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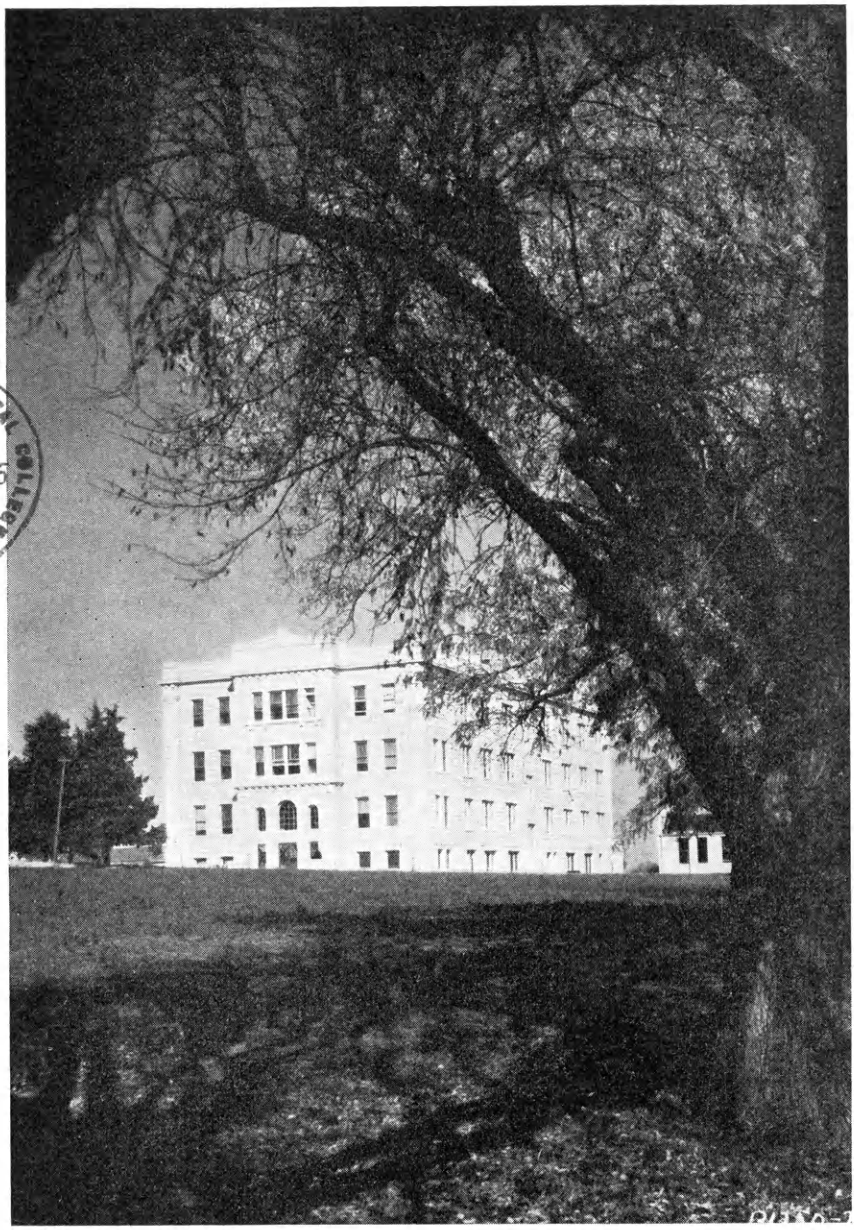


WEST WING OF WATERS HALL

This is one of the newest buildings on the College campus—home of the Departments of Dairy Husbandry, Poultry Husbandry, and Agricultural Economics. It is a fire-proof structure and has been occupied since September, 1923. (See back cover page.)

The Kansas Agricultural Student

VOL. IV Manhattan, Kansas, December, 1924 No. 2

Utilization of Silage and Pasture in the Production of Baby Beef

R. B. Johnson, '25

Cattle feeding experiments recently completed by the Department of Animal Husbandry of the Agricultural Experiment Station indicate beyond a doubt that short feeding makes yearling steers as good as the packers are willing to pay for. It also shows the feasibility of utilizing more young cattle in handling both silage and bluestem grass in Kansas.

Steer calves half fed during the winter of 1923-24, grazed on bluestem pasture from May 5 to August 3, 1924, then full fed ground corn and cottonseed meal while still on grass until November 1, returned when marketed, $20.88 more profit per head than steers half fed during the winter and full fed while on grass from May 5 to November 1. These results demonstrate the practicability of cutting down the amount of high-priced feed used and of utilizing grass, the most economical feed available, to the best advantage in producing baby beef.

These groups of steers are hereafter designated as lots 1 and 2. The only essential difference in their management is that lot 1 was full fed on bluestem pasture from May 5 to November 1, 1924, while lot 2 received no other feed than bluestem pasture from May 5 till August 3, after which they were full fed on pasture till marketed. Data of importance in the experiment are given in the following tabulation:

WINTER FEEDING, 1923-24 (a)	Lot 1 Pounds	Lot 2 Pounds
Av. initial weight per calf..	452.60	451.73
Av. final weight per calf....	780.40	766.00
Av. daily gain per calf.....	2.19	2.16
Av. daily feed per calf:		
Corn	4.69	4.69
Cottonseed meal	.91	.91
Alfalfa hay	2.00	2.00
Cane silage	24.38	24.38
SUMMER FEEDING (b)		
Av. initial weight per calf ..	780.40	766.00
Av. final weight per calf ...	1,146.67	1,099.40
Av. daily gain per calf	2.00	1.85
Av. daily feed per calf:		
Corn	14.69	14.81
Cottonseed meal	.98	.95

(a) Winter period, December 7, 1923, to May 5, 1924—150 days.

(b) Summer period, March 5 to November 1, 1924—180 days. Lot 2 had no other feed than bluestem pasture during first half of the period.

These calves topped the Kansas City market at $11.25 per hundredweight, no difference being made in price in spite of the fact that lot 1 was on full feed three months longer than lot 2. The shrinkage on lot 1 was 2.08 percent and on lot 2, 2.4 percent. Lot 1 dressed 61.7 percent and lot 2, 60.2 percent. The gains on grass made may not seem large, but it must be remembered that these were young cattle that went to grass after being half fed through the winter. Furthermore this method develops the weight and class of cattle most in demand.

Each lot returned a margin above all costs. Corn was figured at 75 cents per bushel prior to May 1, $1 after May 1; cottonseed meal at $50 per ton; alfalfa hay, $15 per ton; silage, $5 per ton; and pasture, $8 per head (2½ acres per head). The average selling price per steer in lot 1 was $122.41; in lot 2, $117.46. The average total cost per steer in lot 1 was $122.19; in lot 2, $96.36. Therefore while the steers in lot 1 made an average profit of only 22 cents per head, the steers in lot 2 made an average profit of $21.10 per head. The difference in profit per steer, $20.88, represents the margin in favor of short-time, late summer feeding in this experiment.

A year ago the Agricultural Experiment Station completed a feeding experiment in which one lot of calves had been roughed through the winter on silage receiving no grain till April 1, 1923. They were eating five pounds of corn per head per day when

they went to pasture May 5, 1923, and were then put on full feed as rapidly as possible, remaining on full feed on pasture until marketed. The management of this group varied from lot 1, described above, only in method of wintering. The data for this group of experimental feeders refigured for comparison on the basis of prices used in lot 1, show the following results:

ROUGHING THROUGH THE WINTER VERSUS FEEDING A LIGHT GRAIN RATION

	Roughed	Light Grain
Number of days in winter feeding	162	150
Av. weight per calf at beginning of winter period	391.53 lbs.	452.60 lbs.
Av. weight per calf at end of winter period	524.00 lbs.	780.40 lbs.
Av. daily winter gain per calf	.82 lbs.	2.19 lbs.
Av. daily feed per calf:		
Cane silage	22.00 lbs.	24.38 lbs.
Alfalfa hay (a)	.37 lb.	2.00 lb
Cottonseed meal	.98 lb.	.91 lb.
Corn (a)	.97 lb.	4.69 lb.
Per head cost of wintering	$15.23	$23.70
Calf and feed cost up to May 1 when started on full feed on grass	48.51	62.17
Cost per cwt. at end of winter feeding period, May 1	9.19	7.97
Cost of summer feeding on grass including pasture	58.60	60.02
Number of days on grass	180	180
Total cost of calf and feed when marketed as yearlings	$107.11	$122.19
Av. weight per steer after full feeding during summer on grass	945.73 lbs.	1,140.67 lbs
Gain per steer full fed on grass, based on home weights	421.73 lbs.	360.27 lbs.
Daily gain per steer full feed on grass	2.34 lbs.	2.00 lbs.
Necessary selling price per cwt. at home to break even	$11.33	$10.71

(a) No corn or alfalfa hay was fed during the winter season except between April 1 and May 1. The figures represent what the daily average would have been had the amount received during this 30-day period been distributed throughout the winter feeding period.

It will be noted that the calves roughed through the winter made practically 200 pounds less gain per calf during the winter and 60 pounds more gain per calf during the summer when full fed on grass than the calves of lot 1 half fed during the winter and full fed on grass during the summer. Though the per head cost of wintering was $8.47 less for the calves roughed, the cost of these calves was $1.22 per hundredweight more on May 5 than the cost of the calves half fed during the winter. Further, though the calves roughed through the winter had cost $15.08 less per head at the close of the test than the calves half fed during the winter yet it required 62 cents less per hundredweight to break even where the calf was fed during the winter than where the calf was roughed during the winter. The calves half fed during the winter went on the market fatter and sold for a higher price than the calves roughed through the winter. Since these half fed calves required less to break even and sold at a higher price than the roughed calves, it would seem that light winter feeding is a much better method than roughing to prepare calves for summer feeding on grass.

Finally it should be repeated for emphasis that full summer feeding on grass represents poor management under the conditions of these experiments, the margin in favor of feeding on grass the last half of the summer season, or approximately August 1 to November 1, being in the data herein presented, $20.88 per steer.

Ray B. Watson, '21, one of the newest members of the K. S. A. C. married men's club, was a pleasant caller on old college friends recently. He is in the employ of Dieges and Clust, 603 Garrick Building, Chicago.

I. F. Correia of Curityba, Brazil, is a special student of cereal crops and the milling industry. He is a graduate of the Agricultural School of Lavras.

Winter Care of the Farm Flock

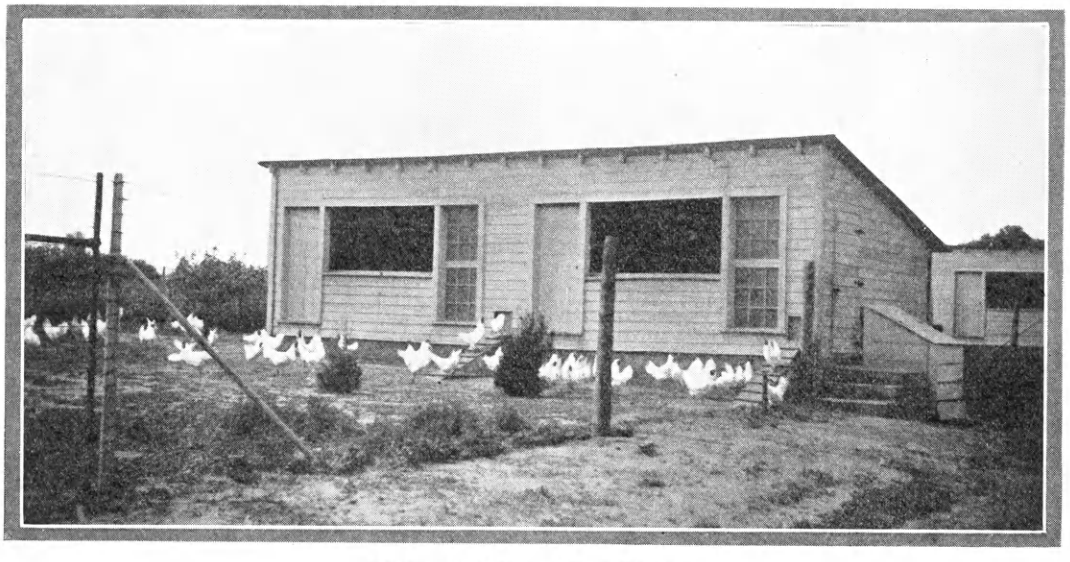
Stanley Caton, '26

One of the most important poultry problems is to see the flock through the winter months without the loss of birds, or seriously lowering their vitality. Summer care is less complicated because the elements which are contended with are less severe than those in the winter. Winter care involves housing and feeding problems, which will be discussed to some extent in this article, primarily from the point of view of egg production.

