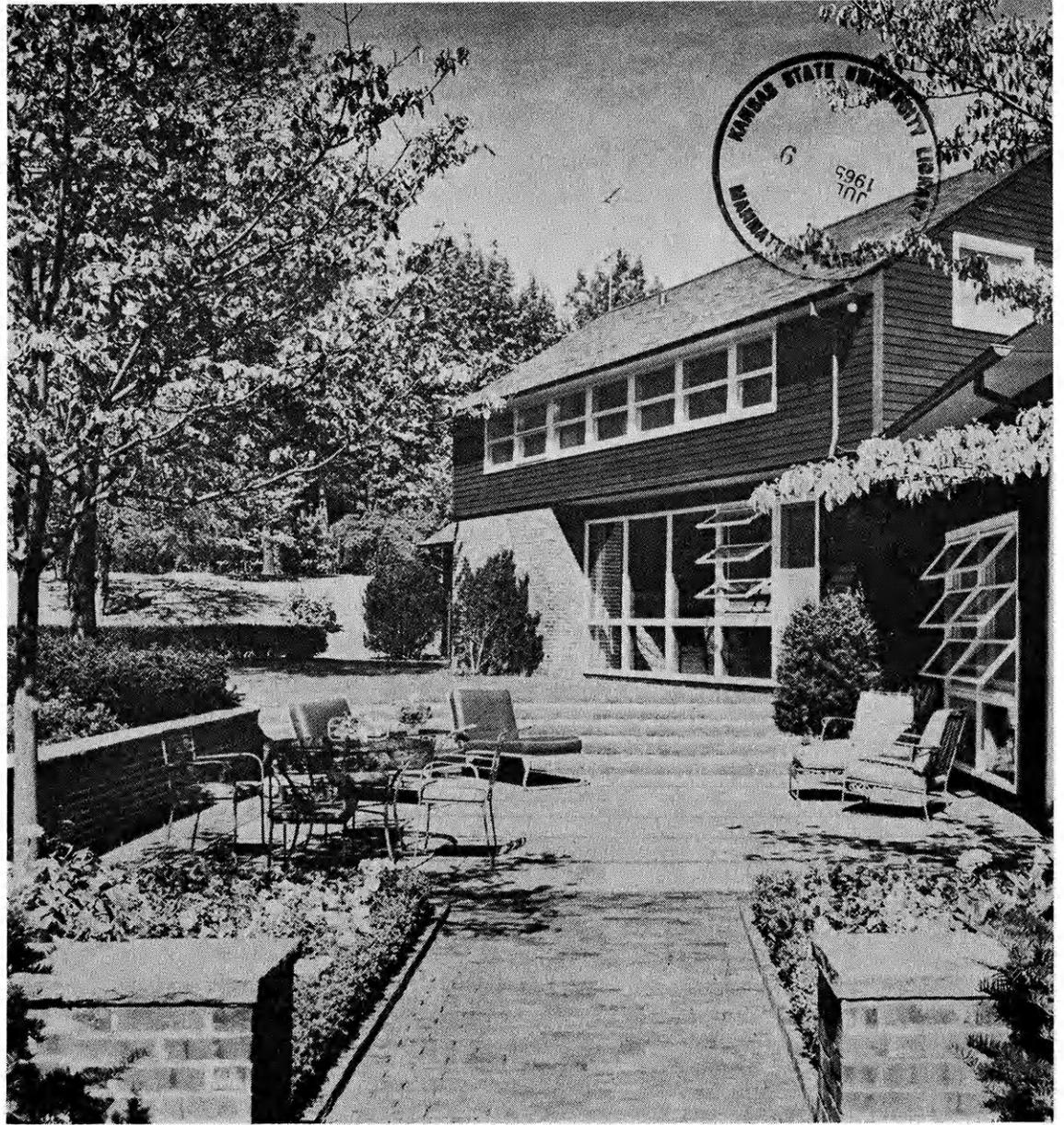


S
K3
43/
16

SPJ
c1



KANSAS STATE UNIVERSITY
HG STUDENT MAY 1965
FARMS--Places to LIVE and to MAKE A LIVING... page 6

Kansas State college of agriculture & applied science

This cow is stopping horn flies



Just by *eating* something?

Sure—when the “something” is MoorMan’s Rid-Ezy® Medicated.

Rid-Ezy is a combination of balanced minerals plus the systemic insecticide *ronnel* that does away with the need for spraying or other horn fly control.

When fed free-choice to beef cattle on grass, Rid-Ezy breaks the life cycle of horn flies.

MoorMan Research tackles stockmen’s problems

Rid-Ezy is the direct result of the kind of practical understanding of stockmen’s needs that is typical of MoorMan Research.

● We knew that beef cattle on grass *must* have balanced minerals to aid reproduction, promote milk flow

and stimulate growth and gains.

But we also knew that cattle can’t make profitable use of grass and minerals if they stop grazing and waste energy to fight pesky, blood-sucking horn flies.

And we knew it takes time, work and trouble trying to control horn flies with sprays or back rubbers.

Free-choice Rid-Ezy supplies minerals, too

Seven years of research—including field testing with cooperating farmers and ranchers in 14 states—went into building a self-feeding product that would supply needed minerals and control horn flies at the same time.

That product is Rid-Ezy—further proven by two years of free-

choice feeding by cattlemen in more than 30 states.

Rid-Ezy stops cattle grubs, too—with summer-long self-feeding on grass or a 14-day mixed-feed treatment in the feedlot.

It’s just one of the many research-proven leadership products available to livestock producers through the frequent, direct visits of their service-minded local MoorMan Men.



Moorman Mfg. Co., Quincy, Illinois

KANSAS STATE UNIVERSITY AG STUDENT

Vol. XLIII

May 1965

No. 6

The Ag Student Magazine is written and edited by students interested in agricultural journalism, and is published by the Agricultural Association of Kansas State University of Agriculture and Applied Science, Manhattan, Kansas, in October, December, February, March, April, and May. Subscription rates \$1.50 a year; 2 years, \$2; single copies by mail, 30c, at office 20c.

The Ag Student is a member of Agricultural College Magazines Associated, and its advertising agency is Littell-Murray-Barnhill, Inc., 369 Lexington Ave., New York 17, N.Y.

Second class postage paid at Manhattan, Kansas.

It's Not "If" but "When"

Japanese Beetles Invade Kansas

By Tom Darnell

"JAPANESE beetle grubs and adult beetles cause many millions of dollars worth of damage each year," said Dr. T. H. Lord, bacteriologist at Kansas State University until recently, "but a natural bacterial infection that will destroy the larvae or grubs may effectively control them."

Japanese beetles were accidentally introduced into this country from Japan. They were first found at Riverton, New Jersey, in 1916, and have since become serious economic pests.

The broadly oval adults are about a half inch long and a fourth inch wide, with bright metallic green bodies and darker green legs. Their hard wing covers are coppery brown and extend almost to the tip of the abdomen. Just behind the wing covers are two small tufts of white hairs. Five white patches along each side help identify them. The patches identify Japanese beetles from beetles that resemble them.

