT

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A Practical Lamb-Feeding Experiment

B. W. Wright, '24

Many problems confront the practical lamb feeder. One of these problems is the selection of roughage. Alfalfa is without question the most satisfactory roughage for sheep. But alfalfa production is impossible in some sections of Kansas. It is therefore necessary, in promoting sheep production in Kansas, to find a satisfactory substitute for alfalfa in a ration for fattening lambs. The Department of Animal Husbandry of the Kansas Agricultural Experiment Station has recently completed an experiment testing the value of some possible substitutes. In addition one phase of the experiment was planned to show the value of feeding kafir in the head as compared to feeding threshed kafir and incidentally the value of kafir as compared to corn.

For the experiment the department purchased 150 western lambs on the Kansas City market, December 19, 1923. The lambs were in half-fat condition from the San Luis valley of Colorado. They were divided as uniformly as possible into six lots with 25 lambs in each lot.

Immediately the lambs were put on the ration they were to receive throughout the experiment. The grain ration was started at 0.25 pound per lamb per day, and gradually increased as the lambs were able to take it. The amount of roughage at the beginning of the experiment was 1.55 pounds per head per day. This amount remained constant until January 25, 1924, when it was reduced to 1.2 pounds per head per day. This reduction of roughage was necessary because of the increase in the quantity of grain in the ration. The lots received the following rations:

Lot 1, Shelled corn and alfalfa hay
Lot 2, Shelled corn and sweet clover hay
Lot 3, Shelled corn and Sudan grass hay
Lot 4, Shelled corn and cowpea hay
Lot 5, Threshed kafir and alfalfa hay
Lot 6, Kafir heads and alfalfa hay

During the entire period the experiment was conducted on the basis of the least consuming lot or the lot consuming the least amount of feed. Lot 3, the lot receiving shelled corn and Sudan grass hay was the controlling lot. This lot made its best gain during the early part of the experiment. It was without question the lot which had the poorest appetite and did not appear to be doing nearly so well as the other lots. Lots 5 and 6, the lots receiving threshed kafir and kafir heads, had the best appetites and from the eye of the feeder appeared to be doing the best. Lots 1, 2, and 4 did not show any considerable difference in appetite.

The source of the sweet clover hay was first year's growth which had been sown with oats. The oat crop was harvested and when the hay crop was cut there was considerable oat stubble in the hay. This roughage was very palatable to the lambs from the start. The alfalfa was No. 2 and somewhat stemmy. The Sudan grass was good quality hay. The cowpeas were cut at the stage when the pods were beginning to ripen. The stems seemed to be hard and woody but the hay was readily eaten by the lambs. The corn graded No. 3 mixed. The kafir was white kafir. Tests showed kafir in the head to contain five-eighths of its weight in grain. It was on this basis that the lot receiving kafir heads was fed.

The experiment was continued for 44 days after which the lambs were shipped to Kansas City and sold, February 15, 1924.

The lambs were purchased at $11.35 per hundredweight. The selling price per hundredweight was as follows: Lot 1, $14.40; lot 2, $14.15; lot 3, $13.60; lot 4, $13.85;

lots 5 and 6, $14. The feed required for 100 pounds gain and the average daily gain are shown in the following tabulation:

Lot. No.	1	2	3	4	5	6
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Feed required for 100 lbs. gain:						
Grain....	420.69	405.87	543.66	446.24	419.49	410.70
Hay	456.69	440.61	590.19	484.43	455.39	439.39
Average daily gain.....	0.32	0.33	0.25	0.30	0.32	0.33

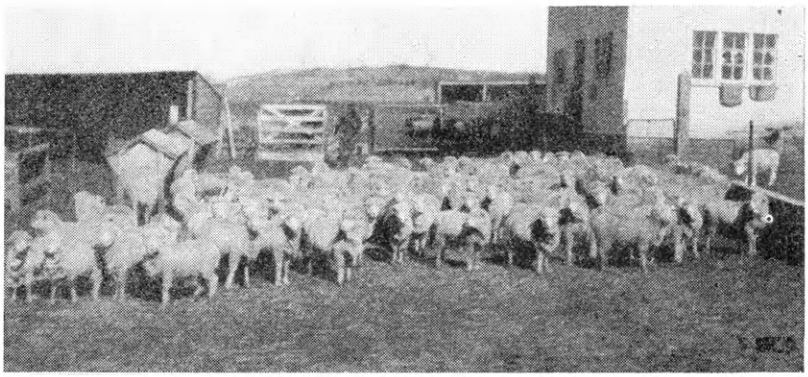
The average daily ration was the same in all lots, except that a slight variation was necessary in feeding kafir heads to lot 6. From the standpoint of the grain alone, however, the grain fed in lot 6 was the same in quantity as that fed in lot 5. The grain ration averaged 1.34 pounds per head per day and the hay ration 1.45 pounds.

The following conclusions may be drawn from results secured:

1. As regards the comparative value of roughage substitutes for alfalfa in fattening lambs, sweet clover proved to be equal to alfalfa. Neither the lot fed cowpea nor the lots fed Sudan grass hay gained equal to the lots fed alfalfa or sweet clover. The Sudan grass hay proved to be the least efficient of any hay fed in this experiment.

2. It did not pay to thresh kafir for fattening lambs.

3. Corn did not produce any greater gains than kafir.



FAT LAMBS READY FOR MARKET

K. S. A. C. AGRICULTURAL ALUMNI IN THE FOREST RESEARCH COUNCIL

Secretary Wallace of the Department of Agriculture has organized a Forest Research Council consisting of fifteen members. The council will act in an advisory capacity to the Northeastern Forest Experiment Station and to other forest research agencies throughout New England and New York. The membership of the council includes R. S. Kellogg, '96, secretary of the News Print Service Bureau, New York City; F. A. Waugh, '91, head of the Division of Horticulture, Massachusetts Agricultural College; and J. C. Kendall, director of the New Hampshire Agricultural Experiment Station, formerly professor of dairy husbandry in K. S. A. C. The purpose of the council is to stimulate and guide forest research without interfering with the freedom of the various research agencies. Beyond doubt its recommendations will command respect and greatly increase the efficiency of forest research.

Lewis Long, M. S., '23, and Russell S. Kifer, '23, are employed in the Division of Cost of Production and Farm Organization of the Bureau of Agricultural Economics, United States Department of Agriculture. They are both located in Washington, D. C.

The Production of Farm Turkeys

Donald C. McMillin, '25

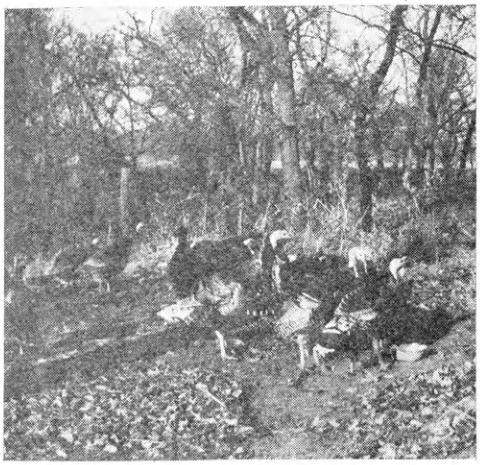
Turkey raising, as ordinarily engaged in, is a sideline upon the general farm. With turkeys as with chickens the idea that the birds must be kept on a scavenger basis to be profitable is a thoroughly mistaken one. Turkeys, as rule, are more efficient than any other class of livestock in turning grains into edible flesh, while the market value of the finished product is several times that of an equal weight of table meat produced by any of the common classes of farm animals. The farmer therefore who wishes to feed off his grain crops cannot afford to ignore the possibilities of turkey raising.

In spite of advantages, the production of turkeys in recent years has steadily decreased. The principal causes of the decrease are: (1) The increase in intensive farming; (2) the high mortality among young poults due to outbreaks of disease, particularly blackhead; and (3) the serious losses in many sections resulting from the presence of predatory animals. However, for farmers favorably situated for raising turkeys a more profitable sideline can hardly be found. Given plenty of range, turkeys will readily consume large quantities of grasshoppers and other insects, green vegetables, the seeds of weeds and grasses, and waste grains.

Our present turkeys have all originated from the wild turkey but by judicious breeding turkeys have increased markedly in size since domestication. Wild turkeys of today average in weight about 12 pounds for young toms and 8 pounds for young hens, while the standard weight for the Bronze variety is 25 pounds for young toms and 16 pounds for young hens. The Bronze variety is the heaviest variety of turkeys and the most popular.

One of the most important steps toward success in turkey raising is the proper selection of breeding stock. In selecting turkeys for breeding purposes, strength and vigor are the first points to be considered. To indicate this the body should be deep and wide, the back broad, and the breast round and full. The head should be of good size and of a clean healthy appearance. A strong well-made frame is shown by thick sturdy shanks and straight strong toes.

The male at the head of the flock should be a purebred bird of the best type obtainable. As inbreeding is harmful it is advisable each year to obtain a new tom of unrelated blood, but of the same type. A vigorous tom can be safely mated to 15 turkey hens. If 25 or 30 hens are kept, two toms should be kept, using each one on alternating days.



A FLOCK OF BREEDING TURKEYS ON THE LINN FARM NEAR MANHATTAN

In saving breeding stock it is an excellent plan to keep as breeders each year one-half yearling hens and one-half early-hatched pullets, and mate them with a well-developed and vigorous early-hatched young tom. The most satisfactory time of the year to select breeding stock is in November or December as this enables one to have a larger number of birds to choose from and gives the breeding stock selected ample time to get acquainted with their new surroundings before the mating season, which begins about the middle of March in Kansas.

Good breeding condition means being well-fleshed but not fat. Given free range where there is an ample supply of natural feed during the winter and early spring, a

good daily feed of grain, preferably oats or wheat, is sufficient to keep the birds in good breeding condition. The natural feed of turkeys at this time of the year consists largely of grass, tender buds, young leaves, insects, and seeds of various kinds. Animal feed is often supplied in the form of meat scrap, beef livers, or skimmed milk, either sweet or sour. Free access to grit, charcoal, and shell-forming materials, such as oyster shells, is necessary throughout the breeding and laying season.

Soon after mating, hens begin to look for nesting places and usually commence laying in from a week to ten days after the first mating. Pullets usually commence laying a little earlier than yearling or older hens. Some turkey hens can be made to lay four or five litters, but this is not usually advisable as poults hatched later than June do not have a chance to develop for the Thanksgiving and Christmas markets, and are not sufficiently mature by the following spring to use as breeders.

Turkey hens are very close sitters and, if properly managed, they are the surest means of hatching turkey eggs. Poor hatches are often due to crowding more eggs under one hen than she can handle. One egg too many means that every egg in the nest will be chilled at some time during the incubation period of four weeks. The average number of poults raised under ordinary conditions is about 50 per cent, or about seven poults for each turkey hen. The losses occur mainly with poults under one week of age. Unless there is an outbreak of disease there is seldom any losses after the first month.

For the first two days after hatching, poults require no feed, the yolk of the egg, which they absorb before breaking out of the shell, being sufficient to maintain them for that length of time. Access to clean drinking water and a little coarse sand and green feed to pick at is all that is needed until the third day. Beginning on the third day, the poults should be sparingly fed three times a day a mixture of equal parts of cracked corn and wheat together with clabbered milk or cottage cheese. They should be given limited range after one week of age and free range when four to six weeks, depending on the environment and whether the poults are being brooded by chicken or turkey hens.

