

**THE KANSAS  
AGRICULTURAL STUDENT  
MANHATTAN, KANSAS**



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MARCH 1935

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# The Kansas Agricultural Student

VOL. XIV

Manhattan, Kansas, March, 1935

No. 3



A RECENT PICTURE OF THE SOUTH GATE OF THE CAMPUS TAKEN AT NOON

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# Agricultural Credit

Maurice I. Wyckoff, '35

The agricultural industry has for a long time been an important and large user of credit. This credit formerly was supplied entirely by individuals and private agencies but during the last 20 years governmental and semi-governmental agencies have stepped into the farm credit field in order to serve more adequately the expanding agricultural business. The Federal Farm Loan Act of 1916, providing for long-term credit on first mortgages, was the first step in this direction. This act established 12 federal land banks which were distributed over the United States. All banks were under the direction of the Federal Farm Loan Board.

These regional banks contact individual borrowers through a system of national farm loan associations scattered throughout the banks' territory. Loans of \$100 to \$50,000 are made to farmers for 20 to 36 years. Payments on these loans provide for both the interest and amortization payments on the principal. The maximum loan may be 50 per cent of the appraised valuation of the land and 20 per cent of the improvements. To receive a loan the borrower is required to buy stock in the farm and loan association equal to 5 per cent of the loan. Thus the borrower becomes a participant in a cooperative enterprise.

The stock market crash and general business decline in 1929 demoralized agricultural credit and caused a drop in the value of agricultural products to a point below production costs, making it impossible for farmers to keep up taxes and interest payments. To rescue and stabilize the farm business various emergency measures have been enacted, some of which are now incorporated in our federal agricultural credit system.

By authority of the Emergency Farm Mortgage Act of 1933, land bank commissioner loans were made possible to

refinance distressed farm mortgages and in some cases to redeem foreclosed mortgages. These loans are not to exceed \$7,500 and are made up to 75 per cent of the appraised value of the land and improvements. They may be made on either first or second mortgages and are for a term of 13 to 43 years, depending on the type of the loan, with interest rates at 5 per cent. Creditors may be asked to scale down voluntarily their claims so the loans may be acceptable. If creditors refuse to cooperate so the commissioner loans are possible, farmers may participate in the Frazier-Lemke amendment to the bankruptcy act. This act allows farmers to retain possession of their property for six years, requiring only 1 per cent interest the first year and increasing regularly each year until it becomes 5 per cent. Debtors may redeem their farms any time during the period of bankruptcy.

A system of 12 regional agricultural credit corporations was set up by the Reconstruction Finance Corporation in 1932. These corporations were organized to finance temporarily both crops and livestock, thus replacing the loans the commercial banks were liquidating. These loans remained on an intermediate-term credit basis at 6½ per cent and averaged \$1,502 per loan. This system served only as an emergency measure and has been replaced by the production credit corporations.

Crop and seed loans were first advanced to drought-stricken areas in 1921. Since then loans have been made in eight out of the last 15 years, requiring over 190 billion dollars in such loans. These loans are made only to farmers who cannot obtain credit from other sources and they are made for only \$500 each. Until recently Kansas farmers dealt directly with the crop loan office in St. Louis. Crop and seed

(Continued on page 79)

# Analysis of Cooperative Associations

Ned O. Thompson, '36

During the last four years an analysis of cooperative marketing and buying associations has been made by the extension division of the college with the aid of local farm bureaus. Most of these associations are known as "cooperative elevators," although many have service station departments and merchandise. The survey and analysis are carried on as an educational program for those associations which request service.

To foster better business methods and to further cooperative marketing and cooperative buying are the goals of this type of service. This work is conducted with each cooperative association for a period of from three to four years after which time the association should be able to make their own analysis.

Analysis work is conducted in cooperation with the Farmers National Grain Corporation and the cooperative regionals. In Kansas there are three regional organizations—Farmers' Union Jobbing Association in eastern and northern Kansas, Equity Union Grain Company in northwestern Kansas, and Farmers' Cooperative Commission Company in southwestern Kansas. The cooperative elevators own stock in at least one of these regionals and tend to market the majority of their grain to that association.

At the present time surveys are being made of 150 cooperatives. For better comparative purposes these are divided into three groups based on their location in the state—eastern Kansas, northwestern Kansas, and southwestern Kansas. This is necessary because the character of the organizations varies considerably throughout the state.

## HOW ANALYSIS IS MADE

Some of the cooperatives make their audits in the spring of the year and others near the end. Thus there are two different periods during the year

when analyses must be made. Mr. Vance M. Rucker and Mr. Glenn S. Fox, marketing specialists, who conduct the survey, visit each cooperative soon after the audit is taken and obtain all the necessary information for the analysis. This material may be divided into four headings—analysis of financial statements, analysis of memberships, analysis of by-laws, and volume of business analysis.

## ANALYSIS OF FINANCIAL STATEMENTS

Of these four phases the financial analysis is the most important because it is made with the aim of improving the cooperative financially. From the audit statement various factors are determined which show the nature of the business as compared with certain desirable standards. The factors of each cooperative for the last three years are then placed on a chart in different colors so that the manager and board of directors may easily see what trends their business has taken during recent years and also how it compared with the desirable standards. An example of one of the charts for a cooperative elevator is shown in the accompanying illustration.

Few if any of the cooperatives attain the desirable standard in every respect but the closeness with which they approach it may easily be seen from the charts. The ratio in which most of the cooperatives are deficient is the ratio of sideline sales to receivables. In the northern part of the state few of the cooperatives have a surplus equal to the standard set up, while in the southwestern section most concerns are near the standard set for surplus to outstanding stock. One may see from this comparison that these cooperatives in the southwest are in better financial condition than those in the northern and eastern sections. However, the southwestern elevators carry a much higher percentage of their current as-

sets in the form of receivables, indicating surpluses in the form of accounts receivable.

The analysis of financial operations shows the amount of margin which should be allowed in the buying and selling of grain and sidelines. It may be seen from the desirable standard that more profit is allowed on the merchandise handled than on grain and more on the handling of other grain than on wheat.

During the the last few years practically all cooperatives have been above the standard in regard to percentage paid in salaries and wages. Yet this is in

reality not so desirable as it might appear. It means that the manager's salary and wages for other help have decreased in proportion to other expenses. Since the success of the business depends to a large extent on the ability of the manager, it is highly desirable to keep wages high enough to attract men with good management qualifications. In northern Kansas cooperatives managers' salaries have decreased from an average annual salary of \$1,611.72 in 1931, to \$1,129.41 in 1933. In southwestern Kansas the decrease has been from \$2,303.58 in 1931, to \$1,647.65 in 1933. The manager's

	WORKING CAPITAL ANALYSIS			ANALYSIS OF CAPITALIZATION			ANALYSIS OF FINANCIAL RESULTS OF OPERATION				ANALYSIS OF VOLUME OF BUSINESS			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
12-28-33	195.15													
12-28-32	146.7													
12-28-31	3.12													
	4.5	22		13	2.5	16.1								44
	4.0	20		12	2.3	14	.89	.87	.85			200	20	19.5
	3.5	18	10.1	11	2.1	13	.91	.89	.87	.70	30	175	16	
	3.0	16	10.1	10	1.9	12	.93	.91	.89	.75	42	150	14	
	2.5	14	10.1	9	1.7	11	.95	.93	.91	.80	54	125	12	
DESIRABLE STANDARDS	2 to 1	12 to 1	40% or under	8 to 1	1.5 to 1	1 to 1	.97 to 1	.95 to 1	.93 to 1	.85 to 1	60% or less	100 members	10 to 1	100%
	1.5	10	50	7	1.3	.9	.99	.97	.95	.90	70	75	8	90
	1.0	8	60	6	1.1	.8	1.01	.98	.97	.95	80	50	6	80
	.5	6	70	5	.9	.7	1.03	1.01	.99	1.00	90	25	4	70
	2.37	4		4	.7	.6	1.023	1.03	1.01	1.05			2	60
	2.24	2		3			1.043	1.05	1.01	1.05			1	50

The factors on the above chart, indicated by column numbers because of space limitations, are as follows:

1. Current assets to current liabilities.
2. Sideline sales to receivables.
3. Percentage receivables are of current assets.
4. Sales to fixed assets.
5. Net worth to fixed assets.
6. Surplus to outstanding stock.
7. Operating cost to gross income.
8. Cost of wheat sales to sales.
9. Cost of other grain sales to sales.
10. Cost of sideline sales to sales.
11. Percentage salaries and wages to total operating expense.
12. Membership needed.
13. Capacity turnover.
14. Loyalty of membership.

Note the "desirable standards" for the various factors considered.

position is in far too many cases held by men who have had experience in grain without the background that a college education would offer.

#### MEMBERSHIP ANALYSIS

The analysis of membership shows the number of members, their loyalty, and the status of the members—whether they are farmers or not, resident or nonresident, landlord, owner, or renter, and so forth. Many concerns have sufficient members but the loyalty of the members is poor or, in other words, they don't give their patronage to the cooperative to which they belong. Hence, an educational program for the present members often is recommended.

#### ANALYSIS OF VOLUME OF BUSINESS

The analysis of volume of business is made largely from the shipping record. It shows, in addition to the amount of business handled, the different concerns to which grain is shipped. It is interesting to note how the volume of business shipped to cooperative regionals has increased during recent years. In 1930 the southwestern cooperatives shipped 29.64 per cent of their grain to the cooperative regionals; in 1933, 70.28 per cent. The northern Kansas cooperatives shipped 49 per cent of their grain to cooperative regionals in 1932 and 54.2 per cent in 1933. These figures show that grain marketing through cooperative regionals is on the increase.

