

# *The* KANSAS AGRICULTURAL STUDENT



VOL. VI, No. 2    DECEMBER, 1926  
MANHATTAN, KANSAS

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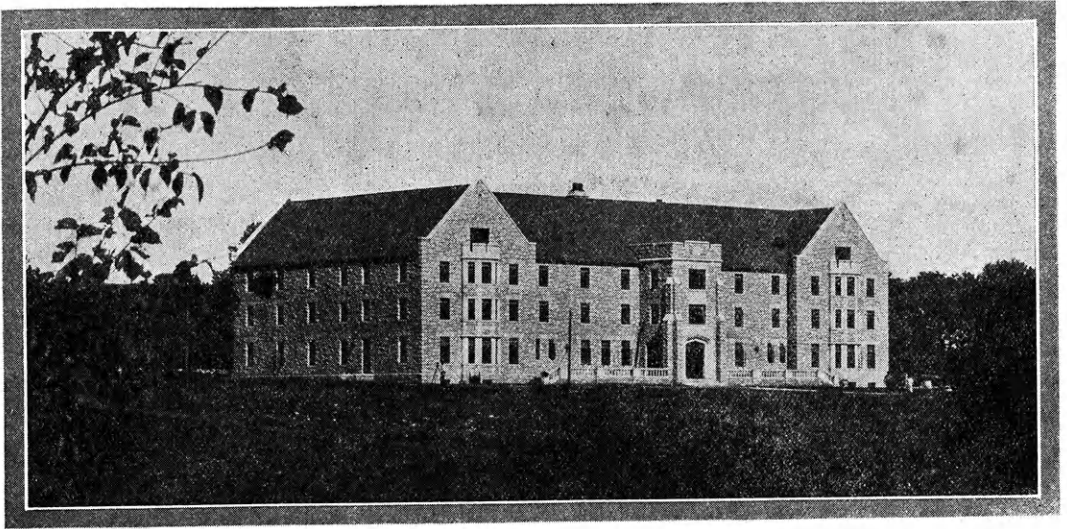
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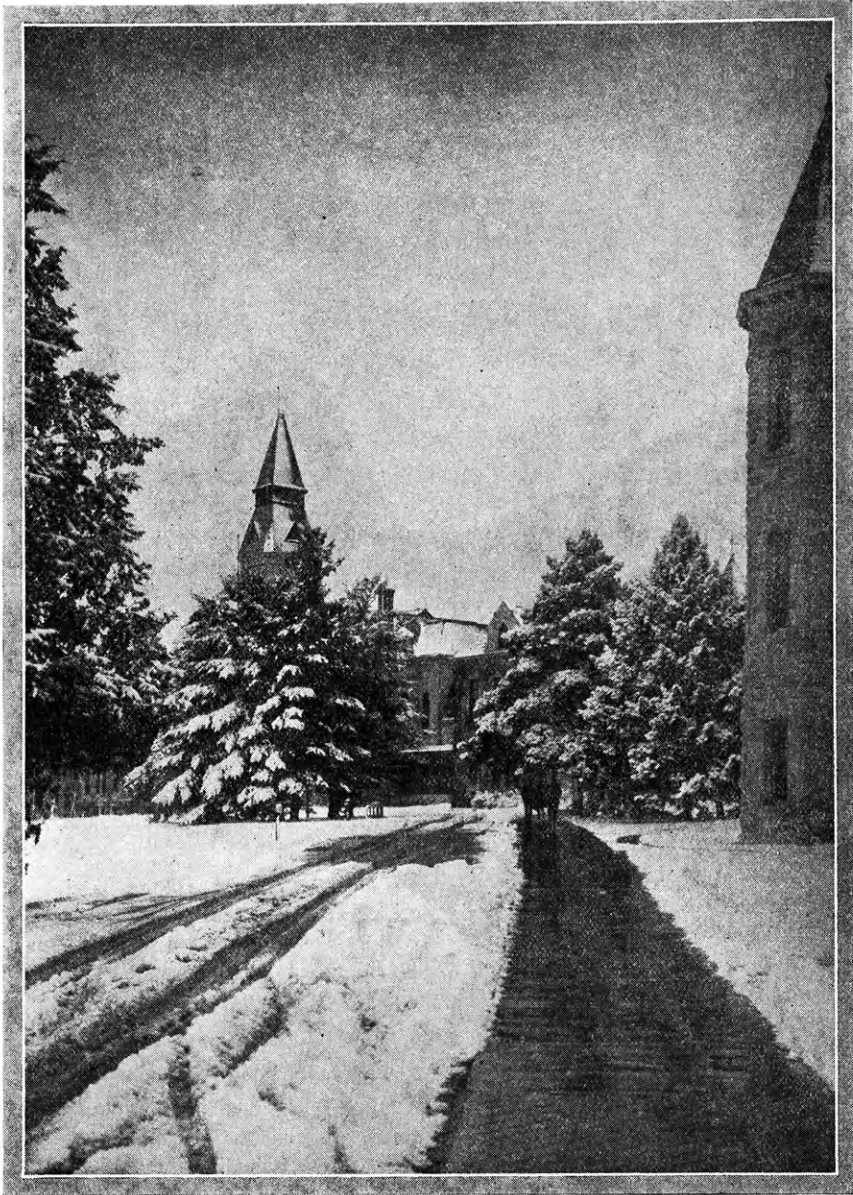
VAN ZILE HALL

This is the fine new girls' dormitory recently completed on the northeast corner of the college campus. It provides a splendid home for 115 college girls. Landscaping plans to be carried out during the next few years will make Van Zile Hall one of the most beautiful spots on the campus.

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A WINTER SCENE AT K. S. A. C.



# The Kansas Agricultural Student

VOL. VI

Manhattan, Kansas, December, 1926

No. 2

## The Baby Chick Industry

Stanley Caton, '27

Hatching of baby chicks has entirely outgrown the natural method or the use of hens for incubation. This method is not economical and consequently artificial means have been developed. Artificial incubation was practiced by the Chinese and the Egyptians centuries before Christ, yet it has not been until recently that it has developed commercially in this country.

Since the production of baby chicks has become so highly specialized it may be considered as a commercial venture, or an industry in itself. One might ask why it is considered an industry; and the answer is, because of its importance and economic value to poultrymen. Through a process of sound reasoning and experience the commercial poultry raiser and the general farmer have found it both convenient and economical to buy from a commercial hatchery the quality of chicks they want, in the numbers they want, and at the time they want them. This entirely obliterates the work, worry, and expense of hatching in small numbers and even then not being too sure of the desired quality. The quality of chicks now being produced by reliable commercial hatcheries is becoming so high that a flock owner can secure his chicks from a commercial hatchery cheaper than he can produce them himself.

With this demand and an apparent potential increase in demand the logical question is, what is the future of the baby chick industry? This industry may be considered in its infancy. From a booklet published by the Buckeye Incubator Company the following information has been gleaned:

1. There were two billion baby chicks hatched in the United States last year.

2. One-fourth or 25 percent of these chicks were produced by commercial hatcheries.

3. According to extensive investigations conducted by questionnaires in Minnesota and Texas, 76 percent of the poultry raisers in those states were still hatching their own chicks.

4. The Country Gentleman conducted an investigation by questionnaire the results of which showed that 84 percent of those making replies were still hatching most of their own baby chicks and that 57 percent had never bought any baby chicks at any time.

These results may be considered reliable and nonprejudiced because the Buckeye Incubator Company carried on their investigations through the International Baby Chick association and farm journals of good repute.

In addition to these results, a survey of Kansas made by the Department of Poultry Husbandry of Kansas State Agricultural College showed that in 1926, the average number of chicks hatched and bought per farm was 418. Of these, 10 percent were purchased. Only 17 percent of the farmers bought baby chicks. If this information be coupled with the knowledge of the rapid increase in the number of birds being kept on farms, the demand is apparently in excess of the supply.

Such a promising future will bring an advance in the commercial hatchery industry. It is not, however, a venture to be entered upon in a haphazard hit-and-miss manner, any more than any other commercial venture.

It might be well to consider some of the more important aspects of a good commercial hatchery. The first and perhaps the most important is the quality of chicks produced. In this day and age of intensive competition, the man who produces the highest quality product at the most reasonable price is

bound to succeed. Quality gives satisfaction, and satisfaction is good advertising. In order to achieve this ideal the hatchery must get eggs from standard-bred flocks, which in turn must be vigorous, high-producing, and disease-free. In all the cases the flocks should be inspected by the hatchery operator personally or by some competent representative. This insures a source of high-quality hatching eggs. Of course the ideal situation is personal ownership of the flocks by the hatchery. The baby chick associations have realized the importance of this aspect and are placing due emphasis on the production of "quality chicks." Kansas hatcherymen are showing much interest in this matter and some of them insist on the flocks, from which they draw their supply of hatching eggs, being tested for bacillary white diarrhea, a disease which causes high mortality in baby chicks.

Another factor which must be considered is the price of baby chicks. Chicks must be sold at a price which will insure the movement of large numbers of them; but the quality should not be lowered in order to lower the price. Any poultryman desiring quality is willing to pay a price in keeping with the quality of stock being obtained.

Marketing baby chicks is not as much of a problem as one might think. The baby chick industry provides a large volume of business for the postal and express carriers. These carriers have provided regulatory and protective measures which insure a minimum mortality of baby chicks in transit. Two of these measures are the special delivery stamps and the special handling stamps. It is a common occurrence for chicks to be shipped distances equal to two-thirds of the distance across the continent with a very low percent of mortality. In fact such shipments without loss are not unknown.

In Kansas, as in other states, poultrymen do not want poor-quality chicks, and Kansas hatcherymen are endeavoring to meet this demand for high-quality products by having flocks tested for bacillary white diarrhea, accredited for standard breed characteristics, and culled for high production. Right now there is a demand for chicks of certain breeds

which have trapnest records, and this demand cannot be met.

If one will watch the development of commercial hatcheries the gradual growth of the hatchery business may be noted. New hatcheries are being built each year or additions being made to those already established. The total capacity of hatcheries in Kansas, July 1, 1926, was 2,746,171 eggs, which was an increase of about 200,000 eggs over the capacity of the preceding year. Since July 1, however, there has been a decided increase in the purchasing of mammoth incubators which adds to the above-stated capacity.

The eight leading counties in hatching capacity, July 1, 1926, were:

Shawnee .....	212,325
Osage .....	210,900
Dickinson .....	185,540
Geary .....	141,000
Washington .....	115,680
Labette .....	111,696
Brown .....	106,662
Clay .....	104,124

Many other counties have a total hatching capacity of 1,000 to 100,000 eggs.

E. J. and H. C. Bird, '14, are farming near Great Bend.

D. D. Hill, who completes his work for his master's degree at the end of the present semester, majoring in plant breeding, will return at once to Oregon Agricultural College, Corvallis, his alma mater, to accept work along crop improvement lines.

G. A. Read, '25, is with the Pioneer Hatchery Service Department, Petaluma, Calif. His article in this issue on "The Community Unique" presents information of real interest. The Petaluma community produces more eggs than any other community in the world.

L. E. Long, M. S., '23, is research economist in the Agricultural Experiment Station of Mississippi. He writes an interesting letter as regards his work and the opportunities in the South, especially in Mississippi. Mr. Long was an early contributor to the Ag Student and its readers may have an opportunity to hear from him again in the near future.

# The Harvesting of Grain Sorghums in Southwestern Kansas

Roy Bainer, '26

The sorghum crop for southwestern Kansas is the best and most profitable crop that farmers can raise under ordinary conditions. This is chiefly because of the low rainfall in this region. In the fall of 1925, however, conditions were very favorable for winter wheat, so an unusually large acreage was planted to wheat. As conditions continued favorable, little of this acreage was abandoned, so the acreage planted to row crops in the spring of 1926 was unusually small.