When about 12 weeks old young turkeys are old enough to go to roost. Practically all turkey raisers allow the birds to roost in the open on trees, fences, or roosts provided for them. By driving them to the roosting place and feeding them there every evening just before dark, young turkeys can be made to roost wherever desired.

In fattening turkeys for the market an excellent plan is to begin about October 1 to feed night and morning, not feeding enough at a time but that the birds will go away hungry, and gradually increasing the quantity until they are given all they will clean up three times a day during the week before marketing. Some turkey raisers feed wheat and oats during the first part of the fattening season, gradually changing to corn as the weather becomes cooler.

Turkeys are very subject to most of the diseases and ailments affecting fowls. The most serious turkey disease is blackhead. Blackhead occasionally affects grown turkeys, but it is most common among young poults between the ages of six weeks and four months. A bird infected with blackhead drinks a great deal, but refuses to eat and grows steadily weaker until its death, which usually occurs a few days to a week after the disease is noted. No positive cure for blackhead has been found. As in the case of all other infectious diseases, the sick bird should be immediately removed from the flock to prevent further spread of the disease. As further control measures, reduce the ration; feed sour milk; add disinfectant to the drinking water; and allow plenty of free range.

H. P. Gaston, '23, began work April 1, 1924, as assistant in horticulture in the Michigan Agricultural College. His headquarters will be Grand Rapids and his work largely record work, about half of his time being spent on the Graham Horticultural Experiment Station near Grand Rapids and the other half on large cooperating fruit farms located in the fruit district of Michigan.

Testing Wheat for Quality

T. T. Hogan, F. M. E., '24

Quality of wheat is related to its use. Durum wheats are better for making macaroni and soft wheats are better for making self-rising flour than the hard wheats. "Quality" in this article is limited to the hard red winter wheats.

Quality in wheat is reflected in the flour it makes. A wheat of high quality will make a flour of high quality. The difference between flour milled from high-quality wheat and flour made from low-quality wheat, both milled under the same conditions, is best shown by the results of the baking test. In this test absorption, fermentation period, loaf volume, texture, and color are factors which measure quality. Strength is a general term used in describing quality of bread wheats. Strength includes the ability of the flour to withstand mixing methods without injury and its power to make a light loaf of good volume and texture. Absorption measures the amount of water necessary to make a dough of proper consistency. Without a high degree of absorption the number of loaves possible per barrel of flour is relatively small and the universal demand is for a large number. A flour lacking in any one of these factors is considered weak. In bakeries the dough is subjected to more or less severe treatment. Unless the flour is strong enough to withstand this the resulting bread will not be of high quality. From this it follows that quality in flour goes hand in hand with quality in wheat.

Some of the most important effects of quality in a wheat are the visual properties of the bread made from the flour. There are several possibilities in a loaf. It may have small volume with good or poor texture or large volume with good or poor texture. A loaf of bread from high-quality wheat will have large volume and good texture. The cells will be small and well distributed and the walls thin and even throughout.

The capacity of flour to produce a good loaf depends on the quality of the gluten. Gluten is produced from the flour proteins, gliadin and glutenin, when the flour is mixed with water to form dough. Gliadin is a gluey substance which binds the glutenin and other constituents together, holding in the carbon dioxide which gives the loaf its lightness. If the gluten is too weak the partitions between the globules break, and these coalesce resulting in a coarse-grained bread. A weak gluten will yield under the weight of the dough and a well-rounded loaf will not be formed.

Quality in wheat is affected by the following factors: Climate, soil, and variety. Ground on which wheat has been grown for many years will become deficient in certain fertilizing elements and the quality of wheat will be lowered. Rotation of crops or any system of tillage or of fertilization which will increase the available nitrogen in the soil will improve the quality of the wheat. Baking tests made in the Department of Milling Industry have shown that wheat grown on ground plowed in July give both a better loaf volume and a better texture than wheat grown on ground plowed in August or September. Any method of soil preparation which removes or keeps down the weeds will have its effects on the loaf. Here quality and yield per acre go together. Varieties of wheat have an influence on the bread, but this is less than that of climate and soil, providing the varieties are not grown outside of the region to which they are adapted. The region where the wheat is grown has a great deal to do with the quality of wheat. For instance, a wheat grown in western Kansas is hard and flinty with a dark color and a vitreous kernel, while one grown in the eastern part of the state is softer, larger, and more starchy. The former has usually a high protein content and makes a strong bread flour. The latter may have a high protein content, but this is of a different quality which is reflected in the flour. In general wheat grown under semi-arid conditions will make a strong flour.

Three classes of tests are regularly made by the Department of Milling Industry in determining the quality of wheat; namely, milling tests, chemical analyses, and baking tests. Milling tests include the following: Taking the test weight or determining the weight per bushel; cleaning the wheat or removing

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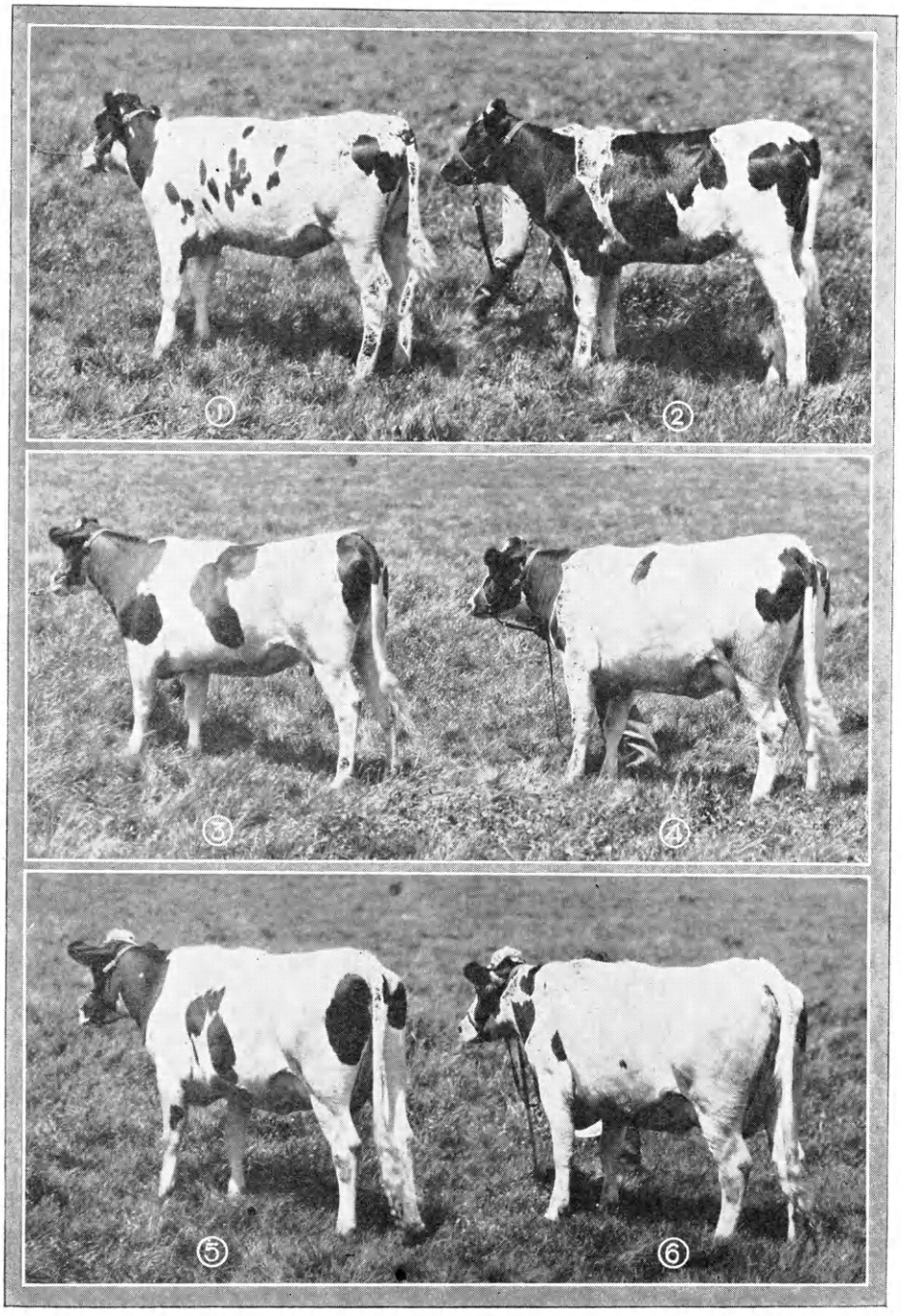


THREE PROMISING PAIRS OF TWIN HEIFERS

(1) K. S. A. C. Korndyke Ina and (2) K. S. A. C. Korndyke Inka at 9 months and 28 days of age. (3) Canary Paul Lightning and (4) Canary Paul Thunder at 2 years, 11 months and 2 days of age. (5) Canary Paul Stripes and (6) Canary Paul Stars at 3 years and 13 days of age.

The Twin Trio

Floyd M. Wright

All readers of The Kansas Agricultural Student will remember Inka and her twins. Their pictures were shown on the cover page of Volume II, No. 2 of the magazine, issued December, 1922. But Inka was following a precedent in the college herd of purebred Holsteins. Her offsprings, born August 1, 1922, were the third pair of Holstein twin heifers born in the college dairy herd within a 26-month period. The entire group (1, 2, 3, 4, 5, 6), designated "The Twin Trio," is herewith presented. The pictures were taken June 27, 1923.

Inka's twins were named K. S. A. C. Korndyke Ina (1) and K. S. A. C. Korndyke Inka (2), "K. S. A. C." being the prefix attached to the names of Campus Sir Korndyke Qaud's daughters. At birth Ina weighed 90 pounds and Inka 80 pounds. Between ages of nine and twelve months Inka surpassed Ina in weight tipping the scales her way. However, at the present time Ina has at the age of nineteen months regained her poise and weighs 909 pounds, Inka weighing only 835 pounds. True to Holstein type these heifers at the present time appear somewhat leggy and tall. Their full development will be awaited with interest, their mother being regarded as the queen of the K. S. A. C. dairy barn.

On Flag Day, June 14, 1920, the first pair (5, 6) of the Twin Trio were unfurled. On July 25, 1920, the second pair (3, 4) arrived during a thunder storm. The sire of these two pairs of twins is Canary Paul Fobes Homestead 6th. To commemorate these important events the twins born on Flag Day were named Canary Paul Stars (6) and Canary Paul Stripes (5). The twins born during the storm were named Canary Paul Thunder (4) and Canary Paul Lightning (3). The sire of the two sets of twins being the same they are all half sisters on their sire's side. Carlotta Mattie DeKol is the dam of Stars and Stripes. Maid Wayne Dekol is the dam of Thunder and Lightning. The mother of these two cows, Mattie Wayne DeKol, is the maternal granddam of the two pairs of twins. Further the grandsire of Stars and Stripes on their dam's side is Sir Carlotta Pontiac Cronus who is also the great grandsire of Thunder and Lightning on their dam's side. These two pairs of twins, therefore, carry 87½ percent of common blood. On January 1, 1924, these four heifers at approximately 3½ years of age, averaged 1,419 pounds in weight.

