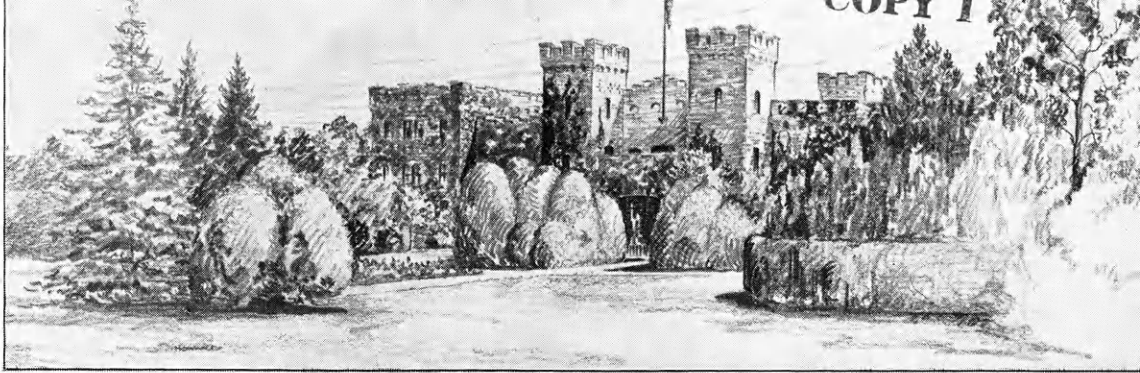


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The Kansas Agricultural Student

VOL. XIII

Manhattan, Kansas, May, 1934

No. 4



LOOKING NORTH FROM NEAR THE LIBRARY BETWEEN CLASS PERIODS

At the right is the library. In the background are the east agricultural building and the low flat judging pavilion next on the left. At the extreme left may be seen a corner of the veterinary hall.

CONTENTS

Cover Page.....	F. J. Hanna	Close Clipping Injures Lawns.....	83
Farming Prospects for 1934.....	68 J. Warren Mather, '34	The Pea Aphid—an Alfalfa Pest.....	84 Dr. Roger C. Smith
Editorial—To the Class of 1938.....	70	Alternatives Open to the Dairy Farmer.....	85
Student Judging Contests.....	71	Silage in a Fattening Ration.....	87
Judging Team Sets a High Mark.....	72	The Scandinavian Countries.....	88 Miss Inge K. Kjar, M. S. '34
Looking Ahead in Livestock.....	72 Prof. Homer J. Henney	Producing Pork at a Profit.....	90
An Egg Storage Cellar.....	73	Highway Planting	91
Future Farmers of America.....	74	The Flour Particle.....	92
The Challenge of Rural Leadership.....	76 J. W. England III	Better Livestock Day.....	92
State Judging Contest.....	77	Efficient Refrigeration	94 Dr. A. C. Fay
State Contest in Farm Mechanics.....	79	New Advances in Farm Credit.....	95 Prof. R. M. Green
Alpha Zeta Initiates, 1933-'34.....	80		

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Farming Prospects for the Coming Season

J. Warren Mather, '34

This article is, in the main, to be a symposium presenting brief ideas from a number of prominent Kansas farmers on farm enterprises that appear to them most promising under present conditions and farm methods or practices they have adopted for the coming season. Most of the statements quoted were made the last week in April and crop conditions over three-fourths of Kansas went rapidly from bad to worse during the first eleven days of May. Prof. A. L. Clapp, in charge of Kansas cooperative experiments, was interviewed May 12. He said much of the best wheat in the state was in the south central section including Cowley, Sumner, Butler, and Harper counties; that most of the bluestem region had a very good growth of grass, and that southeastern Kansas in general was in good condition. Kaw valley potatoes were in satisfactory condition only between Lawrence and Kansas City. He said it was estimated that 80 per cent of the alfalfa in eastern Kansas had been damaged by pea aphids.

The Kansas Crop Report, as of May 1, estimated a wheat yield of 99 million bushels. This was approximately a 20-per-cent reduction from the estimate made April 1, and had an estimate been made May 11, it would undoubtedly have shown at least another 20-per-cent reduction. Rains since May 11, while too late for a large percentage of the wheat and too limited in western Kansas to be of value, have made some material improvement.

Mr. A. Yale of Grainfield (Gove county) reports barley prospects good and good wheat on fields drilled with a deep furrow drill on land properly tilled. He indicates that he is in a favored area, however, since he says some parts of the county are very dry. Milk cows and chickens have been providing the only cash receipts for most farmers in his community.

J. D. Hoel of Ulysses (Grant county), the area of large farms in southwest-

ern Kansas, outlines what he believes to be the best farm procedure at the present time as follows: "Go hand in hand with the government in acreage and animal reduction; leave the government contracted acres to be summer fallowed the following year; also, leave enough more land to be fallowed to make a proper rotation in this semi-arid country. Then last but the most important, raise enough roughage to be preserved in trench silos and stacks to be fed to enough high-grade milk cows, hogs, and chickens to pay the actual living expenses of the family. Do not invest in town enterprises but keep the surpluses in liquid assets to operate on during lean years, and use your influence to keep business men and suitcase farmers from operating any land in your community."

Crops are fair to good in an area in the northwestern part of the state about 60 miles from east to west and 50 miles from north to south, according to C. K. Fisher, '28, director of vocational agriculture in the McDonald Rural High School (Rawlins county). This area has been comparatively unusually productive during the last five or six years and it is maintaining its reputation this season. T. G. Wilkens of McDonald says that, while wheat is the main crop in that area, he has turned his attention more to livestock raising during the last three years. He says, "Feeding a bunch of last-year calves looks as if it would net good returns for labor and feed used."

C. F. McCauley of Coldwater (Comanche county) gets along by sharply curtailing expenses, keeping them strictly within his means, and depending largely on milk cows and poultry for necessary cash.

J. M. Hulpieu of Dodge City (Ford county) says, "My policy has always been to try to find some specialty that is out of the overproducing fields and has a good market." He has been trying Pascal celery under irrigation but

has been handicapped by climatic conditions during the last three seasons.

John M. Lewis of Larned (Pawnee county), a Polled Hereford breeder, says, "I believe the future for the Hereford breeder is very promising. The inquiries for bulls have been greater than at any time during the past three years." Mr. Lewis is a strong believer in diversified farming. He is strong for alfalfa in the valley between the Pawnee and Arkansas rivers. He says, "I do not believe this good sugar beet and alfalfa land in these valleys is appreciated." Pawnee county has doubled its sugar beet acreage in the last five years.

F. J. Habiger, '99, of Bushton (Rice county) considers prospects satisfactory for raising good draft horses and good saddle mounts. He emphasizes that the farmers of today "must be in a position to shift operations quick . . . but avoid radical changes." Mr. H. J. Ott (Great Bend) in the same section of the state, thinks cattle look like the surest thing for 1934. Mr. Ott maintains a herd of 30 high-grade Short-horn cows and markets the calves as baby beeves at 12 to 14 months of age. Wheat, cattle, hogs, and chickens are the main items on his well diversified farming program.

Improved demand for pure-bred bulls makes his herd of registered Herefords look like the brightest spot on the picture in 1934, according to Mr. Ralph Gfeller of Burns (Marion county). He follows the Kansas deferred system of handling range-bred calves. "I have every reason to expect higher prices for choice light yearlings this fall than was received last fall," writes Mr. Gfeller.

Henry Duwe, Anthony (Harper county), says their rainfall this year has been twice as much as it was last year. His wheat, alfalfa, and oats are looking fine.

A well diversified farm is being operated by R. D. Wyckoff, Luray (Russell county). He believes his poultry, beef cattle, dairy herd, and wheat have good prospects for this season.

Roy E. Hanna, Clay Center (Clay county), whose major enterprise is pure-bred beef cattle, feels confident his calves and his cow herd will show a profit this year, and Merle Magaw, '30, of Ames (Cloud county) sees good prospects in beef cattle this year.

During recent months Mr. T. J. Charles, Sr., of Republic (Republic county) has been chairman of the Farm Debt Adjustment committee in Republic county, during which time he has studied and reviewed the worst debt situations and general depressing farm conditions that are to be found in that section of the state. For many of this class there is almost no hope. The youthful farmer must stage the comeback. Mr. Charles says, "Success in agriculture for the young man will combine diligence, science, hard work, and good judgment. Economy is a powerful weapon in economics and if our younger generation will continue to practice it, it will be a great help in pulling out of this present depression. The farm in this locality that has on it a good field of alfalfa is the farm that is standing at the head of the list of successful farms."

Mr. L. S. Hodgson, '16, of Harveyville (Wabaunsee county) says the main change in the operation of his farm during the last few years has been toward greater diversification, especially along livestock lines. Formerly he devoted most of his efforts to hog feeding. Now he has on the farm 1,500 baby chicks, 600 laying hens, 350 hogs, 275 sheep, 156 steers in the feedlot, and 16 Jersey cows. He says, "If the price of anything gets good we have something in that line."

On crop production, Mr. Hodgson says, "The two best paying crops in our county are alfalfa and ensilage crops. The government is paying an allotment on idle land, still allowing it to be put into alfalfa. I put my best land under government contract, have tested for acidity, and expect to summer fallow and seed it to alfalfa about August 1. Ensilage crops are a surer

(Continued on page 93)

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TO THE CLASS OF 1938

The college year, 1933-'34, was certainly an improvement over the year before. A large percentage of students practiced economy and "liked" it. The outside work available was surprisingly large. Altogether the spirit of the student body was one of happiness, contentment, good fellowship, industry, and perseverance. K. S. C. has long been noted for these qualities but their predominance was never more marked than during 1933-'34.

When a young man enters college he selects his college family. He should ask, Will I be happy as a member of that college family? This question is quite as important as the second one, Does this college offer the kind of work I want? Having answered the first question the prospective freshman is ready to consider the second.

Hundreds of Kansas boys are considering enrolling in the Class of 1938 of K. S. C. We invite you to consider seriously what we have to offer. If you want more information just send a post card to K. S. C.

The Kansas Agricultural Student stands first for Kansas State College; secondly, for college work in agriculture—our own special field. We know that many members of Kansas 4-H clubs, students of vocational agriculture, contestants in state high school judging contests, members of Kansas chapters of Future Farmers of America, and graduates of high schools in rural communities are especially interested in agriculture and are considering coming to K. S. C. This magazine will be glad to send the best information obtainable about any phase of our work.

The freshman class in the Division of Agriculture last September was almost 100 strong. How many will be in this group of the Class of 1938 waiting to enroll September 10, 1934? For a high school graduate thinking of entering K. S. C., there is no better date to make the start. Enroll for the first semester even though you have limited assurance of being able to stay the entire year.

Student Judging Contests

During recent weeks three student judging contests have been held—the contest in the judging of dairy cattle, the crops judging contest, and the animal husbandry contest in the judging of beef cattle, swine, sheep, and horses and mules, commonly called the livestock judging contest. The winners in each section in each of these contests are shown in (B) of the accompanying illustration. In (A) of the illustration are presented those who placed first, second, and third in each section of the animal husbandry contest, also the high man in each kind of livestock in each section of that contest. A brief description of each contest giving the winners and their winnings follows:

DAIRY CATTLE JUDGING CONTEST

The Dairy Club held their annual contest Saturday afternoon, April 14. As usual it was divided into senior and junior divisions, the former being for those students having had advanced dairy judging and the latter for all other contestants. In the senior division, 14 student judges competed and in the junior division, 39. The judging of a class of heifers and a class of cows from each of the four main dairy breeds—Jersey, Guernsey, Ayrshire, and Holstein—and the giving of oral reasons on one class from each breed constituted the work for the senior division. Contestants in the junior division placed the eight classes of dairy animals as did the contestants in the senior division, but gave written reasons on a class of Holstein cows and one of Jersey cows only. Since 100 points were allowed for each placing and 100 for each set of reasons, the total possible score in the senior division was 1,200 points and in the junior division, 1,000. William H. "Bill" Juzi was student manager of the contest.