The varieties of grain sorghums that predominate in this section are, common and straightneck milo and Blackhull and Dawn kafir. There are a few fields of Sunrise and Pink kafir, feterita, and hegari.

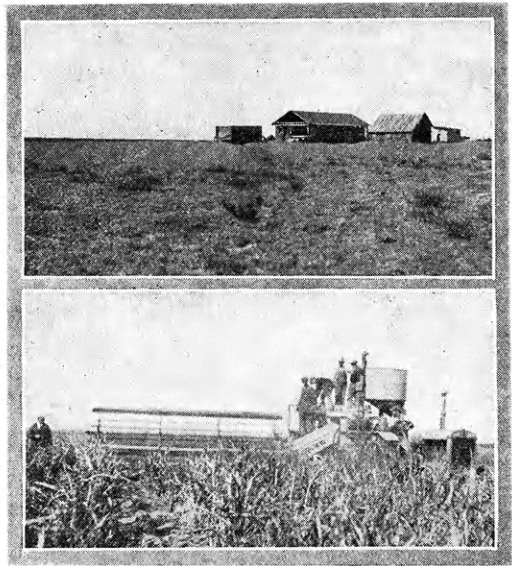
The harvesting of grain sorghums offers a somewhat different problem than the harvesting of wheat. Unless the seed has been carefully selected each year, there is an unevenness in the height of the crop which makes it difficult to get all of the heads, unless hand methods or the row binder is used. Another thing is, the crop goes down, that is, lodges very easily after a frost, especially if damp weather sets in with considerable wind. In fact, some fields were observed in which from 40 to 70 percent of the crop lodged in one day's windstorm after a heavy frost. One variety seems to go down as bad as another. When a crop goes down like this, there are only two ways to save it. One is to pick up the heads by hand, the other is to turn livestock out and let them harvest it. The latter method is the more common in southwestern Kansas.

The goosenecking common to Standard milo offers considerable trouble in that, when cut with the header, wagon-box header, or combine, too much stalk must be cut to get the head. Also the gooseneck tends to catch on the reel, either being thrown over the backstop or carried over and dropped on the ground in front of the machine.

Harvesting by hand seems to be the most popular. In fact, about 50 percent of the

grain sorghums in southwestern Kansas were harvested by hand last fall.

The hand method has its advantages in that (1) there is no expensive outlay for machinery; (2) there is no loss of heads in the field; (3) there is no heavy machinery to pull through the field; and (4) the heads that are cut by hand cure better than those cut by other methods because there is less of the stalk cut with the head.



SCENES IN GRAIN SORGHUM HARVESTING TIME

The upper picture shows a pile of threshed grain. The lower picture shows a combine at work in a grain sorghum field.

However, harvesting by hand is a very slow process. One man usually tops two rows at a time. The quantity topped varies from one to three acres per man per day. This, of course, depends upon the yield, condition of the crop, and the individual. Those hiring their topping done pay about 8 cents per bushel. After an additional 10 cents or more per bushel is paid for threshing and hauling, a substantial portion of the selling price of

the grain has been expended.

About 35 percent of the grain sorghums of southwestern Kansas were cut with the header last fall. The size of header commonly used was the 12-foot cut. Three rows were taken per swath. It was possible to cut from fifteen to twenty acres per day with this machine and one or two barges.

When the crop is even and standing up well, the header method is about the most practical method used. This method cuts down the cost of harvesting considerably. Two men can go out with a header, barge, and eight head of horses, and cut twenty acres per day while if they went out single handed they could cut only about four acres per day.

Some changes are made on the header before it is really successful in row crops. In some cases the platform is raised to make it possible to cut grain ranging from three to six feet in height. This is accomplished in two ways, depending upon the machine. On some it was necessary only to invert the supporting braces under the platform. On others, stilts were placed between the platform and braces. In some cases the reel was built solid from the slat to the axle. The reason for building up the reel was to keep the goosenecks of the milo from catching on the slats and being carried over by the reel; also, sometimes the kafir, due to its heavy head and light stalk, falls over the top edge of the slat, when it is in the bottom position, to the ground.

The head losses in the field with the header method vary a great deal, due to different varieties being cut, condition of the crop (that is, evenness and stand), and the adjustments made on the machine. These losses vary from 2 to 15 percent.

There were very few wagon-box headers used in southwestern Kansas last fall. Three were all the surveying party saw while driving the country. There is a place for this type of machine on some farms, however, especially when a farmer works alone. With an investment of about \$65 he is able to harvest about four times as much as he could working single handed.

The row binder is not commonly used, for a very small acreage was cut by this ma-

chine. Only now and then a farmer was found who used this method. The acreage cut with the row binder ran below 5 percent of the total acreage of grain sorghums harvested.

Harvesting grain sorghums with the combine is in its infancy. Last fall about sixty-five or seventy combines were studied in the survey. They were at work both in southwestern Kansas and the Panhandle of Oklahoma.

The farmers who used the combine were fairly successful. The chief reasons for this was because of the dry fall. They did not have trouble in drying their grain. All that was necessary was to pile the threshed grain on the ground, and the sun and wind dried it out fairly well.

Under favorable conditions the combine was the cheapest method for handling the row crops. It was possible for two men to take a combine and harvest and thresh from fifteen to thirty acres per day.

The head losses were about the same for the combine as for the header. The adjustments on the platform and reel were also nearly the same as for the header. In some cases the speed of the entire machine was changed. It was necessary to slow the cylinder to prevent the cracking of grain. But when the cylinder was slowed down no provision was made for keeping up the speed on the separator. The separator receives its power from the cylinder shaft. The reel was either slowed down, or every other slat was taken off, to keep from beating the heads too much. This was necessary because the machines working in sorghum traveled only about one-half as fast as those traveling in wheat, therefore it was not necessary to have the high reel speed.

The combine did a splendid job, but in most cases the grain coming from the machine was too damp to store in a bin. If the farmer had waited until all of the grain was ripe enough to keep, before combining, his grain would have gone down, so there is a considerable element of risk attached. However, most of the farmers are willing to take

(Continued on page 55)



# The Decline of Kansas Home Orchards

Russell Reitz, '27

A person needs hardly resort to statistics to show that there has been a decline in home orchards. Casual observations through the state of Kansas at the present time would be sufficient to show that there are many neglected orchards with but few plantings of young trees to replace them. In 1905, there were seven million apple trees and four and one-half million peach trees in the state. In 1925, there were only one million six hundred thousand apple trees and less than one million peach trees. There is only one-fifth as many fruit trees in Kansas today as there were twenty years ago.

Further investigation shows that the commercial plantings have increased in the commercial fruit districts of the state throughout this period. Therefore, it must be concluded that since the commercial plantings have increased but the total number of fruit trees in the state has decreased, the small plantings or home orchards have suffered even more than figures for the twenty-year period would indicate.

Fruit trees normally have the power to live for a great many years. Therefore, the main cause for the decline of Kansas home orchards is not necessarily that the trees have grown old and have served their usefulness. Rather, most trees have been killed by causes other than natural death. Insects, diseases, mechanical injuries, and general poor care on the part of the farm operator are responsible for the death of three-fifths of the fruit trees lost during the last twenty years.

The Ben Davis variety was one of the most important in Kansas twenty years ago. Today, Ben Davis trees are relatively scarce and most of those that remain are diseased. Few Ben Davis trees are now being planted. Blister canker, a fungous disease, is responsible for great losses of this variety in all of the middle western states.

Fire blight has caused large losses in home orchards in the years past. The damage caused by this disease is not so great as that from blister canker in the apple.

However, fire blight practically makes it impossible to grow pear trees in Kansas. In every case because of this disease, only the poor, less susceptible varieties can be grown.

Apple blotch and apple scab, two diseases that can be controlled by spraying, also have caused large losses in home orchards. Many of the varieties used in the home orchard were the early ones. These summer varieties of apples are very susceptible to apple blotch and no doubt some trees were killed by this pest. Certainly tremendous damages such as cracking, premature decaying, etc., were done to the fruit.

The San Jose scale and codling moth have made many a home orchard unprofitable. The San Jose scale by sucking the sap from the tree weakens the tree and finally kills it. The codling moth larvae attack the fruit and losses are far greater in these later years than they were twenty years ago. Many a farm operator, unequipped with a sprayer, has given up trying to raise fruit, even for his own use, because of the difficulty in producing a desirable product.

Equal in importance at least with the damage caused by insect and fungous enemies has been the carelessness of the owner or farm manager in the general care of the trees. Many times livestock have been grazed among the trees. This has resulted only in tremendous damage to fruit plants and has caused a decline in the productiveness of the home orchard. Livestock allowed among fruit trees always injure the trees. If cattle or horses run in the orchard they eat the lower twigs, hogs rub the trunk, and sheep will eat the bark and twigs and girdling may result. The enormous losses due to an attempt to secure both fruit and pasturage from the home orchard clearly show that the two objectives cannot be combined and both be maintained. In a large number of cases the livestock were given the preference.

Twenty years ago nearly all trees were grown in sod. In some places this was advisable but on level lands cultivation results

(Continued on page 62)

# Bell's Melrose Carries On

L. M. Clausen, '28

The problem of increasing the production of a dairy herd is much more complicated and difficult than it may at first seem. Every breeder of dairy cattle is confronted with the question, "Where can I secure a herd sire that will increase the production of my herd and at the same time keep up the standard of individual quality?" It requires a great deal of thought and effort to locate a bull which will fulfill these requirements. As a herd is built up and the average production and quality increases, it becomes more and more

first ten daughters milking as two-year-olds had averaged more than 400 pounds of butterfat. After considering a number of bulls, the animal finally decided on was Bell's Melrose, a grandson of Melrose Good Gift himself. That the selection was a wise one has been proved as the daughters of Bell's Melrose not only show a higher average production than did the daughters of Melrose Good Gift at similar ages, but they also show a substantial increase on the records of their dams, which is the real index as to a bull's



BELL'S MELROSE

difficult to secure satisfactory bulls. It is not hard to find a bull which will raise the production of a herd averaging 200 pounds of butterfat, but it is exceedingly difficult when this average has gone up to 400 pounds or more per cow.

Several years ago the Department of Dairy Husbandry in K. S. A. C. was confronted with just such a problem in their Ayrshire herd. The old herd bull, Melrose Good Gift, had been used for several years and had sired a group of daughters that were exceptionally high producers. In fact his

ability.

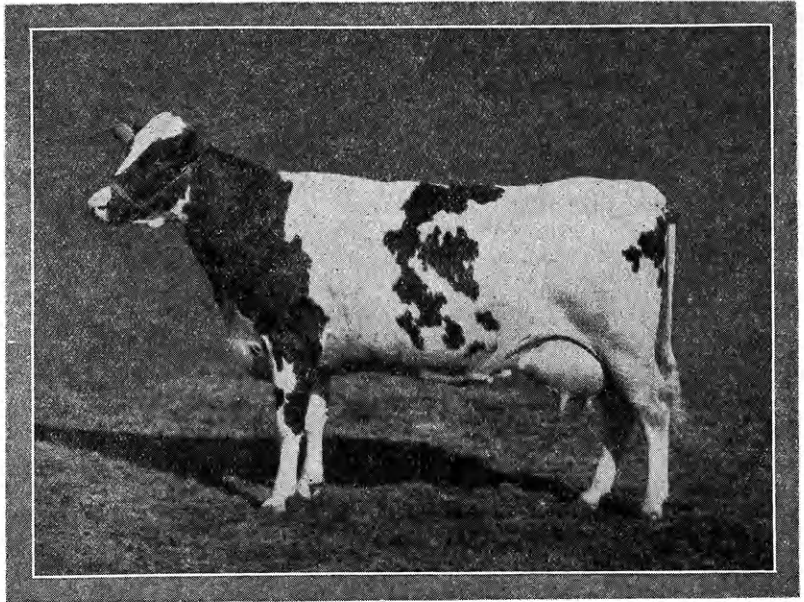
Bell's Melrose has an interesting pedigree, being sired by Elizabeth's Good Gift, whose dam, Elizabeth of Juneau, made a record of 15,122 pounds of milk containing 536.15 pounds of butterfat as a senior three-year-old, a world's record when made. Elizabeth's Good Gift was sired by Melrose Good Gift, whose 22 daughters in the K. S. A. C. herd made an average production of 9,180 pounds of milk and 355 pounds of butterfat as two-year-olds. This was an average increase of 1,381 pounds of milk and 57.34

pounds of butterfat over their dams' records made at similar ages.

