

# The KANSAS AGRICULTURAL STUDENT

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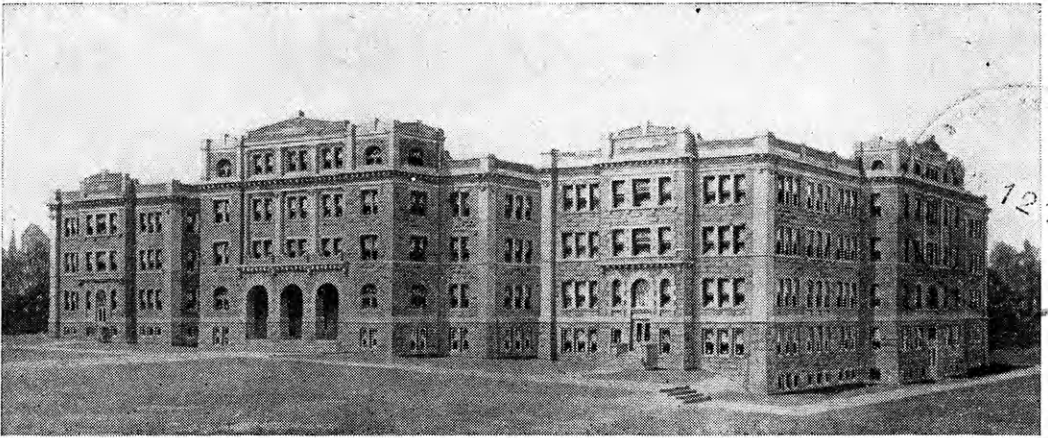
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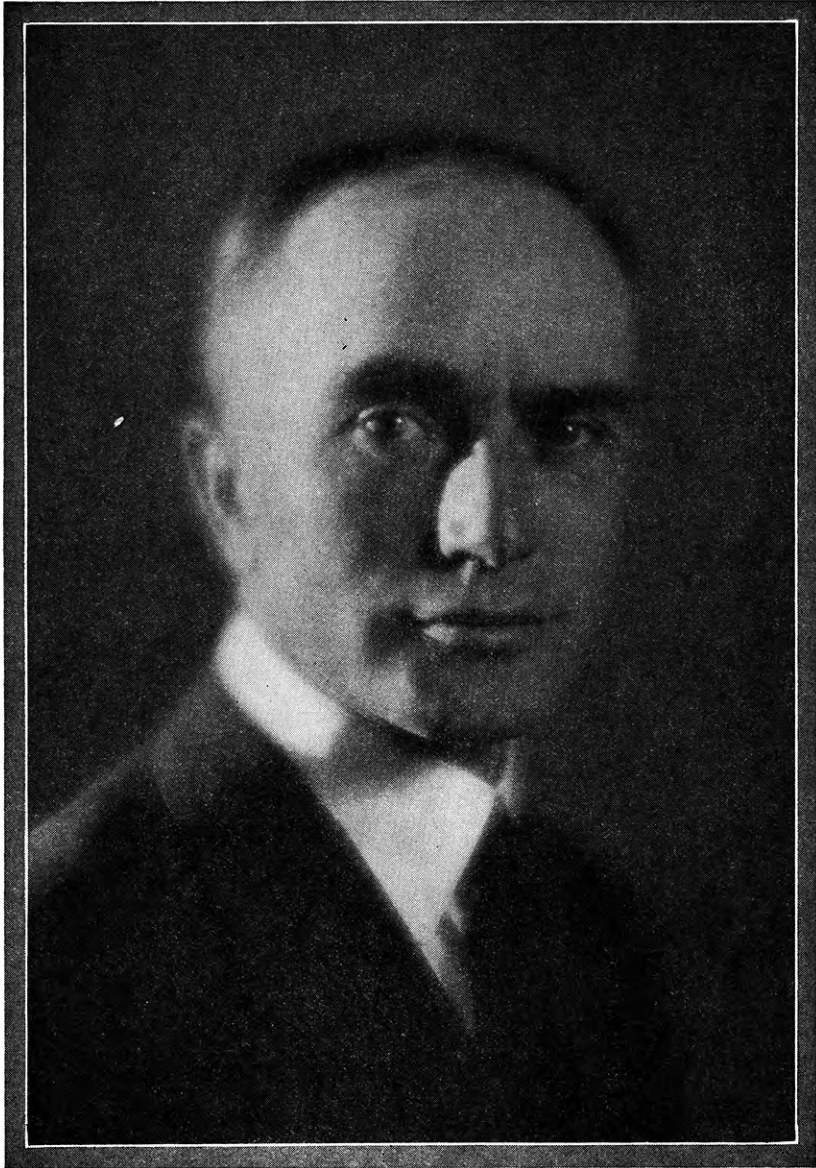
WATERS HALL—THE AGRICULTURAL BUILDING

The picture shows the front view of the building as it will appear, according to present plans, when completed. The fine central section is to join the two wings already constructed.

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DR. F. D. FARRELL  
President, K. S. A. C.

# The Kansas Agricultural Student

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## Blackhull Wheat in Kansas

Lyle Mayfield, '28

Blackhull, a variety of wheat originated by Mr. Earl C. Clark, of Sedgwick, Kan., and introduced to the wheat growers of the state in 1917, has grown rapidly in popularity. This is shown by the fact that probably about four million acres were sown to this variety in the state last fall.

The most striking characteristic of this new variety is the bluish-black color of the chaff which develops under most conditions and makes the variety easy to recognize in the field. Another characteristic which appeals to the wheat grower is its vigorous habit of growth and its fairly large head and stiff straw. It has an erect habit of growth and farmers claim that it makes better pasture than other varieties of hard red winter wheat, resembling in this respect soft red winter wheat. It also resembles soft red winter wheat in its apparent resistance to Hessian fly, which really amounts to an avoidance of the wheat by the fly because this pest seems to prefer hard wheats to soft wheats.

In addition to the points above in favor of Blackhull it has an average test weight of from one to three pounds per bushel more than Turkey or Kanred, the established varieties for Kansas, matures practically as early, and frequently has yielded more bushels per acre than either of these varieties. These advantages explain why Blackhull has appealed to the wheat grower.

But other tests of a variety of wheat are those concerned in bread making. Qualities other than physical appearance, test weight, and yield must be considered by the men who manufacture edible products from wheat. Kansas has been heralded far and wide as the state which "Grows the Best Wheat in the World," and the prestige which this fame has attained, backed by excellent products, must be jealously guarded. It is well to remember that Kansas hard red winter

wheat has some keen competition in the world markets in the wheat raised in the hard red spring wheat belt. Any lowering of standards for Kansas hard red winter wheat will, therefore, result in reduced prices.

Good quality in wheat is measured by the baker by the "strength" it possesses, which is largely determined by the percent of good-quality protein. This is why wheat of high protein content and good-quality protein usually sells at a premium on the market. It is milled with a "weak" wheat, that is, one with a poor quality of protein or a low-protein content, and enables the baker to make better bread from the product than would be possible from the product of the weak wheat alone.

Extensive milling and baking tests have been conducted by the Agricultural Experiment Station since 1919 with Blackhull, Turkey, and Kanred grown in the same fields in different parts of the state. In 1924 a power mixer was installed which worked dough severely as it is mixed in large commercial bakeries. It was immediately found that Blackhull, which under the gentler treatment formerly used, had made as good a loaf as Turkey or Kanred, now produced a loaf of smaller volume and of much poorer texture. Because Blackhull will not stand this severe mixing it is evident that the quality of protein is not so good as that of Turkey or Kanred.

In order to use Blackhull successfully, bakers will have to change their mixing equipment. If, on the other hand, bakers desire a "strong" flour they must shun wheat from Blackhull territory. Some big milling companies have already heard the complaint of the bakers and have refused to buy wheat from Blackhull territory.

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# Cod-Liver Oil in Poultry Feeding

H. O. Stuart, M. S., '27

The use of cod-liver oil in the feeding of poultry has been a development of comparatively recent years. With the discovery of vitamins and their relation to nutrition, the true value of cod-liver oil was ascertained in relation to its Vitamin A and Vitamin D content. Both of the vitamins are essential for the normal physiological functioning of the body.

A deficiency of Vitamin A in poultry usually results in the development of sore eyes, often referred to as "nutritional roup," a nonpathological condition. It is invariably accompanied by lowered resistance to colds and infections, and often by nervous disorders. A noticeable result is the cessation of normal growth.

A deficiency in Vitamin D manifests itself in several well defined symptoms. Probably the most important of these is the condition in chicks known as rickets. Rickets in chicks is often called leg-weakness. However, this is a misnomer in so far as other conditions than Vitamin D deficiency may manifest themselves in weakness and paralysis of the legs. A lack of Vitamin D may also cause the failure of the body to utilize calcium and phosphorus, resulting in nerve, muscle, and bone disorders. Deficiency such as the above, resulting in reduced vitality, will also exhibit in poultry decreased production, fertility, and hatchability. Can the poultryman refuse to recognize these factors?

Since this discussion deals primarily with the one source of Vitamin A and Vitamin D, cod-liver oil, it may be well to consider the method of feeding and the amount to be included in the ration.

The oil is usually given in the proportion of 1 to 2 percent of the ration. It can be mixed in either the grain or the mash, although it is more easily mixed in the grain. If it is desired to mix cod-liver oil in the mash, it is best to incorporate the oil thoroughly into a small quantity of mash and then into the whole. This will avoid "clumping" and aid in a more even distribution. It is generally recommended that the oil should not be mixed into more than a week's supply

of the feed at a time, due to the fact that the vitamin content may deteriorate by oxidation when stored, in such a manner, for any length of time.

Experimental evidence shows that cod-liver oil four months old, which has been subjected to oxidation by "rotting," is of only one-third the value of fresh oil; and that oil held for 12 months and allowed to rot, has but one-twelfth the value of fresh oil. From this and other experimental evidence, it is obvious that the more often it is practical to mix the feed, the greater the value. Surplus oil should be stored in air-tight containers.

Many grades of cod-liver oil, good, bad, and indifferent, are being sold under the name of cod-liver oil. In some sections the situation in this regards has become of such importance that legislative action is under consideration. Michigan authorities, leading the way, have passed rulings in regard to the sale of cod-liver oil. The officials of the Massachusetts and New Jersey Agricultural Experiment Stations are considering the adoption of some program in order to prevent the sale of the poor-grade oils. Consequently, if one is considering the inclusion of cod-liver oil in the poultry ration it is advisable to purchase only the tested oils if available.

Like other commodities, the cheapest oil in initial cost is usually the most costly in the long run. A striking example of such a case has been the experience of a Kansas poultryman whose chicks had developed rickets on a ration containing a cheap grade of untested oil. He rectified his mistake by substituting for the untested oil a certified oil tested for its vitamin potency, and immediate improvement in the young stock was noticeable.

Cod-liver oil may be used in the poultry ration as a source of Vitamin D whenever the birds do not receive direct sunlight. This is particularly applicable during the winter months. Birds receiving direct sunlight are able to synthesize or manufacture Vitamin D within the body. Green leaves and yellow corn are good sources of Vitamin A. Conse-

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# Kansas Home Orchards Could Be Brought Back

Albert H. Ottaway, '28

The people of Kansas have been awakened to the fact that the home orchard has practically disappeared in their state. The small orchard that was once seen on most farms has now vanished until only a few stumps or broken and diseased trees stand as a monument to mark its original location.

Many young people of today are growing to maturity without the joy that the orchard affords. The father tells of many pleasant orchard experiences but his own children must listen to his stories. Few have an orchard that they can personally enjoy.

The home orchard in Kansas has disappeared for one of several reasons. Neglect, insect pests, diseases, and soil conditions were the major causes. Seldom did an owner cut out an orchard to make room for a grain crop, neither did he protect it from its many enemies in the disease and insect kingdom.