#### ANALYSIS OF BY-LAWS

The analysis of the by-laws of cooperatives is made to see that they contain provisions required for Kansas cooperatives by the Capper-Volstead Act and other desirable features such as provision for a surplus, provision for amendment of by-laws, number of and length of term served by directors, control of stock transfer, purchase of stock by company, and distribution of net earnings.

The analysis of the business of the cooperative, together with an analyz-

ing letter—written from the “cold figure” standpoint by a member of the Department of Agricultural Economics—is taken to the members of the cooperative at a discussion meeting and applied to local conditions by one of the extension men.

#### YOUTH PROGRAM

Many cooperatives find themselves with stock held by nonresidents—often dad “passes out of the picture” without transferring the stock to the son as it should be. To remedy this condition, many cooperatives are trying to get a young man on the board of directors, hoping that he will be a drawing card for the younger farmers.

Another way of interesting young people in cooperative marketing is through the 4-H clubs. Each year classes on cooperative marketing are held for 4-H clubs and afterward an examination over the subject is given. The papers of the girl and boy ranking first in each county are sent to the college where the best girl's paper and the best boy's paper for the state are chosen. The girl and the boy ranking highest in this contest last year were given free trips to the International Livestock Exposition at Chicago by the Farmers' National Marketing Association. The winners of trips were Anna Halovoch, Sublette, and Philip Roup, Timken.

To interest college students in cooperative marketing, Farmers' National is willing to give several students employment in some of their cooperatives during the summer or for a longer period. If there is a good Kansas wheat crop, this plan may be adopted next summer. For the young man who is willing to work this indicates a chance to earn enough to finish college and, at the same time, to secure experience that will be a benefit to him on finishing school. The management of one of these organizations is not only a good position but also an opportunity for a real service to the farmers of a community.

# THE KANSAS AGRICULTURAL STUDENT

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## ARE HIGH SCHOOL SENIORS THINKING?

There are a few important decisions or choices in life that positively modify or determine a career. One of these choices involves the step from high school to college. Usually a student's decision to go to college is made tentatively before his senior year in high school. But the selection of a college and of a curriculum in that college are often perplexing problems to high school seniors.

Well may the high school boy or girl consider seriously the selection of a college curriculum, for college curricula vary widely and each student must select for HIS needs. Starting wrong is costly and may seriously discourage the student. Hence, thought, letter writing, and conferences all have a place in preparing the high school student for making the important step from high school to college.

Does a certain college have the atmosphere that will be helpful to me? Does it have the student body that I'll be proud to join? Does it offer the work

I want and the best work available in my line? I have been with neighbors in the community high school but we have come to diverging roads. I am no longer going with Bill because it is the only thing to do. Bill's choice should be the best for him, mine should be the best for me. If I'm going away from home I won't select a college because it is in the next county. At this point in life I must look some distance ahead or probably be sorry later. In some such way many a high school senior is thinking.

Many readers of this magazine will be interested in college curricula in agriculture. We want to call the attention of such readers to our May issue. It will contain some interesting information on agricultural training in K. S. C. Write for a copy for your personal use. Write for any specific information we might supply. Let a 1-cent post card bring you some information of value. Address,

The Kansas Agricultural Student  
Manhattan, Kansas



**CHECK FRESHMEN AND 4-H CLUB MEMBERS IN THE LITTLE AMERICAN ROYAL**

Who was afraid the freshmen wouldn't do their part in the Little American Royal? They were on the job from first to last and made more than their share of high placings. About 45 per cent of the showmen were freshmen. Six of the twelve placing first and six of the twelve placing second were freshmen. Further, the grand championship in each division was won by a freshman. Yes, the freshmen did their part.

Many of the showmen in our Little American Royals of recent years were 4-H Club members from 4-H Clubs scattered all over the state. The grand champions of both divisions of the show both this year and last year were students who had had outstanding records as members of 4-H Clubs. The enthusiasm and success of former 4-H Club members in these fitting and showing contests speak well for the development of interest in better livestock management in 4-H Club work.

**A KAW VALLEY SCENE**

The picture on the front cover page was taken from Bluemont hill near the Manhattan city water reservoir. In the left foreground is Kansas Highway 13. Across the railroad track and the old bed of the Blue river and in the left center of the picture is the barn of the Cochel-Wishart Shorthorn farm. W. A. Cochel, formerly head of the Department of Animal Husbandry in K. S. C., now managing editor of the Weekly Kansas City Star, is largely responsible for this purebred Shorthorn farm. Neil Wishart, Cochel's partner and the operator of the farm, lives in the house among the trees near the barn.

Looking across the plain, on which is U. S. Highway 40, and the Kaw river, the hills on the far side of the river appear more beautiful for their March snow. In the right background on Mount Prospect may be seen the familiar "K S."

**Personal Qualifications of a Successful Farm Operator**

In a successful farming business the value of the operator cannot be stressed too much. There is no rule definitely stating the percentage that can be attributed to the operator. However, it is safe to say that 50 per cent of success of the business is due to the individual while the other 50 per cent is dependent upon the size, diversity, and productivity of the business.

One of the most important personal elements in a successful farm operator is experience. Without experience the rest of the personal qualifications of a successful operator would be greatly inhibited. He would lack efficiency as an operator because of his lack of background in the agricultural field. He would not be able to do the ordinary farm jobs without a waste of time and money if experience were lacking. Experience teaches the amount of work that can be expected from hired help in a day and helps understand their point of view. The individual may get experience by (1) working as employee, (2) going into partnership with a successful man, or (3) investing as an operator and suffering the losses.

A near parallel to experience in importance is knowledge. Fifty years ago knowledge was not considered very important in making a success but as farming changed from an employment to a complex business knowledge soon became very important. To knowledge and experience must be added skill. Skill makes the individual able to do a larger amount of work with less effort. The skillful man is one who, having experience and knowledge, can execute with readiness and dexterity the usual operations of the farm. The importance of knowledge, experience, and skill is frequently underestimated in farm management.

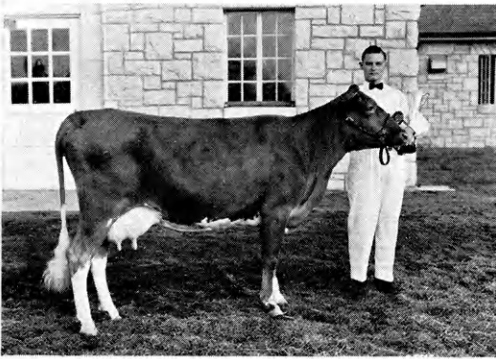
The elements of energy, enthusiasm, faith, and courage are necessary in complete attainment of success. The

(Continued on page 89)

# Farm and Home Week, 1935

## TWELFTH ANNUAL LITTLE AMERICAN ROYAL

The annual Little American Royal is presented primarily for the benefit of Farm and Home Week visitors by students of the Division of Agriculture. The show is sponsored and managed by the Agricultural Association with



THE WINNERS

Above—Willis R. Wenrich and the Hereford steer with which he won the championship in the Block and Bridle Division of the Little American Royal.

Below—Edwin L. Schuetz and the Guernsey cow with which he won the championship in the Dairy Division of the Little American Royal.

the cooperation of the Department of Dairy Husbandry and the Dairy Club and the Department of Animal Husbandry and the Block and Bridle Club.

The twelfth annual show was staged in the judging pavilion Thursday, Feb-

ruary 7, 1935, beginning at 7:30 p. m. In several respects it surpassed the eleven preceding annual shows. The crowd taxed the capacity of the pavilion and scores, if not hundreds, turned away. Interest was keen and the showmanship excellent. The show was well organized and managed and presented throughout on scheduled time.

The show consisted of two major divisions: The Dairy Division (eight classes) and the Block and Bridle Division (four classes). Thirty-eight animals were shown in the Dairy Division, 10 each in the Ayrshire, Guernsey, and Holstein classes, and eight in the two Jersey classes. Thirty-nine animals were shown in the Block and Bridle Division, sixteen beef cattle or calves, seven sheep, ten hogs, and six horses.

Edwin L. Schuetz, freshman from Mercier, Brown county, won the grand championship in the Dairy Division, and Willis R. Wenrich, freshman from Oxford, Sumner county, was declared grand champion in the Block and Bridle Division. Each was presented a silver trophy offered by the American Royal Live Stock Show and the Kansas City Stockyards Company. The official judge in the Dairy Division was R. E. Romig of Topeka, assisted by C. O. Bigford, college dairy herdsman. In the Block and Bridle Division the official judge was A. M. (Andy) Paterson of Kansas City, Mo. On the horse class and the beef cattle class he was assisted by Tom Greer; on the sheep class by Tom Dean; and on the hog class by W. W. Bales. These assistant judges are college herdsman for the respective classes of livestock.

Albert A. Thornbrough, Lakin, president of the Agricultural Association, was master of ceremonies for the evening. Everett L. Byers, Hepler, president of the Dairy Club, did the announcing for the Dairy Division of the contest, and Walter M. Lewis, Larned, president of the Block and Bridle Club,

announced the classes in the Block and Bridle Division.