The dam of Bell's Melrose, was Bell's Bell, a wonderful individual and also a capable producer. Although she died after being on test 214 days in her second lactation period, her record during this period was outstanding. She produced 9,785 pounds of milk containing 371.49 pounds of butterfat with an average test of 3.8 percent butterfat. Her daughter, Bell's Bell 2nd, a sister of Bell's Melrose, produced 15,157 pounds of milk and 645.9 pounds of butterfat as a mature cow. Obviously the dam of Bell's Melrose was a great cow.

The grandsire of Bell's Melrose on the dam's side was none other than Albert Cook, who had seven Advanced Registry daughters. Among them is the nationally known Canary Bell, one of the principal foundation cows of the college Ayrshire herd. Her record of 744 pounds of butterfat stood as a Kansas state record over all breeds for several years.

According to the laws of inheritance Bell's Melrose should be a sire of production,



OLDEST DAUGHTER OF BELL'S MELROSE

This fine, purebred Ayrshire, B M's Bangora Melrose, was United States champion for 1925 in the senior four-year-old class. Record: 16,887 pounds of milk; 703 pounds of butterfat.



PUREBRED AYRSHIRES IN THE COLLEGE DAIRY HERD

and that this is true is borne out by a study of the production of his daughters. A comparison of the records of his daughters at ap-

(Continued on page 62)

# The Community Unique

G. A. Read, '25

The Indian said "Petaluma," and thought of its little hills. The Californian says "Petaluma," and immediately thinks of its chickens, for the tremendous egg production of this interesting community has caused it to be known afar as "The World's Egg Basket." Academically speaking, its major is intensity and its minor is diversity. Here Miss Leghorn is Queen and her capital city has grown to be the richest agricultural city per capita in the United States.

The Petaluma poultry district lies just 36 miles north of San Francisco. Within an eight-mile radius of the town itself approximately twelve million chickens are housed, of which number about four and a half million are laying hens. On an average there are about three thousand hens to a farm, yet one farm has attained the record capacity of forty-two thousand.

The extraordinary development attained by the poultry industry of this region, despite the cool, equitable climate, well drained, sandy soil, and proximity to market, would have been impossible had not it been for the commercial hatcheries. Last year these hatcheries alone turned out more than thirteen million baby chicks. Not long ago, even in Petaluma, the hatchery business was considered but a side line for the spring months, but now hatcheries are fast becoming corporations, if you please, whose operations extend throughout the entire year. Single baby chick orders for ten thousand or more are not uncommon, as certain "ranchers" do nothing but raise pullets for the market, some brooding as many as four lots a year. In 1927 there will be one hatchery in Petaluma with a capacity of 1,800,000 eggs—that means 5,000 cases or an equivalent of ten average carloads. Incidentally, this firm has a plant that is valued at three-quarters of a million dollars.

Petaluma's baby chicks enjoy quite the same popularity throughout the Pacific coast states as do her well known "Nulaid" and "Calpro" eggs in the New York markets. Due credit must, of course, be given the County

Accredited Hatcheries Project, since it was a pioneer in the nationwide movement for the betterment of chick quality. Insurance is thereby granted the customer of a standard chick, from carefully culled hens, mated to males having a production pedigree of not less than 175 eggs on the side of the dam and sire's dam. With such additional control as this project imposes upon the local breeders, better stock each year is inevitable. Indeed it is estimated that the yearly flock average about Petaluma has been raised by 25 eggs, since the advent of the Accredited Hatcheries Project, five years ago.

With such potential heavy-producing stock great interest has been aroused in the economics of feeding for high egg production. Incidentally there has been more advancement in this line in the past twelve months than in the previous five or six years. Notable, indeed, is the fact that the traditional use of mill feeds (bran, shorts, and middlings) and charcoal are being relegated to the discard. Realization has come about that the former are far too expensive to use in an egg food when figured on the basis of cost per digestible unit. Feeding the latter, it has been learned, is an economic waste and has no value in the poultry ration. The practice of feeding fresh greens to poultry is also coming to be regarded in a different light. Green feed is said to be of value only because it is a source of Vitamin A, but this, it has been found, can be provided much more economically by the addition of dried alfalfa leaves and blossoms to the ordinary mash mixture.

Dr. W. A. Lippincott and his associates of the Poultry Department of the University of California deserve much credit for their stimulus to Petaluma's present progressive trend.

---

R. K. Bonnett, '13, is vice-president of the Washburn-Wilson Seed Company, Moscow, Idaho.

---

J. H. Corsaut, f. s., has a prosperous greenhouse business in Hutchinson. He specializes in forcing vegetables.



# The Possibility of Producing an Early Variety of Wheat for Kansas

L. L. Davis, '27

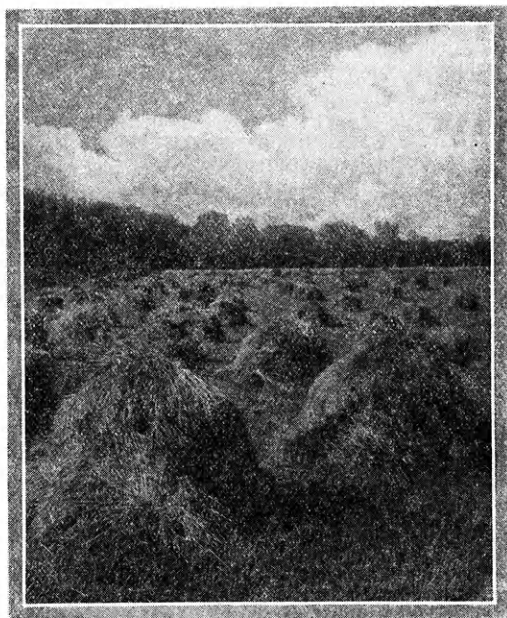
An earlier variety of wheat would be a distinctly valuable contribution to the wheat industry of Kansas. The earliness factor alone would avoid great losses each year owing to the usual hot winds and drought in the period just before harvest. A variety of wheat ripening four to eight days earlier than the varieties commonly grown in Kansas would escape this injury to a large extent. An earlier-maturing variety of wheat would also help distribute the labor at harvest time, as part of the acreage could be planted to the early variety and a part to a standard variety such as Turkey or Kanred. This question is especially important now that the "combine" has come to Kansas.

It is useless to say that earliness is the only essential character of a good variety of wheat. Associated with it must be such characters as winter hardiness, high-yielding ability, good milling and baking quality, stiff straw, and high test weight. Resistance to such diseases as stinking smut or bunt, and leaf rust, and to such insect pests as Hessian fly would add much to the value of a variety.

To secure these characters or some, of them, in combination, several different crosses and a very large number of hybrid selections have been made. Some of the hybrid selections which now deserve careful testing are Kanred X Marquis, Kanred X Hard Federation, and Kanred X Nebraska No. 28.

The crossing of varieties and selecting the desirable hybrids is a very long process. Individual plants of the various varieties that are to be crossed are grown in pots under greenhouse conditions or in short rows in the wheat breeding nursery. Plantings must be made at intervals of about 10 days to insure proper stages of development for crossing, especially if the varieties to be crossed differ widely in time of heading. The period during which varieties can be crossed is limited to a very few days. The pollen grains or male

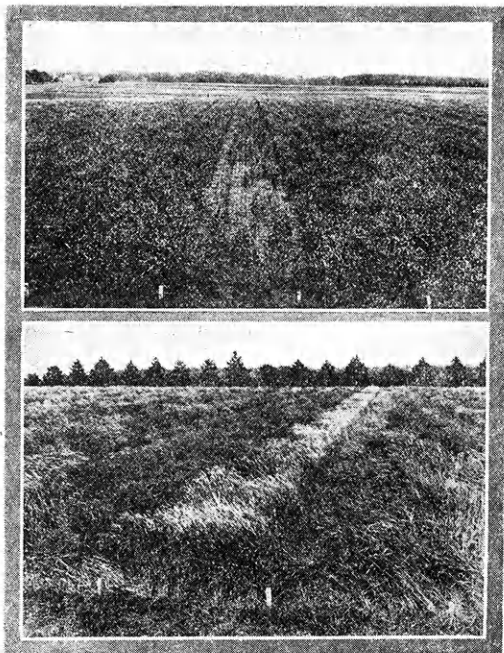
reproductive cells must be transferred to the feathery stigmas of the female parent at the proper time to insure setting of seed. The stigmas must also be at the receptive stage if the cross is to succeed.



The seed of the first cross is planted individually, one kernel in a place. The seed produced by these plants is used to make space plantings in eight-foot rows in the plant breeding nursery. Each row has twenty-five plants from one individual hybrid plant of the previous generation.

Each plant in this second generation is harvested separately and individual plant notes are taken on characters of the plant, head and grain. The most desirable plants

are threshed and the seed space-planted, again providing the opportunity for making individual plant selections. This procedure is continued from three to six generations depending on the number of characters and differing hereditary factors involved in the cross. It is essential that individual plant notes be taken so that all the desirable char-



Courtesy of Prof. T. A. Kiesselbach of Nebraska Agricultural Experiment Station.

#### WHEAT VARIETY PLOTS SHOWING GOOD AND BAD POINTS OF THE SAME VARIETY

Nebraska No. 28 is shown in the center of both pictures. The upper picture shows severe injury from winter killing following a hard winter. The lower picture shows the value of this early stiff-strawed variety in a wet season when other varieties are badly lodged.

acters can be considered. Any one of these plants may have some one desirable character but a combination of several desirable characters is what is wanted. Thus Kanred is rust resistant, yields fairly well, but has a rather weak straw. Blackhull yields well, has a heavy test weight, but is seriously lacking in cold resistance or winter hardiness, and its milling and baking qualities are still a subject of debate. Nebraska No. 28 (see accompanying illustration) excels in

earliness, has a stiff straw, but lacks winter hardiness and the milling quality of the wheats of the Crimean or Turkey group. Varieties such as Buffum No. 17, Odessa, Minhardi, and Minturki are remarkably cold resistant, but are quite unadapted to Kansas conditions because of their low yields, late maturity, and poor quality. Plants are selected in this way until it is established that their progenies are breeding true to type. It is then safe to make bulk or mass, instead of individual or pedigree plantings.

There are many difficulties encountered which tend to slow up the progress in obtaining the ideal variety. Observations indicate that there may be an association or correlation, either physiologic or genetic, between some of the most desirable characters and some of the characters not wanted in the new variety. For instance, there is some evidence which indicates a correlation between lateness and winter hardiness. To get further and more accurate information on this possible relationship, Professors S. C. Salmon and John H. Parker are conducting freezing trials this winter, of early, medium early, late, and very late hybrid plants selected from third generation progenies of the Kanred X Nebraska No. 28 cross. These trials are being made under controlled conditions, using the new refrigeration machine, recently installed in the new agronomy greenhouse of the Agricultural Experiment Station.

In spite of these and other difficulties and complications it is hoped that some of the new varieties now being tested will ultimately find a place for themselves on Kansas farms.