The question now arises, "Can the home orchard of Kansas be brought back and again made profitable to its owner?" This gives rise to another, "Have we gained enough knowledge of fruit growing under these handicaps to make success probable under average Kansas conditions?" The answer to these questions is "Yes," but many "ifs" must be added. The orchardist must cooperate with nature and use up-to-the-minute methods if he is to be successful. The indiscriminate planting of fruit trees by poorly prepared men would most surely lead to failure. Some men could not grow fruit in the Garden of Eden.

The orchard site should be chosen with great care. The site should be near the house on soil that is capable of producing thirty bushels of wheat or sixty of corn per acre. The soil should be deep and the subsoil porous. Air and water drainage are also of great importance. When possible a north-east slope should be used.

After the site has been chosen a number of questions arise: "What varieties should

be planted?" "Where is the best place to buy trees?" "How and when should they be planted?"

The varieties planted should be of those that are well adapted to Kansas conditions. Several varieties should be planted because the season of ripening varies, but the adaptability of the variety should never be sacrificed for its season of ripening.

The young trees should be purchased from reliable nurseries. The nursery putting on the most extensive advertising campaign is not always the most reliable and, other things being equal, a nursery close to home is the best one to patronize.

The trees should be planted not later than April 10, on soil that was worked the fall before. The distance between the trees will vary but the planters' most common error is planting too close. For apple trees the usual distance between trees is 35 feet. This gives plenty of room for spraying, cultivating, and the spreading of the roots.

It is an old saying that "A good start is half the work." So it is with an orchard. An orchard well set is a valuable asset but it requires care and good management to bring it to a profitable bearing.

Orchard management may be divided into three principal parts: Soil management, pruning, and spraying.

The soil should be thoroughly worked and kept in a loose condition until the middle of August or the first of September when a cover crop should be planted. Several crops are used for this purpose but rye or winter vetch is the most popular. The cover crop should be turned under in the spring and the soil again kept in a fallow condition through the growing season.

Pruning makes spraying easier, causes better coloring of fruit, large fruit, and a neater tree. Pruning should be heaviest during the early life of the tree to prevent the

(Continued on Page 127)

# What About the Horse Situation?

Sherman S. Hoar, '28

A gradual increase in the price of horses continued from 1897 to 1911. It is the longest period of rising prices known in the history of the horse industry. During this period of rising values expansion took place, and with the desire to expand and the endeavor to profit by increasing values, little attention was paid to the kind or quality of the offspring. An illustration of the promiscuous breeding that was carried on can be had from stallion license reports. In 1910, 52 percent of the stallions standing for service in Kansas were either grades or scrubs. The result was what might be expected—a lot of misfits and plugs, for which there was neither a market nor a possibility of moving them at a profit. In this situation in 1912 came a period of falling prices. The decrease was gradual from 1912 to 1923.

During this long period of depression the logical events took place. The man with the poorest stock became disgusted first and discontinued the breeding of horses. As the period progressed more and more breeders dropped out of the business, until in 1920, the number of horses produced had dropped off 20 percent and since that time it has dropped an additional 52 percent. Part of this decrease is no doubt due to the use of tractors and trucks in the place of horses.

During the last few years the number of foals produced has been considerably below that required to replace older stock, which means the use of old stock that would otherwise be discarded. Practically no heed has been given to future needs by the horse producers. An analysis of the tax rolls of any township will give sufficient evidence to cause some thinking in regard to the future horse supply. It will be found that, on the average, 36 percent of the total number of horses are over 16 years of age, only 8 percent are under three years, and only 6 percent, under two years of age. The following report of a township may be considered quite typical:

Number of colts .....	22
Number of yearlings .....	20
Number of two-year-olds.....	8
Number three to sixteen years of age	372
Number sixteen years and older ...	247

The average life of a horse is fifteen years, and with 36 percent of the horse supply over fifteen years of age there is some cause for alarm as to the future supply of horses. Basing its figures on a farm-to-farm census of the Federal Government, the Horse Association of America recently issued a bulletin calling attention to the fact that there was a shortage of young horses and urging an immediate increase in production. On January 1, 1925, there were only 1,626,883 horses and mules under two years old on farms in the United States and, according to the association, at this rate of production it will take 27 years to produce the total of 2,266,376 horses and mules on farms January 1, 1925, or nearly twice the average life of a horse.

At the present time there is a good demand for draft horses from the large cities and our northeastern or nonhorse-producing states, and this demand is going to become greater within the next few years. Horse buyers from these parts are paying relatively high prices for horses that meet their requirements, but there is an inadequate supply. To meet their requirements a horse must be of good draft type, weigh 1,700 pounds or more, be well broke, fool proof, and absolutely sound, so that a producer must aim at this type if he expects to receive the highest prices. To do this he should breed only his best, draftiest mares to a good purebred stallion. Even then only a portion of the foals produced will measure up to the standard required, but those that fall short of it will be good enough to find a ready outlet in agricultural work. A big trouble at the present time is that too many farmers are trying to raise draft horses from the pony mares with which they are trying to farm, with the result that there is a large surplus of small colts that bring a small price on the market. Careful and judicious mating on the part of farmers who are renewing their interest in horse breeding, may be rewarded by rising values and profitable production.

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# High Points in Dairy Herd Management

Success or failure in dairy farming will be governed largely by the methods practiced by the herd manager. Some of the most important factors to consider are:

**1. Selection of Animals.** To the beginner, the foundation animals are of prime importance. They should be selected on the basis of their actual production if such records are available. If production records are not available, cows of large barrel and udder capacity should be chosen. The man in the dairy business must improve his herd by selecting good bulls and discarding poor-producing cows on the basis of their production records.

**2. Winter Feeding.** In this season of greatest production, feed must be supplied in abundance. More cows are underfed than are overfed. The nutrients must be present in the feed in proper proportion, and this condition will be nearest attained by using a variety of feeds. Protein is most often lacking in the feed, but it may be easily obtained in cottonseed meal or linseed oilmeal. Alfalfa or other legume hays, because of their high protein content, should be used in the ration if possible. Succulent feed is very important and is best supplied by silage. Grain should be fed in proportion to milk production—one pound for each three to four pounds of milk produced. Roughage should be fed more in proportion to the size of the animal, but usually about all the animal will clean up.

**3. Summer Feeding.** Pasture grass is the basis of the summer ration, but this is not sufficient for the cow giving more than 25 pounds of milk daily. This is because of the high proportion of water to dry matter in grass. A good grain ration should be given the heavier producers at the rate of about one pound of grain to five pounds of milk. When pastures get short, as most Kansas pastures do, hay should be used and the grain increased. Silage makes an excellent pasture supplement. Salt and good water of reasonable temperature should be available to the cow summer and winter.

**4. Regularity.** The dairy cow is a great

creature of habit, and should be handled with marked regularity for best results. Milking and feeding should be done at a certain time and in a certain order. The hours between milkings should be as nearly the same as possible. Early each fall the cow should drop her calf since fall calving cows are most profitable. A rest of a month or six weeks on good feed between lactation periods will allow the cow to build up her body for the strain of the new lactation.

**5. Housing.** Protection from bad weather will mean more profit due to higher production. If cows are allowed to stand in a cold rain there will be a noticeable reduction in their milking flow. A stable should protect them from the weather, keep them dry and clean, and be so constructed as to be comfortable. Cement floors are best in most respects, but they are hard and cold for the animals to lie on. This objection can be overcome by the liberal use of bedding.

**6. Care of Calves and Heifers.** Nothing equals milk for raising calves. Skimmilk may be gradually substituted for whole milk after three or four weeks, but additional grain must be given to take the place of the butterfat. Cleanliness is absolutely necessary for healthy calves. Calf-feeding buckets should be washed and sterilized the same as milking buckets. Weaned calves on pasture should have other feed as they will seldom eat enough grass for proper nourishment. Heifers probably can be handled satisfactorily without grain between the ages of 12 and 20 months. They should, however, be fed liberally on hay and silage with grain for three or four months before calving. To secure satisfactory growth, Jersey or Guernsey heifers usually should not calve before 24 months of age and Holsteins or Ayrshires, before 28 to 30 months of age.

**7. Care of Herd Sire.** The importance of the herd sire cannot be overemphasized. A good purebred bull is necessary if a herd is to show increased production from year to year. When a good bull has been secured he should remain in service many years but

will not unless properly handled. The bull should be fenced away from the herd so his service may be properly regulated and a fairly accurate record of breeding dates kept. The bull should be kept only in fair flesh. To keep active he should have considerable exercise and special arrangement for this is sometimes necessary. Green feed in the diet is very desirable, but more than a light feeding of silage is not to be recommended.

8. **Herd Records.** Intelligent selection in the herd must be based on accurate knowledge. Only carefully kept records will show what the cows actually do. Keeping daily milk weights on each cow is an excellent system as cows can then be fed strictly according to production. Records are not complete unless the consumption of feed is also kept, as cows vary greatly in economy of production. The most satisfactory records are obtained through the cow-testing association and the man is fortunate who has one accessible in his community. Accurate dates of breeding and expected calving are necessary if cows are to be given the necessary month to six weeks of rest between lactations and be properly prepared for the new lactation period.

9. **Cropping System.** The most economical ration is the one which is largely home-grown. All of the roughage and a large part of the concentrates necessary in a good dairy ration can be produced on most Kansas farms. If at all possible, provision should be made for sufficient alfalfa or other legume hay. There is no section of Kansas where either corn or one of the sorghums cannot be grown for silage. The sorghums, either in the form of silage or as a grain feed, have been proved to be almost equal to corn for milk production.

10. **Care of Milk and Cream.** Milk is human food and should always be handled in a strictly sanitary manner. Cows should be brushed and cleaned and their udders should be washed before milking if muddy or soiled with manure. The stable should be reasonably clean and as free as possible from odors and dust. All utensils in which milk is handled should be clean and sterile. As soon as possible after milking, the milk or cream should be cooled to a temperature near 50° F. and kept cold until delivered.

—H. W. Cave, Professor of Dairy Husbandry.

## Poultry Raising in Bulgaria

K. P. Nikoloff, '28

About 82 percent of the population of Bulgaria live in villages and make a living by farming. The average land property of the ordinary peasant is about 20 acres and consists of five to fifteen strips of land scattered about the village region. This "strip farming" inhibits the development of commercial farms so common in the United States. The work of such farming is very hard and the introduction of modern machinery is an impossibility. Farmers usually distribute their labor by carrying several lines of intensive work in the so-called small agricultural branches. Under this head are included horticulture, sericulture, and poultry raising.

The poultry business in Bulgaria is simply what people in this country call back yard poultry keeping. In fact it is "primitive"

back yard poultry keeping. Every peasant home ordinarily keeps and raises 20 to 50 head of poultry, including chickens, geese, ducks, and turkeys, for supplying the family with eggs and meat and providing funds for the purchase of such necessities as salt, soap, and kerosene. Not a single farm in Bulgaria is engaged exclusively in raising poultry.

Mongrel stock predominates. The rural population prefers to keep dual-purpose breeds because they combine meat and egg qualities. In some favored mountain regions, however, one can find standard-bred Leghorns, Wyandottes, and Plymouth Rocks.

The State has established 12 modern breeding stations supervised by poultry specialists. Eggs from those flocks are sold to farmers exclusively for breeding purposes. No doubt in the course of time this systematic

breeding will replace much of the now prevalent mongrel blood.

The methods of raising and marketing poultry and poultry products are very crude. Usually an elderly woman, unfit for work in the fields, cares for the poultry. The birds consume waste grain from the granary and scraps from the table. In the summer they are housed in the trees in the yard; during the cold winter months they enjoy the warmth of the barn, together with the horses or oxen.