The contestants placing first and second in each of the 12 classes in the show are as follows:

**DAIRY DIVISION**

**Ayrshire Cows**

ELMER A. DAWDY, Washington  
BOYD D. PHILLIPS, Sedgwick

**Ayrshire Heifers**

HERBERT S. DAVIES, Topeka  
ARDEN E. RINEHART, Greensburg

**Guernsey Cows**

EDWIN L. SCHUETZ, Mercier  
HARLEY A. STEWART, Oskaloosa

**Guernsey Heifers**

CECIL L. BOEHNER, Glen Elder  
D. V. DAVIS, Dodge City

**Holstein Cows**

REX E. WATTS, Havensville  
J. DONALD ANDREWS, Bloom

**Holstein Heifers**

EARL C. BORGELT, Zenda  
CLAUDE L. COLEMAN, Abilene

**Jersey Cows**

WAYNE E. BEER, Larned  
HUGH G. MYERS, Milo

**Jersey Heifers**

J. LEROY YOUNG, Cheney  
GILBERT L. TERMAN, Columbia City, Ind.

**BLOCK AND BRIDLE DIVISION**

**Beef Cattle**

WILLIS R. WENRICH, Oxford  
CARL M. ELLING, Manhattan

**Sheep**

H. FREDERICK DUDTE, Newton  
WALDO W. POOVEY, Oxford

**Hogs**

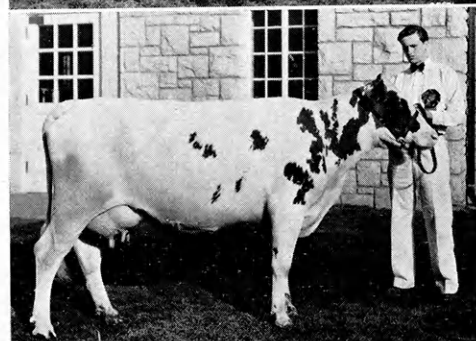
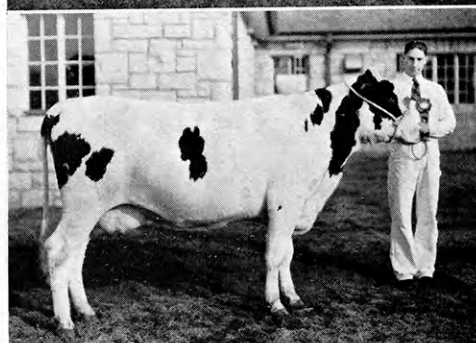
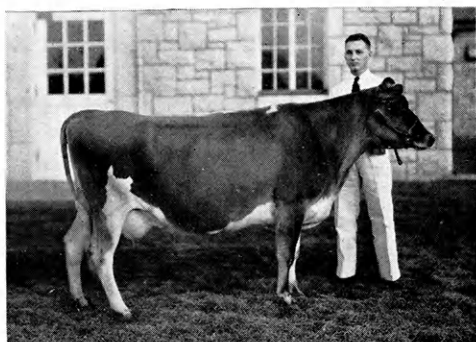
CLARENCE L. BELL, McDonald  
SAMUEL W. KERR, Americus

**Horses**

H. DOIG MARTIN, La Cygne  
LLOYD J. SCONCE, Halstead

At 10 p. m., taps were sounded by Master Robert McFarlane, Manhattan, bugler, which officially ended the show. The contestants were then ushered into the meats laboratory where sandwiches, coffee, and doughnuts were served under the supervision of Charles E. Murphey, famed student cook of the Department of Animal Husbandry. After these refreshments a few short informal talks closed the program for the workers.—Emory L. Morgan, '36, and L. Wayne Herring, '36.

Russell Reitz, '27, is unit director of the Shelterbelt Project in Kansas.



THE THREE RUNNERS-UP IN THE DAIRY DIVISION

Above—Wayne E. Beer and the cow with which he won first place in the Jersey class.

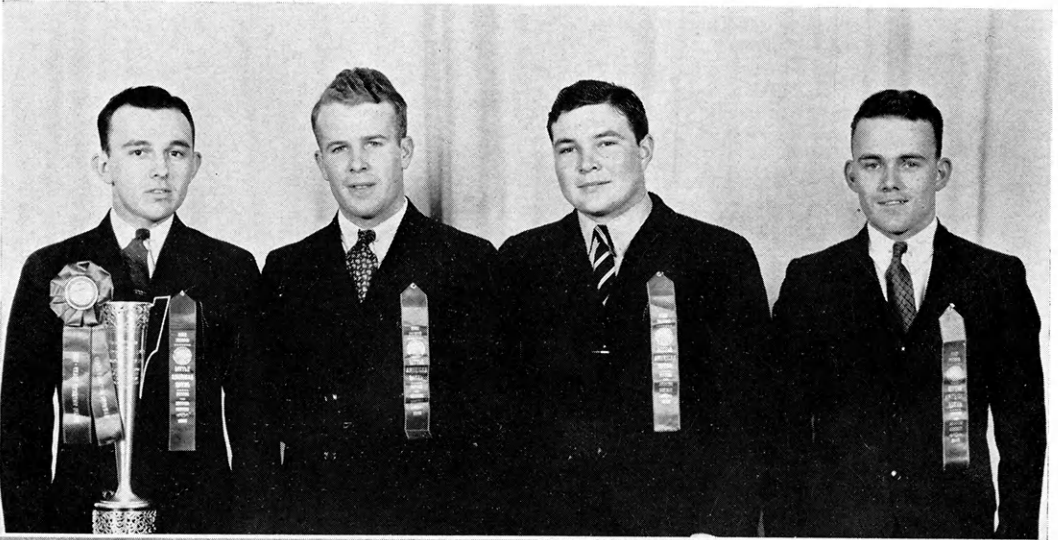
Center—Rex E. Watts and the cow with which he won first place in the Holstein class.

Below—Elmer A. Dawdy and the cow with which he won first place in the Ayrshire class.

**COLLEGIATE 4-H CLUB ACTIVITIES**

The Collegiate 4-H Club of Kansas State College took an active part in the program Farm and Home Week. The club aided Miss Amy Kelly in sponsoring a new feature on the program

known as Home Talent Night. Plays are presented of not more than 30 minutes in length and any county may enter a play. The 4-H Club helped Miss Kelly in selling tickets, ushering, taking care of properties, and changing scenery for the plays. There were 19 club members actively engaged on



CHAMPIONS AND RUNNERS-UP IN BOTH DIVISIONS OF THE  
LITTLE AMERICAN ROYAL CONTEST

Above—Winners in the Block and Bridle Division of the contest. From left to right: Willis R. Wenrich, champion showman; Clarence L. Bell, first on hogs; H. Doig Martin, first on horses; H. Frederick Dudte, first on sheep.

Below—Winners in the Dairy Division of the contest. From left to right: Wayne E. Beer, first on Jerseys; Rex E. Watts, first on Holsteins; Elmer A. Dawdy, first on Ayrshires; Edwin L. Schuetz, champion showman.

committees besides others who helped in the sale of tickets.

The club was asked to furnish three numbers on the Achievement banquet program. The numbers were given by Miss Betty Campbell, who gave a whistling solo, the Girls' String Trio, and the Boys' quartette of the 4-H Club. The trio is composed of Lucille Hernon, Margaret Higdon, and Julia Ellen Crow. James Williams, Clare Porter,

of the visiting poultrymen facts established by recent experiments at Kansas State College and elsewhere, as well as the current economic aspects of the poultry industry.

Prof. L. F. Payne gave the results of heating experiments with White Leghorn hens and pullets during the winter of 1933-'34. It was found that during such a mild winter, heating was not economical. Early morning light-



THE FIVE STATE POULTRY CHAMPIONS

From left to right: Mr. R. C. Black, Enterprise; Mrs. Grace M. Hutchinson, Sabetha; Mr. D. B. O'Neill, Ransom; Mrs. Samuel Wenger, Powhattan; Mr. Bernard I. Mella, Ford.

Wilton Thomas, and Roy Freeland make up the quartette.

Many other members were active in showing either parents or friends of their home counties various interesting phases of the campus and of college life.—Karl G. Shoemaker, '36.

#### FARM AND HOME WEEK POULTRY PROGRAM

The poultry day program of 1935 was arranged to bring to the attention

ing of turkeys secured a very definite response according to the work of Prof. H. M. Scott. Turkey hens receiving morning lights started laying about two months earlier than did those kept in a similar house but unlighted, as well as those kept on an open range. The early-hatched turkeys matured to be placed upon the September market which has proved to be the best over a period of years.

The importance of vitamin G in the

diet of fowls was shown by a series of experiments which had been carried out by Prof. E. R. Halbrook, extension poultryman.

The economics of poultry keeping was discussed by Profs. Morris Evans of K. S. C., and H. L. Kempster of the University of Missouri. Although the present situation is not especially encouraging they expressed the belief that the latter part of the present year would be more favorable for the poultry business.

Prof. C. A. Brandly demonstrated four methods of testing for pullorum disease in fowls and discussed their relative merits. The program was closed with the presentation of the poultry champions for the year and a visit to the college poultry plant.

Five poultry champions for 1933-'34 were named and awarded silver trophies by the Kansas Poultry Improvement Association. Three were selected for the three phases of improvement work in the state. They were Mrs. Grace M. Hutchinson of Sabetha, in the Record of Performance group; Mrs. Samuel Wenger of Powhattan, in the Certified group; and Mr. D. B. O'Neill of Ransom, in the Accredited group. Two other special champions were Mr. Bernard I. Melia of Ford, who won the poultry brooding contest, and Mr. R. C. Black of Enterprise, who won the poultry management contest. Mrs. Wenger and Mr. O'Neill are Single Comb Rhode Island Red breeders, and Mrs. Hutchinson, Mr. Melia, and Mr. Black carry the Single Comb White Leghorn breed.—Dr. D. C. Warren, professor of poultry husbandry.

#### MASTER FARMERS OF KANSAS

The eighth group of Kansas Master Farmers was announced at the Achievement banquet held during Farm and Home Week at Kansas State College. The first group of Master Farmers was selected in 1927, and at the present time 85 farmers have attained this award, 83 of whom are still

living and residents of Kansas.

The qualities considered in making the awards are: Good farmers, good managers, home builders, and leaders in their respective communities. Each farmer receives a gold medal awarded by Senator Arthur Capper who sponsors the Master Farmer project.