Each of the four heifers has just completed a semi-official record. In 365 days Canary Paul Stars, beginning her record at the age of 2 years and 7 months, produced 12,582 pounds of milk and 409 pounds of butterfat; Canary Paul Stripes, beginning her record at the age of 2 years and 4 months, produced 11,065 pounds of milk and 364.5 pounds of butterfat; Canary Paul Thunder, beginning her record at the age of 2 years and 6 months, produced 10,416 pounds of milk and 345.4 pounds of butterfat; Canary Paul Lightning, beginning her record at the age of 2 years and 4 months, produced 8,228.5 pounds of milk and 272.68 pounds of butterfat. The average yield of the four heifers is 10,572 pounds of milk and 347.9 pounds of butterfat.

These are not phenomenal records for two-year-old Holstein heifers. The breed requirements for advanced registry are more than 318 pounds of butterfat. However, each of these heifers produced more than three times as much milk and twice as much butterfat as the average Kansas dairy cow.

Prof. H. W. Cave, Department of Dairy Husbandry, was official judge of dairy cattle for the Southwestern American Livestock Show held in Oklahoma City, March 4 and 5, 1924.

The Executive Committee of the Ayrshire Breeders' Association has selected Prof. J. B. Fitch, Department of Dairy Husbandry, to be one of the eight official Ayrshire judges for the United States for 1924.

J. C. Holmes, '12, is assistant to the Commissioner of Agriculture of South Dakota, his work being largely livestock and wool marketing.

Cooperative Experiments with Farmers Yield Valuable Information

T. B. Stinson, '24

Cooperative experiments with farmers have been conducted by the Department of Agronomy of Kansas State Agricultural College since 1911. In the first years nearly all of the work was devoted to tests with corn and wheat. Since then, however, investigations with other crops have been undertaken until at the present time all of the important crops grown in the state receive attention. The kinds of tests conducted in 1923, as well as the number of each kind and the number of counties in which they were located, are shown in the following tabulation:

Kind of Test	Num. of Tests	Num. of Counties
Wheat variety	110	65
Oat variety	38	35
Barley variety	10	9
Corn variety	57	38
Sorghum variety	69	41
Sorghum-corn comparison	7	7
Soybean variety	33	23
Wheat fertility	50	32
Oat fertility	4	4
Alfalfa fertility	23	19
Kafir fertility	3	3
Potato fertility	3	3
Wheat seedbed preparation	3	3
Rotation studies	12	4
Corn disease	2	2
Grass seeding	2	2
Crop adaptation	23	8
Miscellaneous	12	10

A total of 461 tests were conducted in cooperation with farmers in 75 counties. The number of plots in each test ranged from 1 to 50, most of them containing between 5 and 15 plots. The accompanying illustration shows the location and distribution of the tests. The nature of the experiments in each county may also be seen by noting the symbols used to designate the different kinds of work.

H. H. Laude, agronomist in charge of cooperative experiments, states that the tests are conducted to secure reliable information for all parts of Kansas regarding the relative value of varieties of crops and methods of growing them. It is desirable to locate cooperative tests in numerous places in view of the wide range in precipitation and elevation, and the great variety of soil types.

Cooperative experiments are also conducted to aid in the distribution or adoption of new and improved varieties and practices. The tests are located on farms under actual farm conditions and thus furnish results upon which reliable and practical recommendations may be based. The crops as they grow in cooperative plots afford ideal field demonstrations where county agricultural agents may hold meetings and where farmers may study the relative value of different varieties or different methods of growing crops in their neighborhood. The evidence presented in such demonstrations is convincing and is effective in establishing the best varieties and practices.

Cooperative experiments are conducted on a purely cooperative basis in which the participants are the farmer, the Department of Agronomy, and the county agricultural agent, in counties having agents. The farmer furnishes the land and the field labor and keeps a record of his field operations. The Department of Agronomy furnishes the seed for variety and adaptation tests, the fertilizers for fertility tests, and provides directions for conducting the experiment and report forms for recording the data. The department threshes the crop in all tests where the results include the yield of threshed grain. The work of calculating, tabulating, and analyzing the data is also done in the Department of Agronomy. Members of the department staff visit as many tests as possible every year, especially at harvest to obtain data and to discuss the work and results with the cooperator, the county agent, and others.

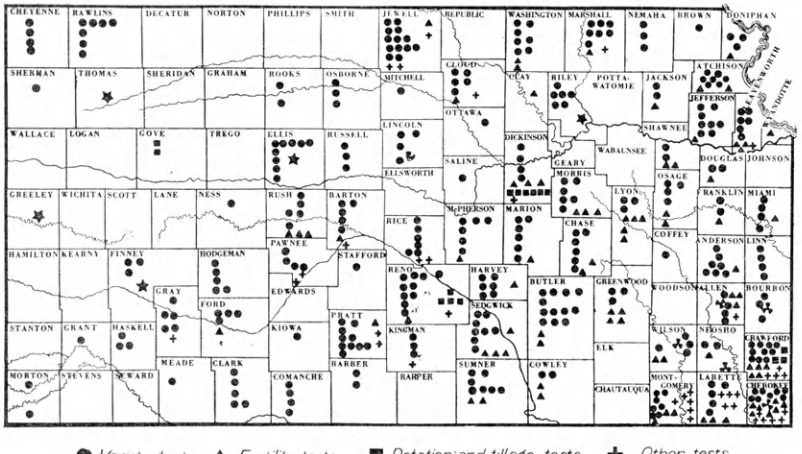
The county agricultural agent takes an active and important part in cooperative experiments by locating cooperators who are qualified to handle the experiment, by supervising the work and assisting with various features such as planting, harvesting, and keeping records. The county agricultural agent keeps a file of all tests in the farm

bureau office and publishes results in the Farm Bureau News and the county papers.

Cooperative experiments have done much to determine the best varieties of crops and the best methods of growing them in various parts of the state. For example in the corn variety tests last year Pride of Saline produced more than any other variety in northeastern Kansas where it averaged 50 bushels per acre. Shawnee White, which for the last 10 years has averaged approximately the same as Pride of Saline, made 3 bushels per acre less last year. Boone County White, the most commonly grown variety of white corn in Kansas, produced 4 bushels per acre less than Pride of Saline last year in the northeastern part of the state. In the tests last year Reid Yellow Dent ranked somewhat lower than Boon County White although the average for several years shows that they are about equal and that they average about 6 bushels less than Pride of Saline.

In extreme southeastern Kansas early varieties such as Freed White and Colby Bloody Butcher yielded relatively high last year because of the unusual drouth which damaged the medium- and late-maturing varieties. Midland Yellow Dent, a medium-season variety which was developed in that locality, did remarkably well under the severe conditions. Farther northwest in what is usually termed the hill section, Commercial White and Pride of Saline stood at the top of the list. Pride of Saline maintained its high rank throughout the north central part of the state but in south central and western Kansas it was superseded by Freed White, Cassel White, and Colby Bloody Butcher, all of which are early hardy western corns.

In northwestern Kansas where the season was unusually favorable for corn, the yields were high. Pride of Saline again approached the top but did not exceed the yield of the early western varieties.



Approximate location of the various cooperative experiments conducted by the Department of Agronomy of K. S. A. C. during 1923.

C. A. Perry, '22, has moved from Denver to Scottsbluff, Nebr., where he is going into the green house and truck business.

G. A. Filinger, '24, has been appointed as graduate assistant in the Department of Horticulture, K. S. A. C.

L. H. Fairchild, '16, is associate professor of dairying, Purdue University, Lafayette, Ind.

F. M. Wadley, '16, is junior entomologist, U. S. D. A. His address is 126 South Minneapolis Avenue, Wichita, Kan.

Tomato Wilt Experiments

Earl M. Litwiller, '24

Perhaps few persons realize that Kansas produces an appreciable quantity of tomatoes, but the annual value of this crop in Kansas is approximately $500,000. During 1920 there appeared in several of the southern and eastern counties of the state a tomato wilt disease so serious in its destructiveness that the commercial production of this truck crop was threatened with ruination. The plant pathologists of Kansas Agricultural Experiment Station at once began experiments in order to develop or ascertain varieties of tomatoes that would be resistant to the particular strains of the disease present in the state. The Department of Horticulture began to test resistant varieties under garden and field conditions. Their object is to find the resistant variety that will prove the largest commercial success under Kansas conditions. These field tests of the last three seasons have shown some positive results in favor of certain varieties and methods of culture.

Tomato wilt disease is caused by the pathogenic organism, *Fusarium lycopersia,* one of the numerous soil borne fusariums. When once the soil becomes infected with this disease, it is impossible to grow the ordinary varieties of tomatoes upon such land unless long-time rotations are practiced. The fusarium gains entrance to the plant through the roots; it permeates the fibro-vascular bundles of all parts of the plant clogging them in a manner that the free movement of water throughout the plant is prevented. This does not inhibit the transpiration of the water from the leaf surfaces, but the failure of the roots to renew the supply soon results in a wilting and finally in the death of the plant. Wilting is the first and only external indication of the presence of this disease. Because the wilting does not occur until the plants have set fruits, the entire planting may be infected before one realizes that the disease is present.

It has been found that the only practical remedy known whereby the wilt in tomatoes may be controlled is through the growing of resistant varieties and strains. In other states there have been developed several such varieties; but because of changed environmental conditions and perhaps the fact that different physiological strains of the disease organisms might attack such varieties when grown here, it became necessary to test the resistant varieties under local conditions. Futhermore, it was not known how these varieties would adapt themselves to Kansas conditions or how fruitful they might prove to be. The experiments that were conducted aimed to investigate these questions as well as to make a comparison of methods of culture.

Tomatoes of both resistant and nonresistant varieties were planted on the campus in soil that is known to be heavily infected with the wilt disease. Young plants, which had all been given the same kind of treatment, were set three feet apart each way and one variety to each row. By dividing each variety into four groups that were given different treatments, it was possible to subject each to four kinds of treatment. In the first group, no attempt was made to prune or train the plants. The ground was cultivated to control weeds and to form a dust mulch. In group two a single main stem was allowed to grow with all side shoots, which were not blossom clusters, removed. The soil treatments were the same as in group one, but the plants were trained to a trellis. The trellis was used also for group three, but about four inches of straw mulch was applied after the soil had been thoroughly worked up to a dust mulch. The plants in group four were mulched with straw but were allowed to remain unpruned and without training of any kind.

Thus far comparative yields of the different varieties and strains tested have been obtained for three seasons. Not all the varieties tested have persisted. After the first year, some varieties indicated that they had no commercial value. These were abandoned. The varieties used during the three seasons are: Ponderosa, Norduke, Self Pruning, John Baer, Bonnie Best, Louisana Red, and Earlina. Of these Norduke and Louisiana

(Continued on page 124)

Comparison of Three Methods of Producing Baby Beef

H. H. Carnahan, '25

Experimental work carried on last year by the Department of Animal Husbandry of Kansas Agricultural Experiment Station indicates that it pays to full feed calves from the start rather than to rough them along for awhile and then put them on full feed. The experiments also indicate advantages of winter feeding over summer feeding but suggest that if it is necessary to summer feed, grass should be included in the ration.