When the hen becomes broody early in the spring she is allowed to set. No culling or selection is made prior to her setting. The hen scratches and rears her own offspring until large enough to rustle for themselves. Incubators are a luxury enjoyed on a few of the government farms. A very high custom tax prevents the importation of incubators into Bulgaria. This tax applies to all farm machinery as well.

With these crude methods of management a yearly production record of 60 to 80 eggs is considered very good.

Eggs are gathered and sold on the market direct to consumers. A circuit of market days is formed, one village having market day on a particular date and the next village the day after, etc. There is usually no grading or sorting of eggs.

During the last few years representatives of Dutch packing houses have been purchasing the village eggs, storing them, and then exporting to Switzerland and Germany. Last summer the price received by the farmer for each egg was two cents.

Poultry packing, an industry in itself in America, is unknown in Bulgaria. Birds are sold alive.

Nevertheless, in spite of these primitive conditions poultry surplus and exports play an important role in the economic life of the country. The total surplus of eggs produced in the peasant yards in recent years is expressed by large figures. During the last five years the export of eggs has been estimated as follows:

Year	Carrloads Exported	Value
1921	572	\$ 786,000
1922	812	3,450,000
1923	559	1,600,000
1924	1,286	4,080,000
1925	1,523	5,356,000

In the list of products exported from Bulgaria in 1925, eggs are the second item, being exceeded only by tobacco. In that year the value of eggs sold amounted to one-fifth of the whole state budget. The export of eggs has helped stabilize money values.

The work of improving poultry raising in Bulgaria rests upon the shoulders of agronomists and teachers. Government enterprises are helping to enlighten the people. Small exhibits and shows are becoming more frequent. Because of their peculiar village life, the peasants are very conservative people. They hold tenaciously to traditional methods of work. They accept a new idea only after they have seen the real benefit of it. However, conditions since the World War have helped to penetrate the thick shell of conservatism and more rapid progress may be expected in the near future.

Every conscientious man of Bulgaria today believes that the wounds of the war can be healed only by hard, intelligent work in any line and especially in the various phases of agriculture. The poultry industry seems to be on the threshold of an era of improvement. It requires the widespread introduction of high-producing strains of standard-bred stock; better housing and better feeding; culling and an adequate and general knowledge of poultry diseases; and last, but not least, intelligent marketing of poultry products. The road is long but the Bulgarian peasants show definite earmarks of being ready to march.

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Fred Bangs, '23, who is managing the home farm near Madison, visited the college recently.

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Frank W. Houston, '23, is making a good showing in the dairy business near Wendell, Idaho. His herd contains 26 Holstein heifers and cows and he points with pride to the fact that in a cow-testing association, testing more than 600 cows, one of his cows made the highest record last year, producing 15,574 pounds of milk and 551.5 pounds of butterfat. As Frank figures the case, the feed this cow consumed cost \$82.72 and the butterfat alone which she produced was worth \$243.48.

# The Combine in Southwestern Kansas

Bernard I. Melia, '27

The combine was introduced on the general farm in southwestern Kansas less than a decade ago. Harvester-threshers had been used for many years in certain districts on the Pacific Coast, but this type of machine was not considered practical by the farmers of the Great Plains. Most of the older machines cut a swath 20 or 24 feet wide and were drawn by large tractors or by teams of 20 to 36 horses. Power to operate the machinery was taken from the ground drive of the machine and the threshed grain was sacked. Such an outfit required a crew of not less than five men and the threshing season extended over a long period. The development of the small prairie type of harvester-thresher, commonly called the combine, gave the Kansas farmer a practical machine the use of which is increasing rapidly.

Combines first made their general appearance in Ford county (Kan.) in 1920. Only a few farmers, however, were adventurous enough to try them that year. At the present time probably 80 percent of the wheat farmers in that county use combines. Most of the smaller machines are 15- or 16-foot cut and in an ordinary day's run it is quite common to harvest and thresh 40 acres.

The time of getting started in the morning usually is not much later than when a header or binder is used, except in damp weather, and western Kansas does not have much of this during the harvest season. Usually by the time the machine is oiled and other starting preparations made, the wheat is dry enough to cut. As a rule but little time is lost after rains. Usually as soon as the ground is dry enough for the machine to get around, the grain is also ready. One of the worst things with which to contend after a rain is the small ponds or "buffalo wallows" that often cannot be seen because of being hidden by the standing grain or heavy stubble. Frequently, too, these "wallows" look dry enough but prove not to be when they are driven into. Usually, however, they are small enough that it is a simple matter to get out by using a log chain. A chain will get

tractor machinery out of more tight places than any other one thing.

If the combine is run properly less shattering will occur than with the header or binder. Consequently less volunteer wheat will come up behind the combine provided shattering did not occur previous to harvesting.

Of course, the combine has disadvantages. The initial cost of the machine is high, running around \$2,100. This is quite an investment for an ordinary farmer to put in one machine that is to be used only a few days in the year. To operate a combine successfully, a man must have a great deal of mechanical ability and a little of the knowledge of a thresherman. A combine can thresh successfully only when run properly.

The man who is in a hurry to start the harvest has no business with a combine. Even when the grain appears to be dead ripe it often has green spots in it that will make the threshed grain damp enough to burn in the bin. To get around this the first few loads are often piled on the ground to dry before binning, or hauled direct to an elevator. Ventilated bins are coming into use somewhat, but even these will not prevent burning if the wheat contains much more than the usual amount of moisture.

Two other disadvantages of the combine are the lack of straw for livestock and the tendency to go back to the one-crop system of farming. No doubt, however, it aids in building up the soil fertility to scatter most of the straw back on the land as a combine does; but if any livestock is kept on the farm some straw is needed. Because of so much being made on wheat during the past few years as a result of good crops and cheap, efficient methods of handling it, the raising of livestock and feed crops is decreasing on many farms. Much native sod is also being broken up and planted to wheat. However, a period of overproduction, or two or three years of failure in the wheat crop, will tend to bring livestock back again after a time.

Because of a shorter harvest season, the

(Continued on Page 128)

# How Much Power is Required?

R. H. Driftmier

Associate Professor of Agricultural Engineering

One of the chief aims in motor development is increased brake horse power, whereas in machinery development a reduction in power requirements is sought. An oft repeated question, "How much power is required to operate my feed grinder, ensilage cutter, etc.," resulted in the construction of an internal combustion engine cradle dynamometer by two senior students in Agricultural Engineering, L. H. Paddock, and M. W. Bloom.

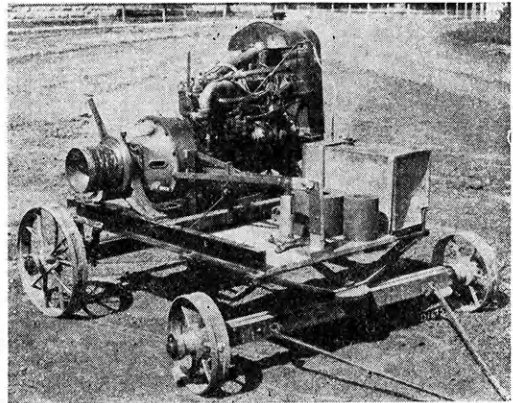
A dynamometer is an apparatus used to determine the power output of an engine. One of the most practical devices for measuring the belt horse power of an engine is the cradle dynamometer. (See accompanying illustration.)

The dynamometer constructed by Bloom and Paddock utilizes a 15 H. P., four-cylinder engine. This engine in itself is a complete power unit, fully equipped with standard ignition, cooling, lubrication, and carburetion systems. It was necessary to attach a special clutch assembly to facilitate mounting the engine in the cradle bearings and to provide positive control of the driven machine. The clutch assembly consists of the bell housing, one end of which was machined to accommodate an S. K. F. self-aligning bearing, a twin-disc clutch, an enclosed flywheel, and the pulley shaft. The pulley shaft is then equipped with a face plate to which pulleys of different sizes may be securely bolted. The construction is such that perfect balance, essential at high speeds, may be maintained.

The trunnions at each end of the engine are supported in S. K. F. anti-friction bearings, to allow free rotation of the engine. The engine is counter-balanced to bring the center of gravity of the cradle and its load to the center of rotation of the crankshaft, thus no factors except those due to belt resistance will be effective in causing the engine to rotate about the crankshaft. The engine is balanced only through its working range, which is approximately six degrees, or one and three-fourths inches on each side of the vertical plane through the crankshaft.

The torque arm is attached in such a way that the torque is transmitted directly to a spring which indicates the resisting turning force in pounds. It is only necessary then to measure the engine speed, and by means of a predetermined power constant the horse power required to operate the driven machine may be calculated.

The cradle dynamometer as constructed by Paddock and Bloom is now being used on feed grinder tests to determine the effects of speed, fineness of grinding, moisture content,



A CRADLE DYNAMOMETER CONSTRUCTED BY K. S. A. C. STUDENTS

sharpness of burrs, heat generated, etc., on the power requirements of feed grinders for different feeds.

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C. A. Brewer, '21, who since graduation has been teaching vocational agriculture and principal of the Webster Consolidated Schools, has been elected principal of the Linwood Rural High School for next year.

---

The class in vocational agriculture of the Chase County Community High School, under the leadership of George F. Ellis, '25, successfully completed a class project in baby beef production May 9. Their net profit was \$400. The class built the feeding shed as a part of their early fall farm shop activities.

# THE KANSAS AGRICULTURAL STUDENT

KANSAS STATE AGRICULTURAL COLLEGE

MANHATTAN, KANSAS

VOL. VI

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NO. 4

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## SECRETARY JARDINE VISITS K. S. A. C.

The presence of Dr. W. M. Jardine, secretary of agriculture, former president of K. S. A. C., at the college Friday and Saturday, May 20 and 21, seemed like old times to hundreds of upper-classmen, faculty members, and visitors. He was the speaker of honor at both the Kansas Bankers' Convention and the Kansas Livestock Feeders' Convention and "delivered the goods" and delighted large audiences on each occasion. We are proud of Doctor Jardine in and out of K. S. A. C. For hard-working, conscientious, capable leaders that ring true under all circumstances, the country has few his equal.

## OUR COVER PAGE

By the courtesy of F. E. Colburn, college photographer, we present on the cover page of this issue a beautiful campus view taken from near the women students' dormitory on the northeast corner of the campus square. A partial side and back view of the east and west wings of Waters Hall is on the right. On the left is the fine new college library building, still under construction, while in the center and somewhat in the background is the Veterinary Hall.

With the exception of the Department of Horticulture, Waters Hall houses all the de-

partments of the Division of Agriculture and is the center of the activities of the division. The two wings only are completed at the present time. In the near future it is hoped the central section will be added, giving the structure substantially the appearance shown by the picture on our "Contents" page.

## WHO CAN FARM?

Farming today is one of the most complicated of industries. It is not true that "anyone can farm." Farming is not an industry that offers a living to people who fail in other pursuits. It is an industry the successful pursuit of which requires thorough preparation and training.

The man on the farm must know the laws of successful crop and livestock production. He must know good business methods; must possess ability in cost accounting, marketing, and financing. Recent years have demonstrated that each succeeding year it becomes more true that a well rounded education is necessary for a successful farmer.

The high schools teaching vocational agriculture are doing a real job in providing the education a farmer needs. Of course, a college education requiring further time and providing further training is better. Even more emphatically it should be said that the best college training available for the leading

and successful farmers and citizens of the future is that provided by the curricula in agriculture in K. S. A. C.

**THE CURRICULA IN AGRICULTURE**

We are glad, indeed, to present in this issue brief outlines and explanations of the two most popular curricula in the Division of Agriculture, the Curriculum in Agriculture and the Curriculum in Agricultural Administration. We have endeavored to make the presentation fair and clear. The necessary technical terms of the usual college catalog have been avoided purposely. We trust many prospective college students will be interested.

These curricula are both distinctly flexible. The selection of electives under competent and interested advisors and with reasonable restrictions makes it possible to provide the best college training for scores and even hundreds of objectives.