The Beetles Work West

Since 1921, the beetles have been working their way westward at five to ten miles a year. Adult beetles are spread by wind, float on debris in streams and hitch hike on busses, cars, planes, trains, and trucks. Larvae and eggs may be spread in the soil when it is moved.

Because of the serious damage the grubs and adults cause, their move-

ments are carefully watched. Anyone finding a suspected Japanese beetle in a new location should take it to the nearest federal, state or county agricultural official. He will make certain that it is a Japanese beetle and take the necessary steps from there, Lord advises.

Temperature and moisture appear to be important influences in the beetles' spread beyond presently infested areas, according to Dr. Herbert Knutson, Professor of Entomology at Kansas State. The following conditions help determine the beetles' spread westward to Kansas and other adjacent states: 63 to 82 degrees Fahrenheit in the upper 3 inches of the soil and about 10 inches of moisture uniformly distributed during the summer.

Rapid freezing and thawing, along with high soil temperatures, kill the grubs.

Huge Populations at First

Beetle populations tend to be huge for the first several years and then decline considerably after that, Knutson said. In 1929, southern New Jersey had an estimated 500 million adult beetles per square mile. Then the population started to decline and by 1945 they were not considered of major economic importance in most areas of southern New Jersey.

"Population declines are thought to be caused by naturally occurring parasitic and predator infections," Knutson said, along with people getting accustomed to living with

the beetle. Over 25 different soil microorganisms can infect the beetle. Wasps imported from Korea and Japan parasitize the grubs and thus help to some extent control them.

The beetles attack more than 275 economic plants, said Knutson, including field and garden crops, fruit and ornamental trees, and flowers. Grasses are attacked by the grubs.

Hit Corn and Soybeans

Corn and soybeans are the only major field crops they damage severely. The adults eat silk of corn,

which damages grain set on the ears.

When the grub population is dense enough, grubs seriously damage seedling corn, beans, cabbage, tomatoes and other truck and garden crops, Knutson said.

They Also Like Fruit

Adults readily eat the foliage of apple, cherry, and plum trees and fruits of apple, peach, nectarine, plum, and quince.

Shade trees are well liked by the pests; among their favorites are Japanese maple, Norway maple, black walnut, pussy willow, American chestnut, grey birch, and American, English, and Chinese elms.

The adults are also fond of hollyhock, zinnia, and dahlia, and they will feed on geranium, gladiolus, iris, peony, phlox, and sunflower.

Roses are particularly attractive to the pests—they attack both rose blooms and foliage.

Grubs Like Golf Course Grass

The grubs, which prefer tender grasses, are most abundant in well-kept lawns, pastures, and golf courses. They burrow just below the soil surface where they cut and eat the tender grass roots.

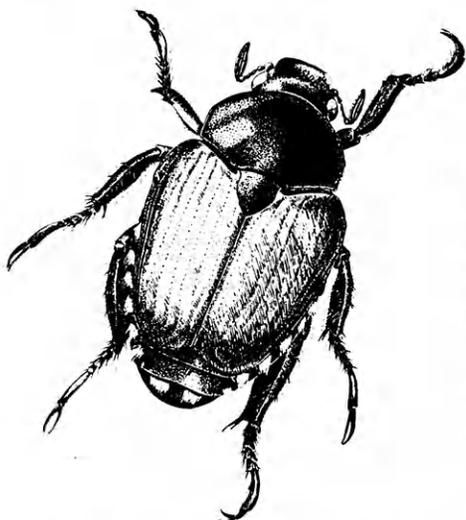
Beetles and larvae can be controlled rather effectively by spraying plants and treating the soil for the grubs. Bacterial infection, according to Knutson, can do away with these expensive and time-consuming methods if the person is willing to put up with severe damage for several years

until the bacteria get a foothold. Bacteria, when effective, eliminate risks of insecticides being harmful to animals and humans, when not applied judiciously.

The bacterial infection, called "milky disease" of Japanese beetles, occurs naturally. It was discovered in New Jersey in 1933.

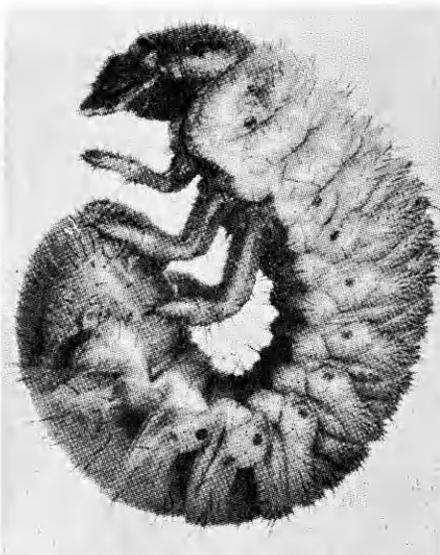
A bacterium is a single-celled plant too small to be seen except through a microscope. It is responsible for many plant and animal diseases but is used for such beneficial processes as making cheese.

Because of expensive methods of obtaining and growing large quantities of the "milky disease" bacterium, called *Bacillus popilliae* by scientists, cheaper methods are being developed, Dr. Lord said.



Adult beetle makes its appearance in June and July. Note the white tufts. Six times natural size. (Photo—courtesy USDA.)

Research by U.S. Department of Agriculture scientists shows that the bacterial cells can be grown on corn sugar and some other nutrients. However, Dr. Lord said, more information is needed on how to get



Full-grown Japanese beetle grub. Six times natural size. (Photo—courtesy USDA.)

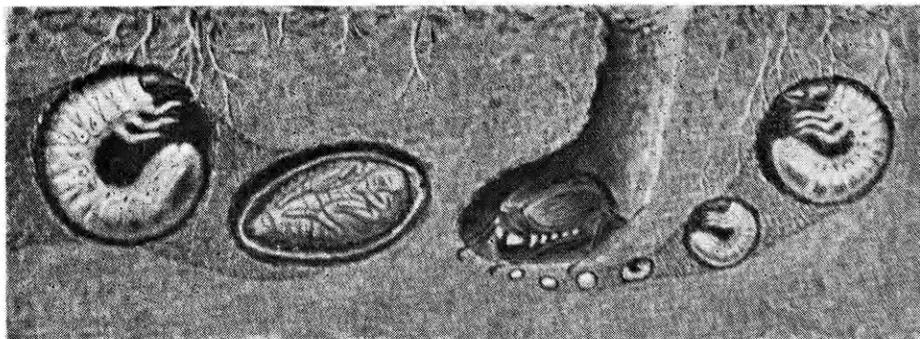
the artificially grown cells to develop spores in beetle grubs.

Milky Disease Needed

The spores survive in the soil and cause "milky disease." As a feeding grub works its way through the soil, it ingests spores. The spores then germinate or grow and penetrate the wall of the grub's intestine and enter his blood. There the bacteria multiply and form new spores. After the spores appear in the blood of a grub, the grub's development ceases. The speed with which the disease becomes established depends on the number of grubs in the soil. After the infected grub dies, billions of spores are released back into the soil and will infect other grubs, said Knutson.