One lot of calves were full fed shelled corn and cane silage from November 3, 1922, to June 22, 1923. In addition they were fed daily, during this period, one pound of cottonseed cake and two pounds of alfalfa hay per calf. Their average daily consumption of shelled corn was 9.71 pounds and of cane silage, 9.12 pounds per calf. At the beginning of the experiment their average weight was 342.67 pounds. They gained 2.06 pounds per calf per day, weighing 819 pounds per calf at the close of the experiment. They sold for $10.35 per hundred or $84.77 per head. These calves cost $29.13 per head which, added to the feed cost, $42.44, made a total outlay of $71.57, leaving a margin of $13.20 per head between calf and feed cost and selling price.

A second lot of calves of similar size and quality were roughed through the winter on silage, alfalfa, and cottonseed cake, only enough being fed to produce an average gain of 75 pounds per calf by April 1, 1923, when they were started on a ration which averaged 12.44 pounds of corn per calf per day for the entire period (April 1 to October 30, 1923) with a daily feed of one pound of cottonseed cake and alfalfa hay as roughage. No silage was fed after May 1. This lot averaged 395.75 pounds per calf November 20, 1922, when they were started on the roughing ration; 468.97 pounds April 1, 1923, when they were put on grain; 843.75 pounds October 30, 1923, when they were marketed. While on the grain ration these calves made an average daily gain of 1.75 pounds per head, the selling price was $10.75 per hundred or $90.74 per head. The calves cost $33.64 per head; the feed from November 20, 1922, to April 1, 1923, $10.92; from April 1 to October 30, 1923; $46.92; making a total steer and feed cost of $91.48. The calf and feed cost per head was, therefore, 74 cents per head greater than the selling price. This outlay of 74 cents per head in excess of the selling price may be compared with the margin of $13.20 per head secured in the first lot.

A third group of calves of similar size and quality to the other two were fed from November 20, 1922, to April 1, 1923, the same as the second lot. On April 1 they were started on grain, getting up to ten pounds per day by May 1, when they were turned on grass and given a feed of corn, supplemented by one pound of cottonseed meal per head, each day at 5:30 a. m. The daily feed of corn from April 1, to October 30, 1923, averaged 13 pounds per head. The calves averaged 394 pounds November 20, 1922, 469.17 pounds April 1, 1923, when started on grain, and 910 pounds October 30, 1923, when marketed. They made an average daily gain of 2.1 pounds per calf while being fed grain. The selling price was $11.25 per hundred or $102.37 per head. The calves cost $33.49 per head; the feed from November 20, 1923, to April 1, 1923, cost $10.92 per calf and from April 1 to October 30, $48.99 per calf, making a total steer and feed cost of $93.40, leaving a margin of $8.97 per head between calf and feed cost and selling price. Figuring on the same basis the margin on the first lot full fed during the winter was $13.20 per calf, while the calf and feed cost in the second lot, wintered the same as the third and fed the same grain ration in summer but in dry lot without pasture, exceeded the selling price by 74 cents per head.

These results indicate: (1) That under the conditions herein described the roughing of calves through the winter and then full

(Continued on page 124)

Monopoly Control of Farm Products

George W. Montgomery, '25

Because monopoly control has been the basis of phenomenal success in a few instances, many persons believe that monopoly control of farm products through cooperative marketing will deliver the farmer from the present critical condition in agriculture. Monopoly, to many, carries the thought of magic power; they see only results, not looking beyond to consider the conditions which make the monopoly possible.

Monopoly may be defined as such substantial unity of action on the part of one or more persons engaged in some kind of business that exclusive control of a commodity or of the trading in some market is secured. The essentials of a monopoly are substantial and controlling unity of action and management. Those in control of a monopolized business act as one man and gain the advantages of unified action.

Is it possible for farmers to obtain monopoly control of farm products? By the use of strikes and boycotts, labor has been able to obtain and enjoy a monopoly. If the farmers were organized could they use the same methods to obtain and hold a monopoly? There are some outstanding differences between labor and farm products. When labor is wanted it is wanted at a definite time and place. It cannot be easily transported, nor can an over-supply of labor of one period be saved to satisfy a future demand. Labor is not a freely moving commodity, while on the other hand, farm products are freely moving. Farm products can be transported easily and an overproduction of one season may be saved to satisfy a future demand. It is impossible to get a permanent monopoly in any one place on most agricultural products of the United States, because these products are universally produced and their prices are determined in the world market. A monopoly in one section or even in one country cannot control the price under free trade. Suppose the farmers of Kansas had complete control of Kansas wheat, there would be nothing to prevent buyers from going to South Dakota or Canada for their wheat and Kansas farmers would be compelled to sell their wheat at the price determined by the world market.

To secure a permanent monopoly, the production of the commodity must be controlled. As soon as a temporary monopoly is established and profitable prices are set up, production will increase. There are three ways in which production of a crop may be increased. These are: (1) Increasing acreage by bringing new land into production, (2) increasing acreages by crowding out or decreasing the acreage of some other crop, and (3) by increasing the product per acre. It is difficult to control these ways of increasing production. Farmers outside the organization may do as they please with their products and men from other industries may be attracted to farming by the profitable prices. This has been illustrated by the overproduction in the raisin industry in California and the milk industry in Washington. Due to his independent nature, the farmer is not willing to submit to rules of a controlling oraginzation. He does not want to be told what he shall raise, the amount he shall raise, and how he shall raise it. So long as the individual farmer is free to increase his product, a monopoly can never be maintained.

Even if farmers submitted to such drastic regulation and evaded competition of world markets by means of a tariff, it is doubtful if these conditions could be maintained, since they would be disadvantageous to the 70 per cent of the population of the United States who are not farmers.

Cooperative marketing was inaugurated to obtain justice for and improve the financial condition of farmers. It will continue to exist only if it accomplishes those things which farmers expect of it, and monopoly control of prices is one thing that cannot be secured. Forces within and without the agricultural industry tend to keep it on a competitive basis. It may be possible for farmers to gain monopoly control of a product, but it is very improbable. As long as the American farmer values independence of action and a spirit of initiative, he will not desire mon-

(Continued on page 126)

Effect of Time of Cutting Alfalfa on Stand and Quality of Hay

Max M. Hoover, '24

The time of cuttting alfalfa is one of the important considerations in the culture of the crop. There is, perhaps, more literature available on this phase of alfalfa culture than any other, and this available literature is full of conflicting statements. In order to secure reliable data on this phase of alfalfa production the Kansas Agricultural Experiment Station outlined and conducted the following described experiment:

Nine plots of ground, 169 by 62 feet, with practically uniform soil, were marked out for the experiment. However, only an inner portion of each plot, approximately 169 by 27 feet and containing one-tenth acre, was harvested for the test. The waste border on each plot elminated the error due to the border effect of two contiguous plots. The presence of a border also prevented the spread of leaf spot, *Prenopeziza medicaginus*, a disease which was found to develop in plots that were allowed to stand.

These plots were cut in four different stages of growth: (1) Bud stage, when the flower buds were formed but before the blossoms appeared; (2) tenth bloom; (3) full bloom; and (4) seed stage, when the seed pods were well formed but before they became mature. Representative green samples were taken from each plot at the time of cutting. Analyses were made of these samples by the Department of Chemistry. Livestock feeding tests on the hay cut in different stages were conducted by the Department of Animal Husbandry. Counts were made in the spring of each year to determine the effect of treatment on the stand of the various plots. The work required eight years, 1914 to 1921, for completion. The following data are among the results obtained.

DATA SHOWING RESULTS OBTAINED IN EXPERIMENT IN TIME OF CUTTING

Stage of cutting	Av. annual yield of hay including grass (Tons per A.)	Av. annual yield of hay without grass (Tons per A.)	Number of plants per acre in 1914 (000 omitted)	Number of plants per acre in 1922 (000 omitted)	Percent of loss in stand	Average percent of protein	Av. lbs. of hay required for 100 lbs. gain in a three-year test
Bud stage	3.35	2.78	562	129	77.1	17.5	1,628
Tenth bloom	3.41	3.21	534	85	84.1	16.5	2,086
Full bloom	3.51	3.43	447	159	64.4	15.4	2,163
Seed stage	2.94	2.93	427	197	53.9	13.3	3,910

The following conclusions seem to be justified by this experiment:

1. Frequent cutting if practiced continually weakens the alfalfa plants, permits the encroachment of weedy grasses, reduces the yield, and, because of the number of cuttings, increases the expense.

2. Delayed cutting does not weaken the plants in any way yet discovered and cutting off the basal shoots as a result of late cutting does not injure the subsequent growth of the plant as is often believed.

3. The best quality of hay as determined by chemical analysis and feeding tests with steers is that obtained from the earliest cutting. This is true only as long as the stand is not weakened to the extent that grass and weeds come in and take the place of the

4. Hay of good quality has been produced at the least expense by cutting when the plants are approximately in full bloom. This is due to higher yields and fewer cuttings.

5. In the last analysis it would seem desirable to cut alfalfa between the tenth and full bloom stages of growth, the exact time depending on the use to be made of the hay and the future disposition of the field. Weather conditions and labor must also enter as factors in making the final decision.

THE KANSAS AGRICULTURAL STUDENT

KANSAS STATE AGRICULTURAL COLLEGE

MANHATTAN, KANSAS

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THANK YOU

Yes, we heartily thank you for your contribution in making The Kansas Agricultural Student what it is—a success. Many of our friends have assured us that the magazine is a success. Our friends are critical, the magazine is their publication.

Many of our old grads during the past year have sent in messages of encouragement and helpful criticisms. Others have contributed articles for publication some of which were published and some of which were not, but we appreciate them all. It's the spirit of the Aggie Alumni that counts. You are backing the magazine—keep it up.

To our advertisers, national and local, like dad and his prodigal son, your dough made a go of the "Ag Student." Thanks to "Skeet and Wayne" for their efficient work, the books will be closed with a comfortable balance.

The support of Ag Profs, alumni, and students has never been lacking. You contributed more articles than space would permit us to publish. You made the Ag Student what it is today. We hope that you are not satisfied. Keep up the old Aggie fight; make each number better than the preceding number. Make mistakes but don't make the same mistake twice. Let us not be proud of what the Ag Student has been but of what it is.

The editorial staff, that hardworking, ever changing, never give up staff! You made them write when they thought they couldn't; you delayed some from writing when they thought they could. Words fail to describe the pleasure felt in being a part of an organization in which every member plays his part and does it well.

Surely our experiences with the Ag Student have been pleasant and profitable. We are glad if we have made any contribution toward the upbuilding of the magazine and wish it ever increasing success in the future.

OUR COVER PAGE

The cover page of this issue, by F. E. Colburn, college photographer, shows the head of an excellent Dorset ram lamb, bred and owned by the College. Officially in the college flock books and in the Continental Dorset Club records he is known as KSAC 396-27570, but more familiarly to his friends he is "Young Luke." During 1923 he went the route on the show circuit undefeated, winning his class at the Kansas Free Fair at Topeka, the American Royal at Kansas City, and the International at Chicago. At each of these shows he also headed the first-prize lamb flock.