Besides these two four-year curricula the division also offers a four-year curriculum providing special training in landscape gardening and, with the cooperation of the Divi-

sion of Veterinary Medicine, a six-year curriculum in animal husbandry and veterinary medicine. These curricula are first-class and meet the requirements of limited numbers of students interested in these lines. Further information will be furnished promptly by addressing a request to Dean, Division of Agriculture, K. S. A. C., Manhattan, Kan.

**THE NEW EDITOR**

The editor in chief of this magazine for 1927-28 is to be Harold E. Myers, one of the best workers on the staff during 1926-27. Mr. Myers won the Alpha Zeta medal for being the high freshman in the Division of Agriculture for the college year 1924-25. He has shown himself to be a capable leader not only in the class room but in a limited number of student activities. He does a first-class job of whatever he undertakes and the staff of THE KANSAS AGRICULTURAL STUDENT with him at their head will make a record. The retiring members of the staff extend their best wishes for the magazine next year.

**Directory, Class of 1926, Division of Agriculture**

**FARMING**

Name	Address	Further Information
C. H. Chase	Junction City	General farming
G. H. Faulconer	Eldorado	General farming
K. W. Halbower	Anthony	General farming
L. B. Harden	Centralia	General farming
Lionel Holm	Vesper	General farming
H. W. Roebke	Clifton	General farming
H. W. Rogler	Matfield Green	General farming
R. L. Scholz	Frankfort	General farming
W. W. Taylor	Smith Center	General farming
G. K. Terpening	La Pryor, Tex.	Ranchman
N. N. Weberg	R. 1, Salina	General farming
Mrs. Mary E. Haise-Wright	Crowley, Colo.	Housewife of ranchman

**TEACHING VOCATIONAL AGRICULTURE**

Name	Address	Name of High School
A. G. Jensen	Hill City	Hill City Rural
B. J. Conroy	Mankato	Mankato
A. H. Doolen	Cameron, Mo.	Cameron
R. W. Fort	Ford	Ford Rural
A. A. Haltom	McLouth	McLouth Rural
E. M. Knepp	St. George	St. George Rural
G. E. Lyness	Winona	Winona Consolidated
R. H. Perrill	Butler, Mo.	Butler
H. A. Stewart	Paxico	Paxico Rural

## OTHER HIGH SCHOOL TEACHING

Name	Address	Subject	School
T. C. Faris	Sylvia	General agriculture	Sylvia H. S.
F. F. Herr	Johnson	General agriculture	Stanton Co. Com.
F. F. Higbee	Garfield	Agriculture, athletics	Garfield R. H. S.
R. M. Karns	Altamont	Agriculture, athletics	Labette Co. Com.
L. O. Nolf	St. John	General agriculture	Antrim Junior H. S.
Sheridan Settler	Quindaro	Agriculture	Western University

## COMMERCIAL WORK

Name	Address	Further Information
H. J. Brodrick	Tulsa, Okla.	Landscape gardener
M. P. Brooks	Tonkawa, Okla.	Joint owner, Tonkawa Creamery
Ben Grosse	Jamestown	Manager of produce plant
W. W. Gunselman	Herington	Employ of Herington Ice Cream Co.
S. F. Kollar	Kansas City, Mo.	Employ of International Harvester Co.
W. J. Kraus	St. Louis, Mo.	Feed Salesman, Purina Mills
R. V. Macias	Chicago, Ill., 2012 Jackson Blvd.	Translator for Victor X-Ray Corporation
C. M. Murphy	Newton	Employ of Goerz Flour Mills
K. H. Platt	Osage City	Employ of Osage City Ice Cream Co.
R. B. Rieklefs	Salina, 1317 E. Iron St.	Employ of Kansas Evergreen Nursery
J. C. Wallace	Manhattan	Riley County Cow Tester
R. K. Wey	Wichita, 1751 Park Pl.	Western Kansas Dist. Mgr., Fuller Brush Co.

## HIGHER EDUCATION OR RESEARCH

Name	Address	Further Information
A. I. Balzer	Manhattan	Graduate student, K. S. A. C.
John Carter, Jr.	Clayton, N. Mex.	Dry-land farming investigations, Agr. Expt. Sta.
C. E. Dominy	Chicago, Ill.	Fellow in Agricultural Economics, University of Chicago
D. N. Donaldson	Manhattan	Assistant in Dept. of Agr. Econ., K. S. A. C.
F. P. Eshbaugh	LaFayette, Ind.	Graduate assistant, Dept. of Hort., Purdue Univ.
J. H. Hammad	Jerusalem, Palestine	Asst. Entomologist, Dept. of Agr.
E. R. Honeywell	LaFayette, Ind.	Instructor, Dept. of Hort., Purdue Univ.
F. H. Hull	Ames, Iowa	Fellow in Genetics, Iowa State College
T. M. Kleinenberg	Pietersburg, S. Afr.	Dist. Agr. Agt. for Union of South Africa
K. W. Niemann	Manhattan	Student in Vet. Med., K. S. A. C.
H. A. Rust	Morgantown, W. Va., 433 Beverly Ave.	Grad. Asst. in Dairy Husbandry, Univ. of West Virginia
F. W. Schultz	Care Armour Expedition on West Coast of Africa	Employ of Bur. of Plant Indus., U. S. Dept. of Agr.
H. E. Skoog	Manhattan	Student in Vet. Med., K. S. A. C.
Walter Wisnicky	Madison, Wis., 1031 Williamson St.	Graduate student and part-time instructor in Vet. Dept., Univ. of Wisconsin

## COUNTY AGRICULTURAL AGENTS

Name	Address	County
W. H. Atzenweiler	Hiawatha	Brown
A. C. Hoffman	Larned	Pawnee
H. L. Lobenstein	Clayton, Mo.	St. Louis
J. H. Shirkey	Meade	Meade
F. J. Sykes	Coldwater	Comanche
R. L. von Trebra	Kansas City, Kan., Chamber of Commerce Bldg.	Wyandotte



# Opportunities for Agricultural Graduates

[The following paragraphs from college administrators responsible in a large measure for the balance and quality of the curricula in agriculture in K. S. A. C. will certainly be of large interest to many of our readers.—Editor.]

An intelligent and industrious young man who enjoys the open country, who likes plants and animals, who desires to follow a career that is interesting, dignified, useful, and financially remunerative, and who will prepare himself for success by supplementing his native ability with a well-balanced college education, can find no finer opportunities than those offered by American agriculture.—F. D. Farrell, President, K. S. A. C.

Every normal boy desires training that will lead to a successful career. The ambitious, intelligent farm boy, with his background of agricultural experience, will find an excellent opportunity for a worthwhile career by college training in agriculture. An unusually large number of opportunities in farming, business, and professional and industrial work await the capable, agriculturally trained men.—L. E. Call, Dean, Division of Agriculture.

Young men who are looking for success in agricultural fields may be assured that their investment in a college training in agriculture is certain to be rewarded in the satisfaction that comes from knowing the field in which they work and by the increased opportunities for high-class work that will come to them. The men who are handling the big jobs in agriculture are the men who know farm conditions and can fit scientific facts to existing conditions. I have never known a man to prepare himself well who did not find a big job when he was ready

for it.—Albert Dickens, Head, Department of Horticulture.

Young men who complete a course in agriculture and who are well trained are prepared for a career which offers a wide range of opportunities. They are ready for a life which is interesting, full of new ideas, and which offers both worth-while and profitable activity in farming, business, industrial, and professional lines. The farms of Kansas need more college graduates and the business, industrial, and professional fields related to agriculture are calling for more well-trained men than it is possible to supply at the present time.—R. I. Throckmorton, Head, Department of Agronomy.

The farming industry is becoming more complicated. Farmers today are confronted with many problems in production which did not concern the farmers of a generation ago. Maintaining soil fertility, eradicating weeds, controlling plant and animal diseases, and the successful combating of parasites require all of the knowledge and skill at our command.

One can spend several years and secure much of this information by practical experience or he can get it in concentrated form and at less cost by spending four years in college. The college-trained man has the advantage in the struggle against competition.—Loyal F. Payne, Head, Department of Poultry Husbandry.

For a lover of the outdoors, a college education in agriculture is a declaration of independence and an insurance policy. It affords him an opportunity to do what he most desires, and to receive pay for doing it. It broadens his opportunities. He can be

a better farmer or he can follow one of the hundred other occupations related to agriculture. But, and mark this well, his possible material success is not the greatest benefit an altruistic graduate in agriculture derives from his college course. Beyond this, his broadened life horizon and his increased opportunity to render service to his generation will, as time passes, assume a continuously larger place among the realities of his life.—R. J. Barnett, Professor of Horticulture.

#### **Business Opportunities in Agriculture and Closely Related Industries**

With the growing importance of the business side of farming and of industries closely related to agriculture, the well-trained agricultural college graduate needs to combine with his studies of agriculture, studies of business subjects. Financing, accounting, organization, management, marketing, and other business problems are becoming of increasing importance to farming and closely related industries. The curriculum in agricultural administration gives opportunities for such training. Men with this training are finding a wide variety of opportunities open to them.

A young man, who has been reared on a farm or in town in a rural community and who has college training in agriculture and business, is in a position to make the most of the apprenticeship that he has served on the farm or in the rural community. Farming offers interesting, useful, and profitable opportunities to many such men. Industries closely related to agriculture such as the marketing, processing and manufacturing of crop and livestock products, rural banking, real estate promotion and sales, farm equipment sales and service, and many others are in constant need of good men with the practical and technical training secured by the farm-reared and college-trained graduate in agriculture. Teaching and research positions also are constantly available to well-trained men of ability.—W. E. Grimes, Head, Department of Agricultural Economics.

#### **Opportunities in Animal Husbandry**

General prosperity depends upon agriculture and since livestock provides a mar-

ket for approximately 50 percent of the value of all the crops of every kind and nature produced on the farms of the United States, it is at once apparent that livestock production is a very important industry and one that demands the most modern and efficient methods in its operation. This situation offers many and splendid opportunities for men well trained in animal husbandry, not only in the field of actual production, but also as teachers, investigators, county agricultural agents, and livestock specialists for the packing, banking, insurance, railroad, and other industries.—C. W. McCampbell, Head, Department of Animal Husbandry.

#### **Opportunities in Dairy Husbandry**

Commercial organizations are looking to the colleges more and more for men with dairy training and experience. This is true not only of dairy manufacturing work, but applies also to the production phase of dairying. A greater number of requests for men with dairy training have come to the Department of Dairy Husbandry in the last six months than for any similar period of time in the last 15 years. Of 33 requests received for dairy manufacturing men, only 17 men could be recommended for positions. This scarcity of men with training and experience is one of the big reasons why young men might well consider taking a college curriculum in agriculture with major electives in dairy husbandry.—J. B. Fitch, Head, Department of Dairy Husbandry.

#### **Opportunities in Milling Industry**

Flour milling is one of the major manufacturing industries in the United States. One-third of the food materials of the people comes from wheat flour. An industry of such magnitude has opportunities for college-trained men. An industry which manufactures products in excess of one billion dollars annually needs men of business training. The mechanical processes which convert annually over 600,000,000 bushels of wheat into flour need engineers. Chemists are needed for testing and in research. As relatively few college men have gone into this industry, it is practically a virgin field for liberally educated men.—C. O. Swanson, Head, Department of Milling Industry.

# Why I Am Studying Agriculture in K. S. A. C.

[The viewpoints presented on this page are those of representative students of the Division of Agriculture. Their reasons for studying agriculture are commended to prospective students as being worthy of careful consideration.—Adv. Ed.]

I am studying agriculture because all my life I have been directly connected with agriculture as a vocation, and because I believe that scientific agriculture, now in its infancy, holds vast and unlimited opportunities for the man with a good agricultural education.—I. Milburn Atkins, '28.