Spores of *B. popilliae* remain in the soil many years but it may take up to six years to get a high rate of infection. The time required is a drawback to this type of control, Dr. Knutson said, because most peo-

Left to right, mature grub (late spring); pupa; beetle laying eggs (summer); developing grubs (late summer and fall); all are just over twice natural size. (Photo—courtesy USDA.)



ple want a method that will work immediately.

Under contract with the USDA, Dr. Lord's research was to find a cheap and effective method of growing and stockpiling the bacterial cells instead of the spores. Other bacteriologists are investigating methods of preserving cells in storage, ability of cells to cause "milky disease" after being preserved, and their effectiveness in the soil. Freezing and drying the cells has been tried, Lord said, but the survival rate has not been good. USDA scientists hope to develop or discover a way to store the bacteria dry and alive so at least half live six months and retain the ability to kill the grubs.

Kansas Tests Disease Cells

Dried cells will be placed in Kansas soils to see how long they stay alive. They will then be sent to Peoria, Illinois, where Japanese beetle larvae are kept at a USDA laboratory. USDA scientists there will see if bacteria stored in Kansas soil can give larvae "milky disease."

Effective techniques will need to be developed to infect the soil with the cells and still have a large percentage of cells live and be infective to the beetle grubs.

The Disease Is Safe Control

Although the bacteria kill the Japanese beetle grubs, they do not infect any other plants or animals, Lord said, so they are a safe control.

Scientists at several other universities are working on related aspects of the problem, with money for their studies, like that for the Kansas studies, from the USDA. However, live beetles themselves cannot be imported for study in Kansas because some might escape.

"One thing is certain: if and when the Japanese beetle gets established in Kansas, and it's more 'when' than 'if', it will become the number one insect pest. It probably will be several years before 'milky disease' can bring it to a level where we can live with it," Knutson said. "However, these bacteriological investigations are very promising and important," he added.

College is a four year loaf made from the flavor of youth, and the old man's dough.

Want to take on animals, diseases, fires, insects?

Prepare Yourself in Forestry Curriculums

By Lois Hudgins

BEING a forester is a demanding, time-consuming job—but the rewards are great. A forester can see the results of his labor in the great, green forests of a nation, and he feels that forests are a mainstay in our natural resources and of our economy.

A forester pits his skill, faith and courage against natural elements, animals, disease, fire and insects. He may not live to see the results in board feet of lumber from a seedling he planted, but his work is indispensable.

The first step toward a career in forestry now is offered by the Department of Horticulture at Kansas State University, Manhattan. A two-year pre-forestry curriculum was inaugurated two years ago with seven students enrolled. Twenty-two are now in the curriculum.

The process of becoming a forester has been aided by an arrangement with the University of Missouri, Columbia, which allows students at K-State to transfer to Missouri at in-state tuition fees. Students who begin their college education at K-State in pre-forestry can go to Missouri to complete their degree without paying nonresident fees there.

More Jobs than Foresters

Paul Roth, head of the pre-forestry curriculum, says the number of jobs in the profession is greater than the number of qualified persons available. Graduate assistantships in schools where degrees are offered also outnumber applicants.

The KSU curriculum was set up to satisfy entry into as many existing four-year curriculums as possible.

"When we started, we obtained catalogs and class descriptions from 12 different universities," Roth said.

The two-year course permits a stu-

dent to develop a basic background leading to an area of specialization such as forest management and production, wood utilization, forest recreation, marketing and others. The student might also choose to enter a related field such as forest entomology or pathology, watershed management or forest engineering.

Could Stay at KSU

If the future forester preferred, he could spend all four years at K-State. Bachelor of science degrees with specialization in municipal or urban forestry, park management, arboriculture, nursery management, wildlife conservation or fishery biology are offered.

Roth said it also would be possible for a student to major in entomology or pathology, with special emphasis on forestry, and get a degree in the combined fields. He then could enter a forestry curriculum at the graduate level.

Urban or municipal forestry deals with work in special problems found in urban areas such as spraying, planting programs, designing park areas, etc. A regular forestry background would be the same in this field as in others.

Expanding federal and state government programs, increased public use of recreational facilities and development of municipal forestry programs provide excellent opportunities for employment and promotions in all fields of forestry.

Also a Steppingstone

In addition, a qualified forester may use his position as a steppingstone for promotion in other related lines such as administration, public relations, sales, research and education.

Jobs as consulting foresters and with commercial companies are also available; and the growth of forest conservation is providing even more positions.

Forest conservation is the study of

development and progress of private, state and federal lands. A forester working in that capacity would deal with forestry as public policy, planning its role and importance in the economy and in forest recreation.

Basic principles taught at KSU hold true in the Midwest, South, East Coast, Great Lakes states and in the Northwest.

When a student leaves KSU, he could select a college in the area where he wants to work. The University of Missouri is the place to go without paying out-of-state tuition fees.

Transfer to Any University

In the past, Roth said, K-State students moved on to the University of Idaho, Purdue University or Colorado State University, for specializations they desired.

High school students thinking of entering forestry should take all the mathematics, English and basic sciences available, Roth stressed.

A survey by the University of Washington's College of Forestry showed that when a forestry student failed to graduate, in almost every instance failure was blamed on inadequate preparation in mathematics and English.

Of course, a love and feeling for nature and outdoors are essential. College courses may include botany, biology, chemistry, surveying, geology and engineering.

At K-State, 11 foresters are part of the departmental staff involved in teaching, research and extension functions. Other staff members in related fields supplement the faculty.

Department of Horticulture facilities include nearby forestry research plantings and laboratories. Field trips to several forest industries in the state are conducted as part of KSU course work.

Interested persons may get additional information from the Department of Horticulture, Waters Hall, Kansas State University, Manhattan.

It's Only a Way To Make a Living?

By Mary Ann Covalt

SOME may argue a farm is a business, a way to make a living rather than a place of beauty, but Dr. Robert Ealy, head of horticulture at Kansas State University, thinks the two ideas do not conflict. A well-planned, attractive outdoor area increases farm value as well as its beauty. Also perennial trees and shrubs grow each year which increases their value still more. "They appreciate rather than depreciate year by year," he said.

"Consider two farms for sale that are identical except for planting," Ealy continued. "Buyers will be attracted to the one with beautiful trees, shrubs, grass, flowers."

Ealy thinks there's no doubt that well-handled plantings increase the value of a farm. Often the pleasure of developing and maintaining beautiful surroundings outweighs the monetary value added.

Rural Landscaping Popular

Landscape planning in rural areas is nearly as popular as in suburban areas, Ealy said. He thinks modern conveniences and machines on farms today give farm people more time for beauty—as from landscaping—and more time to do something about it. People need satisfaction during their free time, and landscape planning seems to provide it. Also, many housewives today have a college degree. Their interests are much wider, they have more time outside, and they are concerned with how outdoor areas appear.