Feeding is important for two reasons, mainly. It must supply energy for the bird and furnish material necessary for egg production. Green feeds are very essential in the winter and must be obtained in some form or another to go with the regular ration. Where it is available a fourth cutting of green alfalfa makes a very good feed. It should be fed from racks or hoppers which are easily constructed for this purpose.

Sprouted oats make a very succulent winter feed. An oat sprouter is easily constructed, the only necessary requirement being a moderate temperature and plenty of moisture. There are several ways of sprouting oats. They may be left in a tub or bucket of warm water over night and then drained off and scattered on racks to the depth of about an inch and left to sprout. When the tops are about two or three inches high they may be taken out and fed to the birds, feeding one square inch per bird daily. Sprouting at low temperatures (60 degrees to 65 degrees F.) in clean vessels or treating with formaldehyde, one pint formalin to thirty bushels may be used to prevent molds.

Too many poultry owners do not realize the importance of an ever present supply of fresh, clean water. In the winter it is difficult for some to see just why water is so important, but when one realizes that the body of the fowl is composed of more than half water, that each dozen of eggs contains approximately one pint of water, and that the egg is composed of two-thirds water, the necessity of an abundant supply of water is not so hard to comprehend. It is estimated that about four gallons of water per day are required by every one hundred hens. There are many styles and types of water heaters on the market today and the price is such that they will easily pay for themselves in a year by the increased production of eggs. If one does not wish to purchase a heater, water



GOOD WINTER QUARTERS

should be changed at least three times a day in the cold weather, using warmed water at all times.

It is customary to supply the regular ration in two forms: (1) Whole or cracked grain mixtures, commonly called scratch grain, to be fed in the litter. (2) A dry mash, made up of finely ground grains, to be fed in hoppers. The ration may be simple and easily mixed. Two are suggested below. Either one will give good results, other conditions and requirements having been met satisfactorily.

A.

SCRATCH GRAIN

Cracked corn	25 pounds
Wheat	75 pounds

DRY MASH

Ground corn and oats	40 pounds
Bran	20 pounds
Shorts	20 pounds
Tankage (high grade)	20 pounds

B.

SCRATCH GRAIN

Milo or kafir	50 pounds
Wheat	50 pounds

DRY MASH

Ground corn and oats	80 pounds
Tankage (high grade)	20 pounds

In addition to these rations the birds should have before them at all times a plenteous supply of grits and oyster shell. Both of these are necessary as neither one can replace the function of the other. The absence of either will result in considerably lower number of eggs.

Housing of birds is unnatural due to the fact that the modern chicken is a descendant of the jungle fowl, to which housing was unknown. Therefore when birds are put in a house they are put under artificial conditions to a very high degree. The house should be located where it is free from high winds, free from low spots where damp air is apt to settle, and also where ample water drainage may be had conveniently. Therefore high ground is more desirable than low lands.

Every measure possible should be taken to insure that the building is free from parasites before the birds are put in for the winter, making sure that the house is clean, dry, and sanitary. The poultry should be bedded at all times with clean, dry straw, which is available on any farm, and the bedding should be changed as soon as it becomes badly broken, filled with droppings, or damp.

Housing pullets should be started as soon as the laying season begins. From this time on the pullets should be kept in the poultry house at all times and especially during the days when the weather is apt to be the least bit severe. If green feed is available in the yard where the house is located it would be advisable to let the birds out for short periods when the weather is very mild. The reason they should be kept in during the more severe weather is because it is undesirable to force them to use their energy for heat production in place of egg production. One very important factor to be looked after is having plenty of room for the number of birds in the poultry house, allowing three and one-half square feet per bird as a minimum. Too close confinement causes discontentment and a consequent falling off of egg production. Feather pulling is also apt to result if too close penning is practiced, as well as a larger loss of eggs from breakage. Ventilation of the house should be such as to provide plenty of fresh air with an absence of draughts. Draughts promote disease, especially colds, and from these epidemics of roup, diphtheria, and catarrh result.

In the case of breeding stock much the reverse method is used as to confinement. Breeding stock should be given free range of the yards until two weeks before hatching eggs are wanted, from then on they should be kept penned up until good weather comes in the spring. The amount of space per individual and the ventilation should be the same as in the case of pullets. The pens should also be kept dry and well bedded.

Conclusions:

1. Give the birds an ample supply of green feed in the form of fourth cutting alfalfa or sprouted oats.

2. Provide plenty of clean fresh water, using a heater or changing the water two or three times a day.

3. Feed a standard ration.

4. Supply plenty of grit and oyster shell.

5. Pen the pullets at the beginning of the laying season and keep them inside during bad weather.

6. Prevent crowding, allow three and one-half square feet as a minimum per bird.

7. Keep the house well ventilated without draughts; dry, well-bedded, and free from vermin.

Lime in Southeastern Kansas

Richard L. von Trebra, '26

In the three eastern tiers of counties of Kansas the limiting factor of legume production is the acid condition of the soil. If the farmers of that section of the state could grow sweet clover, alfalfa, or red clover the producing capacity of their soil would be greatly increased. The growing of legumes would also enable them to get away from their present system of grain production. Where no legumes are raised and the soil is continually planted to corn, oats, and wheat, as most of it is in that section, it becomes low in nitrogen, compact, and loses its mellow condition or what is called good tilth. After heavy rains it runs together and when dry again becomes very hard. These conditions are due to an absence of organic matter.

All legumes have the power to take free nitrogen from the air and put it in the soil as nitrates ready for plant use. To do this they must have the cooperation of bacteria that live either in nodules on the roots of legumes or as free bacteria in the soil. These bacteria cannot live in an acid soil. Therefore legumes cannot be grown on acid soils to good advantage.

If the fertility of the soil is to be maintained the growing of legumes and the fixation of nitrogen must go on uninterrupted. Lime is the factor that will allow bacteria to work with these legumes and carry on their process of building up the plant food of the soil. If the acidity of the soil is not corrected, the farmer has no other course to follow than to grow soil-exhausting crops year after year and the depletion of soil fertility will be the ultimate result.

Lime is usually applied to the soil in one of three forms; namely, raw ground limestone, calcium oxide or quick lime, and hydrated lime. Raw ground limestone is the most common form used and under most conditions is the cheapest and most practical to apply. It is prepared by crushing the raw rock to such a degree of fineness that no particles are over one-tenth of an inch in diameter and the finer the better. Calcium oxide or quick lime is raw limestone that has been burnt in a kiln and decomposed to calicum oxide and carbon dioxide gas, which passes off. It is very caustic and should not be applied to soils in such a large quantity as the raw ground limestone. The third form is known as hydrated lime. It is simply caustic lime that has been slaked by taking up water. The cost is to be considered in using this form. Every 100 pounds of slaked lime contains 32 pounds of water and if freight is paid on 640 pounds of water in every ton of hydrated lime it is more economical to apply the caustic lime and let it be slaked under natural field conditions.

The rate of application of lime should depend on the form used and the acidity to be corrected. One thousand one hundred twenty pounds of quick lime is equal to two thousand pounds of raw ground limestone or one thousand five hundred pounds of hydrated lime. The rate of application will vary from 1 to 2.5 tons of raw ground limestone per acre.

The average cost of crushing limestone is about $1.50 per ton. This pays interest on the investment in the crusher, labor charges, and depreciation on machinery. Shipped-in, pulverized limestone costs from two to three dollars per ton delivered at the station. In the three eastern tiers of counties 85 to 90 percent of all upland soils are in need of lime. Bottom lands of southeastern Kansas are usually well supplied with lime and applications will not give profitable returns. Numerous outcroppings of high-grade lime occur in almost every local community of this section of the state, testing about 90 percent pure or above. All limestone testing 85 percent purity or more is satisfactory for agricultural purposes. A good policy would be to send a sample of the stone to K. S. A. C. and have it analyzed for purity. At the same time, a representative sample of the soil should be sent to have the lime requirement determined.

Lime should be applied on the plowed ground and thoroughly worked into the soil. If applied as a surface dressing very little good is done. Lime corrects the acidity of the soil by coming in contact with the soil and therefore must be thoroughly incorporated to produce the desired effect.

In 1923, 5,600 tons of lime were used in the southeastern part of the state. Most of this was in 2 to 10-ton lots for experimental purposes to show the value of lime alone or

in combination with acid phosphate and manure in increasing crop yields. Acid phosphate may be used in place of manure when manure is not available. Manure and lime have produced practically the same yields as acid phosphate and lime. In 1924 about 7,000 tons were applied to acid soils largely through the cooperation of the Division of College Extension and the efforts of the local county agricultural agents.

Applications of lime for legume crops in southeastern Kansas have shown surprising results in their yield and ability to combat grass and weeds. Most of the work to date has been with alfalfa. At the present time in Cherokee county experiments are being conducted which prove that alfalfa can be successfully grown on the light-colored soils in that region that are underlaid with heavy clay subsoils. On upland soils in Allen county experiments have been carried on for a period of nine years with alfalfa. The surface soil is a heavy silt loam about 12 inches deep, underlaid by a heavy clay subsoil. This is characteristic of much of the upland soil of southern and eastern Kansas. The results secured prove that alfalfa cannot be grown unless the acid condition of the soil is corrected. Many people think manure and fertilizers applied heavily will be sufficient to secure a good stand and grow alfalfa successfully. The experiments conducted show that after a few years the stand of alfalfa is killed out by weeds and grass regardless of the application of manure and fertilizers. The following interesting data were secured on this experimental work:

After five years where no lime was applied the stand was entirely killed out, due to weeds and grass taking the place of the alfalfa. A stand of alfalfa may be secured on the most acid of soils. The alfalfa comes up fine, grows a few inches high, begins to turn yellow and look sickly, and finally dies. The cause is acidity of the soil and inability of the micro-organisms that are necessary to the health of all legumes to function properly. Lime is not a fertilizer. It only corrects the acidity of the soil and allows the bacteria that live in the soil and on the roots of legumes to do their part properly. These bacteria, as previously stated, cannot live except in a slightly alkaline or neutral reaction.

These results have been duplicated in the demonstration work of the Labette County Community High School at Altamont. The soil there is the Cherokee silt loam and underlaid at about a depth of 8 to 10 inches by a very hard impervious clay subsoil. The demonstration was conducted for a period of three years. At the end of the three years no stand was left on a check plot, it being killed entirely by weeds and grass. On an adjacent plot 10 tons of manure and 1,000 pounds of quick lime per acre gave an average yield of 5,597 pounds of alfalfa compared to 758 pounds per acre for the plot receiving no lime. Another plot was treated with 1,000 pounds of quick lime per acre as the only application. It showed an average yield of 3,109 pounds for the three years as compared to the 758 pounds for the nonlimed plot.

All these results go to show that lime applied to the soils of southeastern Kansas will give profitable returns and greatly increase the farmer's income besides allowing him to make his farming operations more diversified.

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THE EFFECT OF VARIOUS SOIL TREATMENTS ON ALFALFA YIELDS IN ALLEN COUNTY

TREATMENT	Av., 1915-1919	1920	1921	1922	1923	Av., 9 yrs.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
None	2,301	0	0	0	0	1,278
Limestone	3,260	7,042	4,040	3,233	3,010	3,736
Acid Phosphate and Limestone	5,504	11,025	4,718	3,628	3,366	5,584
Manure	4,254	0	0	0	0	2,363
Manure and Limestone	5,101	9,150	5,840	5,306	3,413	5,746

The Aesthetic Value of a Flower Garden

E. R. Honeywell, '26

Flowering plants are the missionaries of nature constantly at work attempting to cover some ugly scar which civilized man has made in his attempt to wrest from the earth the living which he claims she owes him. The more familiar one is with the function of plants and the structure and purpose of their leaves and flowers the more fully and completely one will appreciate and interpret their beauty and refined sentiments they represent.

FLOWER GARDEN, DEPARTMENT OF HORTICULTURE

If you will but give nature the suggestion of your wishes in the form of a few choice seeds she will paint for you rich shades of the pansy or the phlox; she will carpet your floor with a velvet rug of green and strew upon its surface in bold contrast the golden disks of the dandelion or the bright, saucy faces of the crocus; she will drape your walls with a festoon of green and hide therein rich gems of purple, of crimson, and of white; and if you ask it, she will screen one apartment from another with barriers of green which may or may not carry bright floral gems.