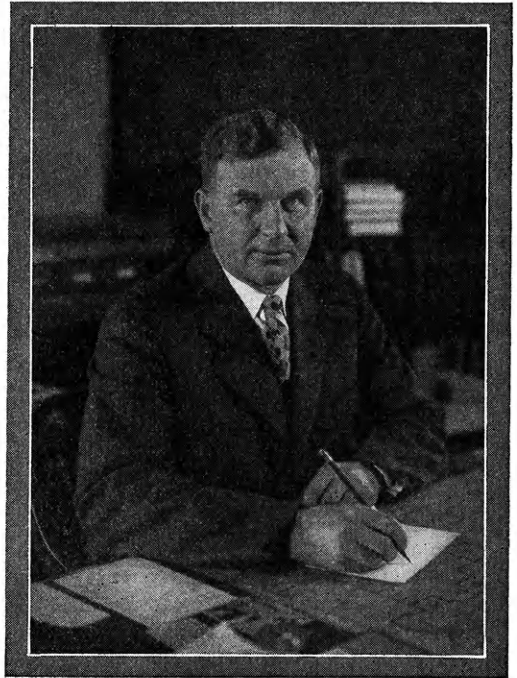
I am studying agriculture to better understand the foundation principles underlying all agriculture and to get new ideas so as to be better fitted to pursue successfully any agricultural work that I may select for a life job.—R. N. Lindburg, '28.

I enjoy agricultural work and I believe that the agricultural industry is one that has many possibilities for the college man of today.—Harold A. Miles, '29.

Agriculture is the basic industry upon which the vitality of the nation depends. The scientific discoveries being made continually make it interesting and worthy of the best a man can give.—Vance M. Rucker, '28.

Agriculture offers more opportunities to capable men who have a desire to become independent, useful citizens than any other line of work. I have worked at other jobs that paid more per hour and required fewer hours per day than does farming for the day laborer, but I have never found any work so really interesting as agriculture. When I was considering what college work to choose, the work of the Division of Agriculture in K. S. A. C. interested me most because it will teach a man to bring the best experience available to bear on the solving of agricultural problems and I have chosen agriculture as my life work.—Frank Zitnik, '30.

Agriculture offers broadminded, well-trained men opportunities equal to those in any other field. The industry never has faced bigger problems than it faces today. I am studying agriculture to be better prepared to help in their solution.—Russell Reitz, '27.



L. E. CALL  
Dean, Division of Agriculture

The main reasons why I am studying agriculture are: (1) I was reared on the farm and developed an interest in farming that made me want to study agriculture and make some phase of it my life work. (2) In the curriculum in agriculture, I can capitalize the practical experience of my boyhood and use it as a basis of my college training, which without a basis in experience is more or less theoretical. (3) Scholars and research workers in agriculture are relatively fewer than in other industries and professions. The field therefore looked promising to me.—Harold E. Myers, '28.

I am pursuing the curriculum in agriculture in K. S. A. C. because I consider it provides a practical foundation for a life work along agricultural lines.—O. G. Lear, '29.

I have chosen the field of agriculture for my life work and believing a college training is essential for the highest degree of success have selected the college curriculum designed to give the greatest efficiency in agricultural vocations. As agriculture becomes more and more scientific, men with a college training in agriculture will find larger opportunities for service and success.—F. Leonard Timmons, '28.

I am studying agriculture not only because my future is to be spent in that field, but also because agriculture is coming more and more to the front and I believe it will be a much more pleasant and profitable business in the near future than it has been during recent years.—Adrian E. Winkler, '30.

I am interested in studying agriculture primarily for three reasons: (1) The farmer is independent, and independence is envied by every true American. (2) The progressive farmer enjoys economic satisfaction. He can live within his means and, as he prospers, enjoy a more enviable position. (3) Skill is used to the best possible advantage in agriculture.

Since I am interested in agriculture, I desire a college education in agriculture. To be successful in any walk of life one must know his "line." He must also be able to compete with his fellow men; he must be a judge of men. A college education is the foundation for such training.

But the purpose of a college education is broader than personal success in any enterprise. It prepares a man for community leadership, and a man's real value is measured by how he serves. The college curricula in agriculture in K. S. A. C. are not vocational only. They are also cultural and uphold high ideals of service.—F. W. ImMasche, '29.

P. G. Roofe, '24, is a student in the Divinity School in the University of Chicago. His address is 5659 Woodlawn Ave.

### KANSAS FEEDERS' DAY

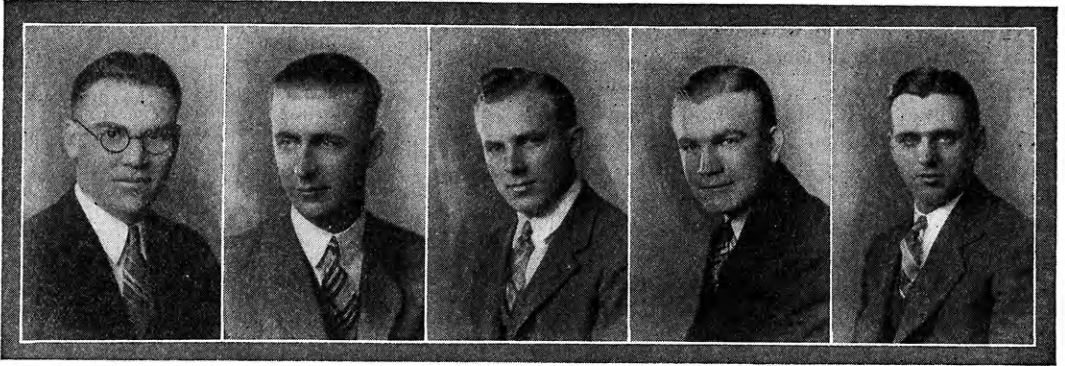
The fifteenth annual Kansas Livestock Feeders' Convention was held at the Kansas State Agricultural College, Saturday, May 21, 1927. Livestock men from every section of Kansas and seven other states were present. The Wichita, St. Joseph, and Kansas City markets also sent large delegations. The forenoon was given over to five speakers: F. D. Farrell, President of the college; Arnold Berns, Peabody, Kan., President of the Kansas Livestock Association; D. A. Millett, Denver, Colo., President of the National Livestock and Meat Board; J. H. Mercer, Topeka, Secretary Kansas Livestock Association; and W. M. Jardine, Secretary of Agriculture.

The afternoon session was devoted to discussions of the results of the past year's livestock feeding experiments conducted by the Kansas Agricultural Experiment Station. L. E. Call, director of the station, reviewed in a general way the work of the station as a whole; Prof. H. E. Reed discussed the sheep feeding tests; and Profs. C. W. McCampbell and B. M. Anderson, the cattle feeding tests.

Some of the more outstanding indications developed from the year's feeding work may be summarized as follows:

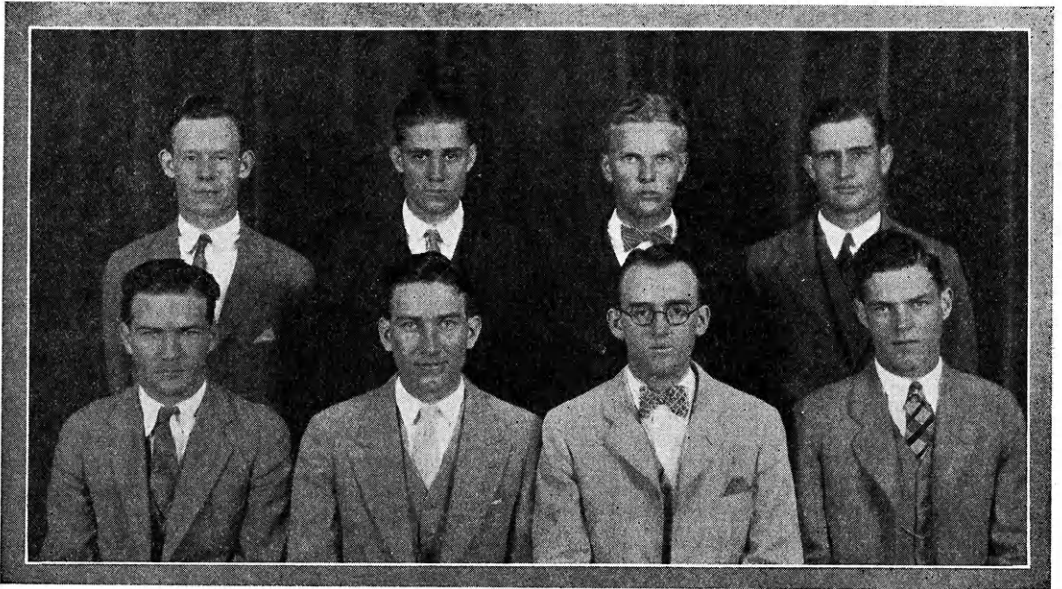
1. Silage may be used satisfactorily as the sole roughage in a fattening ration if properly fortified with calcium and protein.
2. Prairie hay, if properly fortified with calcium and protein, is almost equal to alfalfa hay as the dry roughage portion of a fattening ration.
3. The most satisfactory fattening ration one can feed in this section of the country consists of corn, cottonseed meal, alfalfa hay, and silage.
4. Wintering steer calves well, grazing without other feed the first half of the pasture season, and then full feeding for 90 to 100 days in a dry lot, is the most practical method of cattle feeding one can follow where grass is available.

Each of the seventeen lots of cattle and eight lots of sheep used in the test this year showed a nice profit.



## AGS IN PHI KAPPA PHI

This picture presents the five men highest in scholarship in the Class of 1927, Division of Agriculture, as indicated by their election to the national honorary fraternity; Phi Kappa Phi. From left to right they are: Russell Reitz, Belle Plaine; C. M. Carlson, Lindsborg; C. W. Thole, Stafford; George J. Stewart, Manhattan; and Raymond H. Davis, Effingham.



## NEW INITIATES IN ALPHA ZETA

Each semester the honorary student organization of the Division of Agriculture, Alpha Zeta, elects to membership students from the sophomore and junior classes recognized for their ability in scholarship and all around leadership. In the election of the second semester the eight students shown in the above picture were honored by election to membership in the organization. From left to right they are: Top row—L. L. Compton, Formoso; Ralph O. Lewis, Parsons; Ralph C. Hay, Parker; I. K. Tompkins, Byers. Bottom row—H. A. Miles, Mutual, Okla.; Geo. J. Caspar, Alida; Loren Ungeheuer, Centerville; and F. W. ImMasche, Saffordville.

# The Curriculum in Agriculture

The curriculum in agriculture is designed primarily to train the best farmers of the near future. It provides as good all-round college training, including the fundamentals of agriculture, as is possible for the time allowed. Since the field of agriculture is so broad, students select some phase for special study beginning with the junior year. This phase of agriculture is commonly called their objective of their major. Students thus, to a certain extent, begin specialization in the junior year.

A score or more of distinctly different majors may be chosen. A few of those frequently chosen are: Animal husbandry, dairy manufacturing, dairy production, poultry husbandry, truck gardening, orcharding, soil problems, crop production, farm management, farm marketing, farm engineering, agricultural chemistry, plant pathology, agricultural journalism, and entomology. This list is not complete. It is intended merely to suggest the flexibility and the large variety of opportunities in the curriculum in agriculture.

Many graduates secure positions as teachers, or research or extension workers in various educational institutions of high school or college grade. Others enter commercial fields usually closely related to agriculture.

In the following outline of the curriculum in agriculture the numbers in parentheses indicate the semester in which the subject or course is usually taken. "R" indicates a required course that carries no credits.