The crossbred variety named Tenmarq, which is a hybrid between a hard red winter wheat very similar to Kanred, and Marquis, the most popular and widely grown variety of hard red spring wheat in America, has several desirable characters, such as high-yielding capacity and superior quality, but lacks the cold resistance of Kanred, Turkey, and Kharkof. Based on the five-year averages in the wheat breeding nursery at the college, Tenmarq stands superior to Kanred

(Continued on page 60)

# Alfalfa Wilt Disease

L. E. Melchers

Several thousand acres of Kansas alfalfa have been plowed up during recent years because of thin stands. It is known that part of this loss of alfalfa plants has been due to alfalfa wilt and a closely associated trouble which, for the present, is being called crown rot disease.

Alfalfa wilt is a bacterial disease which attacks the roots of the alfalfa plant. It has been learned through experimental work that the same organism may also attack sweet clover. Outside of these two legumes no other crop is known to be susceptible.

Alfalfa wilt is widespread in the United States. It is most prevalent in areas having annual rainfalls exceeding 25 inches and least prevalent in irrigated districts. It has been known in Kansas for several years. A large share of the alfalfa failures in the southern states is probably due to this disease. Alfalfa wilt undoubtedly has passed unrecognized in the United States for a long time, although it apparently has been only in the last few years that it has become widespread and destructive.

Winter killing of alfalfa, a term which has been generally applied to plants which die during the winter, has undoubtedly covered a multitude of sins. In the past whenever a field died, winter killing has been assigned as the cause. No doubt a large part of this so-called winter killing has been wilt. This disease, unfortunately, does not confine its attack to old fields. At present many fields two and three years old are badly diseased. At the rate the plants are dying in some fields, it is a question of only four or five years before they are unproductive, becoming so at an age when they should be in their prime.

Alfalfa wilt does not show any external lesions by which it might be recognized definitely. The most conspicuous character of a badly diseased plant is a dwarf habit, with a tendency toward an abnormally large number of short stems which are spindling and suggest a "witch's broom." Dwarfed plants are usually paler green in color and their leaves are smaller than healthy plants. The

wilting of older plants occurs during the growing season, resulting in a few of the upper leaves showing a symptom as if frost injury had occurred. The first crop of the season generally shows diseased plants more strikingly than other crops, although one acquainted with the wilt has little difficulty in detecting diseased plants at any time.

The wilting is probably due to the clogging of the vascular system by the bacterial



ALFALFA PLANTS SHOWING RESULTS OF ALFALFA WILT DISEASE

Plants Nos. 1 and 3 are badly infected, the roots showing discoloration of the woody part. No. 2 is a healthy plant showing normal white wood in the root and a normal top growth.

organism, although other factors may be involved. A badly diseased tap root shows unmistakable discolorations which are readily observed in cross sections. The discoloration, which is yellow or brown, is most conspicuous in the outermost part of the woody cylinder, or just beneath the bark. If the bark is stripped back, the woody vascular cylinder will be observed to show a straw-yellow, brownish-yellow, or even dark brown color in the later stages. This is very different

from the white or ivory-white, rather dry appearance of the same tissue in a healthy plant. (See accompanying illustration.) A diseased root shows this condition the entire length of the tap root from the crown of the plant to the root extremity. Plants that go into the winter in this condition are dead or nearly dead by the next summer. This results in uneven growth and thin stands in the spring.

There is a great deal of research necessary before a complete understanding of the life history and the relation of the parasite to the host is understood. Dr. F. R. Jones is devoting considerable time to a study of this disease at the Wisconsin Agricultural Experiment Station.<sup>1</sup> A few of the important things which must be determined are: The methods by which the parasite gains entrance; the manner in which it spreads through the tissues; what the conditions are that are necessary for the most rapid progress of the organism through the host and its death; whether the organism is killed when infected hay is fed to animals, and if not how long it remains alive in the manure; how widely the organism is distributed in the soil and how long it may live over in the soil. It has been learned that the disease may be spread in mowing, the organism undoubtedly being carried on the sickle bar, infecting healthy plants after diseased plants have been cut. There is no definite proof to date that the disease is spread by seed infection.

Because of the nature of the disease, there seems to be little hope at present for a practical and effective method of control. Seed treatment will probably be of little or no value. Crop rotation as far as controlling the disease is concerned will aid but little. Fields which have had the disease, however, should not be planted to alfalfa again for several years, if for no other reason than carrying out a sound agricultural practice. A study of varietal resistance will be made at the Kansas Agricultural Experiment Station in cooperation with the United States Department of Agriculture and there is some

hope that the selection of resistant or relatively resistant plants in the field may bring results. Even if such plants are discovered it is readily seen that immediate relief is impossible since it requires oftentimes many years of work before practical results are obtained.

## THE MARKET DEMAND FOR KANSAS DAIRY PRODUCTS

H. A. Brockway, '27

The broadest market demand for Kansas dairy products is the consumption of cream in butter making. The dairy interests of the state are extensively affected by the demand for Kansas butter. This is particularly true where dairying is carried on as a sideline, as it is for the most part.

Over three-fourths of the Kansas butter is now made in creameries. The market for this product is nation wide, approximately two-thirds of it being sold outside of the state. Of the amount sold outside the state, three-tenths go to four large markets; namely, Chicago, New York, Boston and Philadelphia. As the price of the entire product will depend upon the price at which the surplus over home consumption can be sold, eastern markets and eastern production are of great interest to Kansas dairymen.

In 1924 Kansas produced about sixty million pounds of butter, about twelve million pounds, or one-fifth of the total production, being sold on the four markets above mentioned. In 1921 Kansas stood fifteenth among the States and Canada in size of butter shipments to New York; in 1925 Kansas ranked thirteenth. Beginning in 1921, receipts of Kansas butter on the New York market expanded rapidly, increasing 50 percent by 1923. That year marked the peak and by 1925 the Kansas receipts were back almost to the 1921 level.

On the Boston market, the sales of Kansas butter ranked eighteenth in 1921 and fourteenth in 1925. The receipts of Kansas butter on the Boston market have been steadily increasing during this period, the 1925 receipts being seven times as great as those in 1921. On the Chicago market Kansas has

(Continued on page 64)

1. A Bacterial Wilt and Root Rot of Alfalfa caused by *Aphanobacter insidiosus* L. McC. Fred R. Jones. Jour. Agr. Research. 33:493-521. September, 1926.



# Kansas Should Levy an Income Tax

C. M. Carlson, '27

One of the great changes that has taken place in the economic life of Kansas during the last fifty years is the increase in the number of persons who derive their income from sources other than property. This is a normal result of the economic evolution of the state. Those persons who derive their income from sources other than property are served by the state and local government just as the property owners are served. They receive the benefits of government; their children are educated in public schools; roads and other public improvements are at their disposal. However, under the present system of taxation in Kansas, they do not contribute to the support of the government in proportion to their ability nor in proportion to benefits derived. Our present tax law makes no attempt to reach this form of taxable income. Consequently, the increased cost of state and local government rests most heavily on owners of tangible property.

Persons deriving their income from salaries and professional fees are rapidly growing in number. They pay little or no taxes under our present tax system, but they have the same right to vote as the owners of taxable property. The person who pays no taxes is more likely to wink at public waste and extravagance. A wider distribution of the tax burden should result in more widespread and more intelligent scrutiny of public expenditures, because a greater percent of our voting citizens would be called upon to help bear the public burden.

The facts justify a personal income tax as part of a state program for a more equitable distribution of the tax burden.

Since the beginning of the twentieth century there have been continued efforts to reform the general property tax throughout the United States. The personal property tax in particular, because of its inadequacy and its increasingly unjust and pernicious results, has been receiving more and more criticism. As a result of general and persistent attempts to improve state revenue systems, the movement for taxing personal

incomes has spread until at the present time eleven states have laws taxing personal incomes.

Prior to 1912 some sixteen states had attempted at various times to tax personal incomes, but the results were failures until Wisconsin in 1911 came forward with her plan for a state income tax. Since that time state income tax reform has spread until at the present time there are states in the industrial east and south and states in the agricultural Middle West and South which have adopted income tax laws. These states and the receipts from the income tax in 1923 are shown in the following table:

STATE	REVENUE
New York .....	\$18,000,000
North Carolina .....	3,700,000
Missouri .....	2,900,000
Wisconsin .....	2,200,000
South Carolina .....	2,062,000
Virginia .....	1,147,000
Massachusetts .....	602,935
Delaware .....	368,000
Oklahoma .....	302,000
North Dakota .....	171,000
Mississippi .....	28,000

State income taxes are still so limited in application that the fiscal results cannot yet be used in proof of positive success or failure. An analysis of the various state income taxes indicates, however, that success measured in terms of relatively large amounts of revenue from this source, is possible in any state.

The success of a state income tax is conditioned by the following important features: (1) That it imposes a tax of reasonable amount and that there be an accurate adaptation of the rates to the various types of income represented in the state in question. (2) That it fit in well with other parts of the state tax structure. (3) That use be made of specialized and centralized state administrative machinery, administered by special assessors of income, appointed and controlled

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# THE KANSAS AGRICULTURAL STUDENT

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MANHATTAN, KANSAS

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## ECONOMIC EGG PRODUCTION

Competition will probably regulate the growth of the poultry industry. Those who have discovered the secret of economical production will survive longest and receive the greatest net returns.

The farmer is the most advantageously situated to produce poultry products at small costs. Free range, cheap feed, small overhead, and the utilization of labor during the chore hours are factors which enter into the economic production of eggs and poultry—peculiar only to farm flocks.

One phase neglected by farm operators has been an indifference towards increased production. Individual hens and individual flocks have made wonderful progress in egg production during the past ten years—but the progress of flocks as a whole has been very slight. More rapid advancement in this direction can be accomplished by the use of male birds from high production strains. For an expenditure of five dollars one can purchase a good male bird or a setting of hatching eggs from which several males might be reared. Increased egg yield is one of the foundation stones on which economic production rests.

In our cover page picture, the young lady is presenting a fine standard-bred white Leg-

horn cockerel, a representative of the K. S. A. C. strain. His mother is one of the two 299-egg hens which the college flock has produced. We recommend to the poultry keepers of Kansas the selection of such cockerels for their breeding flocks.

## THE AG FAIR

Many of the Ag freshmen are asking, "What is the Ag Fair?"

To make a long story short, the Ag Fair is a real old-time county fair carnival. On the day of the Fair after long and careful preparation, a big parade of floats and exhibits is made through Aggieville and Manhattan. In the afternoon a broncho busting contest is held, educational exhibits are opened up, and the sideshows turned on full blast. The evening entertainment includes vaudeville shows and a big dance in addition to the features of the afternoon.

Freshmen, be looking forward to this! It is the big divisional activity of the year, and it is here that you will make for yourself a good name and reputation in the division. Whether you know it or not, here is where the instructors and upper classmen will size you up and give you a rating that will stand in the coming years.

The best place for you to get right into

the divisional affairs now is in the departmental clubs. Do you know that we have a Dairy Club, a Horticulture Club, a Block and Bridle Club, a Poultry Club, a Klod and Kernel klub, and an Agricultural Economics Club in the Division of Agriculture? If you don't know in what department of the division you want to take your major work, we suggest that you visit meetings of any or all of these clubs and find out what the departments have to offer you.

In the spring all of these clubs work together as the Agricultural Association to put on the Ag Fair. Raymond Davis is manager of the Ag Fair next spring. Vance M. Kucker is assistant manager, and Pat Murpney is treasurer. Get acquainted with them; they are big men in the division and on the Hill.

#### OUR JUDGING TEAMS

The year of intercollegiate judging for K. S. A. C. is really the calendar year. Each January during recent years we have sent a judging team to the National Western Livestock Show at Denver. This is a team of juniors and, as a rule, is practically the same team that is selected to represent us in the American Royal (Kansas City) and International (Chicago) the following fall. In 1926, for example, the same team competed in Denver, Kansas City, and Chicago. This 1926 team made an unexcelled record of which we are justly proud.