The ten farmers selected this year are: G. D. Hammond, St. John; Arthur Cummings, Fowler; Henry Hatch, Gridley; R. E. Parcel, Coldwater; D. W. Osborne, Rexford; W. V. Stutz, Utica; G. W. Forbes, Cherryvale; G. H. Lumb, Wakefield; H. A. Praeger, Claf-lin; and Harry Givens, Manhattan.

The size of the farms operated by these men varied from 130 acres operated by Mr. Givens, to 3,920 acres operated by Mr. Osborne. All operate their farms under improved methods and each depends on livestock both as a source of profit and for maintenance of soil fertility. Legumes are an important item in the crop rotation on their farms. These farmers pride themselves on their modern homes and up-to-date equipment.—Karl G. Shoemaker, '36.

#### KANSAS CROP IMPROVEMENT ASSOCIATION AWARDS

Fred G. Laptad, Lawrence, veteran seed grower, won the grand championship cup in the Kansas blue ribbon seed corn show held in connection with Farm and Home Week, February 5 to 8, 1935. He received the award on a 10-ear exhibit of yellow corn. In 1930 Mr. Laptad was chosen as one of the Kansas premier seed growers. Frank Reisenbucker, Garnett, won second in the yellow corn division.

The best white corn exhibit was shown by Clark Works, Humboldt. Second place in the white corn exhibit went to A. C. Geffert and Sons, Humboldt. Frank Reisenbucker placed third. The awards were announced by Prof. L. E. Willoughby, crops specialist of the college extension service, at the annual dinner of the Crop Improvement

Association held at 6 p. m., February 7. The exhibits were good in spite of the popular belief that Kansas raised no seed corn in 1934.

Frank S. Smerchek, Garnett, was awarded a Kansas premier seed grower's medal. He was the only man so honored for 1934. Mr. Smerchek is a grower of Fulcaster wheat, Midland yellow dent corn, Kanota oats, Black-hull kafir, Atlas sorgo, sweet clover, soybeans, and lespedeza. All varieties grown in 1934 except the wheat were certified by the Crop Improvement Association.

Mr. Smerchek is the eleventh man to receive this premier seed grower's medal since awards were started in 1930. The selections are sponsored by the Kansas City, Mo., Chamber of Commerce and are supervised by the Kansas Crop Improvement Association and the Kansas State Board of Agriculture. The purpose of the award is to give due recognition to the outstanding seed growers of the state in order that the public better appreciate the important part which these men are playing in the advancement of Kansas agriculture. Bruce S. Wilson, '08, Keats, is president of the Kansas Crop Improvement Association.—Donald R. Cornelius, '35.

#### AGRICULTURAL CREDIT

(Continued from page 68)

loan offices are now established in each land bank district and Kansas loans are now made at Wichita.

Since 1916, when the Federal Loan Act created the federal land banks, it has been necessary for the government to become more and more involved in providing a fair system of agricultural credit. As each new emergency arose a new loan fund was established to meet that particular crisis until governmental agricultural credit was extended through four separate organizations. Such a set-up naturally made the agricultural credit policy greatly decentralized and in many cases there was such an overlapping of functions

that certain of these agencies actually competed for farm credit business. Instead of a centralized administration there were four separate boards, each with one executive officer, each organization working independently in providing necessary agricultural credit facilities. Although federal land banks, intermediate credit banks, and regional agricultural credit corporations all used the same districts as the federal land banks, only the land banks and the intermediate credit banks were administered by the same agency. With crop loans even these districts were disregarded while the Federal Farm Board had no regional organization to handle its loan business with cooperatives. Thus a farmer in some instances was required to apply to several different states through separate and distinctly different organizations to obtain his agricultural credit. While such a set-up seemed to be necessary to get agricultural credit started cooperatively, it was in its original form too decentralized and inefficient to become more than a temporary measure. The plans were, therefore, formulated for a cooperative agricultural credit plan to overcome the weaknesses and secure the benefits of the previous temporary set-up.

By executive order of President Roosevelt March 27, 1933, the present cooperative credit organization was set up and became effective May 27, 1933. The Federal Farm Board was abolished as well as the functions of the secretary of agriculture as a member of the board, and administrative powers given to the governor of the Farm Credit Administration. The Federal Farm Loan Board and its functions were abolished and all such powers vested in the land bank commissioner. The seed and crop loan departments and the regional agricultural credit corporations were placed under the jurisdiction of the Farm Credit Administration. All responsibility of the Farm Credit Administration was placed un-

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# Tenmarq Wheat in Kansas<sup>1</sup>

Armand H. Rousseau, '35

It was not until the introduction of Turkey wheat by the Mennonite settlers in 1873 that Kansas came into its own as a wheat-producing state. Previous to that time Kansas farmers had been far from successful in their efforts to grow soft winter wheats from the eastern United States. Turkey represented a tremendous improvement over the soft wheats, which were not well adapted to Kansas conditions because they were unable to withstand winter cold or summer drought. However, the ceaseless activity of plant breeders was destined to produce still better varieties.

Kharkov hard red winter wheat was introduced in 1900 by the United States Department of Agriculture, but never occupied an important place in Kansas. The next step in the improvement of Kansas winter wheat came with the production of Kanred. This pedigree selection was made by Prof. H. F. Roberts in 1906 and was distributed by the Kansas Agricultural Experiment Station in 1917. Kanred was superior to Turkey in that it was more rust resistant and a better yielder.

It has been long recognized by cereal chemists and millers that Marquis hard red spring wheat is an excellent variety for bread making. The first-class milling and baking qualities of Marquis have established it in the markets of the world as a "measuring stick" for all other wheats.

Dr. John H. Parker, plant breeder at Kansas State College, undertook to produce a cross between hard red spring and hard red winter wheat that would have the baking strength of Marquis and the winter hardiness of Kanred, so that it could be safely grown as a winter wheat in Kansas. In 1916 Marquis was crossed with P 1066,

a pedigree strain of hard red winter wheat very similar to Kanred. Several hundred selections of this cross were tested from 1918 to 1924. In 1924 the one now known as Tenmarq was advanced to the field-plot tests.

The name Tenmarq is derived from the pedigree number of the male parent, Ten sixty-six, and the name of the female parent, Marquis. Marquis is the result of a cross by Saunders, the Canadian cerealist, between an early-ripening spring wheat from India and Red Fife, an introduction from Prussia.

The potential worth of Tenmarq was recognized early in its development. It has been tested in field plots at the branch agricultural experiment stations at Hays, Colby, Garden City, and Tribune, and in cooperative tests on Kansas farms. It has also been tested at agricultural experiment stations in Texas, Oklahoma, Colorado, Nebraska, and several other states.

In most of these tests Tenmarq has been found superior to Turkey, Kharkov, Kanred, and Blackhull, the older varieties of hard red winter wheat, in the following characters of vital importance to the farmer: Yield, stiff straw, and earliness. Tenmarq is not so winter hardy as Kanred and Turkey and for this reason is not recommended for north central or northwestern Kansas, Nebraska, or states farther north. Tenmarq is more susceptible to Hessian fly than Blackhull, and usually does not have so high a test weight.

The milling and baking values of Tenmarq have been carefully studied by Drs. C. O. Swanson and E. B. Working of the Department of Milling Industry at K. S. C., and in a number of cooperative laboratories. Even though Tenmarq has lower test weight than Blackhull, it produces a high yield of flour. Tenmarq flour usually produces a loaf that is slightly superior to Turkey and Kanred in volume, texture, and

1. The writer is indebted to Dr. John H. Parker of the Department of Agronomy and to Dr. C. O. Swanson of the Department of Milling Industry for assistance in preparing this article.



color. Tenmarq flour has a wider range of tolerance than Blackhull and does not require heavy bleaching.

In 1934, sixty farmers who are members of the Kansas Crop Improvement Association produced about 30,000 bushels of certified seed of Tenmarq wheat. Most of the seed was planted in the fall of 1934. Many car lots of Tenmarq wheat should arrive at Kansas terminals after the 1935 crop is harvested. Most farmers who have grown Tenmarq are enthusiastic about it and have testified as to its high yield, stiff straw, and earliness.

To give the milling and baking qualities of Tenmarq the "acid test," a composite sample was made of the certified seed grown in 1934 by 60 members of the Kansas Crop Improvement Association. Samples of this wheat with comparable samples of the 1934 crop of Blackhull and a blend of Kanred and Turkey were distributed to ten representative flour-mill laboratories of the Southwest for milling and baking tests. The reports from these laboratories more than justified the faith placed in Tenmarq. Tenmarq yielded more flour of lower ash than either of the other wheats. Baking tests showed that in loaf volume Tenmarq was outstanding, exceeding Kanred-Turkey and Blackhull. Tenmarq was also superior to the other varieties in color and texture of bread.

Some comments from mill laboratories are: "Tenmarq produced the largest loaves of the closest grain and finest texture." "I like Tenmarq and sincerely hope it can be grown successfully and in large quantities." "Tenmarq, from a milling and baking standpoint, satisfies every given condition."

The production, testing, and distribution of Tenmarq wheat promise to be an important chapter in the history of wheat improvement in Kansas. Millers and bakers desire to obtain it in quantity. Tenmarq is well adapted in south central Kansas, and an active campaign to increase the acreage of

this high-yielding, high-quality variety will be carried on in this section of the state during the summer of 1935.

#### AGRICULTURAL CREDIT

(Continued from page 79)

der the authority of its governor.

The plan of the Farm Credit Administration is to centralize farm credit into a unified system organized on a strictly business basis. The intention is that the plan be a cooperative farmer-owned system so that each borrower and only borrowers are stockholders in the particular credit institution from which they are borrowing. Thus all the benefits of the system are shared by the borrower in proportion to the size of his loan. Since each borrower is a part owner in the organization it is to his advantage to keep his loans in good standing.