The high men in each division of the contest and on each breed of dairy cattle are indicated in the following tabulation of results:

	Score
Senior Division	Wilmer R. Smittle.....987
	J. Warren Mather.....978
	Forrest R. Fansher.....975
	Lester A. Zerbe.....971
Junior Division	Carl H. H. Beyer.....854
	Lewis I. Thomas.....827
	Royse P. Murphy.....826
	Samuel W. Kerr.....807
	Herbert S. Davies.....804
	Thomas M. Potter.....803
Clarence L. Bell.....800	
Holstein Breed	Sr., Forrest R. Fansher....268
	Jr., H. Frederick Dudte....270
	Jr., Howard O. Meyer.....270
Jersey Breed	Sr., Wilmer R. Smittle....270
	Jr., Herbert S. Davies.....260
	Jr., Ray V. Hauck.....260
Ayrshire Breed	Sr., Howard A. Moreen.....287
	Jr., Lewis S. Evans,
	Richard F. King, Frank
	B. Kessler, Thomas M.
	Potter, John B. Shaffer,
	Clifford L. Harding,
and Joe Zitnik, each.....200	
Guernsey Breed	Sr., Philip W. Ljungdahl..234
	Jr., Frank B. Kessler,
	Charles W. Beer, Carl
	H. H. Beyer, Royse P.
	Murphy, Bruce K. Winchester, and Eugene E. Sundgren, each160

A prize of \$7.50 in cash was awarded to the high man in each division of the contest, and \$5 was awarded to the man placing second in each division. Prizes of lesser value, including merchandise and subscriptions to breed and farm papers, were given to the runners-up in the contest whose scores are given in the accompanying tabulation. In the junior division it may be noted that seven contestants made perfect scores in placing Ayrshires. In each division a prize was awarded the high individual in placing and another to the high individual on reasons. The winners were: In the junior division—on placings, Royse P. Murphy, 694 points; on reasons, Ray V. Hauck, 172 points. In the senior division—on placings, Wilmer R. Smittle, 684 points; on reasons, J. Warren Mather, 334 points.

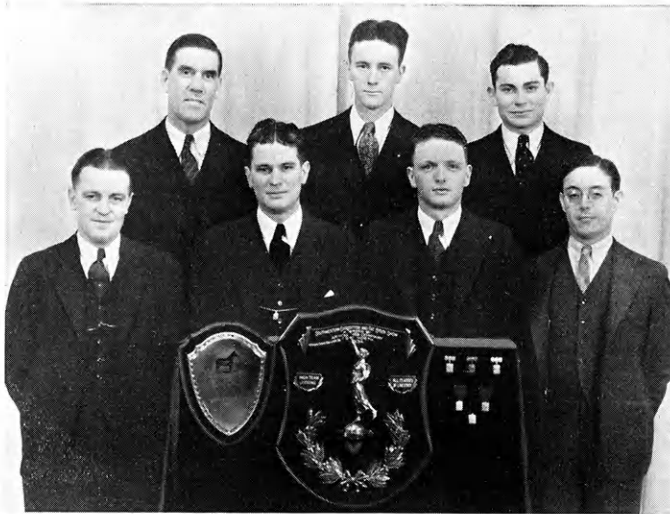
CROPS JUDGING CONTEST

The annual student crops judging contest was held April 21, 1934, under the sponsorship of the Klod and Kernel Klub. The contestants were divided

(Continued on page 81)

Junior Livestock Judging Team Sets a High Mark

A high mark was set by the junior livestock judging team in the annual intercollegiate judging contest of the Southwestern Exposition and Fat Stock Show in Fort Worth, Tex., Saturday,



K. S. C. JUNIOR LIVESTOCK JUDGING TEAM

From left to right: Clifford L. Harding, Prof. F. W. Bell, coach, Walter M. Lewis, Maurice I. Wyckoff, Charles E. Murphey, Lee J. Brewer, and Charlie B. Team.

March 10, 1934. The Aggie team placed first with six teams competing; won both plaques offered for team honors and six of the seven medals offered for individual honors.

The team was coached by Prof. F. W. Bell of the Department of Animal Husbandry who accompanied the students on the trip. The members were:

Clifford L. Harding.....	Wakefield
Charlie B. Team.....	Wichita
Charles E. Murphey.....	Leoti
Lee J. Brewer.....	Hartford
Walter M. Lewis.....	Larned
Maurice I. Wyckoff (alt.).....	Luray

Twelve classes of livestock were judged, three each of beef cattle, hogs, and sheep; two of mules; and one of horses. Oral reasons were given on eight classes.

The Aggie team placed first with 4,491 points out of a possible 5,000. Other teams competing and their scores were: Texas Tech., 4,415; Texas A. and M., 4,365; Oklahoma A. and M., 4,363; Louisiana, 4,061; and Texas A. and I., 3,947. The Kansas team was high in judging horses and mules with 1,142 points out of a possible 1,250; second on beef cattle; and third on hogs and sheep. The highest three individuals of the contest were: Walter M. Lewis, 940 out of a possible 1,000 points; Clifford L. Harding, 937; and Charlie B. Team, 904. Team was first in judging sheep; Lewis, first on horses and mules; and Harding, first on beef cattle.

The large beautiful plaque shown in the picture has to be won three times for permanent possession. Kansas is the first to win it. The smaller plaque was awarded for placing first on horses and mules. The awards were made at a banquet Sunday noon at the Hotel Texas.

Looking Ahead in Livestock

For the longer view (one to two years), hogs probably offer the best outlet for feed grains that are to be converted into meat. Sheep perhaps offer the next best outlet, especially for those who have the breeding stock now on hand. Cattle appear to offer the least favorable outlet for feed grains after the fall of 1934.

For the shorter view (four to six months) cattle appear to offer the best outlet for grains especially if grain and cattle are both on hand at present. Hogs and sheep have about equal chances for second best position with reference to which will pay the most

(Continued on page 86)

An Egg Storage Cellar¹

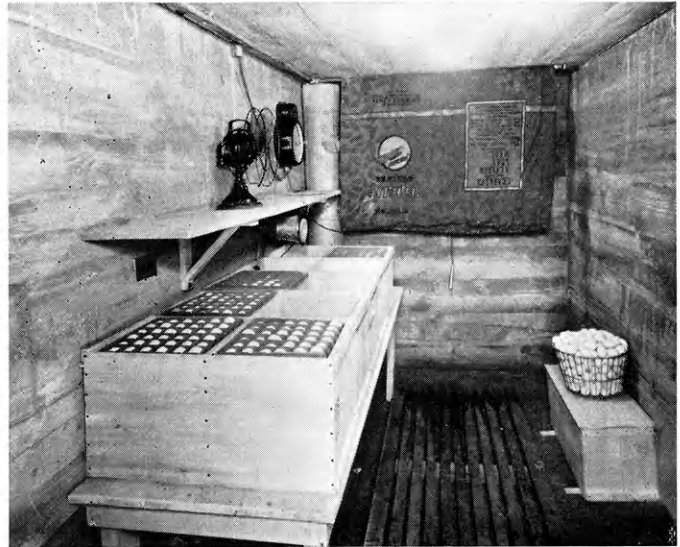
During the warm summer months eggs deteriorate rapidly in quality because of excessive heat and evaporation of moisture. Therefore a summer storage room for eggs should embody both low temperature and high relative humidity in order to maintain the quality of eggs until they are ready to be marketed.

The Department of Poultry Husbandry of the Kansas Agricultural Experiment Station has constructed an egg storage cellar in order to study the question of egg storage on the farm. The cellar was built into the side of a small hill and is similar to the ordinary cellars found on Kansas farms. It was constructed entirely of concrete, with steel reinforcing. The inside dimensions are: Length, 10 feet; width, 6 feet; and height, 6 feet, 9 inches. The walls are 8 inches thick. There is a 6-inch covering of sand on the floor. Double doors give a hatchway effect and prevent escape of cool air and entrance of warm air. A covering of green sod and several near-by trees provide shade for the cellar during the warm summer months.

The accompanying picture shows an interior view of the cellar. A 10-inch air shaft in one corner extending from the ceiling to within 16 inches of the floor and another short shaft in the opposite corner provide for entrance and exit of air. Both shafts are equipped with dampers. During the night, the cool air is allowed to enter as the warm air leaves the cellar. During the daytime the dampers are closed so as to retain the cool night air. The exit shaft

is provided with a rotating ventilator on top of the cellar which allows the escape of air from the ceiling regardless of the direction of the wind. A bi-record recording thermometer fastened on the wall registers the outside and inside temperatures at the same time.

The relative humidity is maintained in the cellar by the introduction of moisture as it drips on a hanging burlap sack, and by frequent sprinkling of water on the sand floor. A wood frame on the floor provides a dry surface for the attendant to walk upon.



INTERIOR VIEW OF K. S. C. EGG STORAGE CELLAR

The cellar is equipped with a table and an egg candle. A wire egg-cooling basket is also shown in the picture. This basket allows rapid escape of the animal heat from the egg before it is cased.

This cellar was constructed during the hot summer months and when the first tests were made, the temperature was maintained at 70° F., day and night without the use of water or any other cooling agent. During the winter a temperature of 40° was maintained regardless of the temperature

1. The author is indebted to Prof. L. F. Payne for much of the material that appears in this article.

(Continued on page 87)

State Congress of Future Farmers of America

The sixth annual meeting of the Kansas Association of Future Farmers of America was held in connection with the fourteenth annual state high school judging contest at K. S. C., April 30 and May 1, 1934. State officers in charge of the two-day program were Wayne D. Trail, Colby, president; Delbert Richardson, Lawrence, vice-president; Max Shoemaker, Ottawa, secretary; Alfred Taylor, Winfield, treasurer; Mabry Wheeler, Mound City, reporter; L. B. Pollom, State Supervisor of Vocational Agriculture, Topeka, state advisor; and Prof. A. P. Davidson, K. S. C., executive state advisor. Each chapter is entitled to two official delegates.

The annual meeting of the House of Delegates was held Monday evening, April 30. There are 95 chartered chapters in Kansas with a total paid-up membership of 1,584. The following officers were elected for 1934-'35: Paul Leck, Washington, president; Elwood Baker, Abilene, vice-president; Arthur Leonhard, Lawrence, reporter; Donald Baughman, Howard, secretary; and Leonard Brown, Smith Center, treasurer.

The state association each year sponsors a Best Chapter contest. The local chapters set up a proposed program early in the year which is filed with the state office. Achievement reports are submitted at the time of the annual meeting. The following chapters were declared to have carried out the most worthwhile programs during the past year: Winfield, Shawnee Mission, Washington, Lawrence, and Mound City.

The House of Delegates elected 25 Future Farmer members to the degree of State Farmer. The State Farmer degree is restricted to 2 per cent of the total state membership. This degree represents a balanced record of achievement including scholarship in all high school subjects, leadership as demonstrated through work in his local chapter, various high school organiza-

tions, project program, and supplementary home-practice work. The following are the Future Farmers elected to the State Farmer degree:

Elwood Baker, Abilene
Hampton Barton, Arkansas City
Kenneth Basford, Lebanon
Donald Baughman, Howard
Ronald Beery, Winfield
Louis Brooks, Scott City
Leonard Brown, Smith Center
Lorimer Cox, Mound City
Paul Crane, Miltonvale
Emerson Cyphers, Fairview
Max Dawdy, Washington
Harvey Dix, Manhattan
Wilbert Duitsman, Linn
Kieth Harrison, Ottawa
Vernon Huck, Coldwater
Paul Leck, Washington
Arthur Leonhard, Lawrence
Walter Love, Lawrence
Clayton Osborne, Mound City
Alfred Pancake, Atwood
Winzer Petr, Waterville
Doyle Reed, Lawrence
Neal Sawyer, Fairview
John Snook, Winfield
John Stradal, Wakeeney

The pictures of the officers of the State Association of the F. F. A. for 1934-'35 and the twenty-five new State Farmers are shown in the accompanying illustrations.