During the year, 1926, K. S. A. C. has been represented in nine intercollegiate contests in the judging of farm products. Our livestock team entered three contests, as stated above, our dairy judging team, two, hence we have been represented by six different teams. In the nine contests we have placed first, twice; second, four times; third, once; and below third, twice. We consider this altogether shows a high-point year for K. S. A. C. in judging—the best we have ever had. Further no other college of agriculture in the country can present results that make as good a showing.

Judging of farm products is an important part of a college education in agriculture. The winning teams first of all must be stu-

dents. They must have the real information and also the tact and the ability to use it.

THE KANSAS AGRICULTURAL STUDENT is glad to present in this issue K. S. A. C.'s six intercollegiate teams in the judging of farm products for 1926. Their work has been a credit to themselves and a splendid piece of publicity for K. S. A. C.

#### TO THE COACHES OF OUR JUDGING TEAMS

Our judging coaches are not mentioned in the team write-ups. We wish to take this opportunity to compliment them on the fine records of their respective teams. Our readers are referred to accompanying pictures and legends for further information.

Sickness prevented Prof. J. W. Zahnley from accompanying his team to Chicago and Prof. C. D. Davis made the trip as coach. Professor Davis, therefore, as well as Professor Zahnley, is to be congratulated on the winning record of the team.

J. H. Coolidge, '25, is county agricultural agent of Gray County, with headquarters at Cimarron.

L. N. Jewett, '19, is manager of the Roxton farm near Chanute. This is a large farm belonging to the Ash Grove Portland Cement Company.

W. L. Blizzard, '10, head of the Department of Animal Husbandry, Oklahoma A. & M. College, had a large part in preparing the livestock judging team which was victorious at the International. Professor Blizzard probably does more show ring judging than any other college man in the United States at the present time.

Carl W. Bower, '25, is now employed by the Bureau of Entomology of the United States Department of Agriculture in European corn borer control work. His headquarters is Toledo, Ohio. Carl had some interesting experience during the past eight months on a banana farm in Honduras, Central America, in the employ of the Cuyamel Fruit Company.

## College Notes

### ALPHA ZETA INITIATES

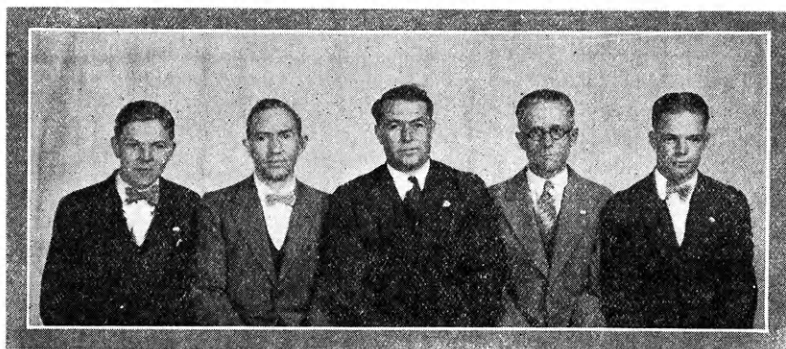
Five students of the division of agriculture were recently elected to membership and initiated into Alpha Zeta, honorary student agricultural fraternity. These new members are: J. P. Sellschop, Potchefstroom, South Africa; Vance M. Rucker, Manhattan; I. M. Atkins, Manhattan; Laurence M. Clausen, Alton; and E. T. Harden, Centralia.

J. P. Sellschop is a senior majoring in agronomy. Mr. Sellschop comes from South Africa where he was connected with the Department of Agriculture as an organizer of

He is the assistant business manager of THE KANSAS AGRICULTURAL STUDENT.

L. M. Clausen is in his junior year and is majoring in dairy husbandry. He was a member of this year's dairy judging team which won first place at the Waterloo dairy show.

These five men were elected to Alpha Zeta in recognition of their scholarship, leadership, and prominence in student activities. The fact that they are making good as students is a good indication that they will be recognized as agricultural leaders.



ALPHA ZETA INITIATES DECEMBER, 1926

Left to right: L. M. Clausen, J. P. Sellschop, Vance M. Rucker, I. M. Atkins, E. T. Harden.

club work in the Transvaal Province and assistant lecturer in crops at the Potchefstroom School of Agriculture.

Vance M. Rucker is a junior majoring in agronomy. He has shown ability as a leader as well as a student. His outstanding work in the 1926 Ag Fair won him the election of assistant manager of the 1927 Ag Fair.

I. M. Atkins is a senior majoring in agronomy. Besides being active in the work of K. S. A. C. literary societies and in the Klod and Kernel Klub, Mr. Atkins was on the high honor roll for the school year, 1925-26.

E. T. Harden is a junior majoring in agricultural economics. He is recognized by his fellows as one who regularly makes good.

### HORT CLUB PUTS ON STUNT

The Horticultural Club of Kansas State Agricultural College attended a banquet in Topeka given by the Kansas State Horticultural Society on December 9, 1926. After the banquet the Horticultural Club put on an entertainment for the society. The occasion was an unusual one and of large value to the members of the club participating. The members present were: R. G. Yapp, Oleve Manning, G. B. Wagner, Russell Reitz, C. R. Bradley, R. W. McBurney, Fred Daniel, C. F. Bayles, Kay Beach, V. I. Masters, and Albert Ottaway.

Wilson G. Shelley, '07, is farming near McPherson.



### APPLE JUDGING TEAM SHOWS UP WELL IN INTERCOLLEGIATE CONTEST

The apple judging team representing K. S. A. C. placed second among five competing teams in the International Apple Judging Contest held under the auspices of the American Pomological Society in Grand Rapids, Mich., December 3, 1926. The team made 11,320 out of a possible 12,000 points. The scores made by the competing teams were as follows:

Team	Score
Ohio .....	11,448
Kansas .....	11,320
West Virginia .....	10,800
Michigan .....	9,993
Massachusetts .....	9,763

The team was composed of the following members: C. R. Bradley, Mayetta; R. W. McBurney, Sterling; Russell Reitz, Belle Plaine; and C. F. Bayles (alternate), Garrison. C. R. Bradley was high point man on the team and ranked fourth in the entire contest. R. W. McBurney ranked fifth and Russell Reitz, sixth in the entire contest.

In this contest the men were responsible for identifying twenty-five important commercial varieties of apples grown any place in the United States. They also had to place twenty classes, each class consisting of three plates of five apples each. Since any plate having one or more apples of a variety other than their class was disqualified, identification was of far more value than judging to the contestant.

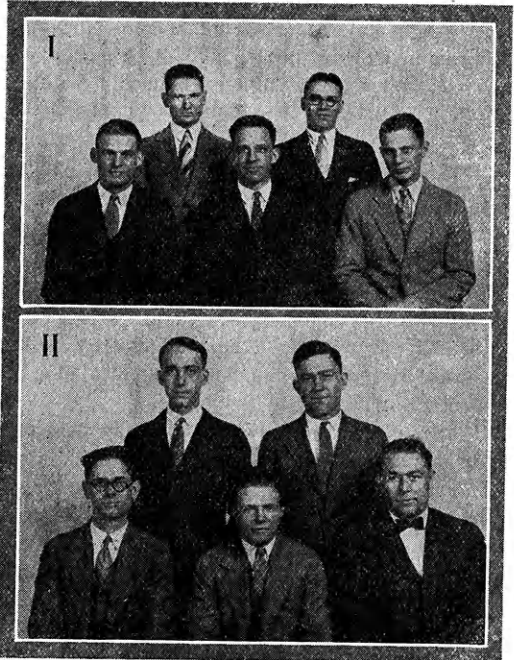
### KANSAS POULTRY JUDGING TEAM PLACES THIRD IN MID-WEST INTERCOLLEGIATE CONTEST

In competition with ten teams the Kansas poultry judging team placed third in the Mid-West Intercollegiate Poultry Judging Contest held at the Coliseum Poultry Show in Chicago, Saturday, December 11, 1926. The Kansas team was only ten points below the Iowa team, which placed first. The scores of the five highest teams were as follows:

Team	Score
Iowa .....	3,211.7
Missouri .....	3,206.7

Kansas .....	3,201.7
Ohio .....	3,160.0
Oklahoma .....	3,098.3

The contest consisted of (1) a written examination on the American Standard of Perfection; (2) the placing of five production classes of birds; and (3) the placing of five exhibition classes. Each class in the last two groups consisted of four birds each. The



JUDGING TEAMS THAT IN 1926 UPHELD THE  
ENVIABLE RECORD OF K. S. A. C. IN IN-  
TERCOLLEGIATE JUDGING

I. Apple Judging Team.—Front row (left to right): C. F. Bayles, Prof. W. F. Pickett (coach), and C. R. Bradley. Back row: R. W. McBurney and Russell Reitz.

II. Poultry Judging Team.—Front row: L. J. Simmons, L. E. Melia, and V. M. Rucker. Back row: Prof. H. H. Steup (coach), and W. M. Mann.

examination counted one-fourth in the complete returns and each of the other two divisions, three-eighths.

The Kansas team was composed of W. M. Mann, Quinter; L. E. Melia, Ford; V. M. Rucker, Manhattan; and L. J. Simmons (alternate), Manhattan. The team ranked first on examination, third on production judging, and sixth on exhibition judging. In placing first on the examination the Kansas team

won one of the most coveted honors of the contest.

L. E. Melia was the highest ranking individual of the entire contest and won the 100-dollar scholarship offered by the Ohio Breeders' Improvement Association and a cash award of \$30. Mr. Melia also won the bronze medal for being third high man in production judging. W. M. Mann was third high individual of the entire contest and received a cash award of \$20. He also won the silver medal for being second high man in production judging. V. M. Rucker won \$5 for being third high man in the examination.

### K. S. A. C. LIVESTOCK MAKES AN OUTSTANDING RECORD IN THE AMERICAN ROYAL

In the American Royal Livestock Show held during the week, November 14 to 20, 1926, Kansas State Agricultural College made the best showing of livestock of any college in the history of the American Royal Livestock Show.

Some of the more outstanding winnings were: Lad's Farceur, junior and grand champion Belgian stallion; Carnalline, junior champion Percheron mare; champion Berkshire and Spotted Poland-China barrows, champion Shropshire and Southdown wethers; and first prize Shorthorn steer herd.

The college raises and maintains livestock primarily for instructional purposes. It shows them primarily for the purpose of acquainting the general public with the quality of livestock raised at K. S. A. C.

### KANSAS HAS CHAMPION LIVESTOCK JUDGING TEAM

The K. S. A. C. livestock judging team for the year, 1926, has a unique record. In three contests the members of the team have regularly scored high. In each contest the team has placed second. In Denver, January 16, 1926, there were but four competing teams; in the American Royal contest, November 13, 1926, there were eleven competing teams; and in the International Livestock Show, November 27, 1926, twenty-three teams contested.

The four teams competing in Denver also competed in each of the other two contests. The total possible score for the three contests was 13,750. Expressed on the 100 percent basis the grades made by the four teams in the three contests were as follows:

Team	Total Score	Percent
K. S. A. C. ....	11,926.....	86.7
Nebraska .....	11,827.....	86.0
Colorado .....	11,570.....	84.1
Wyoming .....	10,915.....	79.3

The grades speak for themselves in presenting the K. S. A. C. team as the champion livestock judging team of the United States.

The members of this champion team are: C. W. Thole, Stafford; J. H. Johnson, Norton; R. H. Davis, Effingham; G. J. Stewart, Manhattan; E. F. Carr, Byers; and Howard Vernon (alternate), Oberlin.

### THE AMERICAN ROYAL CONTEST

Colorado placed first in the American Royal with a score of 4,389 out of a possible 4,750 points. The Kansas team made 4,320 points and Nebraska, which placed third, made 4,228 points. J. H. Johnson was high point man of the Kansas team and ranked second in the entire contest with a score of 885 out of a possible 950 points. E. F. Carr was high individual and G. J. Stewart, third high individual in sheep judging.