This young ram is a winner by right of inheritance, his sire having been the champion Dorset ram at Topeka in 1921, 1922, and 1923, champion at the American Royal in

1922, and first in his class at the International the same year. His dam was also the dam of the champion Dorset wether at the International in 1922. Besides the champion ram lamb and the champion wether, she has to her credit a ewe lamb twinned with the ram, and twin ewe lambs, born in the fall of 1923, which look to be the best ewe lambs in the college flock.

"Young Luke" gives great promise as a sire, the best ram lamb born in the college flock this spring having been sired by him. The Department of Animal Husbandry considers itself very fortunate in having such an outstanding young ram in the college flock.

MORE SHEEP FOR KANSAS

Sheep, properly handled, have for several years past proved a very profitable investment for their owners and apparently there is no reason for their not continuing to do so. There has been an enormous decrease in the world's total number of sheep in the past ten years, and there has developed a good demand for sheep and sheep products. Especially is this true in the United States where an excellent year-round market for lamb is offered. Increase in numbers of sheep on the ranges is not possible but there is a place for more farm flocks. Over-production is not probable for years to come, and with the increasing population and the country's rapidly developing taste for lamb, the farm flock bids fair to continue as a very profitable investment.

FROM HIGH SCHOOL SENIORS TO COLLEGE FRESHMEN

Before the next issue of The Kansas Agricultural Student comes from the press several thousand students—now high school seniors—will be enrolled as college freshmen. The selection of the college course and the selection of the higher educational institution in which that course shall be taken are serious and important steps in the life of any young man or woman.

Choose K. S. A. C.

Undoubtedly twelve to fifteen hundred of these college freshmen will be enrolled in Kansas State Agricultural College next September. They will find here a college community without a superior—a community where every student stands on his own merits, where honest work is respected, and clothes don't make the man. They will find a college faculty willing and anxious to be helpful and to serve and a democratic spirit pervading alike their associations with faculty and fellow students. They will find well organized curricula and standards of life and work pleasing to all who want to do something worth while. If you want a college course in agriculture, home economics, music, journalism, veterinary medicine, engineering, or just a regular standard college course in which you may major in rural commerce or a physical or biological science, don't fail to investigate the opportunities offered at K. S. A. C.

Enroll in Agriculture

Many of the readers of this article will be farmers' sons. There is no better blood to be found. You farmer's sons—and many that can not boast of such parentage— are intensely interested in agriculture, the greatest industry of Kansas. Kansas State Agricultural College has a college curriculum in agriculture. This curriculum not only trains young men for scientific farming and related agricultural industries and professions, but provides an excellent all-round college education for Kansas youth. It is at once both cultural and practical. In pursuing this curriculum young men from the farm can capitalize their early training and prepare themselves for larger and more remunerative service and usefulness in Kansas or elsewhere.

Farmers' sons of Kansas! The curriculum in agriculture of K. S. A. C. appeals to you. Consider carefully the opportunities it offers and the fine training it provides before looking to new fields for contentment, usefulness, and prosperity. "The grass is always greener on the other side of the fence" is a trite saying but the idea is continually leading young and old astray.

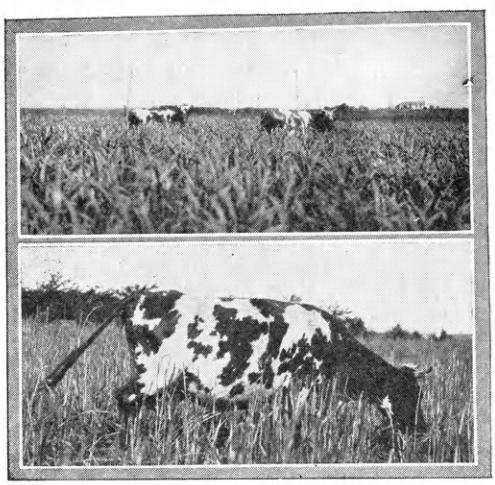
Dudley B. D. Moses, '24, has been elected lecturer in agronomy, Potchefstroom School of Agriculture, Transvaal, Union of South Africa.

Sudan Grass as a Late Summer Pasture for Dairy Cows

Edward Watson, '24

One acre of Sudan grass pasture at Colby, Kan., was worth $26.21 when converted into butterfat. These figures have been ascertained in a three-year test conducted at the Colby branch of Kansas Agricultural Experiment Station by B. F. Barnes, superintendent.

In the spring of 1921 approximately 1.75 acres of native sod was plowed up early in April, worked down into a firm seedbed, and seeded to Sudan grass the first of June. The plan was to use this area for Sudan grass pasture continuously. A firm seedbed was prepared each year and about 18 to 20 pounds to the acre of seed planted with a disk drill. The cows were usually turned on just one month after planting and left on, except at milking time, until frost. The grass may average anywhere from 16 inches to 3 feet in height at the time the cows are first turned on. The accompanying picture shows the cows soon after being turned on the grass in July, 1923; also one of the cows as she appeared in the pasture during the last days of August.



DAIRY COWS ON SUDAN GRASS PASTURE
The top picture shows a heifer (No. 23) and a cow (No. 3) when turned on Sudan grass pasture July 14, 1923. The lower picture shows the cow (No. 3) in the Sudan grass stubble, August 29, 1923.

Each year representative cows from the dairy herd were used. In 1921 and 1922 the cows were mature cows while for the season of 1923 one was a heifer, fresh for the first time.

The length of pasturing season varies somewhat with the season. As a general rule cows can be left on from the time of turning on until frost. In 1921 the two cows used in this experiment were kept on the Sudan grass pasture eleven days after frost; in 1923, nine days after frost. In 1922 the cows were taken off the Sudan grass after only 58 days on account of the severe drouth. This was an unusual season, however, since 98 days of pasture were secured in 1921 and 101 days in 1923. Thus the average time of pasturing for the last three years has been 85 days.

The amount of milk produced from the 1.75 acres in Sudan grass naturally varied from year to year being 5,006.5 pounds for 1921, 3,475 pounds for 1922, and 3,435 pounds for 1923, or an average of 3,972.16 pounds from 1.75 acres or 2,269.8 pounds per acre per year for the three-year period. The milk contained an average of 3.5 percent butterfat which at 33 cents per pound gives an average annual income of $26.21 per acre from the butterfat produced. In 1923 one of the cows was fed grain throughout the pasturing season whereas in other years grain was fed only after the pasture began to get somewhat dry. When grain was fed it was at the rate of one pound of grain for every three pounds of milk produced.

The weights of the individual cows on being taken off the pasture at the close of each season did not vary greatly from the weights on being turned on Sudan grass pasture.

The following conclusions may be drawn from the results secured at the Colby Branch Experiment Station during the three-year period under discussion:

1. Sudan grass under conditions similar

to those at Colby should carry in a normal year one mature cow per acre for 90 days, or from July 10 till about frost, which at Colby occurs normally about October 6.

2. Sudan grass increases the milk flow to a pronounced degree from that produced on native pasture.

3. From results in 1923 it does not pay to feed grain to cows on Sudan grass until after September 1, unless the grass gets too scant before that time.

4. Milk cows will not increase in body weight while on Sudan grass any more than on native pasture.

5. On land cropped continuously to Sudan grass the carrying capacity of Sudan grass per acre, in a season in which the rainfall is decidely below normal, is greatly decreased.

6. The same relative percent of increase in milk flow is noted from fair producers as from good producers.

7. Calculating the value of the butterfat produced at 33 cents per pound the average annual value of the Sudan grass pasture in this experiment was $26.21 per care. The skimmilk would more than pay for the grain fed to the cows.

8. No detrimental effect has been noted from growing Sudan grass on the same land for three years.

9. Cows have eaten the Sudan grass close to the ground without harm when the rainfall was scant.

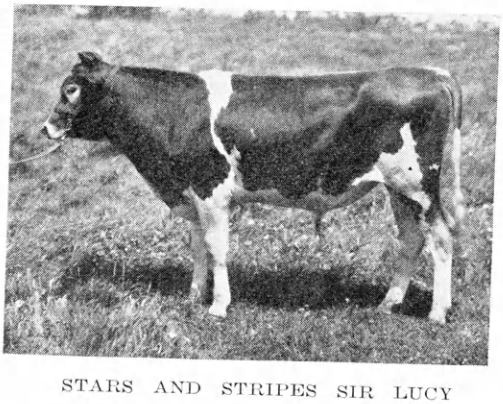
A Promising Young Guernsey

Walter T. Crotchett, '24

Stars and Stripes Sir Lucy was made Junior and Grand-champion Guesrnsey bull by Judge James W. Linn, at the Kansas Free Fair at Topeka this fall. Sir Lucy was shown as a senior calf. He is a very promising individual and was especially praised by the judge for his superior quality and depth. He was also first-prize senior calf at the Hutchinson State Fair.

Sir Lucy was sired by Brookmeads Secret Stars and Stripes, a bull that was used in the college herd but one year (1920-21) being leased from Ransom Farms, Homewood, Kan., for that period. Sir Lucy's dam was Imp. Lucy 2d of Corbinez, a cow owned and developed by the Kansas State Agricultural College. As a two-year-old she made the remarkable record of 423.93 pounds of butterfat in one year and at five years of age made 532.67 pounds of butterfat. Lucy 2nd was formerly state record cow in the junior four-year- old class. In view of the fact that she was a state record cow and her son, Sir Lucy, shows such good breed type he is to be used as the junior Guernsey herd sire of the K. S. A. C. dairy herd.

The college dairy herd is kept to furnish material for class work and for experimental purposes. It is handled by approved methods of dairy management. The four major dairy breeds are well represented. There are several state record cows in the herd and there is one former world's record cow. Sir Lucy's success in the show ring and promise in the college dairy herd are but another proof of the quality of the herd.



STARS AND STRIPES SIR LUCY

W. L. Blizzard, '10, professor of animal husbandry at the Oklahoma A. and M. College, Stillwater, recently visited his alma mater. Professor Blizzard is recognized as one of the best judges of livestock in America.

College Notes

THE HONOR SOCIETY OF AGRICULTURE, GAMMA SIGMA DELTA, ELECTS MEMBERS FROM CLASS OF 1924

Members of the graduating class majoring in agriculture or closely related sciences, whose scholarship is sufficiently high to place them in the upper 25 percent of the class, and who give promise of leadership in agricultural industry, are eligible to membership in The Honor Society of Agriculture, Gamma Sigma Delta.

At a recent meeting of the society the following members of the Calss of 1924 were elected to membership:

CANDIDATES FOR THE DEGREE BACHELOR OF SCIENCE IN AGRICULTURE

F. M. Alexander, Wellington; M. L. Baker, Syracuse; Dan M. Braum, Denison; T. W. Bruner, Lakin; B. R. Churchill, Fiatt, Ill.; Walter T. Crotchett, Louisburg; C. O. Dirks, Augusta; J. L. Farrand, Hunter; G. A. Filinger, Cuba; George E. Hendrix, Lane; Max M. Hoover, Burlingame; F. F. Lampton, Cherokee; R. G. Lewis, Emporia; E. M. Litwiller, Manhattan; J. K. Muse, McPherson; Walter E. Myers, Eskridge; Mrs. Dorothy Lush Nelson, Altamont; R. T. Patterson, Ellsworth; E. C. Scott, Galena; R. W. Sherman, Burlington, N. J.; A. W. Stover, Manhattan; R. L. Stover, Manhattan; C. D. Tolle, Manhattan; and M. M. Williamson, Kansas City, Mo.