The federal land banks and federal intermediate credit banks were reorganized and retained in the new system, while other loaning agencies were discarded and replaced by two new group organizations, the banks for cooperatives supplanting the loaning agencies of the farm board, and the production credit corporations organized to supervise the local production credit associations in extending intermediate-term credit. This latter agency eventually will replace the regional agricultural credit corporations now in the process of liquidation. Thus all agricultural credit will be extended through four major divisions.

The governor of the Farm Credit Administration is chief over all and is advised by two deputy governors. He in turn works through the commissioners of each of the four major institutions who supervise the activities of the 12 regional institutions under their direction.

The four institutions are tied up into a unified regional set-up, and are all required to be located in the same city with the same board of directors serving all four banks. They work through

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# The Farm Seed Situation<sup>1</sup>

Lewis S. Evans, '36

The supplies of farm seeds for planting this season are the lowest for many years if not the lowest ever known. This unusual shortage has developed because of two, and in some sections even more, dry years. Because the drought of 1934 was widespread, causing crop failures over a large area, the shortage is especially disastrous. In 1934, conditions were unfavorable for getting stands and many fields were planted two or more times, thus using the seed reserves held over from 1933. Furthermore, because of the low yields and crop failures of the last two years, much grain that might have been suitable for seed has already been fed or sold for feed. The net result is that Kansas now faces the worst seed shortage in its recent history.

Fortunately there is not a deficient seed supply of all crops. There is ample wheat in sight for planting next fall. An adequate supply of alfalfa seed was harvested, although it was produced farther east in the state than usual. The Kansas flax crop was reasonably good last year so that no shortage of seed should prevail in the southeastern part of the state where that crop is important.

A fairly good crop of oats was grown in southeastern and south central Kansas where apparently enough seed is still available. A shortage of oats prevails in northeastern and north central Kansas. A very small barley crop was produced in Kansas last year and if moisture conditions do not improve materially before planting time there will be relatively little barley seeded this year.

There is an apparent shortage of sweet clover seed. If the Biennial White sweet clover cannot be obtained this spring it may be advisable to wait until the 1935 seed crop is harvested

rather than to use an unadapted variety or seed of unknown origin or quality. Sweet clover seeded in August on a good seed bed will usually provide a good supply of pasture the following spring. Considerable Kansas-grown Korean lespedeza is available and more can be obtained in other states, particularly Kentucky and Tennessee. Very little soybean seed was harvested in 1934 in Kansas. Plenty of seed is available in other states but most of the varieties are not adapted to Kansas.

The Kansas corn crop was nearly a failure in 1934 but considerable corn was held over from 1933 and earlier years. It is desirable that germination tests be made on all seed corn and this is particularly true this year. The seed crop of sorghum was nearly a failure in Kansas last year and most of the 1933 reserves were used to plant and to replant in 1934. Also considerable sorghum grain was fed that would possibly have been suitable for seed if the seriousness of the seed shortage had been realized earlier.

The situation regarding forage sorghums is most serious. Very little Atlas was harvested in 1934 and only a little was held over. Somewhat more Kansas Orange and Sumac may be available but the supply of sorgo seed is far from adequate. Seed of varieties of sorgo grown in southern states is available, but for the most part these varieties mature too late to do well in Kansas. Hegari has been suggested as a variety to take the place of Atlas. Although Hegari does well under irrigation it will yield only about one-half as much forage as Atlas or Kansas Orange when grown without irrigation in Kansas. Very little Sudan grass seed was grown this year and only a little was held over. Sudan grass has no substitute in Kansas. Seed from southern states may contain Johnson

1. The author is indebted to Prof. H. H. Laude for much of the information presented in this article.

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# Game Husbandry

Percy L. DePuy, '18

Department of Home Study Service



A new member has joined the ranks of agricultural sciences. It is taking its place beside animal husbandry, dairy husbandry, horticulture, and all of the others. It has existed as an art almost as long as any of the others but only recently has it adopted exact methods and become a science. Being new, it has not yet acquired the dignity of its fellows but that will come with time. This newcomer has been named "Game Management" and may be defined as the science of making land produce sustained annual crops of wild game for recreational use. It might just as well be called "Game Husbandry."

Ancient kings and nobles frequently maintained game preserves and employed game keepers whose principal duty was to prevent illegal hunting. Robin Hood and his Merry Men came into conflict with the game keepers when they slew the king's deer, which was often a much worse crime than killing the king's people. It is only within recent years that scientific knowledge has been employed to help increase the yield of game upon a given area of land. Game husbandry, which has long been an art, then became a science.

Game husbandry is an agricultural science because it deals with animals that are subject to the same laws of heredity, nutrition, and health as are domestic animals. They eat plants, which are governed by the same natural laws as those governing ordinary farm crops. Game animals may live on land that is used for farming purposes and last but not least, they are capable of producing an income for the farmer. There is not a bit of scientific knowledge useful in other branches of agriculture that cannot also be applied to this new branch.

However, game husbandry differs from the other agricultural sciences,

in that it employs natural species instead of the more or less artificial varieties produced by the hand of man. The bobwhite quail, which are being raised on the state quail farm north of Pittsburg, Kan., are exactly like our wild stock, but a Barred Plymouth Rock hen is vastly different from her wild ancestors. She would not last long if turned loose "on her own" to cope with natural conditions.

During the last three centuries North America has been transformed from a vast wilderness teeming with wild animal life to a great industrial country which even imports some game mammals and birds. Since George Washington's time the United States has changed from a nation of farmers and woodsmen to a nation composed largely of city dwellers, yet many people retain their primitive urge to go back to the country for an occasional hunting or fishing trip even if it is for only a few hours. Labor-saving machinery has reduced toil and drudgery and provided more time for recreation. Good roads and improved means of transportation have made it possible to reach hunting and fishing grounds that were formerly almost inaccessible. These factors have produced a tremendous demand for game and fish.

Set over against the increased demand is a greatly diminished supply. This would be an ideal condition if one were in the business of selling the right to hunt and fish, but most citizens are on the other end of the exchange. They are potential buyers and consumers.

Several factors have been responsible for the decrease in numbers of game animals. By correcting them game may be restored to some semblance of its former abundance. Hunting has been a factor in the declining supply but by

no means the only one. A very important factor is the clearing and cultivation of land which has deprived wild animals of their homes, their hiding places, and in some cases even their food. The drainage of lakes and swamps in the northern states and in Canada is doing as much as anything else to reduce the wild duck and goose population to a small fraction of what it used to be. The grazing of domestic animals has frequently destroyed the food and nesting sites of wild creatures. Stray dogs and cats are among the worst enemies of wild life. Diseases, fires, and other miscellaneous factors have done their part to diminish game supplies.

What is to be done about this increased demand and decreased supply of fish and game? The old-time hunter took a pessimistic view and said that nothing could be done. He maintained that when the original supply of game had been exhausted, it was gone forever. The modern scientific game manager is taking an optimistic view. He says that game is a renewable crop like domestic livestock, grain crops, or forests and not like minerals that cannot be replaced. Game can be made abundant and kept that way by wisely controlling a few of the factors of abundance.

The total population of any species of animals living in a given territory is the result of two sets of forces which constantly work against each other. On one side is the inherent tendency of the animal to increase its numbers. Man is learning that there are practical means of speeding up that tendency. One of them is artificial propagation. This method is especially useful with fish and game birds. Under natural conditions, a pheasant hen will lay 12 to 30 eggs in a season and raise five or six young birds if conditions are favorable. If she is confined in a pen and the eggs are gathered regularly, she can be forced to lay from 75 to 100 eggs in a season. Through the use of artificial incubation and brooding,

a large percentage of these eggs will become mature birds.

Pitted against the animal's reproductive ability are all of the forces that tend to prevent increase. Some of the more important of these factors are: Starvation, flesh-eating animals, hunting by man, diseases, parasites, lack of suitable nesting sites and hiding places, and unfavorable weather conditions. Man is learning how to control these factors and thus reduce mortality. He is feeding wild animals to prevent starvation. The elk in one of the pictures accompanying this article (5) were being fed hay. One winter a few years ago, deer were found to be starving along the southern coast of Alaska. They were fed baled hay from airplanes. The planes flew along the shore and the bales were dropped overboard. They burst as they struck the ground and scattered the hay so the deer could eat it.

The game manager's job is to aid the forces which promote increase and to eliminate or control the factors which tend to prevent it. Sometimes the control of just one or two of the checks is all that is necessary to make game plentiful in a certain region.

Investigators have found that there is a certain combination of factors which a covey of quail must have in order to live and thrive. Furthermore, these birds do not travel far during a day, hence the different factors must be found within a few rods of each other. There should be a small briar patch or brushy area in which the birds may hide, some grass for nesting sites, some grain or weed seeds for food, a bit of pasture land, and a sunny, dusty bank where they may come to scratch and rest. A covey of quail may have its home where one or two of these items are lacking, but in a region where there are some quail already, five or six coveys may eventually be established on each quarter-section of land by providing each covey with the proper combination of the above factors. One flock will not share its domain



PICTURES SHOWING SOME PHASES OF GAME HUSBANDRY

1. Wild Canada geese on a game farm in the Ozark mountains.
2. A swan on an Ozark game farm.
3. Ring-necked pheasants in a back yard.
4. Antelope, Wichita mountains, Oklahoma.

5. Elk, Jackson's Hole Basin, northwestern Wyoming.
6. Mallard ducks in a Manhattan back yard.
7. Scene in Crawford County State Park.
8. Scene in Scott County State Park.

*Photos by the author.*

with another, although two small flocks may combine and become one.

It should be stated that too much management, especially such as rearing birds in confinement, sometimes makes the game so tame that hunting it ceases to be any more sport than shooting domestic poultry or livestock.