## OUTLINE OF THE CURRICULUM

	Semester Credits
<b>Freshman Year</b>	
College Rhetoric I (1) .....	3
College Rhetoric II (2) .....	3
Chemistry I (1) .....	5
Chemistry II (2) .....	5
General Botany I (1) .....	3
General Botany II (2) .....	3
Dairy Judging (1 or 2) .....	1
Library Methods (1 or 2) .....	1
Judging Market Livestock (1) .....	2
Judging Breeding Livestock (2) .....	2
Elements of Dairying (1) .....	3
General Geology (2) .....	3
Agricultural Lectures (1 and 2) .....	R
Physical Education (1 and 2) .....	3
Military Science (1 and 2) .....	3
<b>Sophomore Year</b>	
Organic Chemistry (Agr.) (1) .....	3
Agricultural Economics (1) .....	3
Anatomy and Physiology (1) .....	3
Soils (1 or 2) .....	5
Farm Crops (1 or 2) .....	5

Farm Poultry Production (1) .....	2
Elements of Horticulture (2) .....	4
Principles of Feeding (2) .....	3
General Zoology (2) .....	5
Physical Education (1 and 2) .....	R
Agricultural Seminar (1 and 2) .....	R
Military Science (1 and 2) .....	3

### Junior Year

Genetics (1) .....	3
Plant Pathology I (1) .....	3
Agricultural Microbiology (1) .....	3
General Entomology (2) .....	3
Farm Organization .....	3
Agricultural Journalism (2) .....	4
Agricultural Seminar (1 and 2) .....	R
Junior Electives (1 and 2) .....	13

### Senior Year

Agricultural Relationships (2) .....	R
Agricultural Seminar (1 and 2) .....	R
Major Electives (1 and 2) .....	12
Minor Electives (1 and 2) .....	9
General Electives (1 and 2) .....	11

It will be noted that the electives are grouped as follows:

	Semester Credits
Junior Electives .....	13
Senior Major Electives .....	12
Senior Minor Electives .....	9
Senior General Electives .....	11
<b>Total</b> .....	<b>45</b>

It is impossible in a brief space to present adequately the possibilities of these electives. The majors are selected to bear directly on the objective chosen. The minors are expected to support the majors in a fundamental way. A rather broad spread is permitted, as a rule, in the selection of the courses to be included in the other groups.

In short the elective system is so applied as to meet the individual needs of the students. A great deal of thought is given by the faculty concerned in helping students find themselves and select the work that will be most helpful to them.

Four members of the class of 1927 finished their requirements for graduation one to a few weeks before the end of the college year and entered on regular work elsewhere. They are as follows:

Raymond H. Davis, assistant in soil survey, Doniphan county.

James P. Caster, manager of the Wells and Preston Dairy, Columbus, Ga.

E. F. Carr, county agricultural agent, Rawlins county.

C. M. Carlson, county agricultural agent, Reno county.

# The Curriculum in Agricultural Administration

The curriculum in agricultural administration is planned to meet the needs of students preparing for industries that are closely related to agriculture. These industries require basic training in both agriculture and the principles of business. This curriculum, therefore, primarily prepares for the large group of business enterprises in which agriculture is the predominating factor. This group includes rural banking, the marketing and processing of grains, the sale and development of lands, the hardware and implement business, rural newspaper publishing, the teaching of agriculture, especially vocational agriculture, and certain types of farming. The curriculum also may be adapted to meet the needs of specialists in marketing, farm cost accounting, and other agricultural economic problems.

## OUTLINE OF THE CURRICULUM Freshman Year

(The work of the freshman year is the same as given in the Curriculum in Agriculture. In fact, all curricula in the Division of Agriculture have a common freshman year.)

	Semester Credits
<b>Sophomore Year</b>	
Agricultural Economics (1) .....	3
Soils (1 or 2) .....	5
Farm Crops (1 or 2) .....	5
College Algebra (1) .....	3
Psychology (1) .....	3
Elements of Horticulture (2) .....	4
Feeding Livestock (2) .....	3
Farm Poultry Production (2) .....	2
Agricultural Seminar (1 and 2) .....	R
Physical Education (1 and 2) .....	R
Military Science (1 and 2) .....	3
Opinions (1 and 2) .....	6

<b>Junior Year</b>	
Agricultural Journalism (1) .....	4
Agricultural Seminar (1 and 2) .....	R
Junior Electives (1 and 2) .....	28

<b>Senior Year</b>	
Agricultural Relationships (2) .....	R
Agricultural Seminar (1 and 2) .....	R
Senior Electives (1 and 2) .....	32

The electives provided in this curriculum are grouped as follows:

	Semester Credits
Major Electives .....	15
Minor Agricultural Electives .....	15
Minor Nonagricultural Electives .....	15
General Electives .....	15
Total .....	60

These electives are selected under competent guidance in accordance with both the field selected by the student and the individual needs of the student. Six fields are recognized as follows: Rural banking, land economics, grain industries, agricultural journalism, agricultural engineering, and agricultural education.

The major electives are in agricultural economics. The minor agricultural electives are composed, as a rule, of the advanced courses in agriculture, chosen to provide the best possible specific training for the one of the six fields chosen by the student. The minor nonagricultural electives, as a rule, are chosen to give an adequate training in business principles. Finally, of all the elective groups, the greatest leeway is allowed in the choice of general electives. These are selected to round out the training of the individual student as much as possible.

In the case of the sixth field mentioned above—that of agricultural education—the object commonly sought is preparation for the teaching of vocational agriculture. The groups of electives in this case are so organized as to prepare adequately for the Kansas state teacher's certificate required. This phase of the curriculum has been approved and used as a model for the preparation of teachers in vocational agriculture in several other states.

It is difficult to make clear in a brief discussion the breadth and flexibility of the curriculum in agricultural administration. It stands for business principles applied in a businesslike way to scientific agriculture. It provides an adequate college education for many of the most important business enterprises of Kansas.

C. C. Dethloff, '22, assistant county agricultural agent in the employ of the Association of Commerce, Lake Charles, La., writes that he is "spending his energy trying to develop fruit and vegetable growing where as yet there is very little development."

### SEVENTH ANNUAL STATE HIGH SCHOOL CONTEST IN THE JUDGING OF FARM PRODUCTS

The annual state high school contest in the judging of farm products was held April 21 and 22. Fifty-one Kansas high schools were each represented by a team of three members. Two other high schools were represented by two contestants each. Eleven other Kansas high schools registered teams in advance but owing to bad weather and bad roads were unable to be present for the con-

test. Thus, in spite of the rainy weather preceding the contest a few more teams entered the contest than any previous year.

The contest was divided into four sections, a half-day being devoted to each section. The sections were: Poultry judging; grain judging; judging dairy cattle; and judging beef cattle, horses, sheep, and swine.

The high school making the highest number of points in the entire contest received a parchment certificate from the president of the college. A certificate was also awarded to the team making the highest number of points in any section of the contest. A certificate was awarded by the dean of the Division of Agriculture to the highest individual of the entire contest.

The Poultry Club awarded a medal to the individual making the highest score in poultry judging; the Klod and Kernel Club, a medal to the individual making the highest score in grain judging; the Dairy Club, a medal to the individual making the highest score in judging dairy cattle; and the Block and Bridle Club, a medal to the individual making the highest score in the judging of beef cattle, horses, sheep, and swine. Ribbons were awarded to the five teams making the highest score in each section of the contest; to the five highest individuals in the entire contest; and to the five highest individuals in each section of the contest.

A partial list of the winning teams and individuals is as follows:



SOME OF THE WINNERS IN THE STATE HIGH SCHOOL JUDGING CONTEST AND THEIR COACHES

From left to right those in the picture are: Bottom row—Kenney L. Ford, coach, Lee Albin, Lauren Sanderson, and Gross Page, Jr., of the Norton Community High School, high team in the entire contest.

Second row—Henry W. Schmitz, coach, Paul Davies, Philip Ljungdahl, and Billy Daniels of the Manhattan High School, winners in animal husbandry judging.

Third row—F. D. Allison, coach, Lewis Bacon, Richard Smith, and Allen McGinnis, winners in the judging of dairy cattle. Allen McGinnis was high individual in dairy judging.

Fourth row—A. K. Banman, coach, Wayne Stewart, high individual in poultry judging, Americus High School, and A. P. Davidson, professor of vocational education in K. S. A. C.

Fifth row—Hal F. Irwin, coach, and Edward Mitchell, high man in animal husbandry judging, Frankfort High School. Elmer Hartman and Arthur Heck, members of the Lawrence High school team which won the grain judging section of the contest. Elmer Hartman was also high individual in grain judging.

Sixth row—R. W. Russell, coach, and Joe Mason, high individual in the entire contest, Wakefield Rural High School. W. R. Essick, coach of Lawrence High School team.

#### High Teams in the Entire Contest

Team	Coach	Score
Norton Com. H. S.	K. L. Ford	4,694
Chase Co. Com. H. S.	G. F. Ellis	4,679
Manhattan H. S.	H. W. Schmitz	2,679
Lawrence H. S.	William Essick	4,584
Labette Co. Com. H. S.	R. T. Patterson	4,550

#### High Individuals in the Entire Contest

Individual	School	Score
Joe Mason	Wakefield R. H. S.	1,662
Trent Hunt	Labette Co. Com. H. S.	1,621
Floyd Hess	Chase Co. Com. H. S.	1,617
Clinton Tomson	Washburn R. H. S.	1,603
Paul Davies	Manhattan H. S.	1,598

#### High Teams in Dairy Judging

Team	Coach	Score
Lincoln H. S.	F. D. Allison	965
Norton Com. H. S.	K. L. Ford	939
Bazine R. H. S.	W. E. Stone	918
Partridge R. H. S.	G. B. Railsback	917
Mankato H. S.	B. J. Conroy	913





APRIL 22, 1927

Most of the coaches, contestants, and alternates at the college Thursday and Friday, April 21 and 22, for the state high school contest in the judging of farm products are shown in the above pictures. The two upper groups present the coaches and their teams; the group at the bottom presents the alternates and a few visitors accompanying the teams.

**High Individuals in Dairy Judging**

Individual	School	Score
Allen McGinnes	Lincoln H. S.	360
Clinton Socolofsky	Ramona R. H. S.	344
Bill Wilkins	Bazine R. H. S.	340
Clifford Overbaugh	Frankfort H. S.	339
Vernon Bebermeyer	Harper H. S.	339
George McMullen	Mankato H. S.	339

**High Teams in Poultry Judging**

Team	Coach	Score
Clay Co. Com. H. S.	C. D. Guy	935
Lawrence H. S.	William Essick	925
Ramona R. H. S.	E. L. Raines	922
Americus R. H. S.	A. K. Banman	904
Winfield H. S.	I. L. Plank	902.5

**High Individuals in Poultry Judging**

Individual	School	Score
Wayne Stewart	Americus R. H. S.	343
Norman Sondergard	Ramona R. H. S.	339
Edward Barben	Fairview R. H. S.	336
Tom Dickens	Winfield H. S.	332
Wilton Thomas	Clay Co. Com. H. S.	328

**High Teams in Animal Husbandry Judging**

Team	Coach	Score
Manhattan H. S.	H. W. Schmitz	1,540
Wakefield R. H. S.	R. W. Russell	1,432
Chase Co. Com. H. S.	G. F. Ellis	1,408
Norton Com. H. S.	K. L. Ford	1,375
Frankfort H. S.	H. F. Irwin	1,357

**High Individuals in Animal Husbandry Judging**

Individual	School	Score
Edward Mitchell	Frankfort H. S.	530
Paul Davies	Manhattan H. S.	528
Joe Mason	Wakefield R. H. S.	527
Frank Flipse	Oakley Consl. H. S.	522
Billy Daniels	Manhattan H. S.	521

**High Teams in Grain Judging**

Team	Coach	Score
Lawrence H. S.	William Essick	1,691
Labette Co. Com. H. S.	R. T. Patterson	1,578
Marysville H. S.	W. C. Bruce	1,509
Chase Co. Com. H. S.	G. F. Ellis	1,501
Norton Com. H. S.	K. L. Ford	1,485

**High Individuals in Grain Judging**

Individual	School	Score
Elmer Hartman	Lawrence H. S.	599
Charles Miller	Garden City H. S.	578
Wilfred Cohorst	Marysville H. S.	574
Trent Hunt	Labette Co. Com. H. S.	572
Arthur Heck	Lawrence H. S.	560

The entire contest showed the result of much hard work and serious study. Many of the scores were high and close. It was the best contest ever held at K. S. A. C. in many respects.