While flowers are primarily utilitarian in purpose, the end is attained by attractive and alluring means. The beauty, fragrance, and sweetness of flowers are not rain attributes; each is designed for a subtle purpose. The bright colors are the gala-day attire of the natural fairies to attract and allure the passer-by, be he insect, bird, or man. The perfume wafted upon the still night air suggests the whereabouts of the fragrant night-blooming flowers to moths and other night-flying insects, while the cup of honey at the base of the petals holds a reward for those who have heeded the signal of the color or the odor. The pot of nectar is a sufficient reward for the insect, and the transfer of pollen

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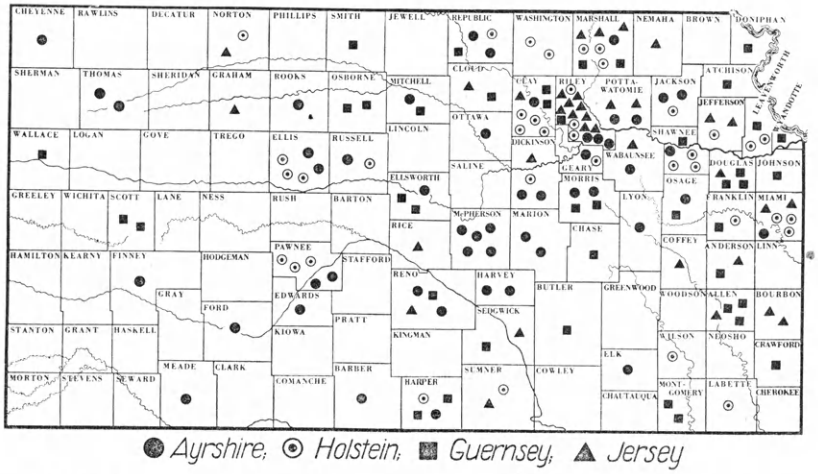
K. S. A. C. Purebred Dairy Sires Improve the Dairy Industry

Howard V. Vernon, '27

The college dairy herd consists of purebred animals of the four major breeds, kept primarily for instructional and experimental purposes. Incidentally, however, many tons of milk and from 60 to 70 calves are obtained each year. Most of the heifer calves are retained to build up the herd, while the bull calves over six months of age are sold to farmers and dairymen who are for the most part just starting up dairy herds or wishing to grade up common herds. Some of the best bred bulls go to head purebred herds.



Map of Kansas showing the approximate location of 165 dairy farmers who have purchased purebred dairy sires from the K. S. A. C. herd during the last 14 years. The breed of the sire purchased is also indicated by the symbol.

The wide distribution of the bulls sold since 1910 is remarkable. Since that date a total of 165 purebred dairy sires have left the college herd, going to head herds in 64 counties of the state. Of the counties which have not received one or more bulls, only 12 are in the eastern half of the state. The western third of Kansas has paid little or no attention to dairying consequently there have been only 12 bulls placed in that region by the college. Riley county, as might be expected, leads in number of purchases with sixteen head, of which nine are Jerseys, three, Holsteins, three, Aryshires, and one, a Guernsey. Marshall county maintains a close second, however, with three Holsteins, one Ayrshire, three Jerseys, and two Guernseys.

In distribution according to breeds, the Aryshires lead with 50 distributed over 34 counties which lie largely in the central portion of the state. The Guernseys run a close second having 42 bulls distributed over 30 counties, which with the exception of Wallace and Scott are all located in the eastern half of the state. The Holsteins come next in order with 38 distributed over 21 counties in the north central section of the state. The Jerseys come last, with 35 distributed over 21 counties in the northeastern section of the state.

This distribution of dairy sires has resulted in the diffusing of blood of high-producing dams, into herds of common or inferior breeding. Two Ayrshire bulls from a dam producing as high as 744 pounds of fat in one year, one Guernsey bull from a dam that has produced 624 pounds of fat in one year, one

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Index Numbers as Applied to Agriculture

Adolph G. Jensen, '26

What are index numbers? What is their purpose? How are they computed and used in relation to agriculture? These are questions which must be understood by all students of agriculture as the use of index numbers is increasing in agricultural work, as well as in other fields.

Index numbers are relative numbers in which data for one year or other period, or an average for a year, or other period, are taken as a base. This base is generally indicated as 100 and upon it data for subsequent years or other periods are computed as percentages. The purpose of index numbers, then, is to reduce to a common denominator, the qualities of different factors or phenomena so as to allow comparisons , which are generally made historically.

Both business men and students of economics have come to look upon index numbers as ever ready tools for measuring, among other things, price and wage changes.

The honor of inventing the device now commonly used to measure changes in the level of prices, probably belongs to an Italian, G. R. Carli. In an investigation into the effect of the discovery of America upon the purchasing power of money, he reduced the prices paid for grains, wines, and oils in 1750 to percentages of change from their prices in 1500. He added the percentages together and divided the sum by three, thus making an exceedingly simple index number. Since his book was first published in 1764, index numbers are over 150 years old.

At the present time, many things are measured by the use of index numbers and several different methods may be used in computing them. A common method of computing index numbers of prices is to take the average price of each commodity for a given period as the base. The current price divided by the base gives the index number. Index numbers can be weighted and averaged and thus the general price level can be ascertained.

If only one product is considered, the average price for a number of years may be taken as the base. This is because high or low prices for one year might be misleading. If many commodities are considered the average price for one year or less might be taken as the base but a longer period is preferred. When the seasonal fluctuations in prices are to be compared, the prices for 1913 are often taken as a base. This is due to the fact that prices during that year were more normal than at any time since then due to the war. When the base is taken too far back the comparison does not mean so much. For comparison of yearly price, however, the period of 40 to 50 years up to 1899 or to 1913 is often taken as the base.

The index number of prices as published by the Bureau of Crop Estimates of the United States Department of Agriculture is the result of: (1) A comparison of the current price of 10 crops with its average December 1 price for the 43-year period 1866-1908; and (2) a combination into one figure of the 10 index numbers thus obtained for the 10 crops. This is done by weighing them with figures approximately proportionate to the importance of the several crops in the aggregate value of the 10 crops for a series of years.

Index numbers are of use in showing the similarity in price decline and recovery after wars or other causes resulting in great fluctuations in the price level. Thus by the aid of past history of other wars in the United States, index numbers indicated fairly well how prices would fall and rise after the late war.

Adjustment between industry and agriculture usually comes somewhat as follows: Prices fall, city industries stop, unemployment occurs, the movement from farms to cities is checked, the channels of trade are cleared of goods, and business revives. Then labor is drawn from farms so that farm production is checked, demand for farm products is increased so that the channels of trade are cleared of farm products and farm prices rise.

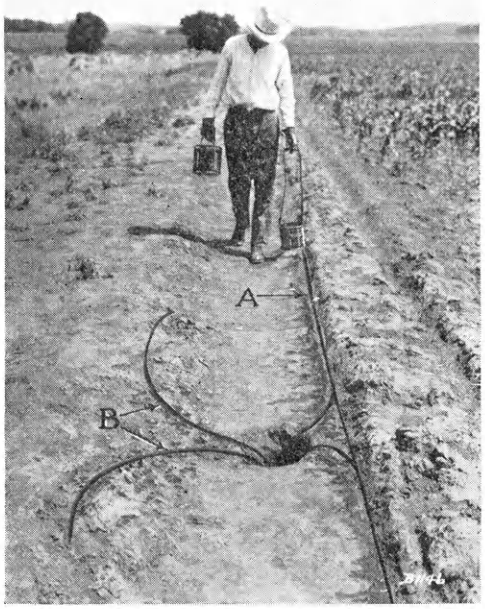
Since shifts can be foretold, to some ex-

(Continued on page 62)

Chinch Bug Control at Harvest Time

J. Edgar Durham, '27

For many years the chinch bugs have been the most serious pest attacking cereal crops in Kansas and farmers have the feeling that their attacks cannot be controlled. Careful and extensive experiments show that they can be controlled and at two distinct times of the year, one during the winter while the bugs are in hibernation and the other in the summer, when the immature bugs migrate from the small grains to corn and sorghums.



RENEWING A CREOSOTE BARRIER

The field on the right is being protected from the young chinch bugs migrating from the small grain field on the left. (A) Main creosote barrier. (B) Wings that assist in guiding the young bugs into the posthole trap.

The destruction of the overwintering bugs by burning over their hibernating places is very effective, but as the damage done by the bugs at this time is very obscure it has been hard to get the farmer's cooperation in this respect. Burning has been employed in many localities and when done systematically in November and early December, has solved the chinch bug problem for the next summer.

The stopping of the immature bugs while they are migrating to new fields is the other method of control. Dust barriers have been recommended for several years, but owing to the uncertainty of Kansas weather these have been, as a rule, rather unsuccessful when the work that they required has been taken into consideration along with the good that they did. During the migration period of 1924 experiments conducted by Prof. J. W. McColloch in cooperation with the Department of Agronomy showed that the creosote-posthole barrier was an effective and economical means of control for Kansas. Creosote has been used for barriers very successfully for several years in Illinois.

The creosote barrier does not require the deep and well fixed furrow that the old dust barrier did. This creosote barrier is made by plowing a furrow between the noninfested field and the infested field, the dirt being thrown away from the small grain field. A narrow strip of creosote (A) is then poured near the top of the ridge. This creosote is best applied, as shown in the accompanying illustration, by the use of a gallon pail with a long wire handle. An eight-penny nail hole is punched in the bottom. By the use of this type of bucket the creosote can be laid down as the operator walks along the barrier. The second bucket in the operator's hand is to carry the long-handled bucket from the creosote barrel to the barrier without the spilling of the creosote.

As creosote is only a repellant, there must be something to kill the bugs. Postholes, 12 to 15 inches deep, with flared edges each containing from one-fourth to one-half an ounce of calcium cyanide are dug about every rod along the barrier on the side near the migration. When the bugs come to the creosote line they are repelled by the odor with the result that they turn and follow along the barrier. It is then that they fall into the postholes and are killed by the hydrocyanic acid gas from the calcium cyanide. Wings of creosote (B)

(Continued on page 62)

Crop Rotations in Kansas

Robert W. Fort, '26

Generally speaking, Kansas soils were originally of unusually high fertility. However, through poor soil management and one-crop farming their producing power has been greatly lessened.

The elements which are of primary importance in crop production are nitrogen, phosphorous, potassium, and calcium. The lack of any one of these elements limits the crop yield. Phosphorous, potassium, and calcium are usually contained in sufficient quantities in western Kansas soils. Phosphorous and calcium are lacking in many of the eastern counties of the state.

Nitrogen is contained in the organic matter of the soil and in fields which have been cultivated a few years is usually deficient due to poor methods or to a lack of any method at all in maintaining soil fertility. Soils which have been under cultivation 30 years have lost from 30 to 35 percent of their organic matter and from 25 to 30 percent of their nitrogen content. Thus since nitrogen is the limiting factor the problem of soil fertility is chiefly a problem of maintaining the organic content of the soil.

This is accomplished through practicing crop rotations as shown by results obtained from experiments at the Kansas Agricultural Experiment Station. These results cover a period of 13 years and are as follows:

METHOD OF CROPPING	AVERAGE YIELDS 1911 TO 1923	
	Corn Bu. per Acre	Wheat Bu. per Acre
One crop continuously.....	19.93	15.58
Three-year rotation—corn two years, wheat one year..	26.45	15.64
Three-year rotation—corn, cowpeas, wheat	29.49	17.71
Sixteen-year rotation—alfalfa four years, two years wheat and one year corn for twelve years	29.50	17.43

These data show that alternating between wheat and corn increases the yield; that the three-year rotation introducing cowpeas following corn before wheat makes a still greater yield; and that the sixteen-year rotation being more complete gives the highest yield of all. However, the sixteen-year rotation does not greatly exceed the three-year rotation in yields.

The maintenance of organic matter is not the only good derived from using a system of crop rotation. Livestock production may be practiced to good advantage. The additional forage crops grown furnish feed for livestock and the manure thus produced may be returned to the land to increase the organic content. In a system of grain farming the soil is robbed of its organic matter and plant food and this is sold in the form of grain, none being returned to the soil.

Crop rotation stabilizes farm business. The farmer does not find himself without a source of income if one crop happens to fail. It is very seldom that the season is unfavorable for the production of all crops adapted to one locality. In addition the farmer has a steady source of employment the year around and a stable source of income from his livestock.