Charles Parks, associate professor of landscape architecture, said that you can do a landscape architectural development economically and satisfactorily if you first draw a plan to scale on paper. That lets you see the parts or problems as a whole. "Mistakes can be erased from paper," he said, "much easier than repouring walks and rebuilding fences."

Fenced in His Combine

While an extension specialist of landscape architecture, Parks found

a farmer who reminded him of a cartoon showing a person who had painted himself into a corner. The farmer, working without a plan on paper, had fenced in his yard with galvanized steel posts. It gave him an expensive little drive too narrow for his combine. Fortunately, the farmer discovered his error before his wheat ripened.

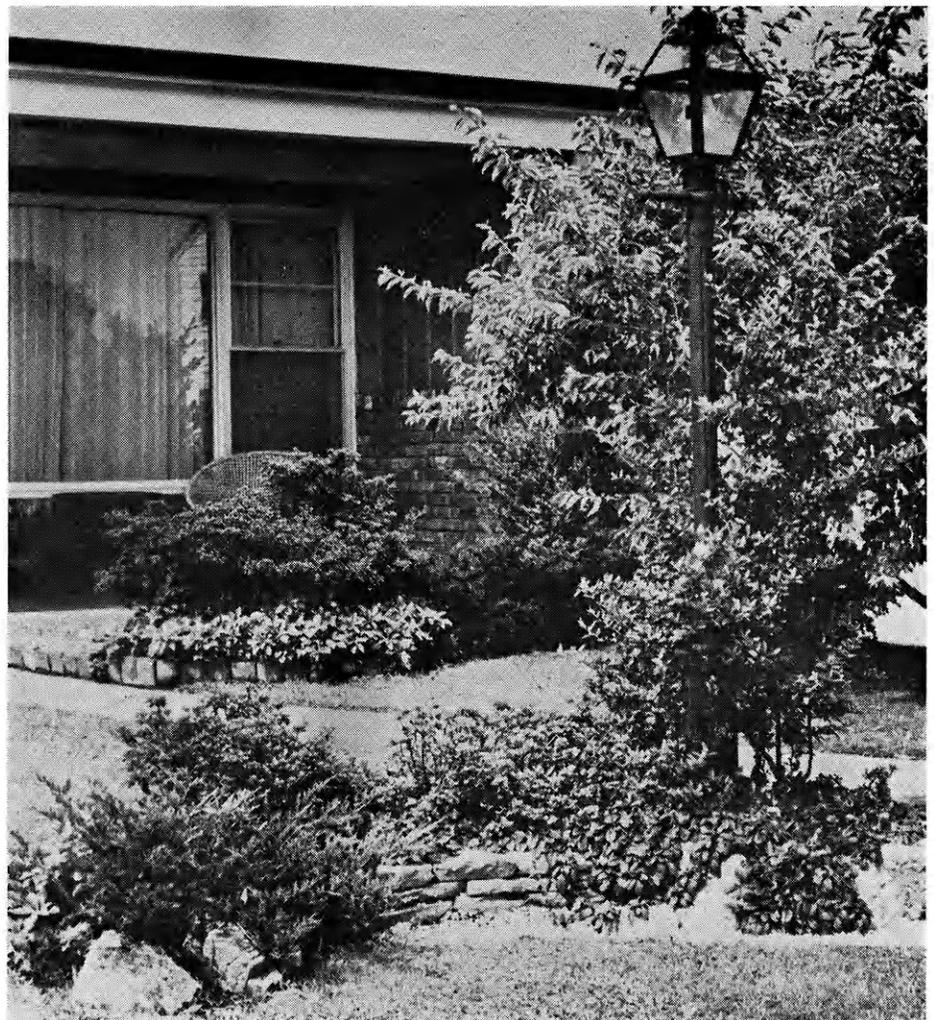
"Also planning on paper lends itself to year-by-year budgeting without losing sight of the whole," Parks pointed out. The expense of a landscape development can be spread over time by gradually developing the plan.

Obtaining functional plants is another factor often overlooked by people planting on their property, Parks said. In other words, the size and shape a plant will be when mature is not considered when it is planted. A person may see a "cute little tree" at a nursery, buy it and plant it by his front door. A few years later, he may have the choice of moving his front door or chopping the tree down because it no longer is either cute or little. It's blocking the entrance to his house.

Need Three Yard Areas

Parks said, "Most homes need three definite yard areas—the approach or

Ideally, each farm home should have three yards. Here is an outdoor living area (one of the three) that uses the beauty of plants and landscaping to provide privacy and enjoyable outdoor summer living.



public area, the private or outdoor family living area, and the service area.

"The public area includes the front lawn, drive, and public entrance. One of the biggest landscaping problems in rural areas is to get guests to enter the front door. The landscape plan has to be designed to allow guests to drive conveniently near the front door.

One for Outdoor Living

"The private area is for such outdoor living as cooking and eating. A problem here is to construct such an area close to the kitchen for convenience, and away from livestock lots.

"The service area is for necessary but usually unsightly things like clotheslines and fuel tanks."

Both Ealy and Parks agree that spring is the season for landscape changes. Plant replacements, treatments, and landscape plans should be made so actions you take will increase your future pleasure as well as the value of your place.

The nervous bridegroom to the minister after the ceremony: "Is it kistomary to cuss the bride?"

FARMERS CO-OPERATIVE ASSOCIATION

PETROLEUM
PRODUCTS

•
FEEDS

•
FERTILIZERS

Main Office—130 Pierre

Manhattan, Kansas

Phone 6-9467

A Hedgerow Beats No Protection from Wind, But Two- or Three-row Belts Are Better

By Mary Ann Covalt

WHEN I was small, my family lived on a farm with almost every field surrounded on all sides but the north by hedgerows. My dad always wanted to remove those hedges; my mom always argued against it. I have always wondered who was right.

Harold G. Gallaher, state extension forester at Kansas State University, says Mom was right. If Dad were living, he might wonder at least a little bit about these professors.

Gallaher says a series of tall-growing 2- to 3-row belts are better than a single hedgerow for wind protection, but that a single row is better than no windbreak at all. He said Dad probably looked at several crop rows next to the trees. That's where crops grow poorly because they compete with the trees for moisture and nutrients. But, said Gallaher, the over-all effect of windbreaks is good.

A booklet called "Tree Windbreaks for the Central Great Plains" published by the U.S. Department of Agriculture reports windbarriers are good investments on the Great Plains, as they protect field crops from the extremes of Plains climate. The extremes include years of low rainfall and high summer temperatures and years of scanty snowfall and low winter temperatures. Windbarriers also provide protection from persistent and strong winds during the late fall and early spring when most soils are vulnerable, not pro-

tected by growing crops. Strong winds uncover and blow away freshly sown seed and later cause lodging of crops.

In summer, hot, dry winds burn crops, decrease yields, increase water losses during irrigation, and dry out soils.