The Kansas team maintained the winning record of K. S. A. C. at the American Royal which is as follows: First in 1922; second in 1923; first in 1924; fourth in 1925; and second in 1926.

### THE INTERNATIONAL CONTEST

In the International contest the scores of the ten leading teams were as follows:

Team	Score
Oklahoma .....	4,407
Kansas .....	4,378
Nebraska .....	4,350
Missouri .....	4,346
Purdue .....	4,253
Colorado .....	4,248
Iowa .....	4,248
Texas .....	4,215
Ohio .....	4,191
Kentucky .....	4,178

The K. S. A. C. team was high in hog judging with a score of 1,198 out of a possible 1,250 points. This is the highest score

that has ever been made in hog judging by any team competing at the International. In winning first place in hog judging the Kansas team won a 250-dollar scholarship. The team was second high in cattle judging, third high in sheep judging, and tenth in horse judging.

Of the 115 contestants taking part in the contest, J. H. Johnson ranked seventh, G. J. Stewart, eighth, R. H. Davis, twelfth, C. W. Thole, twenty-first, and E. F. Carr forty-fourth. Such uniformly high placings on the part of members of the team have characterized each of their contests.

### GRAIN JUDGING TEAM PLACES FIRST IN INTERCOLLEGIATE CONTEST

The Kansas grain judging team won first place among eight competing teams in the intercollegiate hay and grain judging contest held in Chicago, November 25, 1926, in connection with the International Hay and Grain Show.

The competing teams made the following scores:

Team	Score
Kansas.....	4,449
Iowa .....	4,434
North Carolina .....	4,304
Oklahoma .....	4,202
Ohio .....	4,118
Nebraska .....	4,102
Michigan .....	4,081
West Virginia .....	4,027

The contest consisted of (1) commercial grading of grains, hay, and cotton; (2) placing of grain samples, legume seeds, cotton; and determination of staple length of cotton; and (3) identification of approximately 200 varieties of crops, weeds, and plant diseases, including common name, scientific name, name of variety, and regional adaptation of each sample. The Kansas team placed first in commercial grading, second in identification, and fourth in placing.

The team was composed of E. B. Coffman, Manhattan; Albert M. Watson, Osage City; S. M. Raleigh, Clyde; and L. F. Ungeheuer (alternate), Centerville. E. B. Coffman was third high individual for the entire contest, tied for first place in grading oats, was first in judging alfalfa seed, and second

in all classes of commercial grading. S. M. Raleigh was high man in hay grading and second in cotton grading. Albert M. Watson was high man in stapling cotton and high man in placing wheat. Coffman and Watson tied for first place in cotton grading.

In the four annual intercollegiate grain judging contests held by the International Hay and Grain Show, Kansas has placed first twice.



TWO CHAMPION JUDGING TEAMS REPRESENTING K. S. A. C. IN 1926

I. Livestock Judging Team.—Front row (left to right): George J. Stewart, C. W. Thole, J. H. Johnson, and E. F. Carr. Back row: Raymond H. Davis, Prof. F. W. Bell (coach), and Howard Vernon.

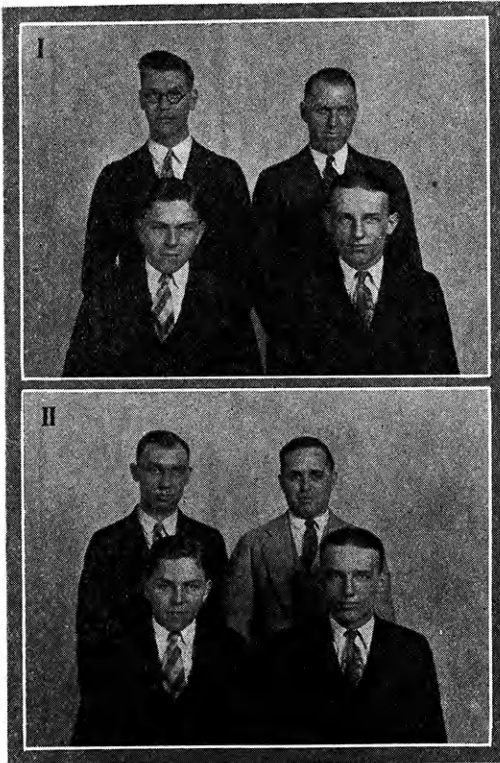
II. Grain Judging Team.—Front row: A. M. Watson, Prof. J. W. Zahnley (coach), and E. B. Coffman. Back row: Stephen M. Raleigh and L. F. Ungeheuer.

### SUCCESSFUL COUNTY AGRICULTURAL AGENTS

During the past year, two recent graduates of Kansas State Agricultural College, John E. Norton, '25, and John H. Shirkey, '26, have been county agricultural agents in Meade county. Mr. Norton resigned, Sep-

tember 15, 1926, to accept a fellowship in Iowa State College at Ames. He will be remembered as an outstanding student during his college career. In the fall of 1924 he was a member of the grain judging team, representing K. S. A. C. at the International Grain and Hay show. In this contest he was high individual.

Mr. Norton's work in Meade county was outstanding from the standpoint of being



#### JUDGING TEAMS IN THE DAIRY INDUSTRY

I. The team that represented K. S. A. C. in two national contests in the judging of dairy cattle: Waterloo, Iowa, September 27, 1926, and Detroit, Mich., October 6, 1926. Front row (left to right): L. M. Clausen and E. I. Chilcott. Back row: Dale Wilson and Prof. H. W. Cave (coach).

II. The team that represented K. S. A. C. at the Tenth National Contest in Judging Dairy Products, Detroit, Mich., October 7, 1926. Front row: L. M. Clausen and E. I. Chilcott. Back row: J. P. Caster and Prof. W. H. Martin (coach).

well planned and definitely carried out. His work aided much in establishing the confidence of the farmer in the agricultural college and county agent work. His principal project

was the improvement of grain crops. In the spring of 1926 seed exchanges were held over the county. These resulted in the planting of 13,320 acres to good seed, the importation of 2,500 pounds of certified seed, and the holding off of the market of 945 bushels of inferior seed.

Probably Mr. Norton's biggest piece of work while in Meade county was teaching the farmer to treat his sorghum for smut. The annual smut loss in Meade county before this time was \$50,000 per year. In 1925 Mr. Norton interested 70 farmers in treating their seed for the first time. The results were astonishing. Check-ups on treated and untreated plots showed 23.8 percent smut infection in the untreated, and less than 1 percent in the treated, thereby increasing the yield for the 70 farmers, by 11,000 bushels. The result of these astonishing demonstrations and the untiring work of Agent Norton in the spring of 1926, was the treatment of the seed for at least 13,275 acres or 60 percent of the entire sorghum acreage of the county. John H. Shirkey, '26, who succeeded John E. Norton on September 15, 1926, stated in his report of November 15, 1926, that Mr. Norton's work had been so thorough that he (Shirkey) had been able to locate only four untreated fields.

The Greenwood County Farm Bureau has just completed another very successful year, under the leadership of J. W. Farmer, '23, county agricultural agent. Mr. Farmer will be remembered as one of the best students in his class. He not only made an exceptional record as a student, but was unusually active in student affairs, especially in connection with the Agricultural Association, the Ag Fair, and THE KANSAS AGRICULTURAL STUDENT. The qualities which made Mr. Farmer a success as a student have also made him unusually successful as a county agricultural agent. He went into Greenwood county when the Farm Bureau was badly in debt, inactive, and ineffectively organized. In three years the organization, through his leadership, has placed itself on a firm financial basis, having at this time a good balance in the treasury. At the present time the paid up membership consists of 300 men and 293 women. The women's part of



the Farm Bureau has been entirely built up during the last two years and is now one of the most effective in the state.

Mr. Farmer's work during 1926, has been principally along the line of farm crops and livestock. His Beef Calf Club is always a strong contestant at state club contests. Other livestock work has been the organization of a cow-testing association, other 4-H clubs, and the production of worm-free litters of swine. Five demonstrations of the "worm-free" method of hog management were carried on in the county in 1926. One of these demonstrators, Joe Blecha, of Severy, states that after paying all feed expenses, interest, and taxes and marketing expense, the time he spent in caring for his hogs has returned him a profit of \$1 an hour. Fifty farmers are now following this method in Greenwood county. Mr. Farmer's farm crops work has consisted principally of the introduction of lime and of the control of the Hessian fly, chinch bug, and sorghum smut. Twelve thousand acres of kafir were planted with treated seed in Greenwood county in the spring of 1926. The saving to the county through this work may be conservatively estimated at \$9,000.

#### HARVESTING GRAIN SORGHUMS

(Continued from page 38)

this risk because of the great saving of expense.

To handle the sorghum crop successfully the farmers must work at it similar to the way they handle the wheat harvest. That is, when the crop is ready to cut they must get in the field and rush it through, to avoid lodging. In the majority of the cases the farmers seem to be in no hurry, last fall at least. Perhaps it was because the large wheat crop they had, made them rather indifferent to the sorghum crop.

Clarence R. George, '23, a member of the dairy judging team in 1922, is herdsman on the Corium Farm, Fon du Lac, Wis., one of the largest Guernsey farms in Wisconsin. Clarence spent two weeks at home and visited the college a short time ago.

### *"With the Least Expense Possible"*

Written orders authorizing scientific and business operations frequently close—"with the least expense possible."

In doing work economically, neither the business nor the scientific world confuses initial price with completed cost, the first cost either in labor or materials is not indicative of economy.

Where commercial cleaning operations are being done well and yet "with the least expense possible," the

#### WYANDOTTE PRODUCTS

are to be found.

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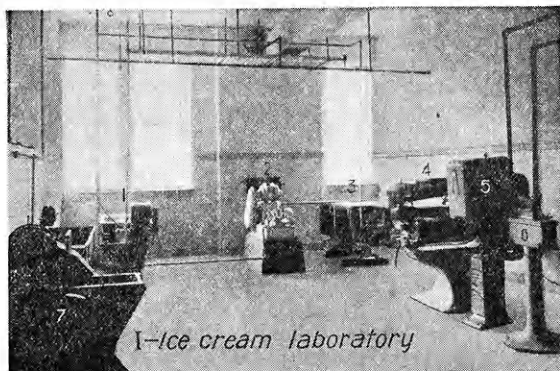
# Dairy Manufacturing in K. S. A. C.

J. P. Caster, '27

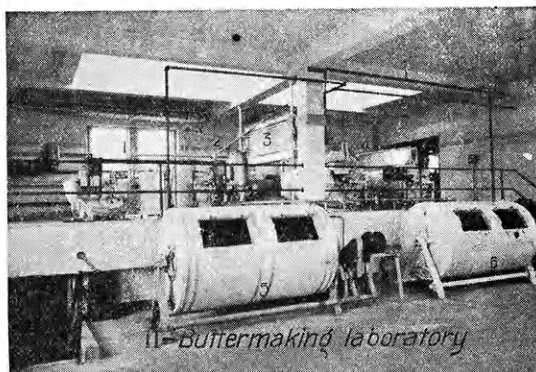
Dairy products manufactured in Kansas in 1925 were valued at \$29,000,000. Butter is the leading product. From a production of 18,000,000 pounds in 1910, the amount produced has increased to 46,800,000 pounds in 1925. A healthy increase has also been experienced in the ice cream and condensed milk industries. The plants of the sunflower state in 1925, froze 3,636,793 gallons of ice cream, valued at \$4,073,208.16, and the condenseries manufactured 26,440,774 pounds of condensed milk valued at \$2,247,465.80.