The control of insects, weeds, and plant diseases is facilitated by a system of crop rotation. Insects, weeds, and plant diseases can so thoroughly infect a region in which their host is used as a continous crop that it is often impossible to cope with them. The wheat rot or "take all" disease is an example of this.

The principles involved in planning a rotation to fit the needs of various types of farming and various soil and climatic conditions are of interest. A stock farmer would want a greater percent of forage crops than a grain farmer. A rotation adapted to eastern Kansas would not do for western Kansas. However, each rotation should have at least one year devoted to a cultivated crop, one year to a feed crop, one year to a small grain crop, and one year or more to a leguminous crop.

Crop sequence is also an important point to consider in planning a rotation since some plants are heavy feeders both on plant nutrients and moisture while others are relatively light feeders and do poorly after a heavy feeder. Thus wheat best follows oats, wheat or corn when the corn has been cut for sil-

(Continued on page 64)

Kansas Production in 1924 as Compared with Preceding Years

A. I. Balzer, '25

What causes the present prosperity in Kansas? The answer to this question will be found in the following article.

The price of wheat is one of the most important factors in the present prosperity. For the week of November 18, 1923, the average Kansas City price was $1.10. For the corresponding week of 1924 the price was $1.49 1-3, an increase of 39 1-3 cents. The 1923 world supply of wheat was unusually large, while in 1924 the supply is short, changing the American market from a buyers' market to a sellers' market. Although the world supply is short, the United States, and especially Kansas, had a good wheat year. While the wheat crop of the United States for 1924 was 70 million bushels more than for 1923, Kansas alone produced 71 million bushels more in 1924 than 1923. The Kansas crop for 1924 amounted to 154 million bushels, the third largest in the history of the state, and the largest since 1919. In addition to the heavy crop, the quality of the 1924 crop is much above the average. This good record in Kansas and the United States, while the rest of the world is below normal, gives the Kansas farmer a big advantage in the market.

In the corn market the Kansas farmers again have a big place. While most of the states in the corn belt had a poor year, Kansas has produced 148 million bushels (estimated), an increase of 26 million bushels over 1923, when the output was far above the average. With a shortage in most of the corn states, the price of corn has gone up to $1.11 in Kansas City, an increase of 32 1-2 cents over last year, taking the figures of the week of November 18. With this increase in price and the heavy output for the state, Kansas farmers are reaping the harvest.

The largest crop of kafir, milo, and feterita since 1915 is indicated, with a probable production of 29,479,000 bushels. The 1923 crop was 28,285,000 bushels on a 10 percent larger acreage. The average production for 1918 to 1922 was 20,832,000 bushels. Although the price has increased only about 2 cents over 1923, the difference in yield makes the situation favorable.

The oat crop is estimated at 40,399,000 bushels, an increase of more than 5 million bushels over 1923. Although this yield is not as large as in previous years it represents a smaller acreage.

For the week of November 18, 1923, hogs averaged $6.90, while in 1924 the price was $9.30 for the corresponding week. As the 1924 supply is much smaller than the 1923, a shortage is expected, which probably will make the price go still higher.

The beef cattle situation is discouraging since the prices for 1924 are practically the same as in 1923. It is estimated that 114,000 fewer cattle will be marketed from Kansas during the last six months of 1924 than in the corresponding months of 1923. This reduction should have improved cattle prices but failed because of conditions affecting the beef cattle industry.

Although Kansas farmers increased the number of dairy cows 8 percent in 1924 over that of 1923, in the face of a reduction of 11 2-3 cents a pound on butter, dairying is still a paying proposition for the Kansas farmer. The profit is made in that dairy cows can use up the farmer's waste and bulky feeds and employ his time when otherwise he would be idle.

The hen is also playing an important part in the situation as poultry flocks have increased in size and productivity while the price of eggs is 8 cents a dozen higher for 1924 than for 1923, taking the prices for the week of November 18.

These increases in production and price have given Kansas farmers a good year just when it was greatly needed to pay debts and make needed improvements on their farms.

The following graduates of K. S. A. C. are doing graduate work in the University of Minnesota, St. Paul: S. C. Salmon, M. S., '23, K. S. Quisenberry, '21, L. A. Schaal, '24, J. H. Neal, '24, Louis Vinke, '21, and Fred Griffee, '19.

Why Some Fruit Trees Do Not Bear

George A. Filinger, '24

Many farmers of Kansas have spent a great deal of money growing fruit trees and are now very much disappointed because the orchards are not producing as they expected. Perhaps the most exasperating question asked of an average horticulturist is, "Why is it that my fruit trees do not bear as they should?"

This is a difficult question to answer because so many different conditions may be responsible for the nonproductiveness of the trees. There are in general two classes of unproductive trees. The trees in one class fail to form fruit buds, in the other class the trees bloom abundantly yet fail to produce fruit.

Several reasons may be responsible for the nonproduction of fruit buds. First, the trees may not be old enough. Such varieties of apples as York Imperial, Yellow Newtown, and Northern Spy naturally come into bearing late. Among the pears the Comice and Anjou are late bearers. Trees must reach their normal fruit-bearing age before they will set fruit buds. Second, the trees may be overstimulated. The application of too much barnyard manure or commercial fertilizer will stimulate wood growth but will retard fruit production. Such trees are large and vigorous, making splendid wood growth and having dark green foliage. Third, the trees may be low in vitality. The lack of plant food has so exhausted the trees that they cannot form fruit buds. Such trees are small and lack vigor. Their leaves are yellow-colored and small. The trees show little or no wood growth. Fourth, trees grown north of their northern limit may continue to grow but will not produce fruit.

The other class of nonproducing trees bloom freely but fail to set fruit, or if the fruit does set it drops off before it attains any size. Several conditions may cause fruit blossoms to drop. First, severe winter injury or a period of drouth may so weaken the buds that the blossoms will not set fruit. Second, diseases or insects may so injure the fruit buds or blossom buds that they will drop after blooming. Third, late spring frosts may kill the blossoms or young fruit. The fourth condition and the most common, is the lack of fertilization. Every blossom of our common fruits must be "fertilized" by congenial pollen in order to produce fruit. Cross-pollination has evidently been encouraged by nature. Many fruit varieties are self-sterile. That is, the blossoms cannot be fertilized by pollen of the same variety. Spitzenburg is an example of a self-sterile apple variety. Some varieties of apples, like the Winesap, produce very little pollen. Hence if Spitzenburg and Winesap were the only varieties in the orchard very little fruit would set, especially on the Spitzenburg. Other varieties of apples that are more or less self-sterile are Arkansas, Stayman Winesap, Arkansas Black, King David, Wealthy, and York Imperial. Among pears Bartlett, Kieffer, Anjou, and Winter Nellis are more or less self-sterile. Most varieties of peaches and sour cherries are self-fertile and can be grown in large blocks. Sweet cherries are not only self-sterile but in many cases are inter-sterile. That is, certain varieties will not fertilize blossoms of certain other varieties.

To insure good pollination, a grower should have several varieties of each kind of fruit which he wishes to produce. Varieties that bloom about the same time and are known to intercross should be selected as pollinizers for each other. A good way is to have blocks of one variety consist of four rows. Such blocks are not so large as to interfere with cross-pollination nor so small as to interfere with orchard practices.

All fruit trees of bearing age, grown in good orchard soil, should produce fruit provided the correct amount of fertilizer is added, protection from winter, drouth, disease, and insect injury is secured, and correct conditions for pollination are assured.

W. E. Robison, '20, is in the grain and feed business, Towanda, Kan.

Leo D. Ptacek, '20, is farming near Emporia.

F. E. Oakes, '20, is teaching in the Salt City Business College, Hutchinson.

THE KANSAS AGRICULTURAL STUDENT

KANSAS STATE AGRICULTURAL COLLEGE

MANHATTAN, KANSAS

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DIRECTORY, CLASS OF 1924, DIVISION OF AGRICULTURE

At each K. S. A. C. commencement for the last 25 years, or beginning with 1900, students of the Division of Agriculture have been graduated with the degree, bachelor of science in agriculture, the total number graduated being 1,164. Ten students of the division were graduated in 1900. The largest number for the quarter of a century, 117, was graduated in 1916, the last year before entrance requirements were raised to the present standards. In 1924, 87 students in the graduating class were from the Division of Agriculture. This was the second largest class in the history of the division and the largest since graduation from an approved four-year high school course, or equivalent training, was required for entrance.

It will be interesting to note what these 87 graduates are doing their first year out of college. It must be borne in mind that no general conclusions can be drawn from the figures. Shifts are common and rapid during the first few years after college graduation. This is particularly true of those engaged in teaching. Probably 75 percent of this group of graduates of the Division of Agriculture who are teaching this year will be doing something else in five years from now. The majority of those leaving the teaching profession will be farming according to past experience. It must also be remembered that any classification contains faulty data because many graduates engage in two occupations at the same time, as teaching and farming, and for other reasons. The summary of the classification given in "Alumni Notes" of this issue is as follows:

Farming	15
Teaching vocational agriculture	17
Teaching other high school work	22
Engaged in commercial work, chiefly agricultural in character	12
College teachers, graduate students, or research workers	17
County agricultural agents	4
Total	87

The directory given in "Alumni Notes" indicates something of the wide range of opportunities which are open to agricultural graduates.

AGRICULTURAL SEMINAR

A monthly general Agricultural Seminar has been inaugurated in the Division of Agriculture this year. The meetings are held at 4 p. m. the second Thursday in each month in the college auditorium. An address of outstanding importance to agricultural interests is to be given at each meeting.

Dean F. D. Farrell is responsible for the change that provides these seminars for agricultural students and beyond doubt they will prove both helpful and popular. Be-

lieving that many readers of the Agricultural Student will be interested in reports of the addresses delivered at these meetings we plan to give a very brief report of each in our columns.

A CORRECTION

In the "College Notes" of No. 1, under the heading Alpha Zeta Awards, the names of the ten high freshmen of the Division of Agriculture for the college year, 1923-24, were given. By a mistake the name of Zaven K. Surmelian of Armenia was not included in this list. Mr. Surmelian passed 40 credit hours of work during the two regular semesters of the college year 1923-24, with an average scholarship of 2.02 or 88.2 percent.

OUR COVER PAGE

The picture shown on our cover page, by F. E. Colburn, college photogrpaher, is that of Royal Crown 1096535, junior Shorthorn herd sire at K. S. A. C. He was bred by Tomson Brothers, Wakarusa, Kan., and was calved November 26, 1921. Royal Crown's dam is a cow belonging to the Scotch Rosemary family. He was sired by Marshall's Crown, the great show and breeding bull now at the head of the Tomson Brothers' herd. The college purchased him from Tomson Brothers in the fall of 1922.

Royal Crown was shown as a senior calf at the Kansas Free Fair at Topeka and the Kansas State Fair at Hutchinson, winning third in his class at each show. He was shown at the Kansas National Livestock Show at Wichita as a senior yearling in January, 1924, where he won first in his class and was also at the head of the first-prize yearling Shorthorn herd shown by the college. (See cover page, Vol. III, No. 2, December, 1923.)

King Cotton

Dorothy L. Nelson, '24

It's a distinct shock to a Kansan when he first gets into the cotton country and finds a prosperous little town minus a single cream station or wheat elevator. He can not help but wonder how the people make a living and after eating cold storage eggs every morning for several weeks he wonders still more. But perhaps by that time he has decided that cotton rules and not "the cow, the sow, and the hen."

Down in southeastern Missouri the growing of cotton has been very profitable, the boll weevil has not caught up yet with the northern advance of the cotton belt and the soil is excellent. The farmers have not had diversified farming forced upon them by economic necessity. Consequently cotton plays an important part in the community. The schools are arranged with a summer and winter term so that the children may be free to chop cotton in the spring and to pick cotton in the fall. Most of the picking is done by women and children from the nearby towns although a transient class of pickers is becoming more evident each year.

Business along main street picks up with the coming in of the wagons full of cotton; stores and banks add extra help to their forces and prepare to keep open from dawn till late at night. Cotton gins fire up and their whistles dispel any air of sleepiness that may have lingered through the summer. There is a general atmosphere of bustle and excitement so contagious that the Kansan is infected and begins to boast of the acre yield of cotton in his county as the highest in the state.

C. V. Holsinger, '95, W. C. Calvert, '16, and J. C. Cunningham, '05, are members of the Department of Horticulture, Iowa State College, Ames, Iowa.

Faye Williams, '21, is teaching domestic science and art in the Ashland high school.