Barriers Slow the Wind

How do windbreaks affect the environment? Planted south and west of fields, windbarriers reduce wind speed which causes important changes in air temperature, atmospheric humidity, soil moisture, evaporation, and plant transpiration. The extent the wind is reduced depends on characteristics such as height, density, width, and length of the tree barriers.

As for air temperatures, during the day air is several degrees cooler in the protected zone of windbreaks. At night, air temperatures near the ground are a few degrees warmer.

Air in the sheltered area of windbreaks is generally more humid than in unprotected areas. Averages of 2 to 4 percent higher relative humidity have been recorded in windbreak-sheltered areas compared with open areas in the Plains states. In dry, hot weather the effect may extend a quarter of a mile from the windbarrier, depending on its height.

Reduce Evaporation

Evaporation is greatly reduced in the lee of windbreaks, Gallaher says,

DUG OUT

IN AGGIEVILLE

Coors on Tap

Mexican Food and Pizza



Various trees and shrubs are adapted to each of Kansas' 105 counties and can be used to increase income as well as to beautify the landscape and provide shelter for wild animals and birds. Despite much opinion to the contrary, even a single hedgerow's assets outweigh its liabilities.

because of reduced wind movement and air temperature, and increased atmospheric humidity. Evaporation may be reduced in an area extending 24 times the height of the barrier leeward. Reduced evaporation conserves water during sprinkler irrigation and reduces water loss from reservoirs and ponds.

Windbreaks conserve soil moisture on their leeward side by reducing evaporation and transpiration and by controlling distribution of precipitation, especially snowfall. Snow commonly blows off bare open fields, so contributes little to field soil moisture.

Hold Snow

Distribution of snow in sheltered areas depends on structure of the barrier. Windbreaks with dense lower levels cause snow to drift deeply within or near the leeward

edge of barriers. Barriers with more permeable lower levels cause 60 to 80 percent of the snow to spread out over leeward fields. Drifting patterns correlate closely with reductions in wind velocity. Windbreaks prolong snow melting on protected fields and thus reduce moisture loss by evaporation or runoff.

"Tree Windbreaks for the Central Great Plains" reports that 83 percent of 331 farmers interviewed in South Dakota in 1952-54 estimated yield increases on protected, compared with unprotected, fields. Their average estimates were 8½ bushels an acre for corn, oats and barley; 3½ for wheat and flax; and 5½ for rye and soybeans.

Increase Alfalfa Yields

Alfalfa yielded 60 to 70 percent more in the best part of protected field than field averages in North

Dakota in 1935, according to other USDA reports.

Germany reported tobacco yields 10 percent greater in shelter of windbreak than on open field. Iceland also has reported increased barley, oat and spring wheat yields with 12-foot windbreaks.

When were windbreaks put into use as field protections?

Gallaher said it began as the U.S. was settled. George Washington was a leader in promoting windbreaks. He planted hedge trees around his fields as windbarriers, and other farmers followed his leadership in that practice.

He: "Where'd you get that dress?"

She: "Do you like it?"

He: "Yeah."

She: "It's really nothing."

He: "That's why I like it."

Underpopulation Is the Real Problem

By Lloyd Davidson

HAS IT become necessary for the cattleman to control the sex life of his cows? Pregnancy diagnosis is one of the management practices that many cattlemen now use to increase profits. With the margin between costs and gross income narrowing, managerial ability is becoming continually more important. The economics of beef production stresses efficiency in the percentage of cows calving each year. The profitable commercial operator tries for an 85 to 90 calving percentage within a 60- to 70-day period.

Sixty to 70 percent of the cows will settle in the first service and 60 to 70 percent of the remainder will settle on the second service. That leaves about 10 percent that are problem cows.

Save "Boarding" Costs

All such cows must be detected and either treated or removed. They only cause financial losses. It costs an estimated \$18 to \$25 to winter an open cow or \$25 to summer one on a calving program.

Pregnancy diagnosis is part of any efficient manager's production program. It is a means of removing waste or overhead and operating expense.

Pregnancy diagnosis involves both knowledge of the subject and extensive experience. An inexperienced person would be ahead to obtain the services of his veterinarian or some other experienced person rather than attempting pregnancy diagnosis himself. Veterinarians recommend that only veterinarians do it.

Factors Used to Detect Pregnancy

1. Heat cycles or external heat signs cease (10 percent of the pregnant cows continue to cycle).

2. Presence of the cervical plug (a mucus concentration in the cervix that keeps foreign materials from entering the uterus during pregnancy).

3. Manually feeling the contents of the uterus through the rectum (fetus, fetal membranes, and fluids).

4. Manually feeling the ovaries. a) See if follicular structures are present on the ovaries. (These structures, if present, will erupt and give off the female egg or ovum.) b) See if a corpus luteum is present on the ovaries. (This is the structure that maintains pregnancy—secretes hormones that stop heat cycles.)

5. Feeling the pulse of middle uterine arteries (arteries that supply the uterus—portion of the reproductive tract housing the fetus. Artery is larger and has a stronger pulse with the presence of a fetus).

Abdominal Bumping Comes Late

6. Abdominal bumping—method of feeling a calf by bumping the abdomen of the cow (cow must be 5-6 months pregnant).

7. Detection of fetal heart beat—used in later stages of pregnancy, so has no economic importance.

8. External physical signs.

The only accurate useful method of pregnancy diagnosis is by rectal palpation (manually feeling). The three factors palpated for are:

1. Structures on the ovaries—egg structures feel different from the corpus luteum.

2. The form and content of the uterus.

3. Pulse and size of the middle uterine artery.

Palpation Is Best Method

If only one of those three were used by itself, it would be palpation of the contents of the uterus. It gives a more nearly accurate picture.

A good technician should be able to detect pregnancy in a cow 40 to 50 days pregnant.

Pregnancy diagnosis not only helps a livestock man cull his herd but also may help detect breeding problems that can cause financial disaster. In most cases costs of diagnosis are greatly outweighed by added income.

It costs too much to board a barren cow, so pregnancy testing has become a regular management practice. A high percentage calf crop often provides the margin between profit and loss. A good cow produces a healthy calf every year.