CANDIDATES FOR THE DEGREE DOCTOR OF VETERINARY MEDICINE

C. J. Coon, Manhattan; E. E. Hodgson, Harveyville; and W. T. Miller, Manhattan.

CANDIDATES FOR THE DEGREE MASTER OF SCIENCE

M. M. Beeler, Topeka; H. R. Bryson, Leon; P. W. Gregory, Frankfort, Ky.; Dudley B. D. Moses, Johannesburg, Union of So. Africa; and R. R. St. John, Manhattan.

STUDENTS' GRAIN JUDGING CONTEST

The sixth annual Students' Grain Judging Contest was held on Saturday, March 29, 1924, under the auspices of the Klod and Kernel Klub. Cash and subscriptions to a number of agricultural publications were awarded as prizes. There were two divisions of the contest, a senior division for the students who had taken the college course in Grain Grading and Judging, and a junior division for all other students participating. In the senior division 20 entered; in the junior division, 60.

George S. Atwood of LaCygne, senior in agronomy, was high man in the senior division, with a score of 802 points out of a possible 1,000. T. B. Stinson of Manhattan, Glenn M. Reed of Galesburg, and J. E. Norton of Grainfield placed second, third, and fourth with 745, 716, and 714 points, respectively. Cash prizes were awarded these men as follows: First place, $18; second, $12; third, $8; and fourth, $5.

In the junior division of the contest, O. M. Williamson of Kansas City, Kan., senior in agricultural economics, won first with a score of 721 points. A. G. Jensen of Neodesha, Ben Grosse of Jamestown, and E. L. Hinden of Strong City placed second, third, and fourth with 718, 667, and 660 points, respectively. These men were awarded the following cash prizes: First place, $12; second, $8; third, $5; and fourth, $3.

Cash prizes were awarded the three highest ranking freshmen. In this group Albert M. Watson of Osage City placed first, winning $5; Stephen M. Raleigh of Clyde, second, receiving $3; and M. G. Myerley of Lyons, third, $2.

The judging was divided into three classes as follows: I. Identification. II. Grading and judging small grains. III. Judging corn, alfalfa, and sorghums. In addition to the prizes awarded on the results of the entire contest, a prize was given in each of the three classes of the contest to the high man from each division. These high men were as follows:

CLASS OF THE CONTEST	HIGH MAN	
	Senior Division	Junior Division
I	F. M. Alexander	Martin Henrichs
II	R. B. Smith	J. H. Coolidge
III	G. J. Ikenberry	Kenney L. Ford

HONORS TO THE AG SENIORS HIGHEST IN SCHOLARSHIP

Recently five Ag seniors were honored by election to Phi Kappa Phi by the K. S. A. C. chapter of that national honorary scholastic society. These seniors are: Dan M. Braum of Denison, Max M. Hoover of Burlingame, T. W. Bruner of Lakin, C. O. Dirks of Augusta, and F. M. Alexander of Wellington. The election of four other Ags of the Class of 1924 has previously been announced. (See The Kansas Agricultural Student, Vol. III, No. 2, page 53.)

This group of nine men constitutes the upper 10 per cent in scholarship of the Class of 1924, Division of Agriculture. Honor to whom honor is due. These men have proved themselves outstanding in efficiency in K. S. A. C.

MAY SCHEDULE OF AGRICULTURAL EVENTS

May, the last month of the college year, is always a full month for all divisions and organizations on the college campus. The agricultural events of outstanding interest for the month include the following:

Thursday and Friday, May 1 and 2.—Fourth Annual State High School Contest in the judging of farm products.

Saturday, May 3—Fourth Annual Ag Fair.

Saturday, May 10—Seventeenth Students' Annual Dairy Judging Contest.

Monday, May 12—Twenty-Second Students' Annual Stock Judging Contest.

Saturday, May 24.—Twelfth Annual Feeders' Day Convention.

FEEDERS' DAY CONVENTION

The annual Feeders' Day Convention (the twelfth to be held at K. S. A. C.) will be of large interest to livestock feeders in Kansas and this section of the country. Besides the regular reports on the livestock feeding experiments conducted the past year by the Department of Animal Husbandry of the Kansas Agricultural Experiment Station, several outside leaders in the livestock industry will have a place on the program. These include: Charles E. Herrick of Chicago, President of the American Institute of Meat Packers; W. H. Shroyer, President of Kansas Livestock Association; J. H. Mercer, Kansas State Livestock Sanitary Commissioner and a director of the National Livestock Meat Board; and J. D. Joseph, farmer, feeder, banker of Whitewater, Kan., who will speak on the value of the Agricultural Experiment Station to the farmer. The date of the convention, May 24, the last Saturday before commencement, is earlier than usual.

AG. ALUMNUS BRINGS PLANTS FROM ORIENT

The following statement published by "Science Service" in the April 4 issue of Science refers to H. V. Harlan, '04, who returned in March of this year from a year's work in plant exploration in the Orient and who has charge of the barley investigations of the United States Department of Agriculture:

"Naked barley, whose peculiar virtue is that it is easily threshed, is one of the desirable agricultural immigrants brought brought back by Dr. Harry V. Harlan, plant explorer of the United States Department of Agriculture, who has just returned from a year's journey to India, Abyssinia, and Egypt. He was unsuccessful in finding any new varieties of bald or beardless barleys, but brought back a general assortment of foreign varieties of small grains and legumes.

"While unwhiskered barleys are known in this country, having been introduced from India many years ago, they are not of the most suitable varieties, and Doctor Harlan hoped to find some of the variants of the species which would serve for breeding crosses. These were said to be found in Nepal in India, but Doctor Harlan learned that travel to that rather remote region was so slow and uncertain that if he tried to make the trip he would be in danger of missing the trip to Abyssinia on the way home. But while in India he found some very early varieties of barley, as well as early wheat and legumes, seeds of which he brought along.

"The 'naked' barley, or barley which is easily separated from the glumes which enwrap the grain, and is therefore easily threshed, was found in Abyssinia and Egypt. Varieties of emmer, also easily threshed, were found."

Care of Young Chickens Through the Summer

H. Arlo Stewart, '26

The care of young chickens after they are taken from the brooder house, is a great factor in determining the development and utility of the birds and the constitution and vigor of the flock for years to come.

Soon after the close of the brooder period, which is usually about eight weeks in length, the pullets and cockerels are separated. It may occur that a male bird will seemingly have the characteristics of a female and be put with the pullets. This will cause no trouble if the bird is removed as soon as the error is discovered.

PULLETS ON SUMMER RANGE
Plenty of range, shade, and other protection, as well as correct feeding, are essential for the best development of pullets.

On most general farms young chickens are raised to increase the laying flock so special care is given the pullets. They should be put on a free range with plenty of good shade. The following is a good ration.

GRAIN	
Cracked corn	60 pounds
Kafir	20 pounds
Wheat	20 pounds
DRY MASH	
Bran	30 pounds
Shorts	30 pounds
Corn chop	25 pounds
Meat scrap	10 pounds
Bone meal	5 pounds

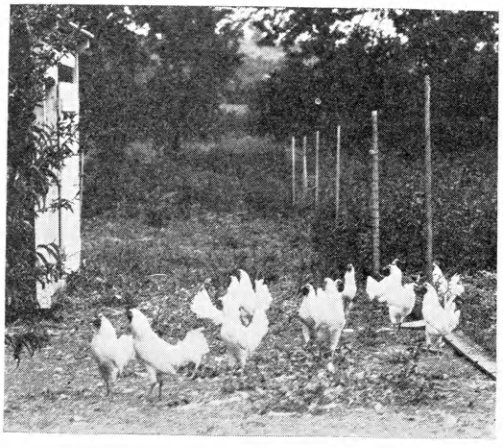
Both of these feeds are kept before the birds at all times in protected hoppers. Sour milk or semi-solid buttermilk is also recommended, if available. In hot weather the mash mixed with sour milk or water has a cooling effect on the birds and helps to keep them quiet during the hottest part of the day. If the mash is fed wet, however, care must be taken that it is fed fresh and not allowed to ferment.

As cockerels are really a by-product of pullet production their development should be as rapid as possible to finish them out for market. These birds may be divided into different classes according to market demands . However, under conditions in Kansas it is advisable to sell them as soon as possible and not hold any over two pounds for roasters. A small flock of capons may sometimes prove profitable. Fat broilers demand the top market price and the price decreases with the number on the market. It is, therefore, the person who has his broilers at or near two pounds at the earliest date who will realize the greatest profit. A broiler should weigh close to two pounds after three or four weeks of feeding after leaving the brooder house if the right methods are used. The birds are confined to small pens to limit their exercise and started on a growing ration the same as pullets but the amount of corn chop in the mash is increased a little each day and the mash gradually changed to 50 per cent of corn chop, the other 50 per cent being made up of equal parts of wheat bran, shorts, and meat scraps. Sour milk is good to mix with the mash. It is also well to keep grit before them and to provide a little green feed for variety if possible. It sometimes pays better to sell at 1.5 to 1.75 pounds than to hold for another week and feed, as the price is constantly decreasing.

Cockerels that are to be kept for breeders are handled much the same as pullets. They are given free range and a growing ration with plenty of shade. It is desirable, however, to separate the sexes and it may

be necessary to limit the range of the cockerels.

The successful poultryman is the one who can start his winter laying pens with a large



WHITE LEGHORN COCKERELS
On limited range with plenty of shade and other protection cockerels may easily be kept through summer, fall, and early winter for next season's use.

per cent of spring pullets after culling out the weaklings and undesirables. The broilers sold will reduce the amount of capital invested in the pullets on hand.

J. F. T. Mostert, '23, is working for the Bureau of Census and Statistics, Union of South Africa, Pretoria.

The following excerpts are taken from a Christmas letter from Lucy Stallings Mostert: "As yet it is all so very strange for me here. I can't think of Christmas when it is so hot. I felt like a fool for a week when I first discovered the sun shining in the north.

"There is a world of flowers and fruit here. The fruit isn't all the best quality and of course is not graded. When they learn to care for it and grade it properly it will make a large export trade.

"The average farm here is far below the average in the United States. A good many men import the best livestock from England and let them starve to death because the mealies (corn) are too precious to feed to them. So they let their own stock die and ship the grain to England to feed the stock there. From what I have heard and seen I believe there is more work to be done in animal husbandry than any other branch of agriculture in this country. The average farmer knows nothing about diversification or the value of his wastes on the farm. When one sees twenty donkeys or oxen and three or four negroes with one medium-size load that an average team of mules could easily handle with one driver one thinks something is wrong somewhere. Horses and mules are never worked with a collar, but only a breast strap. The beef on the market is mostly the oxen that are fattened up after ten or twelve years work on the farm. A little different from the baby beef."

F. J. Robbins, '13, is county agricultural agent of Franklin County which has for the past two years carried off the Kansas City Chamber of Commerce trophy offered to the county replacing the largest number of scrub bulls. This year Morris County, of which Paul Gwin, '16, is county agent, took second prize.