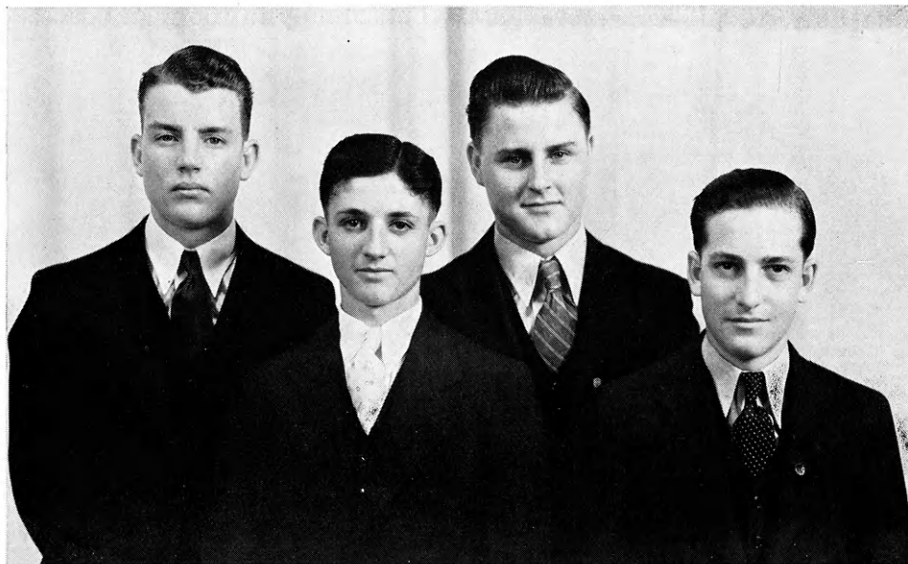
The annual state F. F. A. Public Speaking contest was held Tuesday morning. The judges for this contest were Dr. C. V. Williams, Department of Education; Dr. H. B. Summers, Department of Public Speaking; and Prof. Harold Howe of the Department of Agricultural Economics. The contest was considered one of the best in the history of F. F. A. public speaking contests in Kansas. J. W. England III of the Shawnee Mission chapter won first place. The subject of his address was, "The Challenge of Rural Leadership." Clarence Mason of the Winfield chapter placed second. His subject was, "A Planned Agriculture." Third place was won by Irwin Miller of the Oberlin chapter who discussed the subject, "Cooperation in Agriculture."

The annual banquet given by the Manhattan Chamber of Commerce was

held Tuesday evening at the Community House. The program was in charge of the State Association of F. F. A., Pres. Wayne D. Trail presiding. Glen

Woolpert of the Miltonvale chapter sang, "Hail the F. F. A.," and won his audience. Wilbur Dicken of the Win-

(Continued on page 86)



OFFICERS OF KANSAS ASSOCIATION OF FUTURE FARMERS OF AMERICA FOR 1934-'35

Left to right: Arthur Leonhard, Lawrence, reporter; Leonard Brown, Smith Center, treasurer; Paul Leck, Washington, president; and Donald Baughman, Howard, secretary. (Elwood Baker, Abilene, vice-president, absent.)



FUTURE FARMERS RAISED TO THE DEGREE OF STATE FARMER AT THE RECENT MEETING OF THE KANSAS ASSOCIATION

Left to right: Back row—Donald Baughman, Leonard Brown, Neal Sawyer, Walter Love, John F. Stradal, Louis Brooks, Emerson Cyphers; middle row—Max Dawdy, John Snook, Ronald Beery, C. Lorimer Cox, Paul Crane, Wilbert Duitsman, Winzer Petr, Kieth Harrison; front row—Doyle Reed, Hampton Barton, Arthur Leonhard, Harvey Dix, Jr., Clayton Osborne, Kenneth Basford, Alfred Pancake, Paul Leck.

The Challenge of Rural Leadership¹

J. W. England III

Seventeen years ago the United States was engaged in a world war. The American farmer was called upon, as a patriotic duty, to produce more food. Loyally he responded. Valuable pasture lands were plowed and planted to food crops; inferior animals were bred to add to the nation's meat supply. Everything possible was done to win the war.

Today this nation is again at war, a devastating economic war involving



J. W. ENGLAND III

Winner of the annual Kansas Future Farmers of America public speaking contest held Tuesday, May 1, 1934. Student in the Shawnee Mission Rural High School.

every man, woman, and child. Again the very life of the nation is at stake. We have read of violence and rioting in the industrial centers, but now we see it in the agricultural districts. What has caused this evil to creep out in our peace-loving rural districts?

Yesterday the American farmer was

ordered, "Increase your acreage." Today he is paid to plow up every third row. Both instructions were carried out, blindly in too many cases, not because the farmer really thought he should, but because he was advised to. What the American farmer needs most of all is to be told, "Do your own thinking; produce your own leaders."

We must not criticize the farmer without first of all recognizing that which brought about his weakness—his love for independence. Our forefathers farmed forty acres. They made their own plows, their own harness, their own homes, their own clothes, even their own medicine—but too often they let the local politician think for them. Our fathers farmed one hundred and sixty acres, had their own homes built for them, bought their clothes at the store, paid in hard-earned cash for the combines, tractors, and milking machines; but still they failed to do their own thinking—still they clung to their independence.

Wise ones saw that if the farmers advanced they must work together. They, therefore, began organizing co-operatives. Who, however, were the leaders? Were they farmers trained to think for farmers? No. The farmer said, "We will produce the grain; we will bring it in. We will get men to join the organization; we will plant either more or less acreage—just as you say—but you manage it for us." In other words, "We will do the work; you do the thinking." What happened? The farmer produced the cooperative, but the professional organizer produced the leader.

The lack of rural leadership on a national scale was demonstrated by the recent Federal Farm Board. It had been hoped by farmers that a real "dirt" farmer would be the chairman. We know, with due respect to a capable man, that Alexander Legge, the head of a huge farm implement company,

(Continued on page 89)

1. This oration took first place in the state contest of Future Farmers of America held at Manhattan recently. The author is a student in the Shawnee-Mission Rural High School.

State Vocational Agriculture Judging Contest

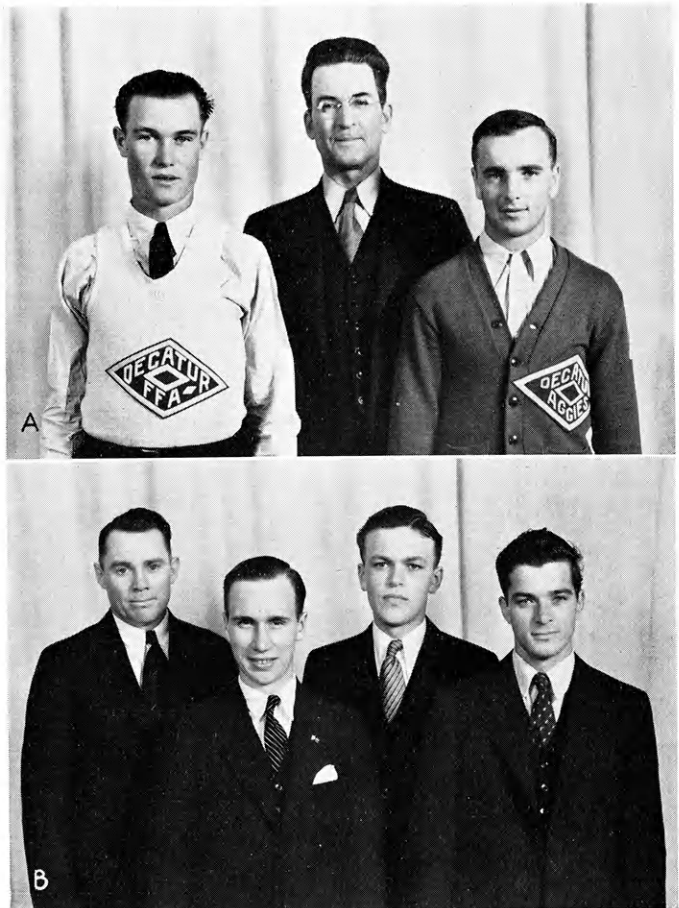
The fourteenth annual state high school vocational agriculture contest in the judging of farm products was held at the college April 30 and May 1, 1934. The total number of contestants was 190, representing 64 schools, one school entering only one contestant. Forty-three teams competed in the entire contest.

The contest was divided into four sections. Section I, animal husbandry judging, consisted of placing two classes each of horses, beef cattle, sheep, and swine and giving oral reasons on one class of each kind of animals. Section II, dairy judging, consisted of placing four classes of dairy cows and giving oral reasons on two of the classes. Section III, crops judging, consisted of the identification of grain and forage crops, weeds, weed seeds, and plant diseases; commercial grading of wheat, grain sorghum, shelled corn, and alfalfa; and judging the seed and market value of alfalfa seed, ear corn, and wheat. Section IV, poultry judging, consisted of placing four classes of hens for past production and a written examination on the American Standard of Perfection. In Section I, 60 teams competed; in Section II, 62; in Section III, 45; and in Section IV, 52.

In Sections I and II, 50 points were allowed for reasons and 50 points for placing, making a total of 600 points in Section I and 300 points in Section II. In Section III, there were eight classes, each given an allowance of 100 points, making a total of 800 points.

In Section IV, 75 points were allowed on placing each class and 100 points on the examination, making a total of 400 points. The total possible individual score for the entire contest therefore was 2,100 points and the total possible team score, 6,300 points.

The president's prize—a certificate—awarded the team making the highest



WINNERS IN THE RECENT STATE HIGH SCHOOL JUDGING CONTESTS

(A) Team of the Decatur County Community High School (Oberlin) and their coach—high team in the entire contest in farm mechanics. Left to right: Roy Cody, S. H. Howard, coach, and Raymond Redman. In individual placings in the entire contest Mr. Cody placed first and Mr. Redman, third.

(B) Team of the Newton High School and their coach—high team and high individuals in the entire contest in the judging of farm products. Left to right: R. M. Karns, coach, Earl Mollen, Frederick Renich, and Dwight McFarlane.