W. D. Austin, '10, is a successful farmer and livestock producer near Isabel.

George A. Filinger, '24, is assistant entomologist of the Ohio Agricultural Experiment Station, Wooster.

**PULLMAN SCHOLARSHIP FOR 1927**

During the last three years the Pullman Company has given \$5,000 each year in 20 scholarships awarded to agricultural colleges in the United States and Canada in proportion to their winnings in the judging contests and livestock classes in the International Livestock Exposition held in Chicago each December. The award is to be repeated in the 1927 exposition.

These scholarships become permanent revolving loan funds in the institutions winning them, with the understanding that they are to be assigned to deserving students who otherwise would not be able to secure a scientific training in agriculture. Last December, K. S. A. C. and Iowa State College each won three of these scholarships. Three other states won two scholarships each, and one scholarship went to each of eight other states.

**KANSAS BANKERS' CONVENTION**

The Fortieth Annual Convention of the Kansas Bankers' Association was held at the Kansas State Agricultural College May 18 to 20, 1927. Nearly 1,500 bankers from all sections of Kansas were in attendance. The general meetings were held in the College Auditorium with Dr. W. M. Jardine, Secretary of Agriculture, as the principal speaker. An extensive exhibit of investigational and educational work in progress at K. S. A. C. was artistically displayed in the gymnasium. Tours over the campus and city, to the college farms, and to the experimental projects were conducted the afternoon of each day of the convention.

The Kansas bankers held their annual convention at the college this year at the suggestion of the Agricultural Committee of the American Bankers' Association primarily for the purpose of giving the bankers of Kansas an opportunity to become better acquainted with the work of the college and



## The Carpet Stick—a Relic

**N**OTHING harder to keep clean than the farmhouse rug—takes a lot of beating and sweeping—but no woman does this on the electrified farm.

Electricity cleans carpets and rugs with a vacuum cleaner for a few cents a day. Washing, pumping, cooking, and sewing can also be done cheaply by electricity. The electric refrigerator keeps things cold. Electric motors do heavy outside work—such as hoisting, grinding, and sawing. MAZDA lamps provide instant, cheery light for house and barn.

The old “carpet stick” is put away and everybody enjoys some spare time on the electrified farm.

If you are on an electric line or hope to be soon, ask your electric power company for a copy of the G-E Farm Book which explains many uses for electricity on the farm.



All G-E products are marked with this monogram. On motors for vacuum cleaners, sewing machines, water systems, or for general utility, it means that the design of skilled engineers has been carried out with the best material and workmanship. G-E motors are doing the hard work of the world both indoors and out. To insure lasting service look for the G-E monogram when you buy MAZDA lamps, Wiring System, or any other electrical equipment for the farm.

# GENERAL ELECTRIC

with the agricultural problems of the state. The Kansas Bankers' Association through its Agricultural Committee has been actively interested for several years in promoting projects for the improvement of Kansas agriculture. Soil conservation by the use of leguminous crops, livestock farming, and crop rotations, is a phase of the work that has been particularly emphasized. It is thought that the recent meeting will result in increased interest on the part of Kansas bankers in this work.

**K. S. A. C. STUDENT JUDGING CONTESTS**

In the second semester of each college year the departmental clubs of the Departments of Agronomy, Dairy Husbandry, and Animal Husbandry conduct judging contests. Each contest is divided into two or more divisions on the basis of scholastic attainments of the entrants and suitable prizes are offered in each division.

**Ninth Annual Students' Grain Judging Contest**

The contest this spring in grain judging was the ninth to be conducted by the Klod and Kernel Klub. This contest was reported to have been the most successful of all. It was divided into three divisions—Senior, Junior, and Freshman. The winners in these divisions were as follows:

**SENIOR DIVISION**

Contestant	Score
Harold E. Myers	832
I. Milburn Atkins	831
Lyle Mayfield	816
George J. Caspar	794
L. E. Melia	740

**JUNIOR DIVISION**

H. H. Brown	699
W. C. Pierce	676
H. A. Miles	667
O. G. Lear	658
J. W. Roussin	656

**FRESHMAN DIVISION**

Elmer Kleisen	614
R. E. Dunn	570
H. R. Bradley	505

In the senior division, there were 18 contestants; in the junior division, 45; and in the freshman, 13. Four hundred points were allowed for identification and six hundred for judging and grading, making a total possible score of one thousand points.

**Twentieth Annual Students' Dairy Judging Contest**

The annual dairy judging contest conducted by the Dairy Club was held Monday

afternoon, May 9, 1927. There were two divisions of the contest, a senior division for those entrants having had advanced dairy judging, and a junior division for all others. In the senior division 20 students entered and in the junior division, 75. A silver loving cup was awarded to the high man in the senior division and a gold watch to the high man in the junior division. Other appropriate prizes were awarded not only to several of the next highest men in each division but also to one or more of the highest men on each breed of dairy cattle in each division. The winners were as follows:

**SENIOR DIVISION**

E. J. Joines	994
T. W. Kirton	983
F. A. Blauer	946
Robert F. Brannan	919
Harold E. Myers	908
Robert H. Dodge	897

**JUNIOR DIVISION**

John W. Decker	1,002
George Washington	997
S. M. Raleigh	980
Walter P. Powers	971
V. E. McAdams	970
George J. Cunningham	958

The high men on each breed of dairy cattle in each division were:

Breed	Division	Contestant
Guernseys	Senior	Harold E. Myers
Guernseys	Junior	T. J. Charles
Jerseys	Senior	E. J. Joines
Jerseys	Junior	L. B. Brooks
Holsteins	Senior	Robert H. Dodge
Holsteins	Junior	Raymond Appleman
Ayrshires	Senior	F. A. Blauer
Ayrshires	Junior	R. G. Yapp

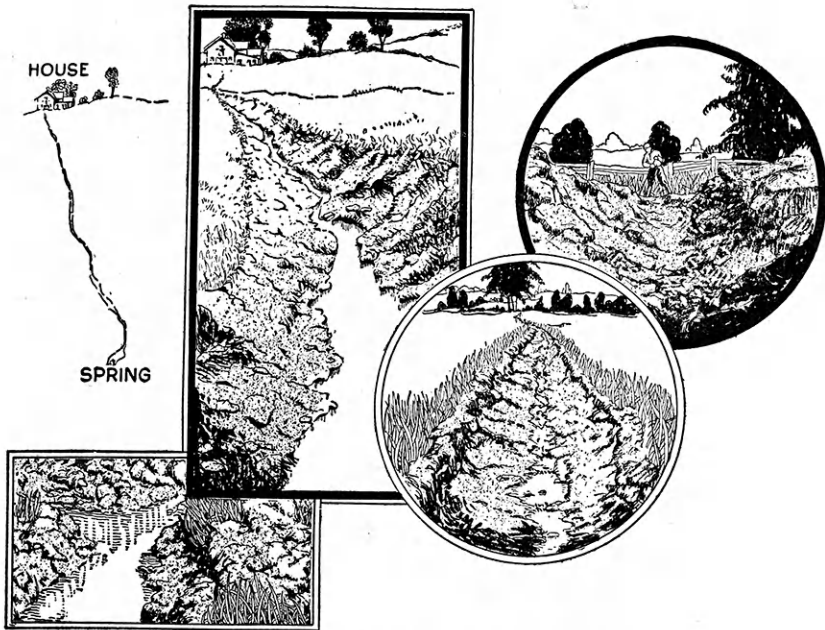
**Twenty-fifth Annual Contest in the Judging of Beef Cattle, Horses, Sheep, and Swine**

The Block and Bridle Club of the Department of Animal Husbandry held their annual judging contest Saturday, May 14, 1927. There were two divisions of the contest. In the senior division there were 21 contestants and in the junior division, 106. The contest consisted of placing eight classes of livestock and giving reasons on four of them. Oral reasons were given in the senior division and written reasons in the junior division.

In the senior division the winner of first place was awarded a gold watch and the winner of first place in the junior division was awarded a silver loving cup. The five highest men in each division were as follows:

**SENIOR DIVISION**

Howard Vernon	476
H. L. Murphey	476
I. K. Tompkins	471
V. E. McAdams	466
E. I. Chilcott	460



# ONE DITCH

## Reclaims 75 Acres and Carries Spring Water to House

**A** RAVINE on the James H. Berry Estate at Old Chatham, N. Y., was so poorly drained that some 75 acres of it were utterly useless.

At the foot of the ravine was a fine spring from which water had to be carried some distance to the farm house, at the upper end of the ravine.

The superintendent of the estate finally hit upon an idea for carrying the spring water to the farm house and draining the 75 acres by means of *one ditch*. With the cooperation of a du Pont representative they plotted the ditch, bored holes, loaded the holes with du Pont 50% Ditching Dynamite and at one stroke dug 14,000 feet of ditch to an average depth of 4 feet.

The pipe line through which the spring water was pumped to the farm house was laid and covered with 2 feet of soil, leaving a 2 foot deep drainage ditch. 75 acres of the best soil on the estate were brought under cultivation. The entire job cost less than half the cost of digging such a ditch by hand.



Do you know what you can do with explosives on the farm? Let us send you—"The Farmers' Handbook of Explosives"—100 pages of illustrations and practical information. Used as a text-book by many agricultural colleges. Ought to be in your reference library. Send for **FREE** copy NOW.

**E. I. DU PONT DE NEMOURS & CO., Inc.**

**ARCADE BUILDING**  
St. Louis, Mo.

**JOPLIN NAT'L BANK BLDG.**  
Joplin, Mo.

**DU PONT**

**JUNIOR DIVISION**

F. A. Blauer .....	529
G. J. Cunningham .....	497
E. J. Joines .....	494
T. J. Charles .....	494
Howard R. Bradley .....	485

The high men on each class of livestock in each division were as follows:

<b>Class</b>	<b>Division</b>	<b>Contestant</b>
Cattle	Senior	Howard V. Vernon
Cattle	Junior	F. A. Blauer
Horses	Senior	H. L. Murphey
Horses	Junior	Andrew P. Grimes
Sheep	Senior	H. L. Murphey
Sheep	Junior	S. A. Gels
Swine	Senior	I. K. Tompkins
Swine	Junior	F. A. Blauer

**SECOND ANNUAL BABY CHICK AND EGG SHOW**

The second Baby Chick and Egg Show was held April 21, 22, and 23, 1927. Entries came from all parts of the state, as well as from outside of the state. The number of eggs and chicks entered this year was nearly 100 per cent larger than last year.

One of the main objects of the show, that of encouraging the production of strong vigorous chicks by commercial hatcheries, was shown to be a possibility. Over 3,500 chicks were handled, some for more than four days with less than 25 deaths.