A. C. Maloney, '18, of Fort Scott, is the Kansas representative for the American Agricultural Chemical Company.

F. E. Balmer, '05, is state county agent leader, University Farm, St. Paul, Minn.

College Notes

KANSAS GRAIN JUDGING TEAM FIRST IN INTERNATIONAL CONTEST

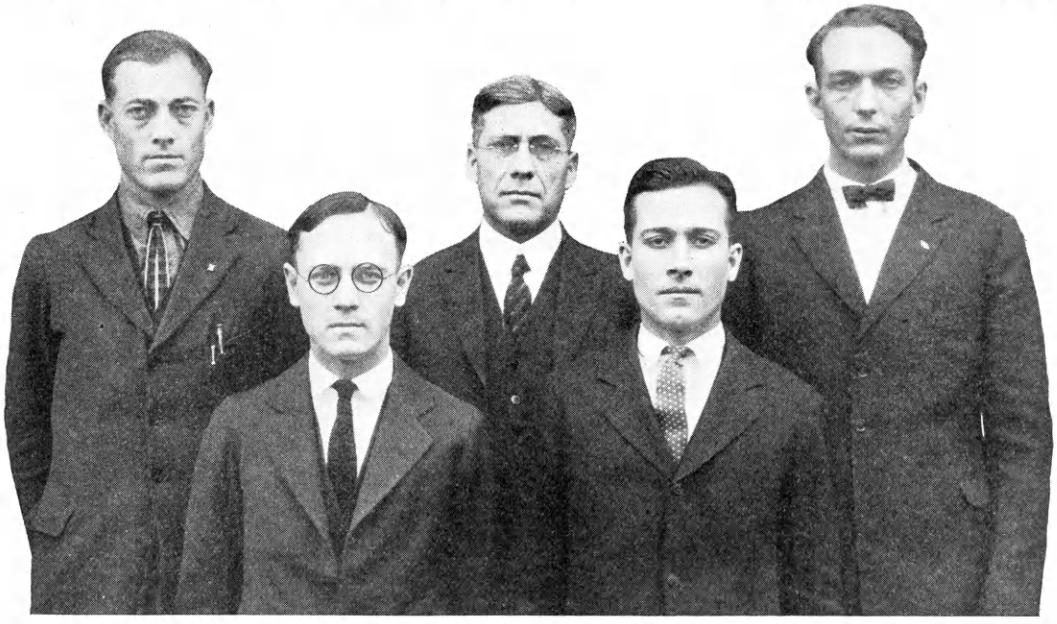
John E. Norton of Grainfield, senior in agronomy, won highest individual honors, and the Kansas State Agricultural College grain-judging team placed first in the students' contest held in connection with the International Hay and Grain Show in Chicago on November 29, 1924. O. L. Norton of La Cygne, senior in agricultural economics and member of the 1924 dairy judging team, placed third among the 24 contestants (8 teams) in the entire contest. Glenn Reed, senior in agronomy, placed ninth. Carl Bower of Manhattan was alternate.

The contest consisted of the identification of weeds, crop plants, and diseases of crop plants; judging of classes of wheat, oats, barley, corn, sorghums, clover, alfalfa, soybeans, cowpeas, field peas, field beans, hay, and cotton; and the commercial grading of wheat, oats, corn, and rye.

The prizes for the winning team are a loving cup trophy and fifteen dollars in cash. Individual prizes are, first, $15; second and third, $5 each.

The ranking of the first three teams with scores out of a possible 5,000 are as follows:

Rank	State	Score
1	Kansas	3,983
2	West Virginia	3,828
3	Michigan	3,803



CHAMPION GRAIN-JUDGING TEAM IN THE 1924 INTERNATIONAL CONTEST
From left to right the men in the picture are: Glenn M. Reed, Galesburg; C. W. Bower (alternate), Manhattan; Prof. J. W. Zahnley (coach); J. E. Norton, Grainfield; O. L. Norton, La Cygne.

Considerable credit is due Prof. J. W. Zahnley for coaching and training the team. O. L. Norton has the distinction of representing the college on two intercollegiate judging teams during the same semester.

AGRICULTURAL SEMINAR

The first meeting of the Agricultural Seminar for the college year, 1924-25, was held Thursday, October 9, 1924. Dr. W. E. Grimes, head of the Department of Agricultural Economics, spoke on the Agricultural Outlook. The following is a brief summary of his address:

The recent increased prosperity for agriculture is due to reduced supplies of wheat, corn, and hogs throughout the world. American farmers are producing a large crop of wheat at a time when the world is short of wheat. Corn supplies in the United States are short and hog production is decreasing. The prices of wheat and corn cannot be expected to remain so high next year if production is more nearly normal. The indications are that hog prices may be higher for another year. From an agricultural viewpoint, the present prosperity is, in part, temporary.

Improved economic conditions in Europe should promote economic stability throughout the world and increase industrial activity. This is a longer-time viewpoint and should give greater prosperity. From the standpoint of farm products, prices of some products can be expected to decline in 1925. The amount of the decline will be dependent, in part, upon the rapidity of the rising curve of increased industrial activity and greater world prosperity. The outlook for the future from a long-time viewpoint is optimistic, although some farm prices may be lower in 1925 than at present.

At the November meeting of the Agricultural Seminar Dr. R. R. Dykstra, Dean, Division of Veterinary Medicine, spoke on the Foot and Mouth Disease. The following excerpts are taken from his address:

The organism causing foot and mouth disease is not known. However, virus from diseased animals is very contagious. Cattle are very susceptible, sheep and hogs to a less degree, and humans comparatively insusceptible. (Children occasionally contract the disease by drinking milk from diseased animals.) The symptoms of the disease are a feverish condition followed by an outbreak of blisters in the mouth and on the feet and udder. Infection is disseminated by stray animals, birds, and man. Quarantine and slaughter are means of control. Owners are compensated by the state and federal governments. The disease is too contagious to permit experimentation and research.

The disease is continuously present in Europe and Asiatic countries. Eight outbreaks have occurred in the United States. The California outbreak was caused by infected garbage taken from a ship that had recently arrived from Japan.

KANSAS WINS FIRST AT AMERICAN ROYAL

The Kansas intercollegiate livestock judging team placed first among twelve teams competing in the annual judging contest held in connection with the American Royal Livestock Show in Kansas City, November 15, 1924.

R. W. Russell of Mankato, senior in agricultural economics, was high point man on the Kansas team and ranked third in the entire contest with 918 points out of a possible 1,000. Twelve classes of livestock were included in the judging, and on these, 600 points were possible for placings, while an additional 400 points were made possible by reasons for the placings on eight of the twelve classes.

The scores made by the first five teams were as follows:

Rank	Contestant	Score
1	Kansas	4,495
2	Nebraska	4,438
3	Colorado	4,379
4	Purdue	4,349
5	Wisconsin	4,346

The first three individual rankings with the scores made by each were as follows: C. G. Mattern, Texas, 935; C. G. Burford, Oklahoma, 919; R. W. Russell, Kansas, 918.

Other members of the team besides Russell were: George F. Ellis, Las Vegas, N. Mex.; C. C. Huntington, Eureka; Earl C. Smith, Pratt; H. H. Carnahan, Garrison; and R. E. Sears (alternate), Eureka; Prof. F. W. Bell, coach, accompanied the team.

The K. S. A. C. team won first at the American Royal in 1922, second in 1923, and first in 1924.

KANSAS LIVESTOCK JUDGING TEAM FIFTH IN INTERNATIONAL CANTEST

Kansas placed fifth in the intercollegiate livestock judging contest held in connection with the International Livestock Exposition in Chicago, November 29, 1924, scoring a total of 4,208 out of a possible 5,000 points. The same team placed first in the contest at the American Royal Livestock Show in Kansas City, November 15.

Twenty-four teams, representing various colleges of agriculture of the United States and Canada, were entered in the contest making a total of 120 contestants. The K. S. A. C. team also placed fifth in the sheep classes.

The first five teams placed in the following order:

Rank	Contestant	Score
1	Nebraska	4,386
2	Missouri	4,231
3	Ohio	4,229
4	Oklahoma	4,212
5	Kansas	4,208

The following seniors composed the Kansas team: George F. Ellis, Las Vegas, N. M.; Earl C. Smith, Pratt; H. H. Carnahan, Garrison; C. C. Huntington, Eureka; R. W. Russell, Jewell; and R. E. Sears (alternate) Eureka.

Though the Kansas team relinquished its

hold on the international championship in livestock judging, it still holds an enviable record by placing first at the American Royal and high at the International. Last year Kansas placed first at the International and second at the American Royal. Much credit is due Prof. F. W. Bell (coach) for his winning college teams.

PRESIDENT JARDINE ON FARM COMMISSION

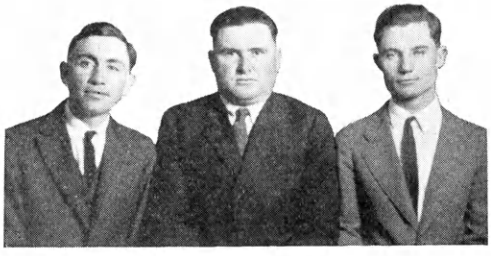
Dr. William M. Jardine, president of Kansas State Agricultural College, has been appointed by President Coolidge as one of nine members on the farm commission. The

PRES. WILLIAM M. JARDINE

President has appointed this commission to consider the present problems of the agricultural industry and to recommend ways of improving agricultural conditions. Their first meeting was held during the second week in November to determine the best approach to agricultural problems.

The investigations of the commission are expected to come under three divisions; namely, agricultural legislation, administration of existing laws, and improvement of argicultural education. Any farm legislation enacted during the next session of Congress will probably be based upon the recommendations of the commission.

The members of the commission besides President Jardine are: Robert D. Carey, chairman, formerly governor of Wyoming and a big cattle man; O. E. Bradfute, president of the American Farm Bureau Federation; Charles S. Barrett, head of the Farmers' Union and chairman of the National Board of Farm Organizations; Louis J. Tabor of Ohio, master of the National Grange; Ralph P. Merritt, president of the Sun-Maid Raisin Growers Association, Fresno, Calif.; R. W. Thatcher, director of New York Agricultural Experiment Station; W. C. Coffey, dean of the College of Agriculture, University of Minnesota; and F. H. Bixby of California, president of the American Livestock Association.



HONOR STUDENTS,
DIVISION OF AGRICULTURE,
CLASS OF '25

The local chapter of the national honorary scholastic society, Phi Kappa Phi, during the first semester of each college year elects new members from the 5 percent of the membership of the senior class highest in scholarship. The honors, this year, for the Division of Agriculture, were won by the men whose pictures are shown above. From left to right they are: M. E. Crouse, Harlan; Glenn I. Wood, Milan; and Walter J. Daly, Tucson, Ariz., all majoring in dairy husbandry. Their scholarship average for the first three years of their college work is, 2.43, 2.44, and 2.45, respectively.

J. W. Ziegler, '22, recently manager of a purebred livestock farm in New York, will became manager of an 880-acre livestock farm on the Republican river in Cheyenne county, January 1, 1925. Mr. Ziegler majored in animal husbandry and now plans to continue to pursue his major interests in the production of beef and pork on an excellent layout in extreme northwestern Kansas. His address is St. Francis.

Grain Sorghum Investigations Applied to Southwestern Kansas

G. M. Reed, '25

Results of investigations with grain sorghums secured by the Woodward Field Station, Woodward, Okla., recently published by the United States Department of Agriculture, indicate that the date of seeding grain sorghums bears a very important relation to yields. The agronomist in charge of the sorghum investigations at the Woodward Field Station states that varietal tests alone are of limited value in determining the variety best adapted to a particular region or locality.

In varietal tests covering a period of eight years, in which all the important grain sorghum varieties were included, Sunrise kafir gave the highest yield, 26.3 bushels per acre. The next four highest yields were: Dawn kafir, 23.8 bushels; Dwarf Yellow Milo, 21.8 bushels; feterita, 21.6 bushels; and Red kafir, 20.8 bushels. In these experiments the seeding has been done at or as near the middle of May as conditions permitted.

Five-year date-of-seeding experiments with Dwarf Yellow milo and Sunrise kafir have been conducted. The two varieties were seeded each year on six different dates—the middle of April, the first and middle of May, the first and middle of June, and the first of July.