HIGH TEAMS IN THE ENTIRE CONTEST

High School	I	II	III	IV	Total	Coach
Newton H. S.	1,535	666	2,022	1,025	5,248	R. M. Karns
Reading R. H. S.	1,448	719	1,643	1,028	4,838	H. C. Wood
Washington H. S.	1,507	749	1,749	777	4,782	H. H. Brown
Lebanon H. S.	1,405	695	1,600	1,044	4,744	F. A. Blauer
Lawrence H. S.	1,341	642	1,762	981	4,726	W. R. Essick
Howard H. S.	1,369	652	1,643	1,061	4,725	J. A. Watson
Wamego R. H. S.	1,254	639	1,777	1,013	4,683	H. A. Myers
Quinter R. H. S.	1,451	678	1,590	932	4,651	J. F. Shea
Manhattan H. S.	1,413	729	1,584	910	4,636	H. W. Schmitz
Harveyville R. H. S.	1,274	639	1,738	912	4,563	H. R. Bradley

HIGH INDIVIDUALS IN THE ENTIRE CONTEST

Contestant	I	II	III	IV	Total	High School	Coach
Earl Molzen	517	249	694	352	1,812	Newton H. S.	R. M. Karns
Frederick Renich	529	189	693	332	1,743	Newton H. S.	R. M. Karns
Dwight McFarlane	489	228	635	341	1,693	Newton H. S.	R. M. Karns
Paul Leck	528	238	641	281	1,688	Washington H. S.	H. H. Brown
Arthur Jones	478	243	567	350	1,638	Reading R. H. S.	H. C. Wood
Leroy Miller	415	220	642	352	1,629	Wamego R. H. S.	H. A. Myers
Thomas Whitaker	523	228	544	332	1,627	Reading R. H. S.	H. C. Wood
John Steiner	458	227	573	364	1,622	Lebanon H. S.	F. A. Blauer
Fred York	508	272	538	296	1,614	Manhattan H. S.	H. W. Schmitz
Delmer Nielson	527	235	533	313	1,608	Waterville H. S.	J. R. Wells

HIGH INDIVIDUALS IN EACH SECTION OF THE CONTEST

Contestant	Sec.	Score	High School
Frederick Renich	I	529	Newton H. S.
Paul Leck	I	528	Washington H. S.
Delmer Nielson	I	527	Waterville H. S.
Hubert Sramek	I	523	McDonald R. H. S.
Thomas Whitaker	I	523	Reading R. H. S.
Fred York	II	272	Manhattan H. S.
Kenneth Hauserman	II	268	Clay Co. Com. H. S.
Verlin Rosenkranz	II	265	Washington H. S.
Robert Smith	II	264	Cherokee Co. Com. H. S.
Lewis Laverty	II	263	Neodesha H. S.
Earl Molzen	III	694	Newton H. S.
Frederick Renich	III	693	Newton H. S.
Leroy Miller	III	642	Wamego R. H. S.
Paul Leck	III	641	Washington H. S.
Dwight McFarlane	III	635	Newton H. S.
Herbert Layman	IV	369	Shawnee Mission R. H. S.
Virgil Nix	IV	365	Howard H. S.
John Steiner	IV	364	Lebanon H. S.
Richard Dodrill	IV	362	Lincoln H. S.
John Lower	IV	358	Kiowa H. S.

HIGH TEAMS IN EACH SECTION OF THE CONTEST

High School	Sec.	Score	Coach
Newton H. S.	I	1,535	R. M. Karns
Washington H. S.	I	1,507	H. H. Brown
Kiowa H. S.	I	1,472	J. A. Johnson
Clay Co. Com. H. S.	I	1,462	Edwin Hedstrom
Waterville H. S.	I	1,454	J. R. Wells
Washington H. S.	II	749	H. H. Brown
Clay Co. Com. H. S.	II	739	Edwin Hedstrom
Manhattan H. S.	II	729	H. W. Schmitz
Cherokee Co. Com. H. S.	II	726	P. W. Hansen
Atwood Com. H. S.	II	725	A. H. Hilpert
Newton H. S.	III	2,022	R. M. Karns
Wamego R. H. S.	III	1,777	H. A. Myers
Lawrence H. S.	III	1,762	W. R. Essick
Washington H. S.	III	1,749	H. H. Brown
Harveyville R. H. S.	III	1,738	H. R. Bradley
Howard H. S.	IV	1,061	J. A. Watson
Shawnee Mission R. H. S.	IV	1,050	H. D. Garver
Lebanon H. S.	IV	1,044	F. A. Blauer
Kiowa H. S.	IV	1,036	J. A. Johnson
Lincoln H. S.	IV	1,036	Elmer Schrag

score in the contest was won by Newton High School, R. M. Karns, coach. The dean's prize—a certificate—

awarded to the individual making the highest score in the contest, was won by Earl Molzen of Newton High School.

Mr. Karns organized the Department of Vocational Agriculture in the Newton High School in the summer of 1929. His team placed second in the state contest at K. S. C. in 1932, one member of his team, Kenneth A. Fisher, being high individual in the entire contest. In 1933, Mr. Karns's team placed first in the state contest and again had the high individual in the contest, John Renich. This year Mr. Karns scores another advance on his competitors, his team not only placing first in the entire contest, but being first, second, and third high individuals in the contest. Further, one of the contestants on his team, Earl Molzen, the high individual in the entire contest, was also high individual in crops judging, and another of his contestants, Frederick Renich, was high individual in animal husbandry judging. The team was high in both the crops judging and the animal husbandry judging sections of the contest. This sets a record of winnings for the 1934 state contest that may not be equalled again in many decades. By winning the contest Mr. Karns's team further becomes the Kansas team in the national vocational agriculture judging contest to be held at the American

Royal Live Stock Show this fall.

The team ranking highest in each section of the contest received a parchment certificate from the department sponsoring that section of the contest. To the contestant making the highest individual score in each section of the contest, the departmental club presented a medal. The teams and individuals placing first to fifth in the entire contest and the teams and individuals placing first to fifth in each section of the contest received appropriate ribbons, thus 50 ribbons were presented to these teams and individuals making the highest placings. The accompanying tabulation of results includes all the winners, both teams and individuals, just referred to and a few others who may be designated as receiving honorable mention.

The Manhattan Chamber of Commerce presented the coaches, the contestants, the visiting high school students accompanying the teams, and delegates from Kansas chapters of the Future Farmers of America attending the state congress, a banquet in the community house Tuesday evening, May 1. Approximately 600 high school students attended the banquet.

Annual State Contest in Farm Mechanics

The annual state high school vocational agriculture farm mechanics contest was held April 30 and May 1, 1934.

One division of the contest was given by the Department of Agricultural Engineering and was divided into three sections as follows: Section I, gas engine valve timing; Section II, concrete work; and Section III, mowing machine repair. There were also three sections in the division of the contest given by the Department of Shop Practice as follows: Section I, roof framing; Section II, welding; and Sec. III, sheet metal work. In each of the three sections of each contest there was a possible individual score of 1,000

points, making a possible score for a two-man team of 12,000 points in the entire contest.

Certificates were awarded to the high team in the entire contest, the high individual in the entire contest, and the high individual in the three sections of the contest in agricultural engineering. Ribbons were awarded for first, second, and third teams, and first, second, and third individuals in each of the three sections of the contest in agricultural engineering, and suitable prizes (tools) were given as awards for first, second, and third individual placings in each of the three sections of the contest in shop practice.

The winning teams were as follows:

Entire Contest	Score	Coach
Decatur Co. Com. H. S.	3,808	S. H. Howard
Cherokee Co. Com. H. S.	3,601	P. W. Hansen
Newton H. S.	3,521	R. M. Karns

Agricultural Engineering	Score	Coach
Sec. I Oxford R. H. S.	667	John Lowe
Sec. II Howard H. S.	735	J. A. Watson
Sec. III Decatur Co. Com. H. S.	946	S. H. Howard

Shop Practice	Score	Coach
Sec. I Newton H. S.	800	R. M. Karns
Sec. II Decatur Co. Com. H. S.	905	S. H. Howard
Sec. III Colby Com. H. S.	980	R. W. Fort

The high individuals were as follows:

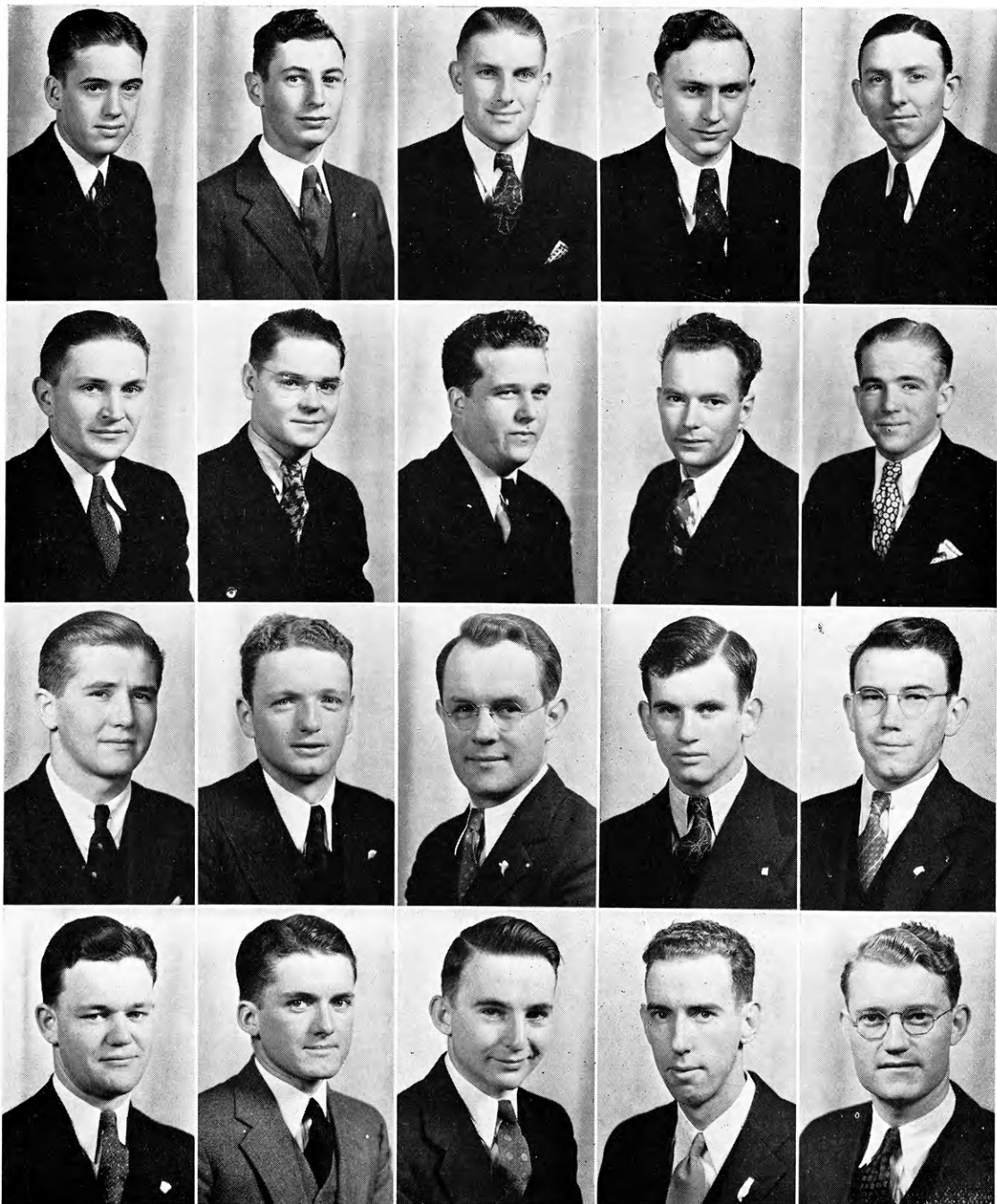
Entire Contest	High School	Score
Roy Cody	Decatur Co. Com. H. S.	3,850
Thomas Lovelady	Cherokee Co. Com. H. S.	3,821
Raymond Redman	Decatur Co. Com. H. S.	3,768

Agricultural Engrg.	High School	Score
Sec. I Vere Lipperd	Oxford R. H. S.	667
Sec. II Lorraine Fear	Howard H. S.	840
Sec. III Roy Cody	Decatur Co. Com. H. S.	961

Shop Practice	High School	Score
Sec. I De Squire	Carbondale R. H. S.	997
Sec. II Raymond Redman	Decatur Co. Com. H. S.	910
Sec. III Fred Yeo	Colby Com. H. S.	985

In the contest in the Department of Agricultural Engineering, 28 teams of two men each competed, and another school was represented by one man. One of the 28 teams did not enter the contest in shop practice. Last year only 18 teams participated in this contest in farm mechanics.