Conservationists recognize four types of game as follows:

1. **Wilderness game** or large animals such as moose, which require wide expanses of uninhabited land.

2. **Woodland game** such as deer and wild turkeys, which can live in small timbered areas and are frequently found close to densely settled communities.

3. **Farm game** such as rabbits and quail that live on farms where general agriculture is being carried on. This type of game usually can be made a by-product of general farming through a small amount of judicious management.

4. **Migratory game** such as wild geese and ducks, which spend the the spring and summer in one part of the continent and the winter in another.

Each of these types presents its own set of problems to the game manager. Kansas has farm game and migratory game. It can have woodland game if it is willing to pay the price. There are many parts of the state where deer and wild turkeys would thrive but in most cases the land is too valuable for grazing or farming purposes to be devoted to recreation at the present time. Under the plan of the federal government to retire certain areas of agricultural land from cultivation and put them into game preserves, deer and turkey shooting may be possible some day in Kansas.

Game, like any other agricultural crop, must have land on which to live. Farm game can use farm land. Since the farmer lives right on the land, the game's fate is largely in his hands. He can allow it to vanish or he can make

it plentiful as he wishes. In some cases the mere pleasure of seeing the animals about or of hunting them is sufficient incentive to cause the farmer to protect them. It is not likely, however, that farm game will ever again become plentiful unless the farmer is given a financial interest in it. In other words, it must become a source of revenue to him. This is accomplished in England by allowing the farmer to sell either the game or the right to shoot it. He then takes an interest in it and protects it, with the result that wild game is far more plentiful in England than in America, and we import frozen game birds and venison on a small scale from England in spite of the fact that there is a tariff on them. Different plans are being developed in various eastern states and some western states where by farmers and sportsmen cooperate in making game plentiful and the farmer receives a reward for his efforts. In some cases he sells the hunting rights on his farm for enough money to pay his taxes.

There are a number of agencies in the United States whose duty it is to protect our game resources. The United States Biological Survey, which is a part of the United States Department of Agriculture, is the national agency. It has charge of the enforcement of federal game laws and regulations. It maintains game preserves where various kinds of wild animals are protected. These preserves are scattered over various parts of the United States. It is establishing a large outdoor laboratory in the Wichita mountains of southwestern Oklahoma where buffalo, elk, antelope, deer, wild turkeys, and wild ducks can be studied under natural conditions.

With one exception, each of the 48 states has its own fish and game department. Some of them are highly organized, with forces of uniformed wardens. Pennsylvania has a well trained warden force whose duty is not only that of law enforcement but also

game management and the education of the public to protect game and song birds. Under the influence of this department, Pennsylvania has become one of the chief game-producing states in the Union in spite of the fact that it has a small area and a large population. It is, however, favored with a great deal of land which is suitable for little else than forests and game preserves and has plenty of money with which to develop its resources.

Kansas is rapidly developing its fish and game department. It has an efficient fish hatchery at Pratt, which is said to be the largest warm-water fish hatchery in the world. Most large hatcheries are devoted to cold-water fishes such as trout and salmon. This hatchery specializes on such species as catfish, black bass, yellow perch, and crappies, which thrive in the comparatively warm waters of Kansas. The first person to ever hatch warm-water fishes artificially was Mr. Seth Way, fish culturist at Pratt. He has developed a method whereby he can hatch channel catfish in troughs, much as salmon and trout are handled in the large hatcheries.

Kansas maintains a quail farm north of Pittsburg where several thousand bobwhite quail were raised last year. This farm is a model of efficiency and sanitation. Its superintendent, Mr. Dan Ramey, raised a small number of prairie chickens last year. This is one of the few successful attempts to rear these birds in captivity. It may be the beginning of a new and profitable industry. The state is also starting a quail farm in Kingman county.

The state park system of Kansas is being pushed very energetically by the fish and game department. Eleven parks are now completed and eleven more are under construction. Each of them contains at least one lake and provides for the citizens of the state fishing, swimming, and other kinds of recreation where such things are comparatively scarce.

A great deal of interest is now being

shown in the federal government's huge plan of game conservation. It is working with the Agricultural Adjustment Administration. If the United States cannot depend upon a large foreign market for the common agricultural products in the future, it seems necessary to reduce the output of those crops. This reduction is now cared for by agreement between the United States government and each individual farmer. It is hoped that this method can be replaced by a more permanent system. The government is acquiring title to farm land which it plans to take out of ordinary agricultural production and put into recreational use. Much of this land will be used for raising wild ducks, geese, and swans, or as game preserves for these and other classes of wild life. When used for these purposes, part of it can be planted to timber which will not only protect and feed the game but will prevent soil erosion and aid in soil building. If this land is needed for farm crops by future generations, it may be cleared and tilled again while other areas which will be exhausted by that time may be put into game preserves. This is really a long-time crop rotation with recreation being the crop produced while the soil fertility is renewed. It is scientific planning and land utilization.

The Plains Shelterbelt Project which is now being started in Barton, Pawnee, Stafford, Edwards, Pratt, Kiowa, and Comanche counties, also has game conservation as one of its objectives. While the main purpose is to prevent soil blowing and to conserve moisture, some trees and shrubs will be planted for the purpose of providing food and protection for birds and small four-footed animals.

There are a number of private agencies interested in game conservation on a national scale. Among them are the large sportsmen's organizations. Another one is "More Game Birds in America," a nonprofit foundation, endowed by wealthy men and devoted to

gathering and disseminating information about the conservation of game birds in this country. It is comparable to the Rockefeller Foundation for the study of human diseases.

One frequently meets young men who inquire about game husbandry as a vocation or career. There is something about the life in the open which goes along with game husbandry that appeals to most young people. The work is healthful and has sufficient variety to prevent monotony. Heretofore there has been very little demand for men trained along this line but a few state game departments are now hiring men who have studied agriculture and biology to act as executives and advisers. The large federal program of game restoration will also need trained men. Any young man who wishes to prepare for this kind of work must feel sure that he is temperamentally fitted for it. He must love animals and out-door life and be willing to delve deeply into scientific studies.

Only a few schools are offering courses in game management at the present time. The North Carolina State College and the University of Minnesota offer four-year curricula leading to the degree of bachelor of science in game management. The University of Wisconsin has a similar department, except that only graduate students are allowed to enter. A number of institutions are adding research men in game management to their staffs. Ten years ago only five or six scientific investigators were probing into the problems connected with game. Today there are at least 100 scientists who spend their entire time on this subject and the surface barely has been scratched. It can be truly said that game husbandry, which for thousands of years was an art, has at last become a full-fledged science.

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Stanley Caton, '27, is associated with the University of Kentucky as field agent in poultry husbandry.

#### THE FARM SEED SITUATION

(Continued from page 82)

grass, making it dangerous for planting in Kansas.

The present seed shortage will injure Kansas farmers now and for some time to come. They will be tempted to use unadapted seed because of its lower price, though this is rarely a saving in the end. The possibilities of poor germination and mixture with noxious weeds are particularly important at this time. Mediocre varieties may yield reasonably well if the growing season in 1935 is favorable and in this way may continue the less desirable varieties for several years. Seed from many sources is being brought into the state and the farmer must be on his guard constantly against the unscrupulous salesman.

In the face of this complex situation brought about by seed shortage, it is of major importance to consider what can be done to avoid the injurious effects or at least reduce them. In this connection it is suggested that farmers save seed from any supplies that they may have if they are at all satisfactory. Where it is necessary to purchase seed, purchase only seed of adapted varieties for planting if such seed is available. If the seed cannot be purchased locally the Federal Seed Stocks Committee has control of a limited supply of certain varieties of various crops which may be purchased through the proper channels.

The Department of Agronomy of the Agricultural Experiment Station has located supplies of seed and has published lists of these. These lists are available in the county farm bureau offices or may be obtained directly from the department. However, no information is available as to the correctness of the variety name, the purity, or the germination of the seed listed. Seed purchased from these lists should be bought only on sample and official germination report.

More than ever before the farmer



must use care in buying seed. It is important that he know what varieties are adapted and avoid using those varieties which are inferior. It is also important that he buy early rather than wait until planting time. It should become a regular practice to save enough seed from good crops to plant three years in advance.

**AGRICULTURAL CREDIT**

(Continued from page 81)

an advisory committee consisting of a general agent and the presidents of the four banks. Federal land banks continue to loan through the national loan associations while the production credit corporations' loans are made through a similar system of production credit associations. Banks for cooperatives make loans to the various cooperatives, thus replacing the loaning functions of the Federal Farm Board, while the intermediate credit banks continue to act as clearing houses for agricultural paper, especially that of the production credit associations.

It is the purpose of the Production Credit Corporation to assist in organizing production credit associations, to provide capital for them not in excess of 20 per cent of their total loans, and to supervise their business activities. Each production credit corporation has a paid-in capital ranging between 8 and 12 million dollars. These assets are United States government bonds, security investments, and class A production credit association stocks.

There are 15 production credit associations in Kansas and 651 in the United States, which are in reality local financing institutions organized by farmers to make discounting privileges of the federal intermediate credit bank accessible to them collectively.

To obtain a loan the farmer must first apply to the secretary-treasurer of his local Production Credit Association. If the application is accepted, an agent of the Production Credit Association inspects the loan and reports

to the secretary-treasurer. The loan is then acted on by the loan committee and if approved the farmer signs the mortgage. The loan must then be analyzed and approved by the Production Credit Corporation and the Federal Intermediate Credit Bank before the money is advanced.

Thus loans are available to farmers offering adequate security and are made for a period of one year. The interest rates charged vary somewhat but they cannot exceed 3 per cent above the discount rate of the Federal Intermediate Credit Bank.

**A SUCCESSFUL FARM OPERATOR**

(Continued from page 73)

individual without energy will find farming intolerable, and without enthusiasm, faith, and courage he will fall by the wayside when the storm is the thickest.