The five-year average yields indicate that Dwarf Yellow milo should be seeded the middle of June. This date of seeding gave an average yield of 33.4 bushels per acre with the June first seeding second, yielding 29.1 bushels per acre. The Sunrise kafir yielded highest from the middle of May seeding, 27 bushels per acre, with the June first seeding second, yielding 24.7 bushels per acre. It will be noted that the best date for seeding Sunrise kafir and the date on which the varietal tests were seeded are the same, which accounts for the relatively low yields of Dwarf Yellow milo in comparison with Sunrise kafir in the varietal tests.

Spacing experiments with Dwarf Yellow milo and Sunrise kafir have been conducted with the plants of each variety spaced from six to thirty inches apart in rows 44 inches wide. The highest average yield over a period of five years was obtained from the 12-inch spacing with Sunrise kafir and from the 24-inch spacing with Dwarf Yellow milo. In no case, however, were the differences between the close and the wide spacing more than two or three bushels per acre.

A comparison of the soils and of the climatic conditions of the two regions shows that results obtained at the Woodward Field Station can be applied very well to southwestern Kansas. The soils in the two regions are quite similar, being sandy, open, and porous. Both regions are characterized by a high average wind velocity, low atmospheric humidity, high summer temperature, and irregular seasonal distribution of rain in which most of it falls between April and November.

The results indicate that to obtain the highest average yields, kafir should be planted between May 15 and June 1, preferably as near May 15 as possible. Milo should be seeded about a month later, preferably on or slightly before June 15. One plant every 12 inches in the row for kafir, and one for every 24 inches for milo is most desirable. However, should a somewhat thinner stand be secured there is no need for replanting since the yield from the thin stand will be almost as large as if a normal stand had been obtained.

R. M. Phillips, '14, is farming near Stockdale, Kan.

E. E. Gottman, '20, is running a dairy farm near Kansas City, Kan.

Frank I. Reynolds, '17, is manager of the Pet Milk Condensing Plant at Mulvane, Kan.

A. L. Hallsted, '03, is dry land agriculturist at the Fort Hays Experiment Station, Hays, Kan.

C. F. Huffman is in charge of the dairy nutrition experiments, Michigan Agricultural College, East Lansing.

Facts That Should Be Known About Rabies

Walter Wisnicky, '26

Rabies is an infectious disease of animals and man affecting the central nervous system. Aristotle (about 300 B. C.) speaks of rabies being purely an animal disease and being carried by the bite of one animal to another. Celsus in the first century describes human rabies as being produced by the bite of rabid animals.

The ancient existence of the disease, and progress in controlling the disease, both by legislative restriction and animal destruction, have not tended to decrease rabies in Kansas as is shown by statistics given out by the Department of Pathology of the Division of Veterinary Medicine in K. S. A. C. During the biennial period commencing July 1, 1922, and ending June 30, 1924, the department received for laboratory diagnosis 270 specimens suspected of rabies. Of these 130 were positive cases, 85 were negative, 8 were suspicious, and 47 were impossible to diagnose due to advanced decomposition. The majority of the cases were dogs, but cases of cats, cattle, horses, hogs, squirrels, and skunks were also received. The 270 cases were received from 55 counties in the state. These figures reveal that over 50 percent of the counties in the state experienced an outbreak or were aroused by a supposed outbreak of rabies during the biennium. Information coming along with the rabies specimens for diagnosis reveals that as many as 11 people were bitten by one rabid dog.

Although the Department of Pathology of K. S. A. C. is the only Kansas state laboratory which diagnoses rabies specimens, the cases received here are by no means all the rabies specimens from Kansas diagnosed, because there are several private laboratories in and about Kansas which receive rabies specimens for diagnosis.

There are but a few diseases more dreaded by communities than rabies or hydrophobia. Tales of the suffering of infected persons, especially those with the furious variety of the infection, characterized by maniacal symptoms have been thoroughly disseminated, so that the cry of "mad dog" on the public streets is sufficient to arouse a general state of confusion and excitement in which an otherwise harmless creature may be compelled to bite or snap for self protection. Not all dogs under these conditions are mad or infected with rabies, and the bite of an angry dog, otherwise normal, is not necessarily dangerous from the standpoint of rabic infection. Furthermore, dogs have running fits, distemper fits, worm convulsion, and convulsions from the absorption of poisons and poisonous products from the intestinal tract, each of which causes the dog to exhibit more or less characteristic symptoms of a rabid animal. The above, however, does not minimize the danger from cases of true rabies of which there are plenty in the state.

Upon being bit by a dog, it is only proper that the person promptly consult his physician in regard to the wound, but the thing that is so often sadly neglected is the care of the dog that produced the injury. A competent, graduate veterinarian should be called to attend the animal. The veterinary practitioner by virute of his scientific training in small animal diseases is the only one in any community who is qualified to handle a situation where a dog is suspected of rabies or actually has rabies. Many dogs are unnecessarily shot by laymen because they show symptoms of fits due to other diseases than rabies, or because they bite someone under defensive circumstances. These animals should have been penned securely and kept under observation for a few days. On the other hand, some dogs are shot when suspected of rabies, no qualified person being present to observe the clinical symptoms, state whether the animal was rabid or not, and properly care for the head of the dead animal for the purpose of future laboratory diagnosis. A trained person can readily tell with a confined animal under observation for a few days, whether the animal is a victim of rabies. The incubation period of the virus in a human from the time of bite infection to the time when actual symptoms appear is usually from 30 to 60 days. It may

be from 16 days to one year. The period naturally gives some time for observation on a suspected animal.

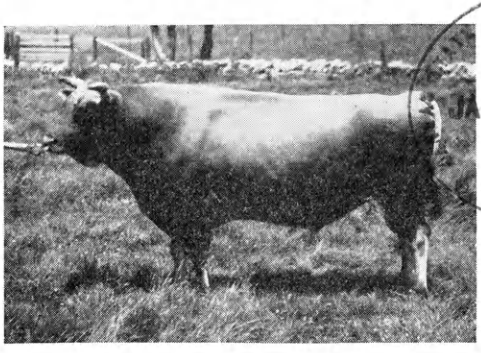
It is the best practice to confine promptly the animal that has bit a person and call into service the practicing veterinarian to attend the animal to determine whether rabies is present, in addition to consulting the physician for surgical attention to the wound. Just where the veterinary practitioner's responsibility ends and where the physician's begins, where clients may have been exposed to rabies, is a point which cannot be definitely settled. While it is not the veterinarian's duty to advise when to take treatment, in some instances he is practically compelled to do so. In many localities, including large cities, physicians have little or no definite knowledge regarding this problem and, as a rule, are glad to confer with any competent veterinarian whenever there is a good reason to avoid having anyone take the Pasteur treatment if this may be done without hazard. It is in such instances that teamwork between physician and veterinarian is productive of invaluable results.

To Pasteur belongs the credit for having discovered (1880) the fact that rabies may be prevented by conferring gradual inmmunization with increasing doses of attenuated virus. This treatment with some modifications is now used with evident success in all parts of the world. According to reliable statistics, the mortality of rabies without the Pasteur treatment in humans is about 16 percent; with the treatment the average mortality is about 0.01 of 1 per cent.

It is not necessary now to go to a Pasteur institution to take the Pasteur treatment. Local physicians can receive the vaccine, with full directions, from commercial biologic houses and administer it with good results.

Muzzle ordinances and practices of picking up all stray dogs in various communities have not proved to be successful in reducing the number of cases of rabies in Kansas and do not control an outbreak successfully.

There is a so-called single dose treatment for all animals, which consists of a single injection of antirabic virus said to confer immunity in most cases for a period of at least one year. This treatment can be given at small cost without injury to the dog or other animals. The virus injected is purely prophylactic and not curative. Reliable experimental statistical data show that in vaccinating 31,307 dogs by the "single dose treatment," the disease was controlled practically 100 percent among the vaccinated dogs while it continued to rage among those unvaccinated.



MANORA'S FAIRY LAD

This bull is at the present time head of the K. S. A. C. purebred Jersey herd. Only one-half interest is owned by the college, the Long View Jersey Farms holding the other half. "Lad" is a show bull of unusual distinction being first-prize junior yearling at the 1920 National Dairy Show at Chicago. He has now been in possession of the college for about a year.

Fred W. Schultz, '26, is spending some time in the fruit growing section of the Pacific Northwest. He went there direct from Fort Snelling, Minn., where he attended the advanced R. O. T. C. summer camp. He will leave the Pacific region for the Hawaiian Islands about January 1, 1925, and expects to spend two months in the pineapple harvest there.

H. E. Dodge, '13, is field representative for the Belle Spring Creamery Company. His present address is New Columbia, Kan.

C. R. George, '23, dairy herdsman on the Corium Farms, Fond du Lac, Wis., spent Thanksgiving with his parents in Manhattan and visited friends in the college and at Homecoming.

H. A. Ames, '23, is teaching physics and agriculture in Corning Rural High School, Corning, Kan.

Alumni Notes

DIRECTORY, CLASS OF 1924, DIVISION OF AGRICULTURE

FARMING

Name	Address	Further information
A. P. Atkins	Range, Okla.	Ranchman
F. M. Alexander	Wellington	General farming
G. S. Atwood	La Cygne	General farming
G. C. Bartgis	Raton, N. Mex.	Herdsman, T. O. Ranch
W. T. Crotchett	Louisburg	General farming
J. L. Farrand	Hunter	General farming
R. C. Hoffman	Haddam	General farming
W. W. Humphrey	Larkinburg	General farming
A. C. Magee	Canadian, Tex.	Foreman, Studer & Sons ranch
J. A. Mier	Aguascalientes, Mexico	Ranchman
A. D. Mueller	Hanover, R. 4	General farming
M. D. Roberts	Pomona, R. 4	General farming
M. B. Spear	Bushong, R. 1	General farming
V. L. Uhland	Rozel	General farming
G. R. Warthen	Hickman Mills, Mo.	Assistant Herdsman, Baker Shorthorn Farms

TEACHING VOCATIONAL AGRICULTURE

Name	Address	Name of high school
A. K. Banman	Americus	Americus Rural
T. W. Bruner	Jewell City	Jewell City Rural
L. E. Deister	Westmoreland	Westmoreland Rural
J. W. Egger	South Haven	South Haven Rural
K. L. Ford	Norton	Norton County Community
Edwin Hedstrom	Spearville	Spearville Rural
Austin T. Heywood	Winfield	Winfield
F. F. Lampton	Medicine Lodge	Medicine Lodge
E. J. McWilliams	Auburn	Auburn Rural
B. J. Miller	Cropsey, Ill.	Cropsey Community
J. R. Moreland	McLouth	McLouth Rural
C. O. Nelson	North Topeka, R. 5	Seaman Rural
R. T. Patterson	Wakefield	Wakefield Rural
R. E. Regnier	Pleasanton	Pleasanton
W. H. Teas	Byers	Byers Rural
O. M. Williamson	Paxico	Paxico Rural
B. W. Wright	Coldwater	Coldwater

OTHER HIGH SCHOOL TEACHING

Name	Address	Subjects	School
Glenn Aikins	Waverly	Agriculture, science, coaching	Waverly H. S.
E. B. Babbit	Wilsey	Agriculture, coaching	Wilsey Rural H. S.
M. L. Baker	Curtis, Nebr.	Head, Dept. of Animal Husbandry	Nebraska School of Agr.
M. C. Barrows	Clifton	Agriculture, manual training	Clifton Rural H. S.
J. W. Dunlap	Manhattan	Science, algebra	Manhattan Junior H. S.
L. E. Erwin	Onaga	Agriculture, coaching	Onaga H. S.
S. P. Gatz	Ionia	Agriculture, coaching	Ionia Rural H. S.
C. C. Griffin	Nickerson	Director "The Farm Shop"	Reno County Community H. S.
R. D. Hahn	Downers Grove, Ill.	Civics, coaching	Downers Grove Community H. S.
G. E. Hendrix	Wellington	Science	Wellington Community H. S.
H. D. Karns	Osborne	Science, coaching	Osborne H. S.
L. D. Keller	Phillipsburg	Normal training, agriculture, geometry	Phillipsburg H. S.
H. H. McGee	Beattie	Agriculture (principal)	Beattie H. S.
W. E. Myers	Willis	English, music, science	Willis Rural H. S.
Dorothy L. Nelson	Senath, Mo.	Science, agriculture	Senath H. S.
E. L. Raines	Keats	Agriculture, manual training	Keats Rural H. S.
Paul G. Roofe	Salonica, Greece 5 Rue Frank	Head, Dept. of Agriculture	Salonica Agr'l & Indus. Inst.
M. E. Rowe	Augusta	Agriculture	Augusta H. S.
R. L. Stover	Altoona	Agriculture, science, coaching	Altoona H. S.
R. R. Stucky	Falun	Agriculture, coaching	Falun Rural H. S.
C. D. Tolle	Saffordville	Science, agriculture	Toledo Twp. H. S.
D. O. Turner	Esbon	Agriculture, mathematics	Esbon H. S.