Floyd M. Wright, graduate assistant in dairy husbandry, received the degree, bachelor of science in agriculture, in 1923 from South Dakota State College of Agriculture and Mechanic Arts, Brookings, S. Dak.

ALFALFA IS THE GREAT LEGUME CROP OF KANSAS

Alumni Notes

E. H. Jantz, '16, is farming near Larned.

C. G. Russell, '23, is operating a 320-acre farm near La Crosse.

Paul L. Findley, '20, is operating a wheat and stock farm near Kiowa.

H. L. Baker, '22, is principal of the Senior High School, Wellington.

John M. Moore, '22, is fieldman for the Cooperative Dairy of Kansas City, Mo.

C. E. Agnew, '23, is county agricultural agent of Wilson County, headquarters at Fredonia.

W. C. Cowell, '22, is athletic director in the Iola High School. His address is 410 East Madison Street.

K. C. Davis, '91, is professor of agricultural education in George Peabody College for Teachers, Nashville, Tenn.

O. R. Peterson, '21, is teaching vocational agriculture in the Frankfort high school. His work has been exceptionally successful.

Charles A. Davis, '13, is teaching vocational agriculture in the Washburn Rural High School. His address is 1183 Wayne Avenue, Topeka.

Robert Osborn, '17, is in the employ of the Sales Department of the Collis Products Company of Clinton, Iowa. His home address is 694 Grand Avenue, St. Paul, Minn.

C. Harold Howe, '22, has returned to college for advanced work in agricultural economics. Mr. Howe secured his master's degree from the University of Maryland last spring.

R. K. Bonnett, '13, who for the past five years has been professor of agronomy in the University of Idaho, is now a member of the Washburn & Wilson Seed Company, Moscow, Idaho.

C. F. Laude, '20, has been transferred from the Kansas City Office of the Insurance Company of North America and is now manager of the Pacific Coast Division of that company with headquarters at San Francisco.

Ezra P. Mauk, '22, is teaching vocational agriculture at Thomas, Okla.

William R. McCoy, '12, is engaged in farming near Partridge, Reno County.

S. H. Coffman, '21, is teaching in the Utica Rural High School, Utica, Kan.

P. J. Englund, '17, is engaged in general farming and stock raising near Falun, Saline County.

W. D. Austin, '10, is one of the successful spring lamb producers in Kansas. His farm is near Nashville.

Bryant Poole, '01, heads a very successful livestock commission company operating at the Kansas City Stock Yards.

Leon M. Davis, '09, is assistant in the Bureau of Markets, United States Department of Agriculture, Washington, D. C.

W. C. Calvert, '16, is assistant chief in horticulture of the Iowa Agricultural Experiment Station, Ames. His address is 2110 Lincoln Way.

A. L. Bridenstine, '23, is junior biologist in charge of rodent control in the Pan-handle of Texas. He is working under the Biological Survey of the United States Department of Agriculture, with headquarters at Amarillo, Tex.

George J. Raleigh, '22, instructor in pomology at Massachusetts Agricultural College, coached the team which took first place in the Intercollegiate Apple Packing Contest of the Eastern Apple Exposition held recently in New York City.

H. J. Henney, '21, research assistant in agricultural economics, has been conducting studies in the cost of producing beef on grass in the Flint Hill region of Kansas. His field headquarters is Cottonwood Falls. He is now temporarily in the department on the campus working out the results of his studies. More than 75 cattlemen cooperated with him in giving figures on the cattle handled by them. This work has been done in cooperation with the federal Bureau of Agricultural Economics.

Fattening Native Florida Steers on Kansas Bluestem

H. Wayne Rogler, '26

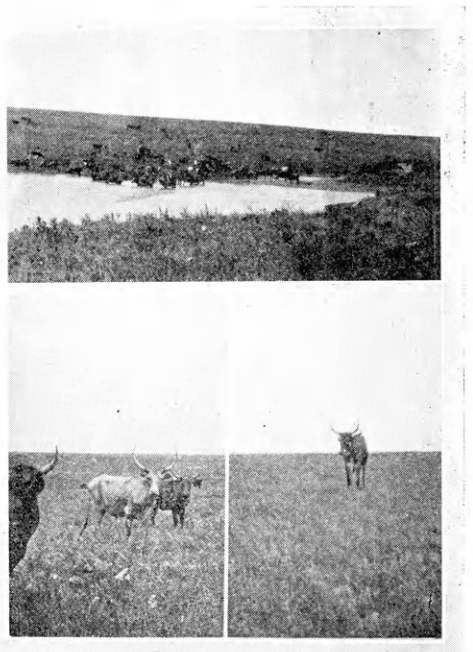
An experiment of considerable interest to the cattlemen of Kansas, and more especially to those of the Flint Hill grazing district, has been the grazing of several thousand head of native Florida steers on the bluestem pastures of Chase and Greenwood Counties.

On the border of the great corn-producing section, people too often think in terms of grain-fed cattle. They forget that an area of cheap land and grass must furnish a large percent of the meat supply. In the past the states of the West and the Southwest have been looked to almost entirely for this production. In the future, the states on our southern coast, east of the Mississippi, are destined to play an important part in the world's meat supply. Of these states one of the most imporant is Florida. In beef production Florida is today where Texas was 35 years ago.

A group of cattlemen have bought several thousand head of steers on the ranges of Florida during the last two years. These steers were shipped to Kansas to summer and grass fatten after which they were put on the central markets of Kansas City and St. Joseph.

These steers show no influence whatsoever of any of our pure breeds. They are the result of generation after generation of inbreeding, their progenitors being the small Spanish cattle brought to our southern coast shortly after the discovery of America. Their long, narrow, shallow heads show somewhere the cross of the East India buffalo. In build they are thin and shallow bodied, high off the ground, and small of bone. All are horned, the horns being for the most part black and from fifteen inches to two feet in length. In age they vary from three to eight years, with the majority four and under. They come to Kansas weighing from 400 to 600 pounds, averaging around 450 pounds. They are practically every color except a distinct red—yellow dunns, brindle, blacks, speckled, murky whites, and sometimes mixtures of all colors showing up plainly. For the most part they are rather a tawny brindle. In temperament they are nervous, easily excited, and fight at the slightest provocation. These facts together with their wildness, frequently make them difficult to handle.

The past season nearly 10,000 head of these steers were bought in the country below Jacksonville, Fla., and shipped to the



FLORIDA STEERS ON KANSAS PASTURES

grazing district of southern Chase and northern Greenwood Counties. These steers were purchased for from $10 to $14 per head. Special shipping rates for this large number put them on the Flint Hill pastures at about $20 per head. They were necessarily scattered over a considerable area, conditions, however, being practically the same in all pastures. They were given about three

acres of grass to the head, which in all cases proved to be more than sufficient.

Of the 3,100 unloaded at Madison, Greenwood County, and driven 30 miles to pasture in southern Chase County—1,200 arrived May 20, 1,400 June 10, and the remainder June 29. The number of times they were dipped accounted for the difference in the time of their arrival. Coming as they did from below the quarantine line, they must all be dipped twice for Texas fever tick before shipment and frequently the Government requires that they be unloaded and dipped enroute. They came in weak and thin from exhaustion and starvation. The cool damp weather at receiving time was not favorable for cattle in this condition, especially those adapted to the warm climate of the South. As a result considerable loss occured on the way to the pasture.

Owing to the coarseness of the grass at the time of their arrival and the extreme dryness of the section immediately following none of them gained satisfactorily. Very few got real fat. The top 1,000 head of the 3,100, which included most of the early arrivals, went on the market weighing about 700 pounds, showing a gain of 200 to 250 pounds.

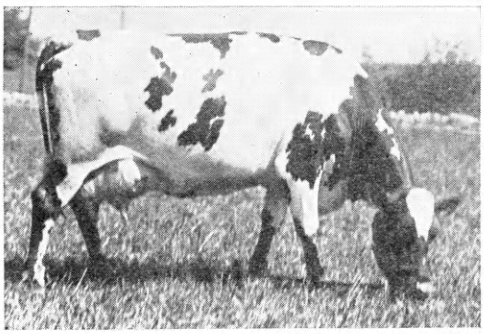
For the season 1922 these same steers when marketed averaged more than 800 pounds and were very fat. They were brought to the Flint Hill pastures, however, about a month earlier and had the advantage of a better season. They also were first shipped to Texas where they were rested and fed for a time before being shipped on to the Kansas pastures.

The pasture bill for 1923 averaged about $6.50 per head. Adding to this taxes and interest on investment, the steers had to bring about $30 per head to pay out. Those that were shipped brought about $5 per hundred. They averaged about 700 pounds per head. This, however, was for the top one-third of the 3,100 head landed at Madison. The remainder were loaded out the latter part of October for shipment to southern Texas where they will be wintered and probably returned to Kansas next spring.

Although the experiment is yet comparatively new, considerable can be said in favor of these cattle. The past two years experience indicates that if they were brought to Texas for some time, and allowed to become acclimated before shipment to Kansas, they would come in earlier in better condition and in a normal year would no doubt make more satisfactory gains during the grazing season. Although they are wild and inclined to be a little roguish until they get located, under proper handling they will put on large gains in a short time on a relatively small amount of grass.

A Remarkable Ayrshire Cow

R. H. Lush, '21



CANARY BELL

The name of Canary Bell has been repeated many times in Kansas dairy history and justly so. She was the first cow in Kansas to produce over 730 pounds of butterfat in a year and still holds the state record for Ayshires with 744.5 pounds of fat and 19,863 pound of milk. This record is also the highest record made by an Ayrshire cow in the herd of any agricultural experiment station in the United States. She was early noticed to be a very persistent producer and before her death in May, 1923, had com-

(Concluded on page 124)

The Importance of Quality in Holding Wheat

Jack W. Dunlap, '24

"Does it pay to hold wheat?" is the question that confronts the Kansas farmer of today. In connection with this question a recent study made by the Department of Agricultural Economics of the Kansas Agricultural Experiment Station is instructive. The question was put to a number of Kansas farmers as to what their experience over a period of years indicated as to the profit in holding wheat.

To the question of whether holding wheat had paid, 200 farmers replied from central Kansas. Of this number 61 per cent more answered "Yes" than answered "No." About the same number of farmers answered from eastern Kansas. In this case 9 per cent more answered "No" than answered "Yes." This shows that many farmers in the central wheat belt have had a favorable experience in holding wheat, while in eastern Kansas the results have not been so favorable.

The reason for this difference in experience is not difficult to find. Central Kansas produces a much larger per cent of "strong" or high-quality wheat than eastern Kansas. A study of the prices of No. 2 Hard Red Winter wheat in Kansas City for the past 31 years shows that the average increase in price for Choice Dark Hard Winter from September to May was 15.7 cents. The best Yellow Hard Winter wheat of the same grade increased only 9.4 cents from September to May. This means that Choice Dark Hard increased 66 per cent more than did the best Yellow Hard. What is more important it means that the 31-year average spread in price from September to May in the case of Choice Dark Hard Winter was more than enough to pay storage costs. In the case of the best Yellow Hard, the spread would hardly have paid storage costs.