Recognizing the increasing importance of dairy manufacturing in Kansas, the Kansas

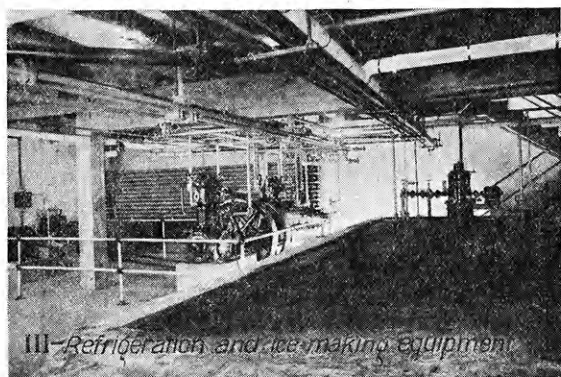
State Agricultural college has built and equipped a commercial creamery in which students can be trained in the various phases of the manufacture of dairy products. The college creamery not only offers facilities for training men who are capable to go out into dairy plants, but it also offers an excellent research laboratory to the manufacturing interests of the state for the solution of their problems. Operating on a self-supporting basis the college plant in 1925 manufactured and handled 24,266 pounds of butter, 4,759 pounds of cheese, 15,096 quarts of cream, 321,276 quarts of milk, 1,854 gallons of buttermilk, 4,480 gallons of ice cream, 1,874



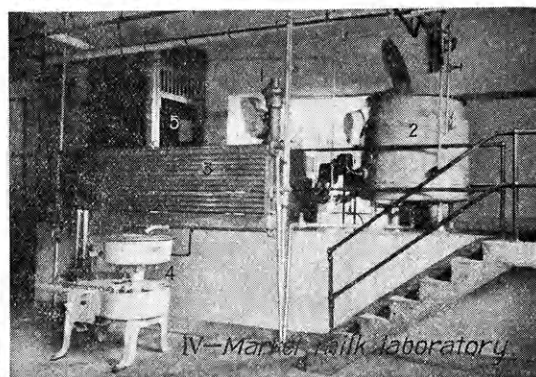
*I—Ice cream laboratory*



*II—Buttermaking laboratory*



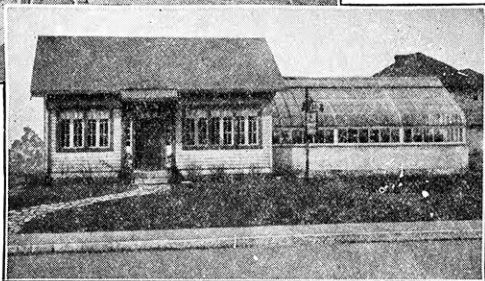
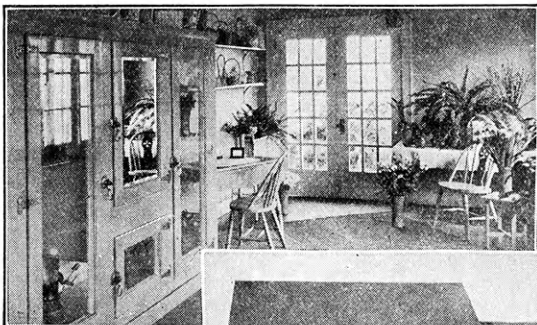
*III—Refrigeration and ice-making equipment*



*IV—Market milk laboratory*

## SOME OF THE EQUIPMENT IN THE K. S. A. C. DAIRY LABORATORIES

**I. Ice Cream Laboratory.** (1) Ice cream batch mixer. (2) Homogenizer. (3) Aging vat. (4) Horizontal brine freezer. (5) Mojonnier overrun tester. (6) DeRaef weight standardizer. (7) Ice breaker. **II. —Buttermaking Laboratory.** (1) Forewarming vat. (2) Flash pasteurizer. (3) Tubular cooler. (4) Ripeners. (5) Two-roll churn. (6) Single-roll churn. **III.—Refrigeration and Ice-Making Equipment.** **IV. —Market Milk Laboratory.** (1) Clarifier. (2) Glass enameled pasteurizing tank. (3) Tubular cooler (4) Bottle filler and capper. (5) Hydraulic lift.



## How This College Man Found the Secret of Making Money Pleasantly and Easily

**T**HE year before he graduated, his father sold out his coffee business and retired.

But he wasn't the kind who could stay retired.

"Son" hadn't made up his mind what to do after graduation, so knowing how he liked flowers, Dad kind of concluded he would have a decision ready.

So he built this sassy little flower shop in one of the residential sections of Indianapolis.

Then he called us in to add the greenhouse, which he calls his "big glass show case".

Dropped in to see them not so long ago.

Say man, but there is just one of the nicest little gold mines I've bumped into in many a day.

A delightful business in every way, and growing every day.

How about it, don't you think your Dad would chip in on a proposition like that?

Write us. We'll give you all the facts you want, and then some.

More and more college men are taking up this flower business every year.

It's fun, and there's money in it—that's why

**If interested write to the Manager of our Service Dept., 30 East 42nd St., New York City, who will give your letter his personal attention.**

# Lord & Burnham Co.

*Builders of Greenhouses and Conservatories*

**Eastern Factory**  
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gallons of cultured buttermilk, and 14,990 gallons of skimmilk.

The buttermaking equipment consists of two complete units for flash and vat pasteurization of cream. The flash pasteurizing (heating the cream to 180° followed by rapid cooling) and the vat system (heating the cream to 145° and holding it at that temperature 30 minutes) destroy the majority of the bacteria present in the cream and make the resulting butter safe for consumption, improving its flavor and increasing its keeping quality. The pasteurized cream is churned in two giant churns which turn out 600 pounds of butter at one time. After packing the butter in ninety-pound boxes it is cooled and printed into pound prints ready for local consumption.

The ice cream making equipment is representative of the machinery in an up-to-date ice cream factory. The pasteurization of the cream, milk, sugar, and gelatin used in the ice cream mix, is performed in the batch mixing vat. From the pasteurizer the ice cream mix is run through the homogenizer. This process gives the ice cream a smooth body and texture. After homogenizing, the ice cream mix is cooled and aged in the aging vat from 24 to 48 hours before it is frozen. The freezing of the ice cream is accomplished in a 40-quart brine freezer.

A very important step in the manufacture of ice cream is the removal from the freezer at the proper time. This is accomplished by means of the Mojonier overrun tester and the DeRaef weight standardizer. These machines aid in giving the ice cream a uniform weight and body. After freezing, the ice cream is put into brick cartons, sealright containers, and cans. These packages are stored in a hardening room at a temperature below zero, where the final freezing takes place. Vanilla, chocolate, strawberry, and orange-pineapple are some of the popular flavors sold at the college sales counter.

Market milk is the largest branch of the dairy industry carried on by the college creamery. Two grades of milk, raw and pasteurized, are handled. The raw milk is produced by the college herd, while the milk which is purchased from dairymen who live

in the immediate vicinity of Manhatttan is pasteurized. Milk received from local dairymen is weighed, sampled, and pumped to the clarifier, where all visible dirt is removed. From the clarifier, the milk flows into a glass enameled pasteurizing vat, where it is heated to a temperature of 145 degrees and held for 30 minutes. After the holding period, the milk flows over the tubular cooler, and into the bottling machine, which fills and caps pint and quart bottles. The milk is then stored at 40 degrees until delivered.

Refrigeration in the dairy business is highly essential and if this equipment is not available the other equipment of the creamery would be valueless. The ice tank has a capacity of seven tons of ice daily. From this tank comes the brine for the cooling of milk and the freezing of ice cream.

Men who have received their training in dairy manufacturing courses at K. S. A. C. have gone to commercial plants where they have been very successful. A former Creamery Short Course student, S. S. Lard, is the president of the Mistletoe Creameries Company, Fort Worth, Tex. H. P. Miller, '18, is the factory superintendent at the DeCoursey Creamery in Kansas City, Kan. Arthur Dorryland, '14, is superintendent of the Chapman Dairy at Kansas City, Mo. Ernest L. Reichart, '24, is in charge of the College Creamery of the University of Nebraska, Lincoln. C. C. Button, '23, is with the Blue Valley Creamery Institute, Chicago. E. C. Scott, '24, is an assistant in dairy manufacturing in the Agricultural Experiment Station of Michigan, East Lansing. Graduates have been placed in many other plants as ice cream makers, buttermakers, factory superintendents, and managers.

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Price H. Wheeler, '16, is colonization agent for the Missouri Pacific Railway. His time is spent largely in fostering the development of untilled lands in the South.

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H. L. Collins, '23, assistant statistician for the Federal Bureau of Agricultural Economics, is now located at Springfield, Ill. He is working in cooperation with the Illinois Cooperative Crop Reporting Service.





## Making a hard job easier



The MAZDA lamp as it is today is one of the greatest achievements of the General Electric laboratories. The Company also manufactures many electrical products which are used on the farm. The G-E Farm Book, describing these products, may be obtained from your local light and power company.

The time will never come when farming will be listed as an easy job. But groping in the dark is one hardship electricity will abolish.

On farms electrically equipped, power lines bring clean, safe lighting to the darkest corners. And the same power drives the motors of many labor-saving machines.

Not since the days when electricity was first harnessed to industrial use has it found a greater opportunity for human emancipation than in its application to farm use.

# GENERAL ELECTRIC

## POSSIBILITY OF AN EARLY VARIETY OF WHEAT

(Continued from page 44)

and blackhull in yield. Tenmarq has yielded slightly more than any other variety tested in plots at the Agronomy farm in 1925 and 1926, according to Prof. S. C. Salmon. In a series of tests at agricultural experiment stations in the northern states, Tenmarq has been found to be about as winter hardy as Blackhull, but much less so than Kanred. Tenmarq is as early as, or slightly earlier, than Blackhull and Kanred, though not quite as early as Kansas plant breeders and farmers desire. The milling and baking qualities of Tenmarq are definitely superior to Blackhull and equal or superior to Kanred. While Tenmarq seems to combine some of the desired characters, its lack of cold resistance is a rather serious defect, one which may prevent the increase and distribution of this particular strain. Tenmarq will be recrossed with a more winter-hardy sort, in an effort to correct this defect.

Two other crosses that show considerable promise but which will require several years further selection and testing are Kanred X Nebraska No. 28 and Kanred X Hard Federation. Some of the Kanred X Hard Federation hybrid selections which were grown in replicated rod rows for the first time in the 1926 wheat breeding nursery, topped the list in yield and have other good qualities. Some of these hybrid selections are about five days earlier than Blackhull and Kanred, have good vigor, stiff straw, and grain which appears to be of high quality. The winter hardiness of these otherwise promising types is yet to be determined, though it is known that many of them are inferior to Kanred in this respect. Thus in this instance, as in the case of Tenmarq, recrossing with a more winter-hardy sort may have to be resorted to, which means more tedious work and a delay of several years in the production of a new variety.

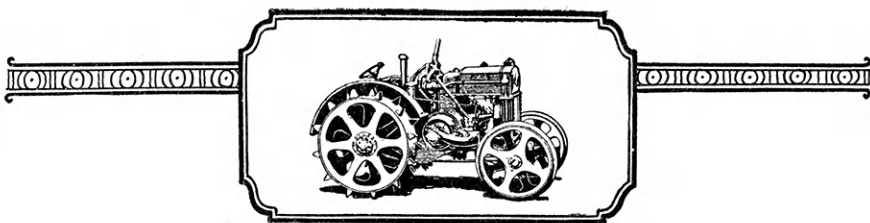
The Kanred X Nebraska No. 28 crosses were only in the third generation in the 1926 nursery, and no data on yield are available as the plantings were only of individual spaced plants, which served as a basis for

making pedigree selections of early, promising types. Earliness equal to that of the early (Nebraska) parent is present in many of these plants. Whether the character, early maturity, can be obtained in combination with cold resistance and superior grain quality, remains to be determined.