D. F. King, M. S. '30, is acting head of the Department of Poultry Husbandry, Alabama Polytechnic Institute, Auburn.



ALPHA ZETA INITIATES, 1933-'34

Howard A. Moreen
 Clarence L. Gish
 David W. Gregory
 Royse P. Murphy

Donald R. Cornelius
 Kenneth S. Davis
 Charles E. Murphey
 Lewis S. Evans

Karl G. Shoemaker
 John O. Miller
 William H. Juzi
 David A. Reid

George A. Rogler
 J. Willett Taylor
 Richard H. Campbell
 Robt. E. Phillips, Jr.

J. Warren Mather
 Edwin R. Lamb
 J. Edwin McColm
 W. Harley Chilson

STUDENT JUDGING CONTESTS

(Continued from page 71)

into three divisions, freshman, junior, and senior. Students who had no college work in farm crops or grain grading were entered in the freshman division; those having credit in or enrolled in the college course in Farm Crops were registered in the junior division; and those enrolled in Grain Grading and Judging or having credit in advanced courses in the Department of Agronomy competed in the senior division. In the senior division there were 11 contestants; in the junior division, 21; and in the freshman division, 9.

The possible score for each contestant was 1,060. The high men in each division were:

	Score
Senior Division	George A. Rogler.....942
	J. Raymond Dicken.....933
	Donald R. Cornelius.....896
	J. Willett Taylor.....891
	Harry W. Coberly.....861
	Lewis S. Evans.....847
Junior Division	Royse P. Murphy.....868
	Leon E. Wenger.....833
	J. Edwin McColm.....814
	J. Lowell Myler.....761
	Karl G. Shoemaker.....751
	David W. Gregory.....730
Freshman Division	H. Frederick Dudte.....835
	Carl H. H. Beyer.....780
	D. Dean Dicken.....778
	Wilton B. Thomas.....650
	Darrell Morey599

Prizes amounting to \$165 were given by various business concerns of the country. These prizes consisted of silver loving cups, cash, merchandise, and subscriptions to various farm magazines. The high man in the senior division and the high man in the junior division each received a silver loving cup valued at \$20, \$5 in cash, and a one-year subscription to Capper's Farmer. The high man in the freshman division received a 10-dollar loving cup and \$2.50 in cash. The contestant placing second in the senior division and the contestant placing second in the junior division each received \$10 in cash and a one-year subscription to Successful Farming. The contestant placing third

in the senior division and the contestant placing third in the junior division each received \$5 in cash and a one-year subscription to Capper's Farmer. To the man placing third in the freshman division, \$2.50 in cash and a one-year subscription to Successful Farming were awarded. Other prizes of lesser value were awarded to those placing fourth, fifth, and sixth in the senior and junior divisions and the contestants placing fourth and fifth in the freshman division.

LIVESTOCK JUDGING CONTEST

Wilton B. Thomas, Clay Center, carried away the grand prize in the awards made for the annual student livestock judging contest. He placed first in the junior division, receiving the gold medal awarded by the Block and Bridle Club, sponsors of the contest, and a beautiful silver loving cup awarded by the American Royal Livestock Show. Walter M. Lewis, president of the Block and Bridle Club, placed first in the senior division of the contest. The contest was held Saturday afternoon, May 5. The winners were announced at the annual banquet of the organization held Monday night, May 7, at the college cafeteria.

The contest consisted of judging beef cattle, swine, sheep, and horses and mules, placing two classes each of cattle, swine, and sheep, and one class each of horses and mules. It was divided into a senior division for those taking or having had advanced livestock judging, and a junior division for those who had had nothing more advanced than the elementary course in animal husbandry. Each class consisted of four animals in the senior division and of three animals in the junior division. Reasons were given on four classes, contestants in the senior division giving oral reasons and those in the junior division, written reasons. The total possible score for each kind of livestock was 150—the total score for the entire contest, 600. In the entire contest there were 98 entrants, 22



WINNERS IN STUDENT JUDGING CONTESTS

(A) Winners in livestock judging contest May 5, 1934. Left to right, front row: J. Lowell Myler, Howard A. Moreen, Walter M. Lewis, Philip W. Ljungdahl, Charles E. Murphy. Back row: H. Frederick Dudte, Ray V. Hauck, Raymond R. Beeler, Wilton B. Thomas, Roger V. Rosenkrans.

(B) Those placing first in each section of each of the student judging contests. Left to right, front row: Royse P. Murphy, Walter M. Lewis, Carl H. H. Beyer. Back row: H. Frederick Dudte, George A. Rogler, Wilmer R. Smittle, Wilton B. Thomas.

in the senior division and 76 in the junior.

To the high contestant in each division the Block and Bridle Club awarded a gold medal; to the man placing second, a silver medal; and to the man placing third, a bronze medal. Subscriptions to breed magazines were awarded to first and second placings in each kind of livestock in each division. Blue, red, and white ribbons were awarded to those placing first, second, and third, respectively, in each kind of livestock in each division. The winners of these prizes and a few others making scores worthy of honorable mention may be found in the accompanying tabulation of the outstanding results of the contest.

WINNERS IN LIVESTOCK JUDGING CONTEST

		Entire Contest	
			Score
Senior Division	{	Walter M. Lewis.....	575
		Charles E. Murphey.....	574
		Howard A. Moreen.....	540
		Maurice I. Wyckoff.....	539
		Philip W. Ljungdahl.....	538
Junior Division	{	Wilton B. Thomas.....	557
		J. Lowell Myler.....	551
		H. Frederick Dudte.....	545
		Richard F. King.....	544
		Ray V. Hauck.....	535
		Frank B. Kessler.....	535
		Virginia Wagner.....	533
		Frederick G. Warren.....	533
Edwin C. Sample.....	526		
Senior Division			
			Score
Beef Cattle	{	Walter M. Lewis.....	149
		Charles E. Murphey.....	145
		Robert J. Danford.....	144
Swine	{	Charles E. Murphey.....	144
		J. Willett Taylor.....	144
		Walter M. Lewis.....	142
Sheep	{	Philip W. Ljungdahl.....	147
		Walter M. Lewis.....	147
		Harry G. Sittler.....	146
Horses and Mules	{	Raymond R. Beeler.....	147
		Lee J. Brewer.....	143
		Charles E. Murphey.....	142
Junior Division			
			Score
Beef Cattle	{	H. Frederick Dudte.....	149
		Vernal G. L. Roth.....	146
		Virginia Wagner.....	146
Swine	{	Roger V. Rosenkrans.....	142
		Richard F. King.....	142
		Wilton B. Thomas.....	141
Sheep	{	H. Frederick Dudte.....	144
		Edwin C. Sample.....	143
		Wilton B. Thomas.....	142
Horses and Mules	{	Ray V. Hauck.....	140
		C. R. Crawford.....	136
		Richard F. King.....	136

Close Clipping Injures Bluegrass Lawns

Mowing is necessary in order to keep the lawn attractive and to maintain a dense turf. Cutting too close, however, is extremely injurious as it weakens the grass, thins the stand, and allows weeds to come in. The energy for growth of both roots and underground stems as well as tops comes mainly from food made in the leaves. If the leaves are removed by too close clipping root growth is seriously interfered with and the plants greatly weakened. Experiments have shown that there are over three times as much root growth and 40 times as much growth of underground stems in bluegrass cut 3 inches high as in that cut $\frac{1}{2}$ inch high. The development of new shoots, which keeps the stand thick, comes from the underground stems. It is therefore clearly demonstrated that a heavy stand of bluegrass can be maintained only by leaving sufficient top growth to supply abundant energy to the roots in the form of food made in the leaves.

Weed control is perhaps the most important reason for maintaining a vigorous growth of grass. Weeds very rarely take a lawn until after the grass has been weakened by improper care. Cutting to leave a growth at least 2 inches high, together with the proper use of fertilizers, enables the grass to form a dense sod. The tall growth also shades the ground sufficiently to prevent weed seedlings from becoming established. Experiments carried on by the Kansas Agricultural Experiment Station at Manhattan show that there is a definite relationship between height of cutting and weed growth. The results show that there were approximately 10 times as many plants of crab grass on plats cut seven-eighths of an inch high and 5 times as many on those cut $1 \frac{15}{16}$ inches high as on plats cut $2 \frac{3}{16}$ inches high. There were about

(Continued on page 85)

The Pea Aphid—an Alfalfa Pest in Kansas

Roger C. Smith

Professor of Entomology

The pea aphid, often erroneously called "greenbug," is a green plant louse which attains outbreak proportions on alfalfa in Kansas during the months of March, April, and May. It has done some damage every spring since 1920. It has long been known to feed on all kinds of peas and all the clovers and vetch, but it was not a serious alfalfa pest until the spring of 1921. It now constitutes an annual threat to alfalfa, particularly to young or fall-sown alfalfa, in the east half of Kansas. It was serious in the spring of 1933 and because of the dry cold weather this spring, has seriously injured the first crop of alfalfa. The aphid is one of the largest of plant lice, being about one-eighth of an inch long when fully grown.

The pea aphid overwinters either as eggs on old dry alfalfa stalks or wingless female aphids on the green growth which survives the winter. The eggs hatch in February or early March into "stem mothers," which are wingless females. Since each of these females may produce as many as 90 young, all of which are females, aphids become exceedingly numerous in a short time. Some of the females have wings. These may fly to other fields and begin colonies there. In mild winters they persist, especially in young alfalfa, as immature aphids or nymphs and begin to reproduce about the middle of February. They overwinter most successfully on south slopes on thin land with little alfalfa growth or cover.

Aphids commonly appear in isolated spots in Kansas alfalfa fields during the month of February or early in March. They reach their largest numbers from the middle of April to the middle of May, after which they practically disappear from alfalfa fields. This reduction is at first due to an increased number of winged forms scattering over all the fields, to increased natural control by aphid enemies, and to the growth of

the alfalfa; and finally to a marked decrease in the rate of reproduction. During the summer the aphids are exceedingly scarce in alfalfa, but in September and October they again become plentiful. They have never done injury to the Kansas alfalfa crop in the fall. True sexes may be produced in October and November when the overwintering eggs are produced, or the rate of reproduction may slow down because of the cold, and the aphids winter as adults.

The first indication of injury is small circular areas in alfalfa fields which appear to be at a standstill. The plants are first short, bunchy, and unthrifty appearing. Later they become yellow and may die. The spots increase in size rather rapidly in all directions. Upon coming closer, one sees the white molted skins of the plant lice on the plants and the ground. There are generally some ladybird larvae and beetles and some bee-like flies on the plants. The young of these are beneficial as they feed upon the plant lice. However, they are often suspected of causing the injury to the alfalfa.

As a person walks through the alfalfa, the green plant lice are jarred from the plants and will be seen on his shoes and on the ground. Upon closer examination, the aphids will be noticed clustered thickly on the younger growth. The insects insert their beaks in the tender growth of the plant and suck the sap, depriving the plant of its food.

Control Measures

1. While the aphids are confined to small spots in alfalfa fields in February and early March, they can be quickly killed by scattering calcium cyanide "granules" or "flakes" in the infested area at the rate of 30 to 40 pounds to the acre. This is a very thin sowing. If sowed too heavily, more or less severe burning of plants will result. The calcium cyanide should be applied when

(Continued on page 86)

CLOSE CLIPPING INJURES LAWNS

(Continued from page 83)

60 times as many dandelions on the closely-clipped plat as on the plat cut $2 \frac{3}{16}$ inches high and 10 times as many on the plat cut $1 \frac{5}{16}$ inches high as on the one cut $2 \frac{3}{16}$ inches high.