Even now with the wheat market showing some weakness, good-quality wheat has not lost ground like poorer quality. For instance on March 18, 1924, No. 4 Dark Hard, 54.7 pounds test weight and 14.6 per cent protein from southwestern Kansas sold for $1.22 a bushel. At the same time No. 1 Hard, 60.5 pounds test weight and 11.3 per cent protein sold for $1.05 a bushel. The best quality wheat on the Kansas City market today (April 12, 1924) is just about the price it was a year ago, while lower qualities are 12 to 13 cents a bushel under prices of one year ago.

Studies made by the Kansas Agricultural Experiment Station indicate that, within limits, the per cent of protein in wheat is proportionate to the amount of available nitrogen in the soil. The amount of nitrogen in the soil can be increased by early and proper seedbed preparation. This factor is largely under the farmer's control. There are, however, climatic conditions affecting the protein content. Light rainfall the latter part of the growing season increases and heavy rainfall during this period decreases the per cent of protein.

If a farmer plans to hold wheat he should pay particular attention to its quality and protein content. There are, of course, other things affecting the advisability of holding or selling wheat any particular year. The moisture content of the wheat at the time of harvest, trouble with insect infestation, financial obligations outstanding, and general market conditions are all things that call for the exercise of individual judgment on the part of the farmer. One year after another, however, the matter of quality needs first consideration in determining whether or not to hold wheat.

L. S. Edwards, '03, is manager of the Deming Ranch, Oswego, Kan.

V. M. Williams, the efficient dairy specialist of K. S. A. C. for the past two years, has recently resigned and accepted a position involving largely dairy research work for the North Carolina Agricultural Experiment Station, Raleigh.

PRODUCING BABY BEEF

(Continued from page 109)

feeding in a dry lot is unprofitable. (2) That summer feeding on grass is more profitable than summer feeding in a dry lot. (3) That winter feeding of calves has advantages over summer feeding. Feed is nearly always higher during the summer than it was the previous winter. More feed is required per pound of gain during the summer months than during the winter months. The animal has a keener appetite for grain in the winter than in the summer.

TOMATO WILT EXPERIMENTS

(Continued from page 108)

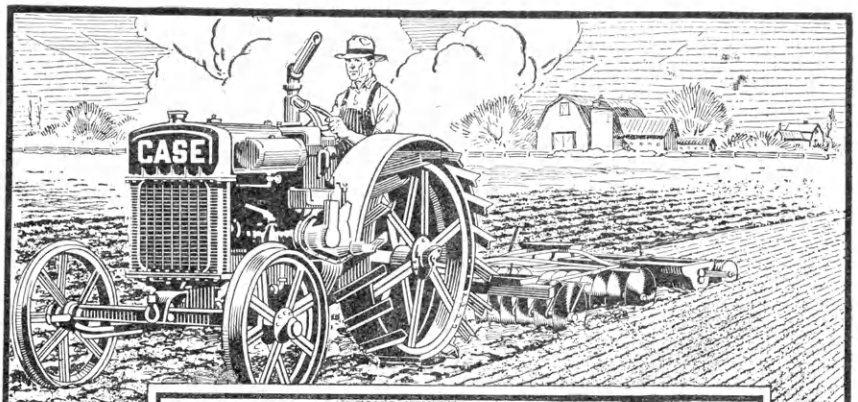
Red are the resistant varities recommended for Kansas. The system of culture which gave the best results commercially was group four where the plants were allowed to run wild and were mulched.

A REMARKABLE AYRSHIRE COW

(Continued from page 122)

pleted six Advanced Registry records that averaged 14,582 pounds of milk and 547.4 pounds of fat. This average gives her fourth place among Ayrshire cows of the United States that have made five or more Advanced Registry records.

By a recent calculation it was found that during her life Canary Bell produced a total of 118,319 pounds of weighed milk containing 4,415 pounds of butterfat, more than 10 times the life-time production of the average cow. She died when fourteen years of age, her average production for her nine lactation periods being 13,146 pounds of milk and 490.6 pounds of fat, a remarkable average. She produced enough butterfat to keep the the average family of four supplied with butter for 81 years and sufficient milk to supply each of 20 children with a quart of of milk a day for 8 years.



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Their unfailing dependability permits you to finish every job on time, in every season, hot or cold. You can increase your crop acreage, do profitable custom work, keep going day and night if need be.

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TESTING WHEAT FOR QUALITY

(Continued from page 103)

all dirt, sand, sticks and other impurities by running through a separator; scouring, that is, beating or scrubbing against corrugated plates to remove the fine hairs at the end of the berry, the dirt which has lodged in the crease, and any foreign material which has not been removed by previous cleaning; tempering, or adding water so as to bring the moisture content up to about 15 percent. The process of milling depends primarily upon the fact that the bran and the germ differ in relative toughness and friability from the endosperm. Tempering increases the toughness of the bran and mellows the endosperm. The time between adding water and milling is usually 48 hours. Milling involves five treatments by the corrugated rolls and seven treatments by the smooth rolls with the necessary siftings and purifications. By these treatments the bran coat and the germ are removed from the endosperm and the latter is gradually reduced to granular flour. These milling tests are made, in the main, on a small experimental mill, but the processes involved are similar to those employed in a commercial mill.

Chemical analyses are made of all samples. These include the analysis of the wheat for moisture and protein; the analysis of the flour to determine its moisture, ash, and protein content, and also viscosity. The ash content of flour is a measure of efficiency in milling. The protein content of wheat is to a large extent a measure of strength in the flour. The amount of protein in a wheat is, as a rule, proportional to the gluten content of a flour. Viscosity measures quality in flour. This determination is new but it is coming into use more and more.

Baking tests are made on all the flour samples milled from the wheat. The amount of water needed to make a dough of the right consistency is determined and is added to the flour together with the yeast, sugar, and salt. After being thoroughly mixed in a machine designed by the department, the dough is put into a cylinder and allowed to rise. After rising the dough is worked down, the process being repeated one or more times. The total time from the moment the yeast is added until the loaf is put into the oven, is known as the fermentation period. This period depends on the diastatic or enzymatic activity of the flour. The fermentation must be guarded very carefully. Over fermentation may give large volume, but a coarse texture. Under fermentation may give a loaf of small volume, fine grained, but of thick-walled texture. Texture and color are judged by baking a loaf from a flour of known quality.

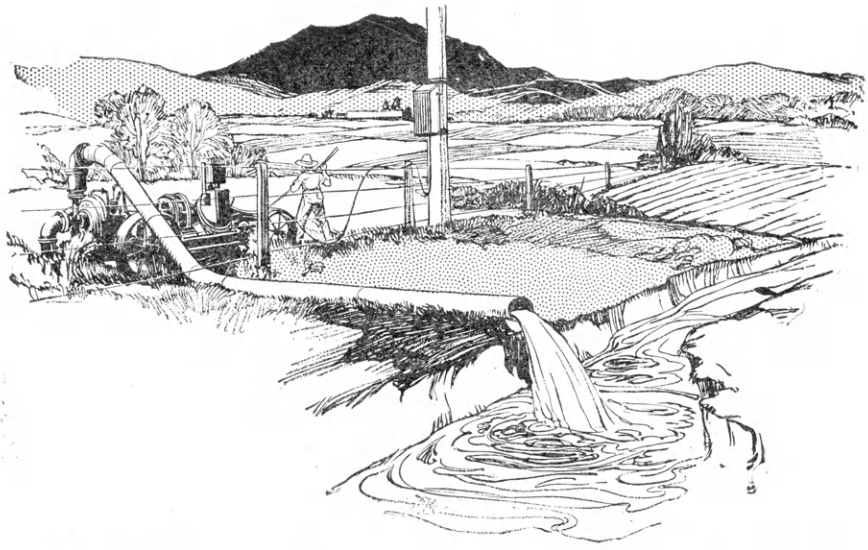
The results of such tests made on samples of wheat grown under varying conditions, are valuable to the farmer, miller, baker, and consumer. The tests show the effects of low- and high-quality wheats on the bread produced and the results suggest means of improving the quality. For the farmer wheat of better quality should mean a corresponding increase in price. Improvement in quality enables the miller to produce a better flour. With better flour the baker can make better bread at a lower price, and better bread at lower cost will benefit the consumer.

MONOPOLY CONTROL

(Continued from page 110)

opoly control and will not submit to it. The advantages of cooperative marketing are not in establishing monopolies, but in increasing the efficiency of present marketing methods and securing for the farmer pay for services now performed by other groups of society. The lesson to be learned is how to stand competition without being destroyed by it; not how to avoid it, since for the farmer it can not be avoided.

Earl Means, editor of Volume I of The Kansas Agricultural Student, is handling a first-class farm near Everest. Last August he purchased 60 good-quality grade Hereford steers on the Kansas City market. He pastured them till about the middle of November and had them on a full feed of corn silage, alfalfa hay, and shelled corn on January 1. During March and April he added two pounds of cottonseed meal per head per day to their ration and marketed the bunch on or about May 1.



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The General Electric Company provides for agriculture little motors that do the farm chores and great ones that operate mammoth pumps to irrigate vast stretches of arid valleys.

GENERAL ELECTRIC

The "Aladdin" of the Farm

COMPARE the farming methods of pioneer days with modern farming practice. In early times clearing land was the settler's *first* job, and he did it by hand labor.

Farming, today, is different. In the well settled areas of our country land-clearing is not necessarily the farmer's first job, but it is one of the most important things he can do. Improved land has become more valuable—in itself and in the crops it can produce.

Much of the so-called cleared land can be improved—stumps, boulders, swamps removed and hardpan shattered. To obtain the highest return from his land, the farmer must put *all* of it to work. Partially cleared land "eats its head off" in taxes, but fields entirely cleared are easier to work and they are more profitable.

For removing stumps and boulders, draining land, improving sub-soil conditions, the dynamite "stick" replaces the pick, crowbar, axe and shovel as tools—and these improvements cost much less in time, money and labor.

That there is romance in the history of explosives is shown by the way agricultural and industrial progress has developed as explosives have been effectively employed. Explosives are a vital necessity in the production and distribution of practically everything used and consumed.

In this development in explosives manufacture, the du Pont Company has been an important contributor. For over 122 years the du Pont name has been associated with leadership in this field.

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DYNAMITE

A COUNTRY ROAD

Every country road tells a story. The one pictured above illustrates a common contrast. On one side are weeds and brambles, suggesting neglect and adversity; on the other—the "right side"—are trees, grass and cleanliness, suggesting prosperity and well-being. The contrast expresses contrasting behavior on the part of the people who live along the road.

In finding the place you will occupy in the world of affairs, you must choose from among contrasts like the one shown above. Your most valuable property is yourself. You may allow this property to become a thicket of "weeds," or you may cultivate it and keep your "fence-rows" clean and attractive. Whether you "cultivate" or neglect yourself will determine on which side of road you are to live.

If you wish to make for yourself a place of useful leadership in agriculture, the most important industry in the world, Kansas State Agricultural College is second to none as a place for you to get the necessary training.

The college offers agricultural courses ranging in length from one week to four years. The four-year courses are for high school graduates. The others are open to anybody more than seventeen years of age.

The college trains men for 150 agricultural occupations, on the farm and elsewhere, and for good citizenship and right living.

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