COMMERCIAL WORK

Name	Address	Further information
L. F. Barth	Cicero, Ill., 2230 S. 50th Ave.	Employ of Gen. Elec. Co.
V. A. Berridge	Chicago, Ill., 3504 S. Mozart	Seed Buyer, Albert Dickinson Co.
B. E. Colburn	Chicago, Ill., 6110 Stony Island Ave.	Employ of Morehead Fruit Inspection Co.
B. F. Houlton	Ellsworth	Ice Cream Maker, Ellsworth Ice Cream Co.

R. G. Lewis	Kansas City, Kan	Employed in Chemical Lab., Proctor and Gamble Mfg. Co.
J. T. Mackay	Kansas City, Mo., 4508 Mill Creek	Employ of O. C. Evans Co.—Fruit, Vegetable Produce House
O. L. Pretz	Kansas City, Kan., 318 Russell Place	Dairy Chemist, De Coursey Creamery Co.
E. L. Reichart	Lincoln, Nebr.	Manager, College Creamery, Univ. of Nebr.
A. W. Stover	Blackfoot, Idaho	Manager, Blackfoot Greenhouse & Wayside Gardens
Edward Watson	Kansas City, Mo., 408 E. 11th St.	Milk Inspector, K. C. Consumers' League
M. M. Williamson	Tulsa, Okla., 420 N. Main St.	Motor Truck Salesman
P. R. Woodbury	Emporia	Ice Cream Maker, Turkish Candy Co.

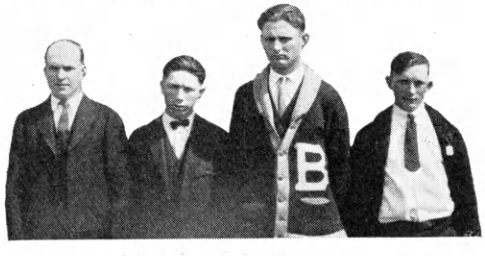
HIGHER EDUCATION OR RESEARCH

Name	Address	Further information
H. G. Burt	Charlottesville, Va., Box 299	Entomologist, U. S. Bureau of Entomology Field Laboratory
B. R. Churchill	East Lansing, Mich.	Graduate Assistant in Farm Crops, M. A. C.
E. W. Davis	Manhattan	Graduate student in Entomology, K. S. A. C.
S. W. Decker	Urbana, Ill.	Assistant in Floriculture, Univ. of Ill.
C. O. Dirks	Ames, Iowa	Fellow in Horticulture, Iowa State College
G. A. Filinger	Manhattan	Graduate Assistant in Horticulture, K. S. A. C.
I. L. Hathaway	Manhattan	Graduate student in Bacteriology, K. S. A. C.
M. M. Hoover	Manhattan	Graduate Assistant in Agronomy, K. S. A. C.
C. B. Hudson	Manhattan	Graduate student, K. S. A. C.
E. M. Litwiller	Manhattan	Instructor in Horticulture, Dept. of Home Study Service, K. S. A. C.
J. K. Muse	Brookings, S. Dak.	Graduate Assistant in Dairy Husbandry, State College of Agr. & M. A.
L. A. Schaal	St. Paul, Minn.	Graduate student in Plant Pathology, Univ. of Minn.
E. C. Scott	East Lansing, Mich.	Graduate Assistant in Dairy Husbandry, M. A. C.
R. W. Sherman	Burlington, N. J., 337 Jones Ave.	Japanese Beetle Project, U. S. Bureau of Ento.
T. B. Stinson	Tribune	Supt., Tribune Branch Experiment Station
W. H. von Treba	Colby	Asst. to Supt., Colby Branch Experiment Station.
C. C. Wilson	Sacramento, Calif. 600 Twenty-Sixth St.	Junior entomologist, Div. of Cereal and Forage Crop Insects, U. S. Bureau of Ento.

COUNTY AGRICULTURAL AGENTS

Name	Address	County
D. M. Braum	Burlington	Coffey
J. D. Buchman	Paola	Miami
C. F. Gladfelter	Cottonwood Falls	Chase
C. A. Jones	Olathe	Johnson

The accompanying picture shows L. F. Hall, '23, teacher of vocational agriculture in the Burlington High School, and his team that won the State High School Judging Contest at K. S. A. C., May 1 and 2, 1924. The same team now holds the unique and enviable record of having won the junior contest at the Topeka Free Fair, September, 1924, at the American Royal in November, 1924, and the recent national junior livestock judging contest of the International Livestock Show, Chicago. They met severe competition in all these contests. In their most recent victory the Kansas entrants competed against teams representing 20 other states. Each team represented a high school or a boys' livestock club organized under the supervision of federal and state specialists.



L. F. HALL, '23, AND HIS JUNIOR CHAMPION LIVESTOCK JUDGING TEAM

L. F. Hall (coach) and Karl Garrett, Ralph Grose, and Edgar Webster, consistent winners in the leading junior livestock judging contests held during the last seven months.

LIME IN KANSAS

(Continued from page 40)

At the same time he maintains the fertility of his soil. Lime and legumes improve the physical condition of the soil by making it more porous and open, and thus aiding in better drainage and aeration. Lime will increase bacterial action in the soil. Increased bacterial action liberates plant food and aids in decomposition of organic matter. Instead of being detrimental to normal plant growth the soil is now a place for practically all useful plants to grow, surrounded by the best of conditions.

The agricultural prosperity of southeastern Kansas is controlled largely by the present type of farming. The farmers must get away from grain farming and methods which deplete the productiveness of their soil. They cannot do this to the greatest advantage till alfalfa and clovers are grown and before these can be successfully incorporated in the rotation, the soil must be corrected for the acidity which now exists.

Lime is plentiful. All that is needed is determination on the part of the farmers to break away from their present methods of soil management and cropping systems to one in which legumes play a leading part. As before stated, lime increases the soil productivity by increasing bacterial action in the soil. Free atmospheric nitrogen will be fixed in the soil by increased activity of these micro-organisms. Legumes will also help break up the hard impervious subsoil by their heavy root systems. They will reach stores of plant food untouched in the past by the shallow-rooted grain crops. These legume roots will later rot and leave the soil more open for circulation of air and drainage water.

Since ground limestone is the most economical form to apply in most instances, the purchase of lime crushers will enable the farmers to obtain their supply of lime at the cheapest price possible. Some farmer might own one of these crushers and operate it something after the manner of the commercial threshing machine, or communities can buy a lime crusher and during the winter months crush their own lime. These crushers are portable and can be moved from place to place or set in a central location. It is unquestionably true that a community in southeastern Kansas can secure lime at a very low cost and by proper soil treatments greatly increase its prosperity.

C. W. Mullen, M. S., '17, is associate editor of "The Oklahoma Farmer-Stockman" published in Oklahoma City, Okla.

Warren Cowell, '22, is coaching freshman athletics at University of Florida, Gainesville.

W. O. McCarty, '23, is a graduate student in the School of Education of the University of Chicago.

J. M. Moore, '22, is field superintendent of the Cooperative Dairy Association of Kansas City, Mo. He lives at 4607 Tracy street.

E. L. Westover, '11, is Western Field Representative of the American Guernsey Cattle Club. His headquarters are in Portland, Ore.

Stump Blasting— Do it the Better Way

JUST as machinery has taken the place of hand methods on the farm, so dynamite has replaced primitive methods for many farm activities.

Stump-blasting, for instance, was formerly one of the hardest jobs a farmer could undertake. Today, it's easier, quicker, cheaper, better and a lot more fun to blast stumps with dynamite.

Dynamite has added millions of acres to productive farms. And blasting stray stumps and boulders on present crop land increases its production, permits the continuous use of farm machinery and removes the breeding places for weed and crop pests.

Various types of du Pont explosives are recommended for blowing stumps—Dumorite, Red Cross Extra Dynamite, and Pacific Stumping Powder (in the Northwest). The selection of the explosive depends upon the type of stump and character of the soil.

Du Pont produces a special explosive to meet the particular conditions in every phase of explosives work—the result of over a century of research and experiment.

Write for free 110-page "Farmers' Handbook of Explosives" telling how to use explosives for land-clearing, ditching and tree-planting.

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DU PONT
DYNAMITE

VALUE OF FLOWER GARDEN

(Continued from page 41)

from antler to stigma by the clumsy but welcome guest is the end for which all this beauty, fragrance, and sweetness have been produced.

Beautiful plants and flowers naturally grouped are pleasing because they are restful. Association with nature is soothing. The sounds in the woods are musical, the colors, beautifully blended. Nature in such moods is restful.

Every family, therefore, should have the pleasure of developing a flower garden, be it large or small, for through the development of a flower garden one becomes more closely associated with nature and her ability to beautify the great land from which we live. If ground area is unobtainable, flowering plants will delight in growing in porch boxes, hanging baskets, or in suitable containers which may hold but a small amount of soil. Wherever there is sunlight, plants may be encouraged to grow. The great pleasure and satisfaction of growing flowering plants does not depend on the facilities with which one has to work. It does depend on the temperament of the person and his enthusiasm to create higher ideas.

More and more cut flowers are needed. At social gatherings the table is not completely furnished unless there is a choice collection of cut flowers. The housewife, instead of sending to the florist at a distance and having them come wilted and bedraggled, should be able, in season, to step into her flower garden and cut them in their morning freshness.

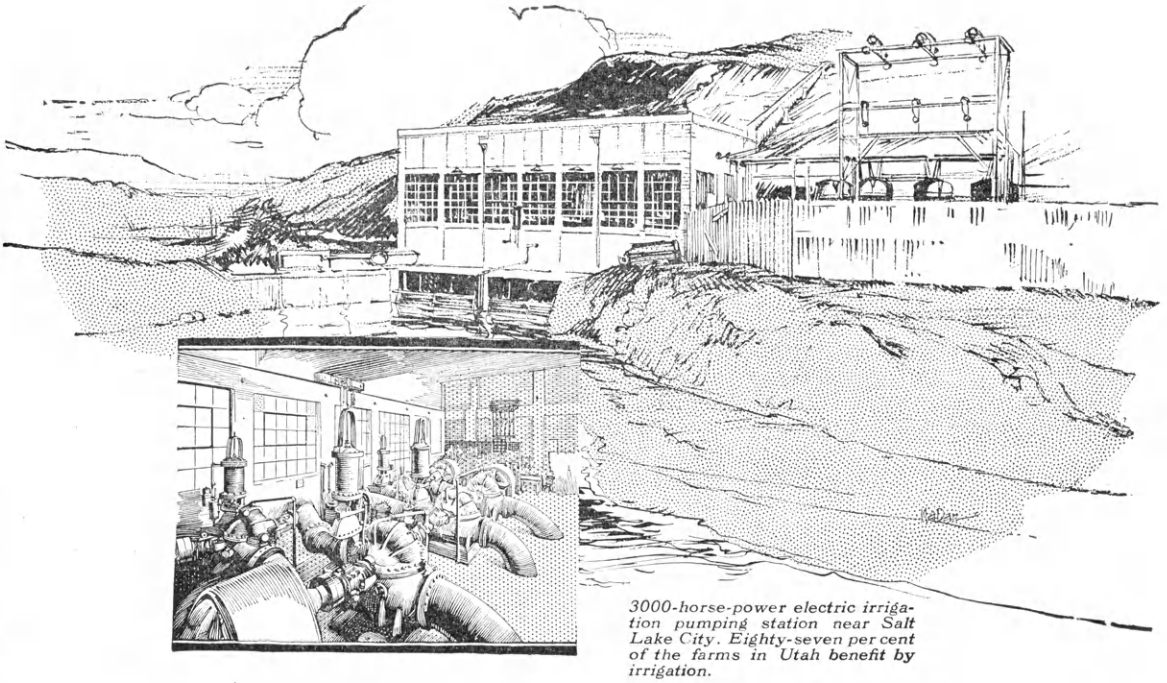
PUREBRED DAIRY SIRES

(Continued from page 42)

Holstein bull from a dam that has produced as high as 22,000 pounds of milk and 774 pounds of fat in a year, and three Jersey bulls from a cow with a record of 650 pounds of fat in one year, have been among the good sires sent out into the state. The prepotency of some of these sires is quite noticeable, and a great number of them have been retained in their respective communities because of the increased production of their daughters over their respective dams.