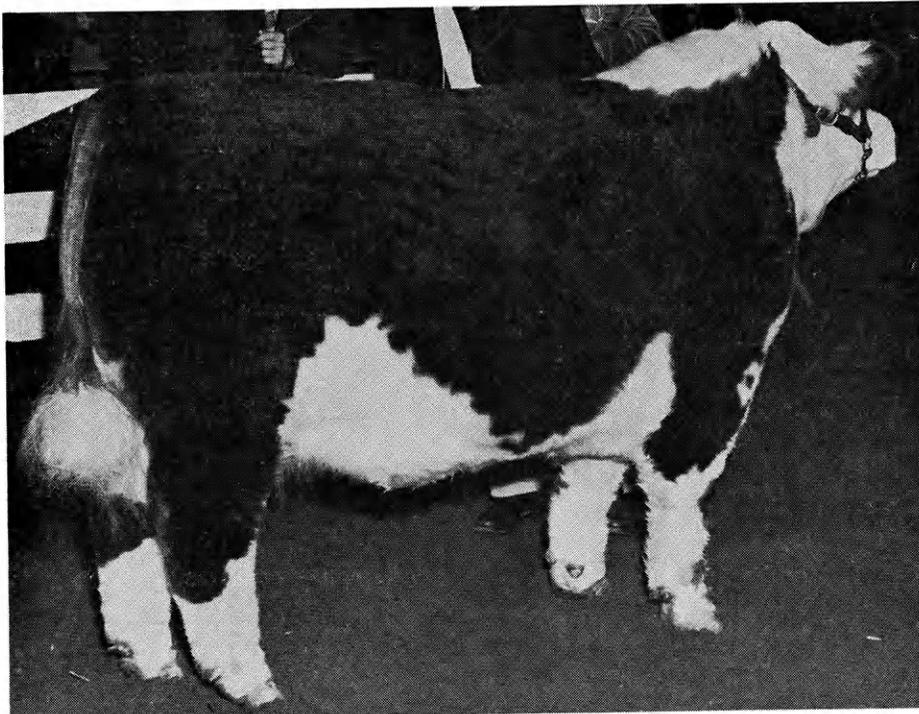
Students Benefit from

Eighty Years of Excellence



KSU PETE was grand champion steer at the Southwestern Exposition and Fat Stock Show in Fort Worth this spring. He sold for \$6,000 at the sale following the show. "One of the best, if not the best, steer in the United States" is how a judge described him.

MR. WOODY was grand champion Hereford steer at the National Western Livestock Show, Denver, this year. The three animals pictured here are examples of the excellence that animal husbandry students study and work with at Kansas State University.



By Dean Davis

STARTING more than 80 years ago, Kansas State University beef cattle have been getting the job done. What job? The job of research, student learning and better beef.

Kansas State Animal Husbandry Department with Rufus Cox as head of the department, Don Good, head of the beef division, and Miles McKee, herdsman, maintains a herd of about 100 cows, consisting of 40 Herefords, 40 Angus, and 20 Shorthorns. To some people this seems like a small herd, and it is. At the University quality, not quantity, is the goal.

Among the many reasons Kansas State has good beef cattle, judgment of the professors ranks highest. Help from Kansas stockmen and their respect for Kansas State University's program also are vital "success" ingredients. By carefully selecting outstanding individual females and bulls and visualizing the offspring from certain cows and bulls, a quality herd is developed.

Sound Breeding

A sound breeding program is important, as is being able to select cows and bulls that will build a reputation, improve the herd and promote better beef.

Proper feeding is essential—knowing how much, when, what kind, what percentage and other phases of a good feeding program. At K-State students and herdsman are up at 5:30 every morning to start chores.

A person may have the best cattle in the world, but he must know how to merchandise his cattle. Selling is very important. At the University, Cox, Good and McKee try to produce the kind of cattle people are willing to pay for and are proud to own. Both Good and McKee feel that cattle should have size, bone, good heads and beefiness.

Management Is the Key

Key to the entire program is management. If sound management is

practiced, success is more likely to result.

By having a sound beef program, students can study and learn to appreciate the ingredients of success from a good beef cattle program.

Kansas State tries to produce good beef cattle so students can learn quality by seeing quality animals in their classwork. Every animal in the KSU barns is used in class several times a semester. The students come first, even when a show bull or heifer might do better by not "going to class."

The cattle are used in extracurricular activities, such as the Block and Bridle judging contest each spring and FFA contests for high school students.

Future K-Staters, such as the FFA boys, often have observed the quality of beef cattle at the University before the students matriculate.

Have Breed Association Clinics

Such organizations as the Hereford, Angus and Shorthorn associations have clinics at K-State. Two years ago the American Hereford Association met in Weber Hall and used the University's cattle. That day the University sold a bull for \$4,500. Such sales help demonstrate to students that good cattle are profitable.

Beef cattle at K-State provide experience and employment for students. Students work at the barn the year around. Those who work



WONDER K-9 was reserve grand champion as a summer yearling at the National Western Livestock Show in Denver in 1964 and grand champion in 1965. Elsnor Cattle Company, Gunnison, Colo., bought him for \$5,000 at the Shorthorn sale that followed the show.

get valuable practical experience in feeding, breeding, management and selection.

Has Champs Regularly

Kansas State regularly has shown champions at both state fairs during recent years. At nine shows, including sales last season, K-State had 24 champions at the following shows: Mid-America Fair, Hutchinson State Fair, American Royal, National Western at Denver, and the Southwest Exposition and Fat Stock Show

at Fort Worth. At Denver, the grand champion Shorthorn bull sold for \$5,000; at Fort Worth the grand champion Shorthorn steer sold for \$6,000; at the fall Hereford sale in Hutchinson, KSU sold a bull for \$4,000, and at the State Fair, KSU had the grand champion Angus bull. He later sold to California Polytechnic Institute for \$3,000.

The ribbons and sale prices indicate that "the best is considered none too good" for KSU Animal Husbandry classes.

FARM BUREAU

KANSAS

INSURANCE

"See your Local Agent"