From these experiments the conclusion is drawn that bluegrass in Kansas should ordinarily not be cut closer than 2 inches and in some cases, as on the south slopes or terraces, $2 \frac{1}{2}$ inches is probably more desirable.

Most lawn mowers cannot be set high enough to avoid injuring the lawn by cutting too close. They can usually be adjusted to cut higher by enlarging the drive wheels by placing a band around them and having new roller brackets made to provide for setting the roller down, thus increasing the height of clipping. At least three manufacturers are now building mowers which will cut high enough to fulfill the recommendation of the Kansas station.—J. R. Dicken, '36.

Alternatives Open to the Dairy Farmer

Two ways are open for the dairy farmer to increase the net return from his product—milk. He can either produce as much milk as possible from his herd by feeding roughage only with very little grain, thus reducing his feed cost to a minimum; or secure a premium for the milk he sells because of special food qualities which it possesses.

The second method involves expenses and extra work which leave only a small extra profit unless the dairyman can build up an extensive retail business for products of exceptional value. Such products are soft-curd milk and vitamin D milk, which, it seems, have found a permanent place in the retail market. Probably, in the near future, milk especially high in vitamin A will also be commonly available.

Soft-curd milk is milk which produces upon coagulation a very soft, flocculent curd, readily digestible by infants and invalids with the most delicate stomachs. The softness of the curd cannot be influenced through feeding in any way. It is characteristic of each individual cow. It is possible to test the curd tension of a sample of milk and determine quite accurately if it may be classed as soft-curd milk. The curd tension of the milk of a certain cow remains nearly constant throughout her lifetime. It is found that Holsteins and Ayrshires are more likely to produce soft-curd milk than the other dairy breeds.

Vitamin D is very important in the assimilation of calcium and phosphorus in bone and teeth building. At present the cheapest and most practicable way to produce milk rich in this vitamin is, first by direct irradiation of the milk with a carbon arc lamp, and secondly, by feeding cows irradiated yeast. Both methods are patented by Dr. Steenbock of the Wisconsin Agricultural Experiment Station. In producing vitamin D milk a license fee of \$1 per cow per year is charged by the Wisconsin Alumni Research Foundation, which holds the patent on this process.

Lack of vitamin A in the food supply leads to weakening of many body tissues, failure to make normal growth, and inflammation of the ears, eyes, and sinuses. Milk produced by cows on pasture is relatively rich in this vitamin. Recent experiments have proved that it is possible to produce milk rich in vitamin A from cows fed on hay and silage under certain conditions. This is very important since there is most need for this vitamin in the winter when the average supply of food is low in vitamin A.

To obtain ample amounts of this vitamin in milk, cows must be fed hay which has been cured in such a manner as will retain its green color. The Cooperative Butter Export Association of Finland recently patented a process

by which the carotin (which the cow in her body changes to vitamin A) is retained to a high degree in silage. Dilute hydrochloric acid is sprayed over the ensilage when put into the silo, to preserve the silage without fermentation and high heat development.

Much of this work is still in an experimental stage. No doubt in the near future standard types of milk will be available to the public which will provide a more nearly perfect food than milk in general has been known to be. Doctors and dietitians recommend that 40 cents out of every dollar spent for food should be used for dairy products. To do this, the average American must double his present consumption of dairy products.—W. H. Juzi, '34.

LOOKING AHEAD IN LIVESTOCK

(Continued from page 72)

for grains converted into fleshing the next few months. Either native spring lambs or light stock hogs have better than a fifty-fifty chance of paying more than the present price of corn if they are finished and sold by September.

Cattle numbers on hand January 1 this year were 67,352,000 head compared with 65,552,000 head last year, and 56,701,000 six years ago on January 1. This is 3 per cent more than last year and 12 per cent more than at the low of the present production cycle in 1928. There is nothing at present to indicate that the peak of cattle production has been reached. Cattle numbers on hand are a bearish influence on cattle prices after 1934.

Hog numbers on hand January 1 this year were 55,976,000 head compared to 60,716,000 head last year, and 54 million head three years ago in 1931. This is 9 per cent less than last year which was the peak of production of the present cycle but is still 3 per cent above the last low of production. The present corn-hog program and the unfavorable corn-hog feeding ratio are two important factors bringing about further declines in hog production which should, by 1935, result in higher prices.

Sheep numbers on January 1 this year were 51,374,000 head compared with 51,736,000 head last year and 53,321,000 in 1932. This is 1 per cent less than last year and 4 per cent less than the all-time peak of production in 1932. The 1932-'34 average production is the greatest on record and the recent price advance will no doubt tend to increase production again by 1935 or 1936. Sheep numbers are sufficiently great to lend a bearish influence on prices after 1935 or 1936.—Homer J. Henney, Assistant Professor of Agricultural Economics.

FUTURE FARMERS OF AMERICA

(Continued from page 75)

field chapter sang "We're the Future Farmers," and was well received. Raymond Bryan of the Ottawa chapter delighted the audience with a group of cowboy songs. Pres. C. C. Brewer of the Manhattan Chamber of Commerce welcomed the group on behalf of the city and Dr. W. E. Grimes, representing K. S. C., extended greetings to the visitors. Mr. C. C. Cogswell, Master of the Kansas State Grange, was the principal speaker of the evening.

THE PEA APHID—AN ALFALFA PEST

(Continued from page 84)

the temperature is at least 60° F., preferably 70° F., or more. The plants should not be wet, for burning is certain to result. It is advisable to jar the aphids from the plants immediately following the sowing, for this brings them in close contact with the poisonous gas which evolves from the granules. The results can be seen in a half-hour, for the gas kills quickly.

2. Use a chain drag as soon as the aphids appear in numbers. The chain drag depends on the rubbing action of the trailing chains to crush and injure many of the aphids. The field should be dragged in one direction and then cross dragged. Dragging must generally be repeated to be worth while and

even then it may not bring real control.

3. Dust the infested spots of alfalfa with a 4 to 10 per cent nicotine dust.

4. Harrowing is sometimes recommended. It is of little value, however, since only a few small aphids are killed.

5. Farm practices which will promote vigorous early growth of the alfalfa may keep the crop ahead of the pest. Mr. C. O. Grandfield, Division of Forage Crops, U. S. D. A., observed this spring that alfalfa on plots which were not cut late last fall and which, therefore, went through the winter with heavy cover, began to grow earlier in the spring and were consequently further advanced when the aphids reached destructive numbers. Such alfalfa was less infested and consequently less damaged than alfalfa with less cover. It is possible that control of pea aphids will ultimately involve uses of resistant strains of alfalfa and such farm practices as will promote vigorous early spring growth of the crop.

AN EGG STORAGE CELLAR

(Continued from page 73)

outside. A recent drop of 56 degrees in outside temperature within a few hours' time caused a drop of only 5 degrees on the inside of the cellar. By applying water to the floor and sack, a relative humidity of 79 per cent was registered inside while on the outside a relative humidity of 19 per cent was registered. By using an electric fan, the relative humidity can be increased slightly, but this practice is not generally necessary.

The cost of constructing this cellar was \$185.76, of which \$107 was paid for materials. This might seem too expensive, but when one considers that the cellar will last for several generations, the cost is not so much.

All of the principles embodied in this cellar can be applied to any ordinary outside cellar on the farm, provided sand is applied to the floor and an adequate ventilating system is installed. Canned fruits and vegetables can be

stored in this cellar advantageously, but perishable foods must not be stored in an egg cellar because of the unfavorable odors they will impart to eggs, and because the high humidity will deteriorate the food rapidly.

This cellar is not to be used for permanent storage of eggs, but only for temporary holding until the producer has sufficient eggs and time to take them to the market.—C. L. Gish, '34.

Silage as the Sole Roughage for a Fattening Ration

Silage alone when properly fortified with lime is satisfactory as the roughage portion of cattle fattening rations. It must be emphasized, however, that the lime be in a powdered form and contain a high percentage of calcium carbonate.

The foregoing statement is backed up by three years of experimental work done at the Kansas Agricultural Experiment Station. In fact, these results showed a slight advantage for a ration of corn, cottonseed meal, silage, and ground limestone over the standard corn-belt ration of corn, cottonseed meal, alfalfa, and silage. One-tenth of a pound of ground limestone per head daily is sufficient.

These results mean that wherever grain sorghum or corn can be produced, cattle can be fattened for market satisfactorily even though hay, either legume or nonlegume, is not available. In other words, the grain sorghum or corn can be fed on the farms where produced, even though hay is absent.—V. E. B., '34.

The Milling Practice class spent March 10 in Salina visiting four flour mills and their chemical laboratories. April 25, 26, and 27 were spent in Kansas City visiting the leading mills, a bakery, a biscuit company, a malt plant, a corn plant, and the Art Institute.

The Scandinavian Countries¹

Inge K. Kjar, M. S., '34

The area and total population and population per square mile of the four Scandinavian countries are as follows:

Country	Square miles	Population	Population per square mile
Sweden	173,356	6,162,446	35.5
Finland	132,589	3,364,807	25.4
Norway	124,588	2,649,775	21.3
Denmark	16,576	3,550,656	214.0

Sweden

About 42 per cent of the people of Sweden are engaged in agriculture. Wheat, rye, barley, and oats are the chief crops. About 300,000 hectares of wheat (1 hectare equals 2.47 acres) were grown in 1932, with a total production of about 721,000 tons. Potatoes, mangels, turnips, and sugar beets are the chief row crops. Legumes and grasses are grown for hay and pasture. There are about two and one-half million cattle in Sweden. The Ayrshire is the most popular breed.

There are two universities, one at Upsala and one at Lund, with a combined enrollment of about six thousand students. There are two agricultural schools in Sweden, one at Alnarp and one at Ultuna. The Academy of Agriculture at Stockholm is another important institution with which the state Agricultural Experiment Station is associated. The Swedish Seed Association at Svalof is a world famous plant-breeding institute and has to its credit rich accomplishments in pure science, genetics, and in practical plant breeding. This association was organized by a group of Swedish farmers in 1886 and for many years was supported entirely by the farmer membership and profits from the sale of pure seed. Svalof now receives a government grant. New crop varieties produced at Svalof are tested

at several branch experiment farms in different parts of Sweden.

In the early years of the work at Svalof mass selection was the method used. Later the method of pedigree or pure-line selection was introduced and is now the chief method used. Hybridization or crossing has yielded rich returns. Plant breeders at Svalof have been able to produce very high-yielding varieties of wheat, oats, barley, rye, timothy, and other crops. They have also given attention to such important characteristics as winter-hardiness, disease resistance, and stiff straw, enabling farmers to grow wheat on ground heavily fertilized with nitrogen.

Finland

Finland is known as the country of a thousand lakes. The cultivated area is only 6 per cent of the total area. Forestry is an important industry. The chief crops are oats, barley, rye, and potatoes. Much attention has been given to making and utilizing silage. The A. I. V. (A. I. Virtanen) method was originated here. Hay is also a widely grown crop. There are about two million cattle in Finland, chiefly Ayrshire and a local race.

Finland has three universities. The University of Helsinki is the largest, with about six thousand students. A majority of the Finnish people are of Mongolian origin and the rest are of Swedish stock.

Norway

Norway has only half the cultivated area of Denmark, though its total area is really eight times that of Denmark. About 72 per cent of the land in Norway is unproductive, 24 per cent is in forests, and only 3.6 per cent is cultivated. Water power for electricity is abundant and much artificial fertilizer is now being manufactured. Fishing is an important industry. Wheat, barley, oats, rye, potatoes, and hay are the chief crops. There are about one and one-third million cattle in Norway and

1. Excerpts from a report on agriculture and agricultural education and research in the four Scandinavian countries. Miss Kjar, the author, is a graduate student in genetics. She is a graduate of the Royal Veterinary and Agricultural College of Copenhagen, Denmark. The report was made in the course in Plant Breeding Literature, Department of Agronomy. Miss Kjar was formerly a student of Prof. O. Winge of Copenhagen.

about the same number of Norse ponies.