The winners of firsts in one or more of the various egg classes were:

**High School Class**

Warren Murphy, Dickinson county  
John O'Neal, Dickinson county

**Commercial Class**

Perry Packing Company, Manhattan

**Accredited and Certified Flocks**

Ray Babb, Wakefield  
Miss Ethel Snider, Sabetha

**Fanciers' Class**

Esbon Leghorn Farm, Esbon  
Miller Brothers Poultry Farm, Montezuma

**College Students' Class**

E. A. Moody	P. B. McMullen
Raymond W. O'Hara	Miss Minnie Johnson
Leonard Koehler	J. E. Payne, Jr.
L. J. Simmons	K. P. Nikoloff

The winners in the 12 baby chick classes were:

- LEGHORNS: Master Breeders, Cherryvale
- RHODE ISLAND REDS: Master Breeders, Cherryvale
- BARRED ROCKS: Master Breeders, Cherryvale
- BUFF ORPINGTONS: Master Breeders, Cherryvale
- WHITE WYANDOTTES: Frankfort Chickeries
- WHITE ROCKS: Master Breeders, Cherryvale
- RHODE ISLAND WHITES: Zurich Hatchery
- ANCONAS: Mrs. Frank Williams, Marysville
- WHITE MINORCA: Ray Babb, Wakefield
- MISCELLANEOUS: Sabetha Hatchery (Solid color)
- MISCELLANEOUS: Bowell's Hatchery (Parti color)
- AGRICULTURAL EXPERIMENT STATIONS: Oklahoma (Stillwater), no competition

**WHAT ABOUT THE HORSE SITUATION?**

(Continued from Page 102)

Profits will not materialize, however, for those who breed promiscuously.

Draft horses can be disposed of into commercial channels easiest and at top prices when six or seven years old. This means that the producer can utilize his horses for a period of about four years, during which time they are not only earning their keep but also actually increasing in value. This suggests a program which should be back of all livestock operations as well as any other business enterprise. It is the man who has a definite plan and sticks through the ups and downs that succeeds in livestock work. Every farmer who plans to raise horses should make his own replacement requirements the aim of his breeding operations. He should plan to dispose of one team every year or at least every other year as the case may be, but have his own replacements on hand.

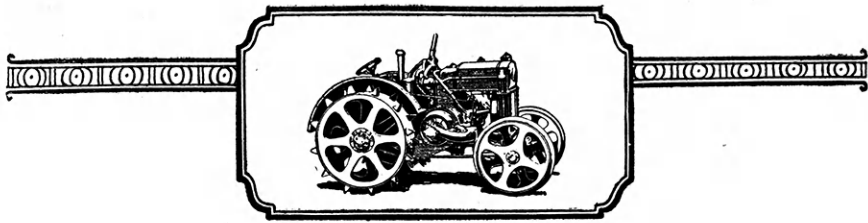
As an example of this plan, Mr. "A" has a farm which he is operating with eight horses. The ages of his horses are as follows: One team of six-year-olds; one team of five-year-olds; one team of four-year-olds; and one team of three-year-olds. Generally half of these are mares. Every fall he sells his six-year-old team but has a team of three-year-olds ready to replace them. In this manner he turns his horse into cash when its value is highest regardless of economic conditions. To do this he plans to raise at least two foals a year and break them to work when two and a half years old, but allows the younger horses to have the lighter work whenever possible. This plan needs only slight modification to suit any farm, depending upon the number of horses needed to do the work.

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F. M. Layton, '15, Blue Rapids, is one of the leading livestock men in Washington county.

---

A. N. Waters, '20, is proprietor and manager of Waters, Inc., 158 Massachusetts Ave., Boston, Mass. He deals chiefly in stationery and office supplies.



## There Must Be A Profit

**N**O INDUSTRY or individual business can long continue without a suitable profit. Therefore there must be profit in farming, because it goes on year after year.



*Established  
1842*

Farm Tractors  
3 sizes  
Skid Engines  
Steel Threshers  
5 sizes  
Combines  
Prairie  
Hillside  
Silo Fillers  
4 sizes  
Baling Presses  
2 sizes  
Steam Engines  
Road Machinery  
Grand Detour  
Plows  
Harrow  
Cultivators

Profit is all contained in the margin between selling prices and production costs. On this margin a few farmers "go broke," others make a good living and many grow wealthy.

Since the selling price at any given time is the same to all farmers it is evident that prosperous farmers are producing at lower costs than those who do not prosper.

How do they do it? Mostly by cutting down power and labor costs through the use of more efficient machinery. It is significant that many of the most prosperous farms are equipped with Case machines—built and sold since 1842 to make more money for their owners.

### **J. I. Case Threshing Machine Company**

**Incorporated**

**Established 1842**

**Dept. E-75**

**Racine**

**Wisconsin**

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



# Growing Flax in Eastern Kansas

Loren Ungeheuer, '28

The Kansas flax crop is worth about one-half million dollars. Five counties in the southeastern part of the state produce four-fifths of the crop. Allen county leads, followed by Neosho, Linn, Wilson, and Bourbon. Kansas flax makes an average yield of 6.5 bushels per acre according to reports of the Kansas State Board of Agriculture, while oats in the same region averages 25 bushels per acre. Due to the difference in price per bushel, however, the acre value of flax is \$14.67 as compared to \$13.07 for oats.

Flax is well adapted to eastern Kansas and may be grown successfully on any soil that is suitable for other small grains. In preparing the seedbed for flax any method that will produce a finely pulverized surface with a thoroughly packed subsurface is satisfactory. Except in the case of clean stalk land, fall plowing is advisable. Spring plowing is unsatisfactory because of the difficulty in preparing a good seedbed by the time flax is to be sown. Land plowed in the fall has ample time to settle and become mellow before planting.

Flax may be seeded either broadcast or with a drill, the latter method being preferable. The drill is ordinarily set to plant very shallow rarely covering the seed more than one inch. The usual rate of seeding is 28 pounds per acre. When the seedbed is in a good condition, and a good drill is used the rate may be reduced to 20 pounds. If sown broadcast under less favorable conditions the quantity of seed is increased to as much as 30 or 35 pounds per acre.

Flax should be sown the latter part of March or the first of April, depending upon the climatic and soil conditions at that time. It is a crop that should have cool, damp weather at the time of blossoming, and the earlier it is planted the more likely this condition is to be obtained.

It is essential to harvest flax when it is fully ripe. If it is cut too green it does not cure readily and the quality of the seed is likely to be reduced. A loss of seed by shattering will result if it is allowed to become over-ripe. It may be harvested either with the

reaper or the grain binder. The binder is considered more desirable since it permits shocking of the grain which keeps the bolls off the ground and prevents damage that might otherwise occur to the seed.

The crop should be threshed as soon as the grain and straw are cured. This usually requires from three to ten days after cutting depending upon the greenness of the straw and climatic conditions. If threshing cannot be done promptly the flax should be stacked, taking great care to avoid tramping and shattering of seed from the bolls.

Circular 133, on "Growing Flax in Kansas," recently issued by the Agricultural Experiment Station will be of value to Kansas farmers and others interested in this subject. Copies may be obtained by addressing requests to Agricultural Experiment Station, K. S. A. C., Manhattan, Kan.

## BLACKHULL WHEAT IN KANSAS

(Continued from Page 99)

Tests conducted during the past five years over the Great Plains area show a greater percent of winterkilling in Blackhull than in either Turkey or Kanred. At this station during the past winter, plants of the three varieties were subjected to controlled temperatures and the results clearly indicate a lack of winter hardiness in Blackhull. This lack of winter hardiness in Blackhull has not been brought to the attention of wheat growers over the state because Kansas winters since 1917 have been comparatively mild.

It is possible that the higher yield, greater test weight, and stiffer straw of Blackhull will overbalance the weakness of its protein and susceptibility to winterkilling and thus make it the most desirable wheat to grow in south central Kansas. However, in northern, western, and northwestern Kansas the danger from winterkilling is so great that Blackhull should not be planted in this area.

Jacob C. Holmes, '12, Laverne, Okla., is a member of the Holmes Livestock Company, formed in October, 1926. They have yards in Englewood, Kan., and Woodward, Okla.



Theo T. Swenson, '20, is in the market news service of the United States Department of Agriculture. His address is 27 Livestock Exchange Building, Buffalo, N. Y.

K. P. Nikoloff, '28, who contributes an interesting article in this issue, is an ambitious Bulgarian student determined, in spite of handicaps, to secure the degree, bachelor of science in agriculture, from K. S. A. C. Mr. Nikoloff lost his parents in the Macedonian uprising in 1903. His early education was then secured by the assistance of American missionaries. In 1914 he went to Bulgaria and served as an artilleryman in the Bulgarian army during the World War. He came to K. S. A. C. last fall to equip himself for better work in the improvement of the poultry industry in Bulgaria.

#### KANSAS HOME ORCHARDS COULD BE BROUGHT BACK

(Continued from Page 101)

removal of larger limbs later. The tools used in pruning should always be sharp in order to have the wounds smooth.

Spraying is necessary if the tree is to produce usable fruit, and the tree itself live a long life. The orchardist must know the symptoms of disease and insect pests, their life cycles, dates, and the materials used in combating them. He must know that diseases such as blotch, scab, or brown rot can be controlled by sprays, but that it would be a waste of time and money to attempt to control fire blight, blister canker, or cedar apple rust by the same method. To be effective, the spray must be of the proper materials, applied thoroughly, at the right time, and by competent workmen.

The man who plants an orchard and then leaves it to exist or die with no further thought or care, who does not care to have his farm a real home, will surely fail in the undertaking; but the man who plants an orchard, cares for it and works in it, who loves his home and his family, will have added value to his farm besides joy and health to himself and his family, especially the children and their friends.

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### THE COMBINE IN SOUTHWESTERN KANSAS

(Continued from Page 106)

necessity for less help, the ability to put the wheat in the bin at smaller cost, and a smaller amount of machine loss, the high initial cost of a combine is justified. Power farming has come to southwestern Kansas to stay and the two greatest labor-saving devices of that region are the tractor and the combine. They are doing much to decrease the cost of wheat production in that region.

### COD-LIVER OIL IN POULTRY FEEDING

(Continued from Page 100)

quently, when birds are receiving plenty of direct sunlight, which enables them to provide their own Vitamin D, and in addition receive either green leaves or yellow corn, or both, which provides Vitamin A, it is not necessary to include cod-liver oil in the poultry ration.

Ira L. Plank, '16, is in his seventh year as teacher of vocational agriculture in the Winfield High School. In the agricultural section of the American Vocational Association in annual convention at Louisville, Ky., December 3, 1926, Mr. Plank presented the Winfield vocational agriculture program. This was a splendid recognition of the good work Mr. Plank has done and his presentation was both first-class and well received by the association.

David Gray, '14, is associate editor of the Kansas Stockman, the official organ of the Kansas Livestock Association.

H. P. Gaston, '23, is doing research work in fruit marketing in the Michigan Agricultural Experiment Station.

E. H. Hostetler, '14, is in charge of swine investigations in the North Carolina Agricultural Experiment Station, Raleigh.

E. J. Bird, '14, is farming near Bird City. There are four children in his family and he says he thinks the farm a dandy place for them.

George M. Drumm, '21, coached the California dairy judging team which represented the state in the National Dairy Show at Detroit last fall.

Iro N. Vowel, '23, teacher of vocational agriculture in Brewster High School, died in Brewster, Kan., March 12, 1927. He was returning home in a rescue party in a severe snow storm and becoming exhausted, collapsed. He lived several hours but did not revive. Iro was one of the most likeable, faithful young men it is one's pleasure to know and his sudden death is a shock to his many friends.

## Ten Principles of Successful Farm Management

1. The man is the most important factor in the success or failure of the farm business.
2. No farm is successful that does not have adequate size.
3. The successful farm must be diversified according to its possibilities and its location.
4. No farm can be successful unless it produces the crops and livestock at less cost than the sale price.
5. If the business is too small, its size may be increased by renting land, proper use of credit, or by farming more intensively.
6. Profitable livestock production is based

on cheap feed, cheap labor, good-quality livestock, and good marketing methods.

7. A good cropping system is built around a sound, workable crop rotation.

8. Soil fertility must be maintained or profits will gradually be reduced and ultimate failure result.

9. The efficient use of man labor, of horse work, and of machinery is necessary if the farm is to be successful.

10. The tenant stage in farming is not to be despised; the tenant becomes a land owner.—Morris Evans, Associate Professor of Farm Management.

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