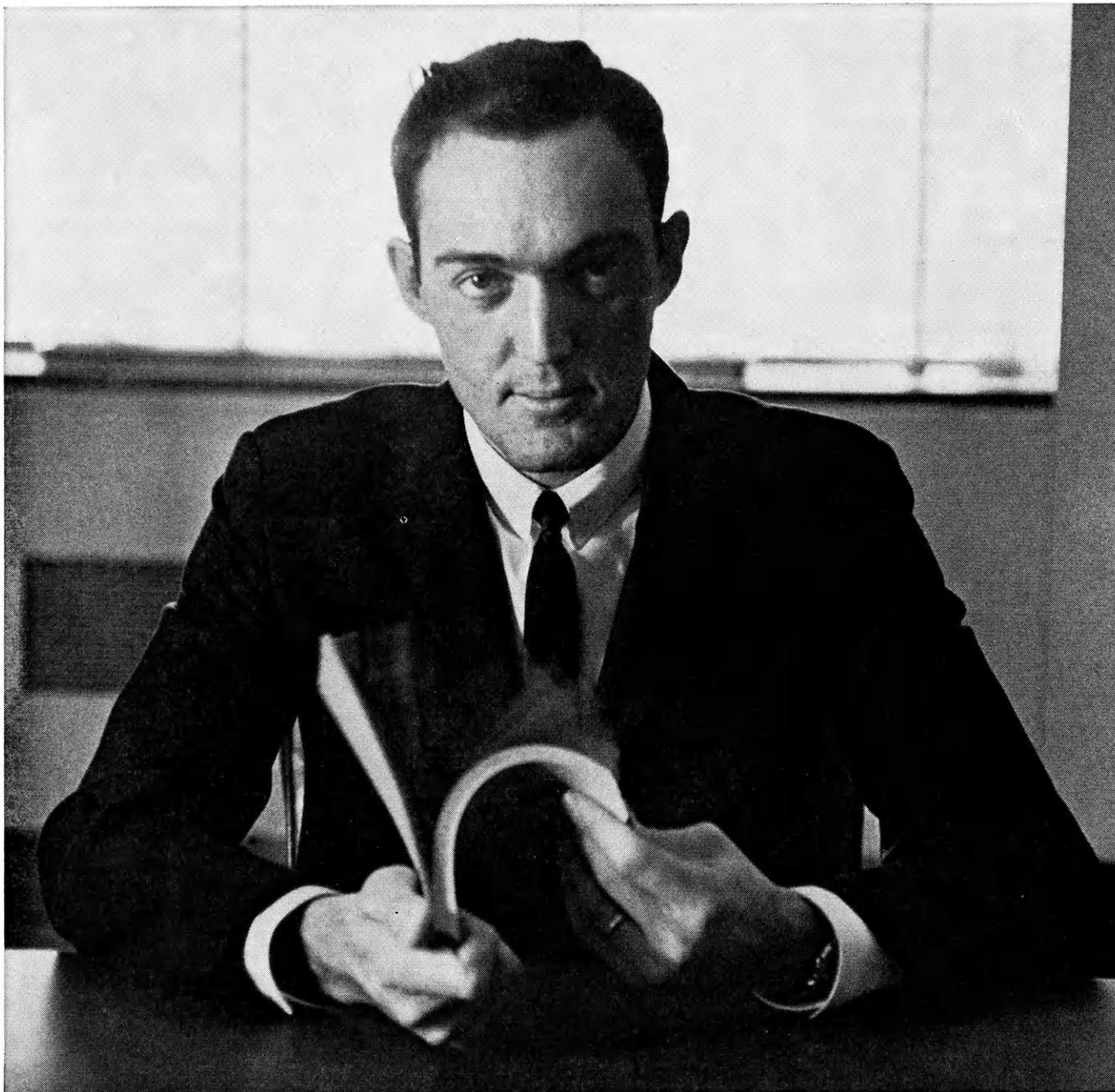
FOR KANSAS PEOPLE...

The leader in Kansas multiple-line insurance protection.

Farm Bureau Insurance is run by and for Kansas people . . .

- AUTO-TRUCK
- FIRE and WIND
- CROP HAIL
- LIFE INSURANCE

*Farm Bureau Mutual — Kansas Farm Life
KFB — Insurance Companies*



How about a friendly game of cards?

Watch out for our Gene Wollaston, though. He stacks the deck. In fact, he's already stacked 80 decks—of computer cards—to build a mathematical model to solve important refinery problems. With his special skills, Dr. Wollaston helps determine proper product yields and properties from key refinery operations. The final result should be an improved product—at a tremendous saving of time and money. (Once the model is built, the cost of solving a problem is as little as \$3.00.)

So, as a card player, Gene's helping to take the gamble out of running a refinery. No mean accomplishment for a chemical engineer two years out of Illinois Institute

of Technology.

You're not a card player? Don't worry. As long as you're looking for a meaningful challenge, your opportunity may be here at American Oil. We're also experimenting with fuel cells, spatial environment, and rust protection in car engines—to mention a few of our diverse fields of interest. Some of them may interest you, whether you're in Engineering, Physics, Chemistry, Mathematics, or Metallurgy.

You can find out by writing for more information. To J. H. Strange, American Oil Company, P. O. Box 431, Whiting, Indiana.



You can use

Tilt-up Concrete for Livestock Shelters

By Robert H. Miller

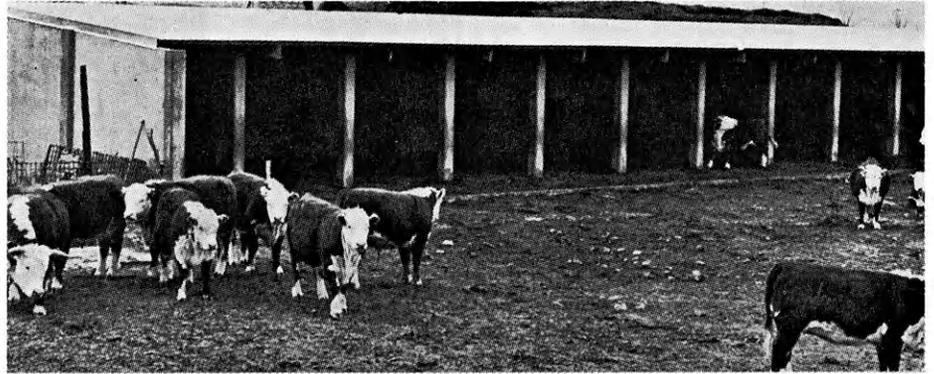
NEWEST material for construction of livestock shelters is concrete. It has proved both inexpensive in original cost and in maintenance. Rodents and insects seldom harm it, and it cannot be destroyed by rot, rust, or fire. Concrete holds up under severe use by all types of livestock and resists damage by farm equipment; it is attractive enough for pride of ownership.

Best way to build most farm concrete structures is by the tilt-up method. You do it by forming walls on the ground, curing them, and then tilting them into position.

Continuous foundations are preferred for livestock shelters—to provide uniform wall support. Continuous foundations also give added rat control and resistance to undermining by erosion. If a low-cost building is desired, pier foundations can be used. Piers are spaced at intervals of 8 or 10 feet to carry the load of columns and wall panels.

Most Floors 4 Inches Thick

Most floors are built only 4 inches thick unless heavy machinery is to be used on them. With poorly drained soils, a fill of coarse gravel or crushed stone 4 to 6 inches thick should be used to provide a dry base. However, most floors are run directly on the earth. The concrete is thoroughly compacted by tamping and then screeded off. The floor is then finished to the desired surface texture. Concrete floors should have expansion joints every 12 to 15 feet. To



An inexpensive, durable cattle shelter constructed largely of concrete.

cure properly, concrete should be kept wet 5 to 7 days.

The tilt-up wall panels can be cast either on a sand bed or on a previously placed concrete floor. When the concrete floor is to be placed later, panels are cast on a smooth 3- to 6-inch bed of sand. After the sand is prepared, a polyethylene film is stretched over it and the forms are set. The plastic film creates a smooth finish on the under side of the panel. When casting the panel on a concrete floor, a bond breaker must be placed over the floor. Either a polyethylene film or a commercial liquid bond-breaking material may be used.

Use Reinforcement Bars

Most panels are 4 inches thick and require a $\frac{3}{8}$ -inch reinforcement bar every 30 inches in each direction. The bars stick 1.5 inches beyond the sides of each panel through slots in the forms—to tie the panels into the wall column. Bolts are tied to the reinforcing bars and protrude through the top panel form for the wall plates. Lifting bolts are set in place and fastened to the reinforcing bars also. The least amount of strain is created in the panel during lifting when the two pickup bolts are located at approximately the quarter points of the panel width and down about one-fourth the panel height from the top. Lifting bolts are unnecessary if the panel is to be lifted by the plate bolts in the top edge.