The population is sparse, only about 22 people per square mile. The University of Oslo has about 3,600 students. There is an agricultural school at Aas.

Denmark

Kansas has an area of 82,030 square miles and a population of 1,813,385, while Denmark with an area of only 16,576 square miles has a population of 3,550,656. The following are the approximate acreages of crops grown in Denmark:

Grain	3,210,000
Green fodder (including clover).....	3,167,000
Root crops	1,253,000
Fallow	144,000
Miscellaneous	98,000

About 937,000 acres of oats and 888,000 acres of barley are grown in Denmark. These two cereals are often grown in mixture. The average size of farm is only about thirty-five acres and the country has about 206,000 farms. A one-acre tract of land with a house is considered a farm but is not by any means enough to support a family. A well-located farm of 12 acres is sufficient to make a reasonably satisfactory living for a Danish farm family provided they work hard and do very intensive farming. Small farms are encouraged by the Danish government. There are about three million cattle in Denmark and the manufacture of butter and other dairy products is an important industry. There are about five million swine and Danish bacon is famous for its uniformity and quality in England especially and on the Continent. The export of eggs from 22 million hens is an important item in foreign trade.

The University of Copenhagen was founded in 1749 and has about five thousand students. The Royal Veterinary and Agricultural College of Copenhagen has about 680 students. There are some twenty main agricultural schools in Denmark. The Danish Folk high schools offer short courses in agriculture during the winter time.

About four or five hundred farm boys attend these agricultural schools from six to nine months each year. There are also evening schools and short courses whose purpose it is to educate people on the farms to use the services of the Royal Agricultural College and the agricultural experiment stations. Research work in plant breeding has been going on in Denmark for the last 50 years.

The Danish seed control station founded in 1871 is a famous institution. Denmark has no seed law, but most farmers have their seed tested for purity and germination at this fine government seed-testing station.

The Danish Agricultural Association conducts about three thousand experiments and variety trials each year. There is also an agricultural extension service with a staff of about 250 men.

CHALLENGE OF RURAL LEADERSHIP

(Continued from page 76)

was selected to fill this important post, a man whose company was to institute a campaign to equip a competing nation, Russia, with modern farm machinery. At the same time the aforementioned implement manufacturer was maintaining near-war prices on machinery sold to American farmers. Again, who was to blame? It was not the administration; rather the blame rests on the American farmer who had few trained leaders to represent him.

A cooperative poorly managed means distress and not relief to the farmer. Just a few months ago, in New York, it was proved that while dairymen were losing their herds and their farms, while their children were going without proper food and clothing, while their farms were being neglected for lack of money to make repairs, while their rural schools were being closed by the hundreds for inability on the farmer's part to pay the necessary taxes—this cooperative was flourishing, piling up its revenue by the thousands and paying exorbitant salaries to

(Continued on page 93)

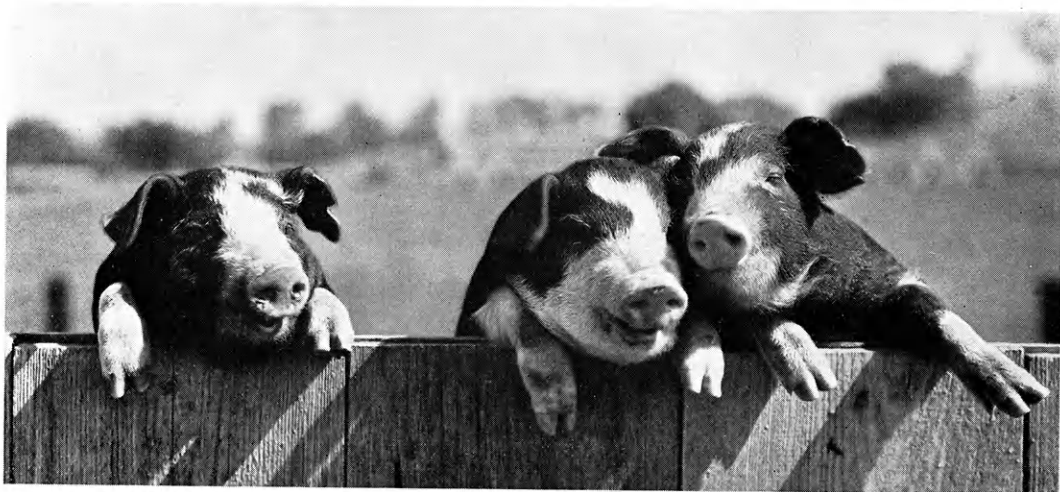
Producing Pork at a Profit¹

D. Ross Haney, '35

The economical production of pork is still as much a problem for the hog raiser as it was in 1919 when hogs were selling for 20 cents a pound. In fact, it can well be argued that in these days of 4-cent hogs, it is really more of a problem. The details of raising and fattening will often be the factors that bring about the difference between profit and loss in pork production. The hog raiser that can keep down feed costs and make cheap gains during the coming year is the one who will have

factory-sized litter from every sow twice a year. By a satisfactory-sized litter is meant one of not less than six pigs and preferably eight pigs. It is foolhardy to expect a sow to farrow but once a year, when by judicious management and a very little extra feed two litters may be forthcoming. This extra litter will almost always double the income from each sow.

In order to raise six to eight pigs to a litter proper feeding of the sow during gestation must be followed, along



WHERE IS THAT ALFALFA PASTURE?

the best chance of showing a favorable balance.

The plans to be pursued for economical pork production may be many and varied, certainly no one plan will be best in all communities. Each hog producer will have to decide upon the ration he is to feed. This selection will vary depending largely on the availability and the cost of feeds in the community. But there are a few well-defined principles which must be followed in any pork-producing project if the operation is to be successful.

First, it is necessary to raise a satis-

with proper sanitary methods, particularly during the farrowing and suckling periods. The proper feeding essentially embodies the allowance of a protein supplement along with the grain ration. The sow should receive the greatest attention at all times, since she is the base of the producing machinery. She should be gaining in weight at time of breeding and continue growing until after farrowing time. A certain amount of loss in weight should be expected after farrowing while the pigs are suckling. This will indicate she is a good milker, converting her feed into milk instead of fat.

The boar used should be of good

1. The author is indebted to Prof. C. E. Aubel for much of the information given in this article.

breeding and in the best of condition at all times. He should not be too fat and to be in good condition must get plenty of exercise.

The sanitary measures should include farrowing and raising the pigs on ground that has not recently been run over by other swine. The equipment should be in the most sanitary condition at time of farrowing and kept so, especially during the suckling period.

A second guide for profitable pork production is the use of suitable pastures. These pastures are invaluable both for the breeding sows carrying litters and those nursing them; also for fattening pigs on a full feed of grain. Experimental studies show that one acre of alfalfa pasture will save 40 bushels of corn in putting fat on hogs. In general, some sort of protein supplement should be fed on pasture. The kind and amount of this protein supplement will vary with individual conditions, especially kind of pasture and cost of various supplements.

Thirdly, the use of home-grown grains for feeding will do much toward lowering pork-production costs. The cost of such feeds will depend much upon raising large yields per acre of the crops concerned. Caution must be used, however, not to depend too much on home-grown feeds, as they may become uneconomical if not properly balanced with efficient supplements. This will apply especially to those home-grown feeds used most extensively for fattening purposes.

With a large number of pigs farrowed twice a year from each sow, and with pastures and cheap home-grown grains supplied, there is still necessary a fourth requirement to raise pigs economically. This is the feeding of a protein supplement, as has been mentioned before. It is just as necessary in these days of 4-cent hogs as in the days of 20-cent hogs. It is not only the selling price of the hogs but the cost of gains that determines whether or not pork production is profitable. Cheaper gains

are made when suitable protein supplements are fed.

There are many protein supplements from which the feeder may select—tankage, milk by-products, alfalfa, fish meal, soybeans, linseed meal, soybean oilmeal, or mixtures of these. Each hog raiser should select protein supplements in accordance with the costs in his locality.

Any hog raiser who will carefully follow these four basic principles can feel that he is producing his pork in the cheapest possible way, and his operations should yield him a favorable balance.

Highway Planting

This year the highways will carry more traffic than ever before; people seeking beauty and relaxation from the humdrum everyday existence. For these, as well as the traveling man, who spends most of his time on the highways, the state, through the Highway Beautification Department, is spending thousands of dollars in plantings. In some cases there may be several miles of highway that will be landscaped quite thoroughly because of bogs, cuts, or unsightly scenes, and then along other roads very little or no landscaping will be possible.

A pastoral scene can be improved upon by framing it with trees and shrubs from another scene, perhaps more picturesque because of its volcanic origin. A long stretch of road can be made more interesting and driveable by groups of flowering shrubs backed by tree masses. Unsightly cuts and fills are being transformed into gardens of beauty by the use of low shrubs or creeping vines, such as the ivies or Japanese honeysuckle.

In all of this work the landscape gardener is striving to create natural plantings by using mostly native plants, and by placing them as nearly as possible as they are found in nature. On the uplands such trees as American elm and hackberry are used, while

sycamores, oaks, and lindens serve to a better advantage on the lower more fertile soils. Some pines are sprinkled throughout the plantings with the help of a few native red cedar, where apples are not grown commercially. The bulk of the shrubs are coralberry, sumac, and dogwood, being supported by some now indigenous shrubs such as the bush honeysuckle, spirea, barberry, etc. Occasionally a shrub border can be introduced as a permanent snow guard instead of the expensive fencing.

The lands on which these plantings are made are called easements, and the farmers are paid a certain amount for their use in the form of rent. In some cases an easement will include enough property to form a small park in which the tourist may eat and rest.

This type of work is being done throughout most of the United States at the present time, and in the near future that long ride need not be endured but rather will be enjoyed.—John L. Duncan, '34.

The Flour Particle

Flour is a very common substance and yet very complex. Each wheat kernel is composed of three physically distinct parts which are the germ, the bran, and the endosperm or floury portion. Because of different physical characteristics these parts can be separated in the process of milling and the endosperm is ground into finely-divided flour particles. These tiny flour particles have not been changed in chemical structure by the milling process but are simply fragments of the endosperm which have been torn apart, and if magnified the ragged edge due to tearing or breaking can be seen. The principal constituents of the endosperm are starch, protein, water, fat, mineral matter, and crude fiber.

The flour particles vary in size, but experiments have shown that the average linear dimension is about 0.004 of an inch. If these particles were laid in a line it would take 250 to make a lin-

ear inch and if packed in a container there would be about 15 million per cubic inch. This makes them seem small but if they are compared to the starch granules and molecular dimensions they seem large.

The starch granules of the endosperm may be seen by an ordinary microscope but the protein cannot be seen and it is therefore impossible to know its exact configuration. While the exact structure of protein is not known, a number of facts make it probable that it is arranged as a network surrounding the starch granules. When water is added to the flour as in baking the protein particles adhere to each other to form gluten and when worked, an elastic mass is produced known as dough, which is capable of stretching and holding the gas formed from yeast growth. When the risen dough is coagulated by the heat in baking, bread results. The cellular or porous structure of bread is one of the characteristics which make it universally liked as food. The thin cell walls make mastication as well as digestion easy.—H. C. J., '34.

Better Livestock Day

The crowd attending the ninth annual better livestock day, Thursday, April 19, 1934, at the A. J. Schuler farm near Junction City, was estimated at 2,500. This annual event, dedicated to better livestock, is sponsored by the Aberdeen Angus Breeders Association of Geary and Dickinson counties, an association known throughout central Kansas for its successful cooperative efforts.