If the new process of testing for winter hardiness, under the controlled conditions as obtained in a refrigeration machine, is perfected, it should be possible to test the cold resistance of varieties, selections, and crosses much more effectively and rapidly than in the past, when natural and uncontrolled conditions had to be depended upon. In this new method, plants grown in the greenhouse are subjected to very low temperatures in a refrigeration machine for a definite length of time, under controlled temperatures. These trials will supplement the field experiments and will provide accurate data on a much larger number of strains over a period of years than the old methods of testing in the field, where little definite information on cold resistance has been obtained since the last "old fashioned" hard winter of 1916-17.

The production of a new wheat variety is a long and complicated process. There is no variety as yet which meets the ideal set up in the minds of the college cerealists, but it is believed that progress is being made and that within a decade, one or more new sorts may be available which are superior to any now grown on Kansas farms. The "impossible" has been accomplished by wheat breeders of England who have bred a new variety known as Yeoman that will produce a good loaf of bread without being blended with the "strong" wheats imported from Canada and the United States.

While the ideal variety of wheat has not yet been produced, marked improvement, at least in some respects, has been made in the introduction of Turkey (1873), Kharkof (1900), Kanred (1914), and Blackhull (1918). The Kansas wheat breeders are thus encouraged in their efforts and are led to believe they are following the proper procedure and using correct methods and that in the future they may come closer and closer to attaining their ideal.



## The Cost That Pays



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1842

Farm Tractors  
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Steel Threshers  
5 sizes  
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Silo Fillers  
4 sizes  
Baling Presses  
2 sizes  
Steam Engines  
Road Machinery  
Grand Detour  
Plows  
Harrows  
Cultivators

IT IS evident that a man who pays 15 cents a bushel to produce a crop makes 60 cents more than a man whose cost of production is 75 cents. Yet variations greater than this are common. In one State, and in the same year, the range in cost per bushel of a certain crop ran from 71 cents to over \$13.00. Also, a difference of \$1.18 per cwt. in the cost of producing milk on neighboring farms is noted.

These figures set farmers to thinking. There is a cost that cannot be exceeded if a profit is to be made. What that cost is, and how near he comes to it, are matters of vital interest to every farmer.

Any analysis will show that a large percentage of farm production costs are due to the cost of power and labor. The best farming practice today is to reduce these costs by the use of highly efficient Case machines—a method that is helping to bring about the reorganization of Agriculture.

### J. I. Case Threshing Machine Company

Incorporated

Established 1842

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Wisconsin

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

**KANSAS SHOULD LEVY AN INCOME TAX**

(Continued from page 47)

by the state tax commission under civil service. While the local assessor is usually honest and desirous of enforcing the law, he is naturally subject to the influences affecting any locally elected official. He cannot secure the information and usually does not possess the training requisite for checking up income tax returns either as regards gross income or deductions claimed.

Taxation of personal incomes by the various states is now much easier of attainment for three reasons. First, great progress has been made in the direction of centralized state administration. Second, on account of the federal income tax people have grown accustomed to this new form of taxation. Third, the federal income tax returns could be used to some extent as a check upon the state income tax returns.

These three reasons, together with the fact that there are a number of highly successful state income tax laws which could be used as patterns, make it possible for a state like Kansas to adopt a state income tax which would supplement the personal property tax and relieve some of the tax burden from real estate. Such a state income tax should serve not as a rival but rather as a complement of the classified property tax.

**DECLINE OF HOME ORCHARDS**

(Continued from page 39)

in larger, more attractive fruit, a bigger tree, and higher yields. In many cases the trees in sod have given small yields of poor fruit and this has not encouraged care of the home orchard.

There has been a decrease of attention in the home orchard with the increase of tenant farmers. This would naturally be expected when so many tenants know very little of orchard care. Many tenants do not have the equipment for the necessary spraying of fruit plants. Under the common custom of short-time tenancy there really is no inducement offered to care for fruit trees and as a result they declined in value. The tenant farmer is not always entirely to blame, for the land owner often insists that

cash crops be grown.

All sorts of mechanical injuries may happen to trees. Bad pruning wounds, carelessness on the part of the person cultivating the trees, rabbit or rodent injuries and many others may occur. It is certain that these have caused the premature death of many fruit plants.

There has been a decline in Kansas home orchards but none of the causes here presented are so formidable but that they can be overcome in some way. There should be a revived interest in the home orchard. There should be an apple a day for every Kansas farm child. This can be accomplished only by the home orchard.

**BELL'S MELROSE CARRIES ON**

(Continued from page 41)

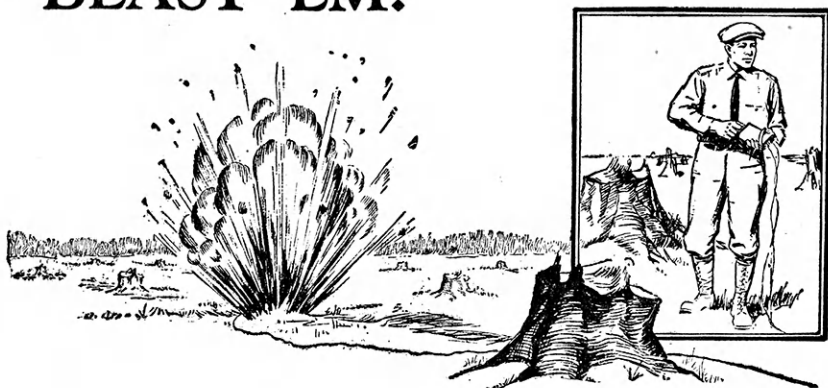
proximately the same age as that of their dams does not give as startling results as if he had been used on cows of lesser production. Bell's Melrose has 12 daughters which have completed records as two-year-olds. These show an average production of 10,038 pounds of milk and 389.38 pounds of butterfat. The average of the dams at the same age was 10,035 pounds of milk and 377.71 pounds of butterfat. The average production of the daughters does not seem much higher than that of the dams, the difference being only 11.6 pounds of butterfat, but this is a creditable showing when the high production of the dams is considered.

In 1925 the oldest daughter of Bell's Melrose, B M's Bangora Melrose, completed, as a four-year-old, a record of 16,877 pounds of milk and 703.83 pounds of butterfat. She was the highest producing four-year-old during that year and she was awarded the French cup for this outstanding production. She has just completed another year's production and has made an even greater record. Her record just completed is 19,491 pounds of milk and 755.11 pounds of butterfat. This record exceeds even the record of old Canary Bell which stood as the college and state record for many years. There seems to be no question but that Bell's Melrose has proved himself one of the great sires of the Ayrshire breed.



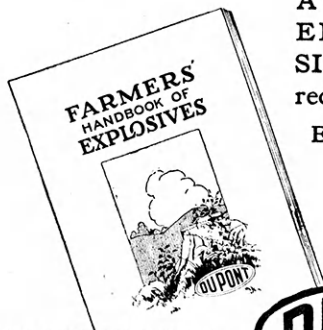
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Are you thoroughly acquainted with the many labor-saving, efficient and economical uses of explosives on the farm? At any rate, you ought to have the "Farmers' Handbook of Explosives." Not just a catalog—it's a *text-book*, and is used as such by many agricultural colleges.



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**MARKET DEMAND FOR DAIRY PRODUCTS**

(Continued from page 46)

not been keeping up with the other states, being sixth in rank in 1921 and eighth in 1925. The receipts of Kansas butter on the Chicago market have fluctuated similarly to receipts on the New York market. Shipments expanded 50 percent from 1921 to 1924, but dropped back to the 1921 level the following year. Receipts of Kansas butter on the Philadelphia market have increased eight fold from 1921 to 1925. In 1921 Kansas ranked sixteenth on the Philadelphia market; in 1925, Kansas ranked ninth.

During the period 1921 to 1925 when Kansas butter shipments were increasing, Eastern production was on the decline. Receipts on the New York market from New York State were at their lowest point in 1923, when Kansas butter receipts on the same market were greater. Likewise, Boston receipts of butter from New Hampshire and Vermont steadily declined during the period 1920 to 1925 and receipts from Massachusetts just about held their own from 1920 until 1925, when they showed an increase.

The deflation following 1920 drove dairymen in the East out of business where dependence was placed upon high-priced feeds grown elsewhere, and on high production. During the same period, Kansas farmers were hit by the low home prices of grain and forage crops, hogs, and cattle. The abundance of cheap feed and roughness available permitted Kansas farmers to turn to dairying as a profitable sideline.

It is very evident that Kansas butter has been favored by decreased production in the East during the past five or six years. This situation cannot be considered permanent; the low point has been reached and eastern production is increasing.

New York producers in June, 1926, received the highest monthly average price per hundred weight for milk that they had received since 1920, and in July, 1926, they received the highest monthly average price for butter. Milk cows that declined from an average of \$106 per head in 1920 to \$68 per head in 1924, were back up to a \$92 average in August, 1926.

Furthermore, dairy feeds in New York declined from 123 percent over prewar prices in 1920 and 51 percent over prewar prices in 1925, to 29 percent over prewar prices in August, 1926. Dairy products in the East then are increasing in price and feed costs are declining. This is helping to revive the eastern dairy industry as is indicated in the increased prices being paid for dairy cows. Increasing competition in eastern markets is therefore to be expected.

Since so large a part of the market for Kansas butter is outside of the state, it is evident that general business conditions rather than local Kansas conditions will have greater influence on price. Butter, like many other products, frequently turns up or down within a few months of changes in the general price level. Since the latter part of 1925 the general price trend has been down. This has worked against any substantial increase in butter prices.

Butter prices are also influenced by heavy and light movements of butter. In the United States, the supply of butter in storage has been above that of last year, but diminishing of late, and the statement for December 1 is expected to show stocks under those of one year ago.

"In past years," says the United States Department of Agriculture, "when storage supplies were ample and feed and butter prices similar to this fall, butter prices have shown less than the usual seasonal rise from September to December, which ordinarily amounts to about 15 percent." The recent large November-December rise is likely therefore to be only temporary.

The present dairy market situation as it applies to Kansas, therefore, urges more economical production methods than usual this winter and especially the use of silage and other home-grown feeds of moderate price.

---

A. W. Knott, formerly extension specialist in dairy husbandry at K. S. A. C., is manager of the Ransom Guernsey farm, Homewood, Kan. Mr. Knott exhibited cattle at the Dairy Cattle Congress in Waterloo, having in his herd the grand champion bull of the show.

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Over First Nat'l Bank

Dial—Office, 2912; Residence, 2166

**This much cream  
was separated  
from the DeLaval  
skimmilk -  
by another  
machine ~**

**17 lbs. of Cream Testing  
4.4% = .075 lbs. of  
Butter Fat**



**This much cream  
was separated by  
the DeLaval from  
an equal amount of  
the other Machine's  
skim  
milk**



**57 lbs. of Cream Testing  
33% = 1.88 lbs. of  
Butter Fat**

## **A Real and Easy Test of Cream Separator Efficiency - Try it!**

Put a De Laval side-by-side with any other separator of approximate capacity. Mix 20 gallons of milk thoroughly and let it stay at normal room temperature of 70 degrees. Run half through each machine. Wash the bowl and tinware of each in its own skim-milk. Then run the De Laval skim-milk through the other machine and vice versa. Weigh and test for butter-fat the cream each machine gets from the other's skim-milk.



**When you do this you will know beyond question of doubt that the De Laval skims cleaner, is easier to turn, and is more profitable to own.**

Above are the results of such a test between a De Laval and another new separator. Note that the other machine left **25 times more** butter-fat in the skim-milk than the De Laval did.

The new De Laval is the best separator made in 48 years of De Laval manufacture and leadership. It has the wonderful "floating bowl"—the greatest separator improvement in 25 years. It is **guaranteed** to skim cleaner. It also runs easier and lasts longer.

*See your De Laval Agent or write us direct for full information.*

### **THE DE LAVAL SEPARATOR COMPANY**

New York  
165 Broadway

Chicago  
600 Jackson Blvd.

San Francisco  
61 Beale St.