In addition to the 165 bulls distributed in Kansas in the past 14 years, twenty-six have been sent to 12 other states, two to San Domingo, and one to Old Mexico to head purebred herds. Of the ones that have gone to other states, five Aryshires have been sold to head the agricultural college herds of Massachusetts, Indiana, Missouri, Minnesota, and Nebraska. One Jersey was sold to head the herd at the University of Nebraska and one Guernsey was sold to the University of Wyoming.

The price of these bulls has ranged from $40 to $500 which means that they have been priced within the reach of the average farmer, or dairyman, and this probably has been an inducement for many to start in dairying in Kansas. As time goes on the influence of the blood of these dairy sires will be more noticeable in the development of profitable dairying in Kansas.



3000-horse-power electric irrigation pumping station near Salt Lake City. Eighty-seven per cent of the farms in Utah benefit by irrigation.

Pumping prosperity through a State

Electricity, carried hundreds of miles from mountain power houses, pumps the water that has transformed an arid region into a land of plenty—does the hard work on the farms—and tirelessly shoulders the drudgery of women's work.

Utah, a state of farms, has doubled its use of electric power in the past five years—many other farm states are making similar records.

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

The new G-E Farm Book, giving interesting facts on the subject of farm electrification, will be sent on request. Write Section C, General Electric Company, Schenectady, N.Y.; Chicago, Ill., or San Francisco, Cal.

GENERAL ELECTRIC

INDEX NUMBERS

(Continued from page 43)

tent, it appears that so far as possible farmers might profitably regulate production to meet the probable demands. Likewise a study of index numbers showing the seasonal changes in price have a tendency to indicate the best time to buy or sell farm products during the year. This is shown by the accuracy with which the price of hogs was predicted last fall by the Department of Agricultural Economics of K. S. A. C. The department was able to tell approximately what the peak price would be and when the drop would come more than a month in advance.

In obtaining the prices of farm products as given by the United States Department of Agriculture in their monthly report on the agricultural situation, and likewise in preparing the information presented in "The Kansas Agricultural Situation" as issued monthly by the Department of Agricultural Economics and the Extension Service of K. S. A. C., index numbers are an invaluable aid.

CHINCH BUG CONTROL

(Continued from page 44)

extend out past the holes for two or three feet so as to assist in guiding the bugs into the trap.

As the chinch bugs usually do not begin to migrate until about 3 o'clock in the afternoon it is not necessary to lay down the barrier until about that time or shortly before the bugs appear. One application of the creosote was found to be satisfactory for the repelling of one day's migration unless there was a strong breeze with much dust blowing which would require the renewal of the barrier. On cloudy days there is sometimes a small migration of the bugs in the morning but the creosote retains its odor for 24 hours and these bugs do not require any special attention.

The efficiency of this barrier was shown by the fact that not a single hill of corn or sorghum protected by it was killed, while on many farms in the vicinity entire fields of such crops were destroyed. Counts of the bugs in the postholes in comparison with those that got across the barrier showed that not more than 1 percent and most of the time about one-tenth of 1 percent of the migrating bugs crossed the barrier. These counts were made at all times and during the various weather conditions of the migration. Some idea of the number of the bugs along the barrier is indicated by the fact that over 400,000 bugs fell into one hole in one day's run. During the height of the migration the bugs were passing a point on the barrier at the rate of 3,800 per minute.

As this experiment was used for the cost of the barrier as well as the efficiency, accurate data on the cost was obtained, and it was found that a creosote-posthole barrier to be efficient, could be constructed and maintained for the period of the migration for $60 per mile. The cost of a mile of this barrier for a 10-day period is summarized as follows:

Creosote, 2 barrels at $10 per barrel	$20.00
Labor, 3 hours per day at 25 cents per hour	7.50
Calcium cyanide, 100 pounds at 18 cents per pound	18.00
Miscellaneous, plowing furrow, digging postholes, etc.	12.00
Total	$57.50

The advantages of the creosote-posthole barrier may be summarized as follows:

1. It is effective at all times and the cost is not prohibitive.

2. Creosote comes in convenient containers and is easily handled.

3. Creosote will remain effective for a period of 24 hours thus holding any migration which may take place in the morning.

4. Calcium cyanide in the postholes takes care of the problem of destroying the bugs after they are trapped.

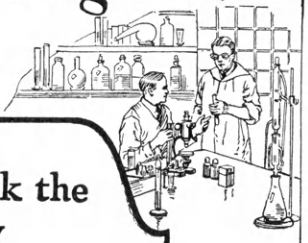
Frank W. Kerns, '23, is farming near Baldwin.

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

H. D. Garver, f. s., 1916-1918, and 1919-20, is operating a dairy farm near Abilene.

George E. Starkey, '22, is teaching agriculture in the high school in Johnson, Kan.

The CASE Engineering Code



Extensive Field Work the Best Laboratory

WITH all the ingenuity and effort of the most exacting engineers, even of the competent, resourceful men who design Case machines, no machine ever reaches the highest state of development until it has been used extensively in field work.

The reason is obvious. The best laboratory and experimental field tests known furnish only limited opportunities for improvement as compared to the infinite variety of conditions met with in extensive field operation.

Here again, this Company is fortunate. We have thousands of machines in operation, in every civilized country on the globe. Every condition of soil, crop, power, weather, climate and handling is represented in field reports on the operation of Case machines.

We maintain a department for the monthly classification and analysis of the accurate information contained in these reports. This system enables Case engineers to proceed with certainty toward refinements far in advance of the ordinary. This is why Case machines meet so successfully all the requirements of profitable farming.

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NOTE— Our plows and harrows are NOT the Case plows and harrows made by the J. I. Case Plow Works Company

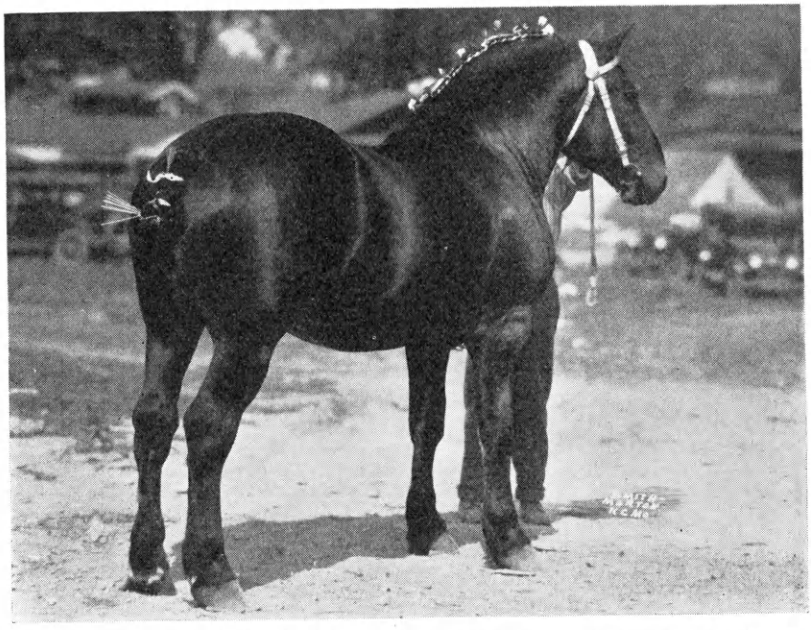
CROP ROTATIONS

(Continued from page 45)

age; oats follows corn well and corn and the sorghums may follow any crop but are best after alfalfa, sweet clover, and grass lands, and sorghums. Sorghums are more douth-resistant than corn and in most sections of western Kansas are a safer crop. Alfalfa and sweet clover are best preceded by small grain crops. Grasses are usually sown with a small grain crop and cowpeas may be worked in anywhere possible but preferably following one of the heavy feeders such as corn or one of the sorghums.

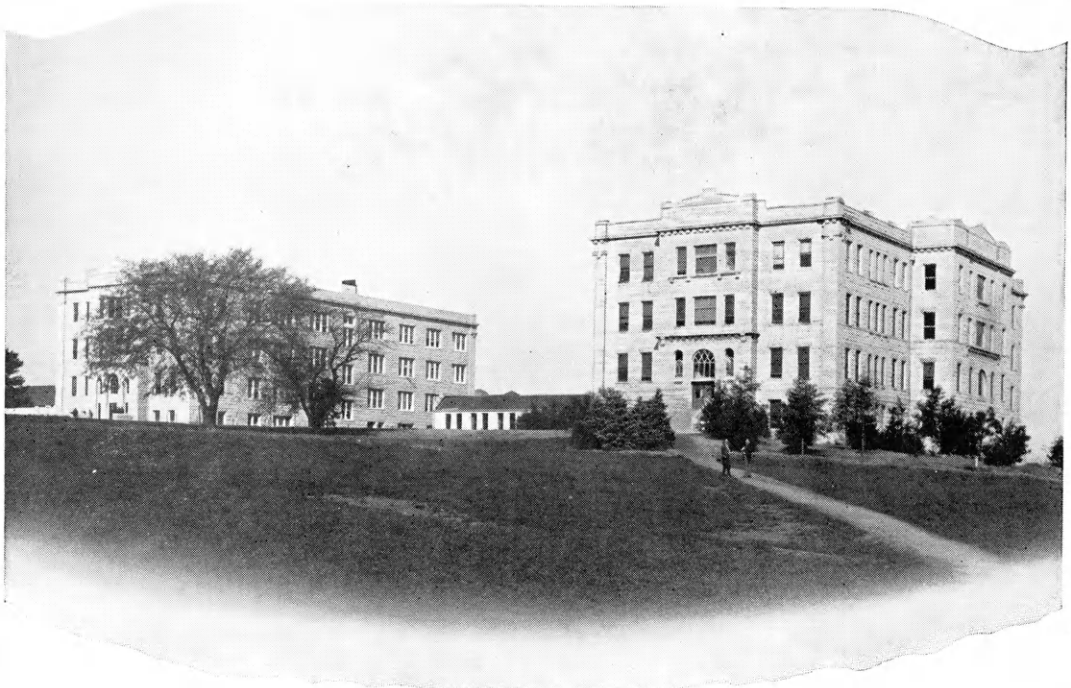
Some of the recommended rotations for eastern and central Kansas require six fields of a convenient shape for quick, easy, and economical handling of implements. For northeastern Kansas the rotation should be two years corn, one year oats, one year wheat, and two years of timothy and clover. Each of these fields would have one of the six crops and on successive years would take the next crop until the rotation was completed. For southeastern Kansas a sorghum may be substituted for the first year of corn. The 36-year rotation is best for central Kansas since it contains six years of alfalfa. The remainder is merely a five-year rotation and is very pliable. It contains one year of kafir, one year of corn, and three years of wheat. Sweet clover may be substituted for the last year of wheat and other changes may be made without interfering with the general scheme.

In western Kansas it is impossible to follow any definite system of rotation. Sorghums are the surest crops but due to the fact that moisture must be conserved it is often necessary to fallow the land. Quite often a five-year rotation is used with three years of wheat, one year of sorghum, and one year of fallow.



HAZELTON LAD—FIRST-PRIZE TWO-YEAR-OLD STALLION, KANSAS STATE FAIR, HUTCHINSON, 1924

Hazelton Lad 13428 is a two-year-old Belgian stallion of exceptionally outstanding type. His sire, Colgo, was raised by the College and his grandsire, Collart, an imported horse, was one of the early Belgian sires used here. His dam died a few days after his birth and he was raised "on a bucket," as a farmer would say. Today he presents a fine example of what can be done with the orphan foal.



WEST AND EAST WINGS OF WATERS HALL

"The rains descended and the floods came and the winds blew and beat upon that house; and it fell not, for it was founded upon a rock."

The above picture shows the partly completed main agricultural building at K. S. A. C. The building is being constructed gradually, unit by unit, of enduring material, on a solid foundation.

The construction of this building typifies K. S. A. C. processes of education for agricultural leadership; education that is based solidly upon fundamentals; that seeks to prepare the student not merely for today and next week, but for a long life of usefulness and happiness; that helps to fit the student to meet the "rains and floods and winds" that will beat upon him, and to meet them smilingly, with intelligence and courage.

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 more than 150 agricultural occupations, on the farm and elsewhere, and for good citizenship and right living.

KANSAS STATE AGRICULTURAL COLLEGE

MANHATTAN, KANSAS

"The College that Serves a State"