The morning program consisted chiefly of the inspection of 75 head of Angus cattle selected and assembled from the herds of the sponsors and a judging contest in which 484 contestants were entered.

The judging consisted of the placing of six classes of Angus cattle, 50 points being given on each correct placing. The contestants were divided into four

divisions as follows: (1) Teams from high school departments of vocational agriculture—21 teams entered. (2) 4-H Club teams—31 teams entered. (3) College students—41 contestants. (4) Miscellaneous, free-for-all group of individual contestants.

F. E. Carpenter's team of vocational agriculture students from the Linn Rural High School placed second in their division of the contest with a score of 769. The Blue Rapids team, coached by C. E. Lyness, placed first, scoring 786. This winning was the third consecutive victory for Blue Rapids and gave them permanent possession of the loving cup offered by the sponsors of the contest.

In the 4-H Club division, the Geary county Who's Who club placed first—score 805. The Wide Awake club, a girls' team from Lyon county, placed second with a score of 785.

The following five K. S. C. students made the highest scores in the college-student division:

	Score
Philip W. Ljungdahl.....	292
Howard A. Moreen.....	290
Clifford L. Harding.....	288
W. Vaughn Combs.....	283
Frank S. Burson, Jr.....	279

The sponsors of the day provided the Angus steer that was roasted for the occasion and supplied meat for the noon-day lunch. They also provided an excellent afternoon program.

Two numbers on the program of special interest to K. S. C. students were the addresses of Prof. W. L. Blizzard, head of the Department of Animal Husbandry of Oklahoma A. and M. College, and Prof. R. M. Green of the Department of Agricultural Economics, now vice-president of the Wichita Production Credit Corporation. Professor Blizzard stressed the strong points of Angus cattle. He listed the qualifications of a good judge as the ability to observe and compare, and the ability to use common sense and good judgment, combined with a thorough knowledge of livestock. Professor Green said that all government agricultural loaning

associations have been combined under one central head. The purpose of the Production Credit Corporation is to establish local units in all parts of the country to make loans to farmers to meet emergencies.

FARMING PROSPECTS

(Continued from page 69)

return than grain and should be grown in acreage sufficient to furnish feed for all livestock on the farm."

Bruce S. Wilson, '08, of Keats (Riley county) says he believes in diversified farming but that he gets the most consistent results from his chickens. Certified seed and a small herd of both brood sows and beef cows make up safe projects for his farm. Two safe goals he believes are, "Maintain a high standard in our homes and market our products through livestock."

The 14 farmers making the above reports are scattered well over the state, especially the western three-fourths of the state. Their cooperation is very greatly appreciated by this magazine. It so happens that no one has been asked to speak for southeastern Kansas. The fact should not be overlooked, however, that climatic conditions this spring in that area have been good to excellent and with the recent rains that were general over all of eastern Kansas, that section, especially southeastern Kansas, is not entering the 1934 growing season under climatic handicaps.—Ed.

CHALLENGE OF RURAL LEADERSHIP

(Continued from page 89)

its professional organizers. Why was the very thing which was created to help the farmer permitted to hinder him? It was unquestionably the fact that these selfsame farmers were letting someone else do their thinking for them.

Turning from one phase of the farmer's problems to another, I find that in my own district, Kansas City, is one of the most active independent dairy associations in the country. Here, how-

ever, the leaders are men who milk their own cows and do their own delivering. As a result of their labor, they have a true knowledge of and sympathy for the dairyman's problems. These men are working with other farmers to obtain a just price for all of them—not just an enormous salary for themselves.

The past few months have seen many codes being formulated, codes designed to bring about economic readjustment. Many will affect the price of farm products and all, it is believed, will affect the farmer indirectly. Here again is the call for trained leaders within the ranks of agricultural America. Will these trained leaders be forthcoming? They must if agriculture is to survive.

The American farmer not only needs well-informed, capable, and wise leaders, but he must also be a faithful and intelligent follower. He must study the men he puts in power so that no more false gods be set before him. He must develop the ability to express his opinions so that he will be able to inform the men he elects as leaders what he wants accomplished. He must, moreover, develop the ability to follow his elected leaders. No man can lead who cannot trust his organization to be back of him.

Today, in America, nearly two hundred thousand boys are enrolled in vocational agriculture because they want to be leaders in rural recovery. We realize we must be trained, just as a lawyer, a doctor, or a soldier must be trained. We recognize the fact that we need a scientific knowledge to meet the new agricultural conditions confronting us as farmers of the future. In a few years we F. F. A. boys will be the American farmers. The ability to cooperate that we are learning in our local chapters will be transferred to men's cooperatives, but no political leaders or false demigods will head our organizations. We are being trained not only to do but to think a problem through to its logical conclusion. We will say, "We will produce the grain;

we will bring it in; and we will get men to join cooperatives. We will grow more or less acreage as we decide and we will manage our business ourselves." For we have trained ourselves to be leaders, to do our own thinking.

Today in America, the challenge comes forth from thousands of F. F. A. chapters, "Future Farmers, why are we here?" Nearly one hundred thousand members are responding, "To practice brotherhood, honor rural opportunities and responsibilities, and develop those qualities of leadership which a Future Farmer should possess."

Future Farmers, let us do our own thinking; let us produce our own leaders.

Efficient Refrigeration a Home Necessity

Decomposition of foods by microorganisms is nature's means of returning the elemental constituents to the soil for future generations of plant life. Refrigeration is an attempt to defeat the function of these decomposing agencies in order to preserve food for subsequent consumption. Less than 75 years ago Louis Pasteur found that microorganisms require but three things for their development—food, moisture, and warmth. Modern refrigeration of foods in cold dry atmosphere is based upon the simple but fundamental researches of this great benefactor of mankind.

Scientists have long contended that the tremendous waste resulting from complete spoilage of foods is of secondary importance, however, to the dangers involved in consuming partially decomposed foods. Certain of these scavenger-like microbes, which leave in their wake poisonous by-products, do not produce sufficient perceptible evidence of decomposition to warn the unsuspecting consumer. In the struggle for existence between species, man

(Continued on page 96)

New Advances in Farm Credit

R. M. Green, Vice President

Production Credit Corporation of Wichita

Farm communities have long felt the need for credit extended in amounts and for such periods of time as permits of its best use in farming operations. Farmers necessarily take the responsibility for proper use of their credit. At the same time they have had little voice or authority in the granting of this credit. Commercial bank credit, from its very nature, must meet the calls of depositors first. Farm users of commercial credit must use this credit so as to be able to return it to banks upon demand of depositors irrespective of how badly this may affect unfinished farm operations.

The federal land banks have for some time been extending long-time farm mortgage credit. This credit is on land and improvements. Since farm real estate investment over a period of years seldom nets more than 3½ per cent, aside from speculative advances in prices of land, it takes 25 to 30 years to pay for a farm. This is particularly true unless one hits a period of rapidly advancing prices as from 1914 to 1920 and uses it to make heavier payments on the farm property he has rather than to buy equities in a lot of additional property. The land bank has met this need for longer-time land-secured credit.

The farmers' working capital credit has, up to 1934, come mainly from commercial banks of deposit. This source of credit has been satisfactory in good times. When times turn bad, however, depositors make more demands on commercial banks for their money. Farmer borrowers must return

their loans to satisfy this demand no matter what shape it happens to catch them in.

The Agricultural Credit Act of 1933 set up two new farm credit agencies to work under the Farm Credit Administration alongside the federal land banks and the intermediate credit banks that had previously been set up. One of the new agencies was the bank for cooperatives to lend to farmers' cooperative organizations. The other was the Production Credit Corporation, to establish local associations to lend working capital credit to farmers. There are 12 of each of these new credit agencies, one at each federal land bank city.

The Production Credit Corporation of Wichita, Kansas, has set up 42 production credit associations in the four states—Kansas, Oklahoma, Colorado, and New Mexico. These 42 leading associations have a total capital of 6½ million dollars, three-fourths of which is subscribed by the Production Credit Corporation of Wichita and one-fourth by the farm borrowers. There are 15 of these production credit associations in Kansas alone, having a capital of two million dollars. It is the purpose of these associations to furnish farmers working capital credit at a moderate rate of interest and be in a position free from demands of any depositors so they can go along with deserving borrowers in bad times as well as in good times when everybody is willing to lend money. These credit associations are the farmers' present best assurance of a refuge in time of need.

Artists **CAPPER** *Engravers*
Engraving Company
TOPEKA, KANSAS

EFFICIENT REFRIGERATION

(Continued from page 94)

has learned to control these enemies by refrigeration.

Biological processes, like other chemical reactions, are affected by temperature. The surprising effect of temperature upon the rate of bacterial multiplication is clearly shown in the following table, calculated from data reported in the United States Department of Agriculture Bulletin 642.

Analyses of many samples of milk held at various temperatures show:

That in 24 hours each microbe
At 70 degrees produced 3,085
At 60 degrees produced 38
At 50 degrees produced 3.2
At 40 degrees gave no increase

These data forcibly illustrate the fact that at 50 degrees Fahrenheit and above, bacterial multiplication begins to assume important proportions.

Experiments conducted by the Bureau of Chemistry show that the growth of organisms is not only retarded in a well-regulated refrigerator (below 50 degrees), but the poison or toxin-producing capacity of such microbes as the one responsible for botulism is held to a negligible minimum. These investigations proved that this dreaded organism grows and produces toxin at 54 degrees Fahrenheit, the minimum temperature of a poor refrigerator.

Intelligent refrigeration, at temperatures never above 50 degrees, not only protects the family purse from the economic losses resulting from food spoilage, but protects the family against the perils of consuming partially decomposed foods. The accumulated experience of housewives, physicians, and refrigeration engineers is ably supported by scientific evidence that 50 degrees is the danger point.—A. C. Fay, Professor of Bacteriology.

L. A. West, '33, is entomologist for the United States Department of Agriculture and is stationed at San Antonio, Tex.

H. C. Holm, '33, is farming near Dwight, Kan.

J. Elbert Loveless, '33, is farming near Denton, Tex.

Robert E. Terrill, '16, is operating a dairy at Guthrie, Okla.

F. A. Mueller, '31, is with the Tindell Hatchery, Burlingame, Kan.

W. D. Brigham, '14, operates a Guernsey farm near Burlington.

Franklin L. Parsons, '32, is working in the Federal Land Bank at Wichita.

O. L. Buzard, '29, is horticulturist for a 265-acre apple orchard near Kansas City, Mo.

Gilbert C. Moore, '33, is now in the employ of the Perry Packing Company, Manhattan.

Dr. Fred Griffiee, '19, is director of the Maine Agricultural Experiment Station, Orono.

Stephen Vesecky, '33, is working for the Campbell-Taggart Baking Corporation in Kansas City, Mo.

Charles E. Powell, '32, is taking graduate work in landscape architecture at Harvard University.

W. H. Hanson, M. S., '31, is assistant milling chemist with the Commercial Milling Company, Detroit, Mich.

F. G. Ackerman, '31, formerly foreman of the agronomy farm, is now assistant in soil erosion work at Hays.

John I. Miller, '33, secured a graduate assistantship in the Department of Animal Husbandry, Cornell University, Ithaca, N. Y. He is working toward a doctor's degree.

The Kansas City, Nebraska, and Pioneer sections of the American Association of Cereal Chemists met at the college March 31, 1934. There were about seventy visitors.

H. J. Brodrick, '26, is with the United States Department of the Interior and is located at Washington's Birthplace, Va. He is supervisor of grounds and forestry and in charge of wild life resources at the George Washington's Birthplace National Monument.