In the machine age, ability, both mechanical and executive, is necessary. Mechanical ability is necessary in the operation of modern equipment in the most efficient manner. Executive ability is necessary in the planning and organizing of work and in securing most efficient returns from hired labor. The success of an operator also depends on judgment and knowledge of market conditions.

There are many other personal traits that influence the success of the farm operator but those mentioned are essential to the successful organization and management of a farm business.—  
Elmer B. Winner, '36.

A. E. McClymonds, '15, has been appointed regional director of a newly established Soil Erosion Service project in eastern Colorado. His headquarters is Colorado Springs.

W. H. von Trebra, '24, M. S. '34, recently resigned his position as emergency agricultural agent in Wabaunsee county, to accept an appointment as associate agronomist on a soil erosion project in California.

# Exploring for Native Plants

Donald R. Cornelius, '35

An effort was made by the United States Department of Agriculture last summer to collect native plants with possible erosion controlling characters or other economic value. Mr. B. Y. Morrison of the Office of Foreign and Domestic Plant Introduction, Bureau of Plant Industry, had charge of the work. Teams engaged in the exploration and introduction work were sent out from six different centers as follows: Pullman, Wash.; Cheyenne, Wyo.; Mandan, N. Dak.; Tucson, Ariz.; Ames, Iowa; and Stillwater, Okla.

The Southern Erosion Plant Studies project was established at Stillwater, Okla., under the direction of B. F. Kiltz, former professor of forage crops in the Oklahoma A. and M. College. Two teams of two men each met for instructions July 13, 1934. The writer was a member of the team collecting in northeastern Texas, eastern Oklahoma, and southeastern Kansas.

Live plant specimens of nearly all the different species of grasses were collected and sent to the federal erosion nursery at Stillwater to be planted in beds where they can be observed and studied. A small quantity of seed of grasses, legumes, trees, and shrubs having possible economic value was also collected and will be tested in the nursery. Approximately a ton of seed of the more important native grasses was harvested, some being picked by relief laborers and some by mechanical strippers. This seed will be used in making plot tests at Stillwater, and to supply the demands of the soil erosion project. Herbarium specimens were collected to verify the identification of all the different plants that were obtained, which in spite of the drought numbered over four hundred species.

Big and little bluestem are very important pasture grasses especially in the Bluestem region and have a wide adaptation extending over the entire

prairie section. Big bluestem is a sod-forming grass often dominant on the lower slopes, while little bluestem makes a bunch type of growth and favors the upper slopes. They are good forage plants and have possibilities in revegetation work.

Silver beard grass (*Andropogon saccharoides*) produces forage of less value than the bluestems to which it is closely related. However, more seed is produced. It is one of the first perennial grasses to become established in natural succession of abandoned land to grass in eastern Oklahoma and Texas.

In the more arid sections, short grasses such as buffalo and the grammas are well adapted. Since buffalo grass produces a small amount of seed, which is almost impossible to harvest, the best method of establishing a stand involves resodding. The grama grasses produce seed which can be stripped by a mechanical stripper. They may have some value in western Kansas and Oklahoma.

Native wheat grasses, especially western wheat grass, are important hay and pasture plants of the northern great plains and prairie region extending through the central plains. The wheat grasses have good seeding habits, produce good quality forage, and are drought-resistant.

Several paspalums grow in the south which may have possibilities, for example, a stoloniferous species was found that may be used around terrace outlets and dirt dams.

A great number of native legumes occur inter-mixed with the grasses in virgin prairie. Many are unpalatable but about six species of lespedezas are grazed to some extent. Since legumes are important in nitrogen fixation it may be desirable to develop and use some either alone or in mixtures in revegetation work.

Roadsides, railroad right of ways,

(Continued on page 93)

# Tankage as a Protein Supplement for Beef Cattle

Walter M. Lewis, '35

During recent months tankage, cottonseed meal, and linseed meal have been selling at approximately the same price per ton. Consequently, tankage, because of its high protein content, has been the cheapest source of crude protein available to cattle feeders. But despite its advantage from a price standpoint, many cattlemen are reluctant to feed tankage since they have always thought of it as a hog feed instead of a cattle feed. Experimental data indicate, however, that under certain conditions tankage is an excellent protein supplement for beef cattle.

About 25 years ago Prof. H. P. Rusk of the Illinois Agricultural Experiment Station fed blood meal and small amounts of tankage for short periods to fattening cattle. No harmful or unusual effects were noted. In a recent experiment at the University of Illinois, two-year-old steers soon became accustomed to tankage as a protein supplement, and after three or four days cleaned their feed bunks regularly. In this experiment digester tankage containing 60 per cent protein produced as large and economical gains as cottonseed meal.

In the Illinois experiment, tankage, cottonseed meal, and meat scraps were compared as single protein supplements. The tankage-fed cattle had the best appetites and made the largest gains. The steers fed meat scrap dressed 60.7 per cent while those from the cottonseed meal and tankage lots dressed 59.8 per cent and 59.6 per cent, respectively. The carcasses of the cattle fed meat scraps were whiter than those from the other two lots.

At the Minnesota Agricultural Experiment Station three lots of 464-pound Hereford heifers were fed alfalfa and prairie hay. In addition to roughage, the lots received concentrates as follows: Lot 1, corn and lin-

seed meal; lot 2, corn and tankage in sufficient amounts to furnish the same quantity of protein provided by the linseed meal in lot 1; lot 3, corn and a mixture of tankage and linseed meal so that each feed furnished an equal amount of protein and the same total amount as furnished by the linseed meal in lot 1.

The average daily gains for a 77-day feeding period were as follows: Lot 1, 2.81 pounds; lot 2, 2.82 pounds; and lot 3, 2.74 pounds. These are exceptionally good gains and indicate the high nutritive value of the supplements fed.

The Minnesota investigator observed that the heifers showed a marked dislike for the tankage at first but after one week ate their ration as readily as those getting corn and linseed meal.

At the South Dakota Agricultural Experiment Station, young bulls averaging 800 to 900 pounds took up to three pounds of tankage per head daily without refusing a single feed. No harmful effects were noted during a three-month feeding period.

At the Ohio Agricultural Experiment Station, steers fed tankage consumed more feed and made larger gains at a lower cost per hundredweight of gain than steers fed a mixture of cottonseed meal and linseed meal. In a more recent Ohio experiment, one-half pound of molasses fed with tankage improved the steers' appetites for grain and resulted in larger daily gains.

Tankage is also giving good results under average feedlot conditions. A Nebraska feeder who handles several thousand cattle near Omaha every year, uses tankage as the main part of his protein supplement. When the price of cottonseed meal and linseed meal is around \$30 per ton, according to Prof. Ray R. Thalman of the University of Nebraska, this Nebraska

feeder uses one-third each of cottonseed meal, linseed meal, and tankage. But when the price of these products gets as high as at the present time, tankage alone is used. Even though tankage is very high in price, it still forms one-third of the protein supplement used by this successful Nebraska feeder. The results are very satisfactory and he is a firm believer in the use of tankage, both for cattle and for lambs.

Experimental data and the experiences of practical feeders indicate that if the cost per ton of the three major protein supplements, cottonseed meal, linseed meal, and tankage, is approximately the same, tankage should be used in preference to the other two feeds as a protein supplement for beef cattle. However, when tankage is selling at a higher price per ton than linseed meal so that a pound of protein costs the same in either feed, the other nutrients in linseed meal make it the cheaper supplement.

It appears justifiable, therefore, to conclude that with apparently abnormal price relationships, such as those that have prevailed during recent months, tankage should be substituted for cottonseed meal and linseed meal in beef cattle rations. Under normal conditions, however, it would seem that most of the meat meal and tankage produced in this country should be used to balance hog rations instead of being used as cattle feeds.

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## Gardening Among the Rocks

Interest in a new type of gardening, that of building rock gardens, has recently become widespread and is steadily increasing. It has interested many people because rock gardens are easy to make and the results when achieved are fascinating.

Not a great deal of ground is neces-

sary, but whether the area used is a few square feet or a hundred the effect is that a miniature landscape has been created. A well designed rock garden may easily contain, on a small scale, rocky hillsides, narrow ledges, windy heights, a woodland, and perhaps a stream or bog.

A rock garden is not only a garden containing rocks and flowers but a garden having definite characteristics of its own. Its ultimate aim is naturalness and this is accomplished in a number of ways. First of all, the rocks used should not be imported or foreign to the locality. They must be of the type which occurs in the surrounding territory. These rocks are placed in the ground just as nearly as possible as they were found, so the weathered or discolored side shows. In order to retain moisture and form pockets of soil for the plants to grow in they are slanted toward the back. It is better to use larger rocks than many small ones which sometimes give a cluttered-up appearance.

The plants which are used to create this dwarf alpine scene are small and of a fine texture. They must be hardy, however, to withstand cold winters. A few such plants are the allysums, campanulas, dianthus, and phlox. These plants produce a mass of small delicate flowers which form a pretty picture for a rocky setting. Few vines are ever used because they tend to cover up the rock areas and whenever any sort of a tree is used in or anywhere near the garden, it must be of the dwarf type.

Anyone with ambition, a piece of sloping ground, and a few flowers can create a rock garden because a little ingenuity and taste are about all that is required. A few essential facts must be observed, however, one of which is the composition of the soil. The best mixture to use is that of one-third well rotted manure or leaf mold, one-third garden loam, and one-third sand or chipped rock. This soil must have good drainage as rock plants do not do

well when they stand in water or have wet feet.

Since the formal type of garden has ruled for so long this direct change to informality, as given by the rock garden, should be welcome. It is certain that this style of gardening is one of the most quaint and charming types of all.—Mary Jane McComb, '37.

#### EXPLORING FOR NATIVE PLANTS

(Continued from page 90)

and unbroken waste land gave the best locations in which to search for new plants. Seed was collected on the same areas and occasionally a protected meadow would yield some seed, but last summer most of the native grassland was pastured or cut early for hay. Many native plants are not good seed producers. Climatic factors, especially humidity and temperature, affect the quantity and quality of seed. Protection from grazing will have to be arranged before a large harvest can be made. Notes were taken on favorable locations for future use and on the adaptation and distribution of different species. Arrangements should be made for locating and protecting suitable areas.

With the necessity of controlling erosion and reducing crop acreage there is a demand for some forage plant to use on abandoned land. The selection and improvement of our native plants appear very promising in handling this situation, because they are better adapted to the conditions under which they have to be grown than many of the introduced plants. Native plants should be collected and tested to determine the characteristics and adaptation of desirable species. Methods of producing, harvesting, cleaning, and planting the seed must be studied and improved. Plant breeding work might be started in an endeavor to improve the more promising native species.

A. L. Ford, '15, is director of the Shelterbelt Project in South Dakota.

## Strange Trees That Will Grow in Kansas<sup>1</sup>

Many of the trees of Kansas have been killed during the summer of 1934 because of the extreme weather conditions. This loss of trees should not discourage the planting of trees in Kansas but should rather induce special efforts to replace those which were lost. Many of the trees that have in the past shown beauty and vigor may be used in replanting. Such weather conditions as we had this past summer are not likely to appear again in the next 50 or 75 years.

This article was not intended to discuss trees in general but to discuss three strange trees that appear on our campus and will grow in most parts of Kansas.

The ginkgo (*Ginkgo biloba*) falls in a big group of trees with the pines. Although it had many relatives in past geological ages, not even a 42d cousin among them all has survived to the present time. The ginkgo tree is tall, straight, and slender, a good street tree. The leaves are fan shape with a deep notch in their summit. They have parallel veins that show on both surfaces and they fall at the onset of cold weather. The flowering habit is dioecious. The fruits are drupes, similar to a plum or cherry, but different in many ways. They are borne singly on long stems. The shell of this nut is thin and the kernel is sweet when ripe. It is eaten in great quantities by the people of Japan and China. In ornamental plantings it is a valuable tree to place alone. It is also good for street plantings. When used for street plantings only the barren trees, those with staminate flowers, should be planted because the fruits, borne by the pistillate trees, which fall over a long period

(Continued on page 95)

1. Summary of a radio talk given by Prof. R. J. Barnett, January 17, 1935.

# Liming Kansas Soils<sup>1</sup>

Howard J. Haas, '36

The term "agricultural lime" refers to any material containing either calcium or magnesium which, when added to the soil, will correct its acidity. It consists of (1) crushed limestone, (2) burned lime, (3) hydrated lime, or (4) marl.

Crushed limestone is most commonly used in Kansas and may be found in strata at varying depths throughout the acid soil region as well as farther west. Marl may be found in loosely cemented deposits in the western part of the state. Burned lime is produced by heating limestone. Hydrated lime is produced by adding water to burned lime.

These forms vary in their effectiveness in correcting the acidity as shown in the following tabulation:

Form	Pounds equivalent to 2,000 pounds of CaCO <sub>3</sub>
Finely crushed limestone (CaCO <sub>3</sub> ).....	2,000
Hydrated lime Ca(OH) <sub>2</sub> .....	1,484
Burned or lump lime (CaO).....	1,120

The rate of application of the various forms should be in proportion to the quantities given in the table. Because of their caustic effect and high price, the second and third forms are used only to a limited extent.

The value of crushed limestone depends on its purity and degree of fineness. A good-quality limestone should have a calcium carbonate equivalent of between 90 and 100 per cent. Limestone should be fine enough to allow 100 per cent to pass through a 10-mesh sieve and 40 per cent through a 100-mesh sieve. The finer the limestone the more rapidly it will be dissolved and leached away, therefore part of it should be coarse in order that its effectiveness may be extended over a longer period of time.

Lime is needed by the soil to replace the calcium which has been removed either by crops or by leaching, the lat-

ter being the more serious. This loss results in an acid condition which is unfavorable for plant growth. Therefore the most acid soils will occur in those areas of high rainfall. Kansas may be divided into four regions: the southeastern part with the highest rainfall, 40 inches or more annually, has the most acid soils; west of this is the 35-inch rainfall belt, where the soils are medium acid. The slightly acid soils are found in the 27- to 30-inch rainfall belt. The fourth region takes in about three-fifths of the state and is in general a region of nonacid soils. This does not mean that all the soil of eastern Kansas needs lime, for there may be areas which are not very acid.

Of the general farm crops grown in Kansas, alfalfa and sweet clover are the most sensitive to lime, red clover being next. Legumes such as soybeans and lespedeza may be produced on the most acid soils of Kansas, although liming will increase the yield somewhat. Alfalfa and sweet clover are both very efficient in soil improving and should be included in the cropping system.

The rate at which lime should be broadcast varies from one to three tons per acre. The reaction of the soil is the main factor influencing this and therefore should be determined before lime is added. One good application will last at least ten years. It should be spread on the soil long enough ahead of seeding to insure thorough incorporation. It is most economical to apply the lime to plowed soil and work it with subsequent tillage operations. There are several machines for broadcasting lime. These include the drill type, end-gate spreader, special attachments for a manure spreader, and home-made lime spreaders. All of these should be calibrated before using.

Kansas has several soil and crop ex-

1. Excerpts from a manuscript being prepared for publication by Professors H. E. Myers and A. L. Clapp of the Department of Agronomy.

perimental fields in the acid soil region on which experiments have been conducted on various soil types. The rate of application was three tons of crushed limestone per acre. The Columbus experiment field in Cherokee county, which is located on Cherokee silt loam, the most acid soil in the state, gives the following average annual increases over no treatment: Alfalfa, 1.57 tons per acre; corn, 9.89 bushels; flax, 3.86 bushels; oats, 6.5 bushels; wheat, 4.93 bushels; and soybean seed, 1.41 bushels. The Moran soil and crop experiment field in Allen county is located on a clay pan soil, but it is not so dense as that on the Columbus field. Lime on this field gave the following increases over no treatment: Alfalfa, .68 tons per acre; corn, 6.2 bushels; oats, 4.43 bushels; wheat, 1.11 bushels; red clover hay, .31 tons; soybean hay, .05 tons; and soybean seed, .39 bushel. Lime alone on these fields gives sufficient returns to justify its use. Because of the relatively greater response of alfalfa, sweet clover, and red clover to lime, this treatment should be applied previous to seeding these crops.

Experiments in the use of lime have been carried on at Manhattan for more than twenty years. Results show no profitable increase from the use of lime.

The lime needs of a soil can frequently be determined by chemical soil tests. Such tests are made free of charge on samples sent to the Department of Agronomy, Kansas Agricultural Experiment Station, Manhattan, Kan. Several samples should be taken from different parts of the field to about seven inches deep. These should be mixed thoroughly and about one pint of the sample forwarded to the Agricultural Experiment Station at Manhattan. In an accompanying letter a description of the land and the crops to be grown should be given.

### STRANGE TREES IN KANSAS

(Continued from page 93)

of time, are more objectional than mulberries on sidewalks.

The Russian olive (*Elaeagnus angustifolia*) is grown widely in Kansas. This tree was imported from Russia. It is a deciduous tree with leaves that are narrow, light green above, and grayish beneath. The flowers are small, pale yellow, and fragrant. This tree is very hardy and can grow in nearly all parts of Kansas. The Russian olive has been used for ornamental plantings and shelter and wind-break belts throughout the state. Its only requirements are a sunny position and a well drained soil.

The pagoda tree (*Sophora japonica*), native to Asia, is another odd tree that can be grown in eastern Kansas. It likes a fertile well drained soil and full sunlight. This tree has beautiful individual flowers that are yellowish white. The seed pods are also attractive, having a yellowish white to amber color. This tree is quite hardy and is recommended for the eastern half of the state.

So among the strange trees which have come from the ends of the earth, here are three that find climatic and soil conditions in Kansas much to their liking. In addition to being strange and different these trees are all valuable and deserve wider planting than has been afforded them in the past.

Clarence L. Gish, '34, is superintendent of the college poultry farm.

F. A. Mueller, '31, is employed by Swift and Company, Hutchinson, Kan.

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#### VIEW OF THE COLLEGE FROM THE MANHATTAN COUNTRY CLUB HILL

Anyone who has been on the college campus will recognize college buildings from left to right as follows: Nichols gymnasium; college auditorium; Calvin hall (home economics building); Fairchild hall; Anderson hall (Kedzie hall on left); Education hall; Dickens hall; chemistry annex No. 2 (the old smoke-stack on the shops of the engineering building in the rear); college library (water tower in the rear); college power plant; Veterinary hall; the two wings of Waters hall (agricultural buildings) with old machinery hall showing in the background and just to their left; between Waters hall and the camera, Van Zile hall, women students' dormitory. In the distant background to the left may be seen the small city water tower, Sunset cemetery being still farther in the background, while the distant background in the center and to the right shows hills on the far side of Wildcat creek.

Kansas State College offers curricula in agriculture, agricultural administration, milling industry, landscape gardening, and veterinary medicine; in the various lines of engineering, including agricultural, architectural, chemical, civil, electrical, mechanical, landscape architecture, and architecture; in home economics, including home economics and nursing, and home economics with special training in art or institutional economics and dietetics, or journalism; in general science, industrial journalism, music, physical education, commerce, and accounting. It also offers in the Division of Graduate Study a large variety of work leading to higher college degrees. The extension service includes a wide variety of correspondence courses. Write for a college catalog or for information on any phases of work in which interested.