The concrete, preferably air en-

trenched, should be well packed and screeded off. The top surface should be finished to give the desired texture to the exterior wall.

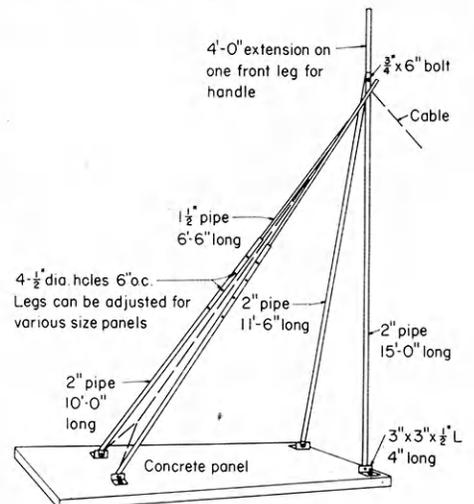
Self-cleaning Walls Possible

A wood float leaves a gritty finish and makes an attractive wall. A stiff-bristled broom pulled across the concrete leaves a striated finish, which always should run vertically so the panels will be self-cleaning.

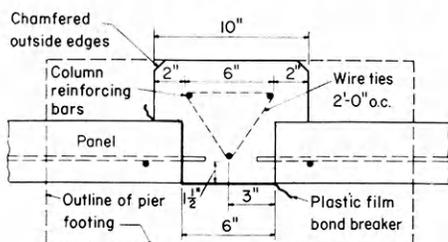
For a more attractive, but somewhat more expensive, finish, colored concrete can be used. Also, plain or decorative aggregates on the outside surface give a unique texture. Patterns can be traced into the concrete for different effects desired.

For windows or doors, place addi-

Dimensions of a simple tilting frame.



Plan for a concrete sidewall column.



tional bars along each side of the opening and diagonally at each corner to prevent cracking. The forms can be used for window jambs, or a metal window unit can be set directly into the panel.

The panels should be cured at least 3 days before they are tilted into place.

Tilt with Front-end Loader

Panels can be tilted by a simple tilting frame, with a crane, or by using a front-end loader. After the wall panels are set and plumbed, they are braced in position. The lifting bolts, if used, are knocked out and the holes filled with mortar. One edge of each panel is wrapped with building paper, plastic film or a bond-breaking substance along with the protruding reinforcement bars, to create a control joint. Such joints are required to prevent cracks from the concrete contracting.

Commonest method of holding wall panels in position is to cast reinforced concrete columns between them. Such columns should be poured continuously and be well settled. The interior wall should be flush for easy cleaning.

While the panels are curing, the roof may be started. Any conventional roof is suitable for a tilt-up building. Clear-span roofs are especially desirable, since they allow more freedom with cleaning equipment. Concrete is an ideal material for roof construction. In some areas, an all-concrete building is granted a low fire insurance rate.

No matter what style livestock shelter is needed, the chances are that a tilt-up concrete structure is an economical, durable, and attractive answer.

Little American Royal Has Had Coed Winners for More than Forty Years

THOUGH it is so old that it is difficult to find a professor who remembers much about its youth, the Little American Royal apparently has changed little while maturing.

Women were among the contestants when the show started as they were in the 1965 show. Ribbons they've won indicate that they can be plenty rough competition in showmanship and in training and grooming animals. Women have won both the animal husbandry and the dairy division championships.

Early in its history (over 40 years ago) the Little American Royal included an outdoor parade of university-owned livestock in addition to the indoor events the show retains today.

When the University still conducted "Farm and Home Week," the Little American Royal was its concluding highlight. The week was discontinued after World War II because housing was too tight and hotel space too limited to provide for the crowds.

The first show was in Waters Annex (now a chemistry laboratory among other uses) but the show quickly outgrew that building and was moved to Ahearn Field House until Weber Hall was completed. Traditionally the show is the second Saturday before Easter recess.

Before War II it was managed by the Block and Bridle and Dairy clubs. Now an executive council consisting of four members each from the Block and Bridle and Dairy clubs

is responsible. Council members serve two-year terms, with the senior representative of the Block and Bridle Club president of the council in even-numbered years and the senior representative of the Dairy Club in odd-numbered years.

Nearly 100 students showed in the 1965 Little American Royal. Proceeds from the show sponsor two scholarships—to a sophomore or junior in the Animal Husbandry or Dairy Science curriculum.

The 100 faculty who teach agricultural science courses at KSU, Manhattan, earned their degrees at 66 different universities in this country and abroad.

"Yesterday I visited Johnny's classroom and shared school lunch. Now I know why so many kids think the supreme court should let them pray in school."



FUN MACHINE \$215

With these extras thrown in:
200 mpg. 4-stroke 50cc OHV engine, 3-speed transmission, automatic clutch, cam-type brakes on both wheels.
Optional: push-button starter.
Added attraction: You meet the nicest people on a

HONDA

OVERSEAS MOTORS

2307 Stagg Hill Road
Ph. 8-3244

TRY J.D.'S PIZZA TODAY



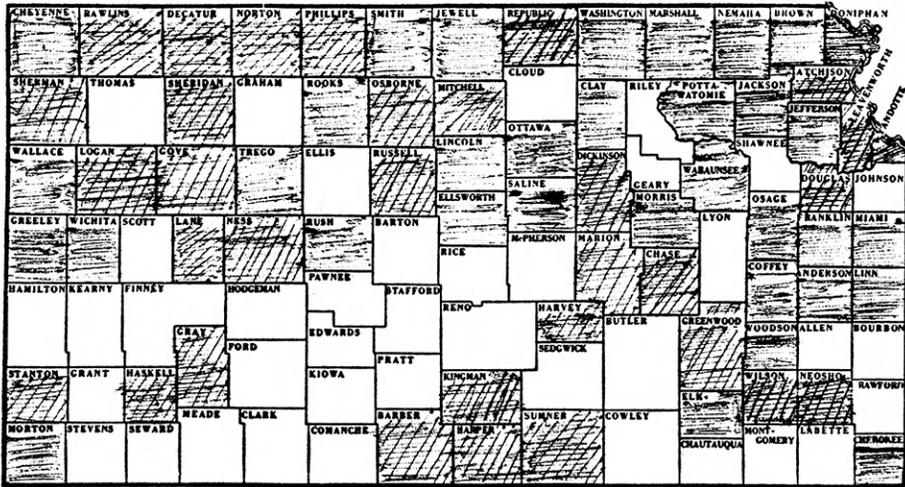
(You can even watch through the glass kitchen wall while they make yours)

PIZZA PARLOR

PR 8-3516 2304 STAGG HILL ROAD
MANHATTAN, KANSAS

Open 11 a.m. to 12 midnight Monday-Saturday

Open 4 p.m. to 10 p.m. Sunday

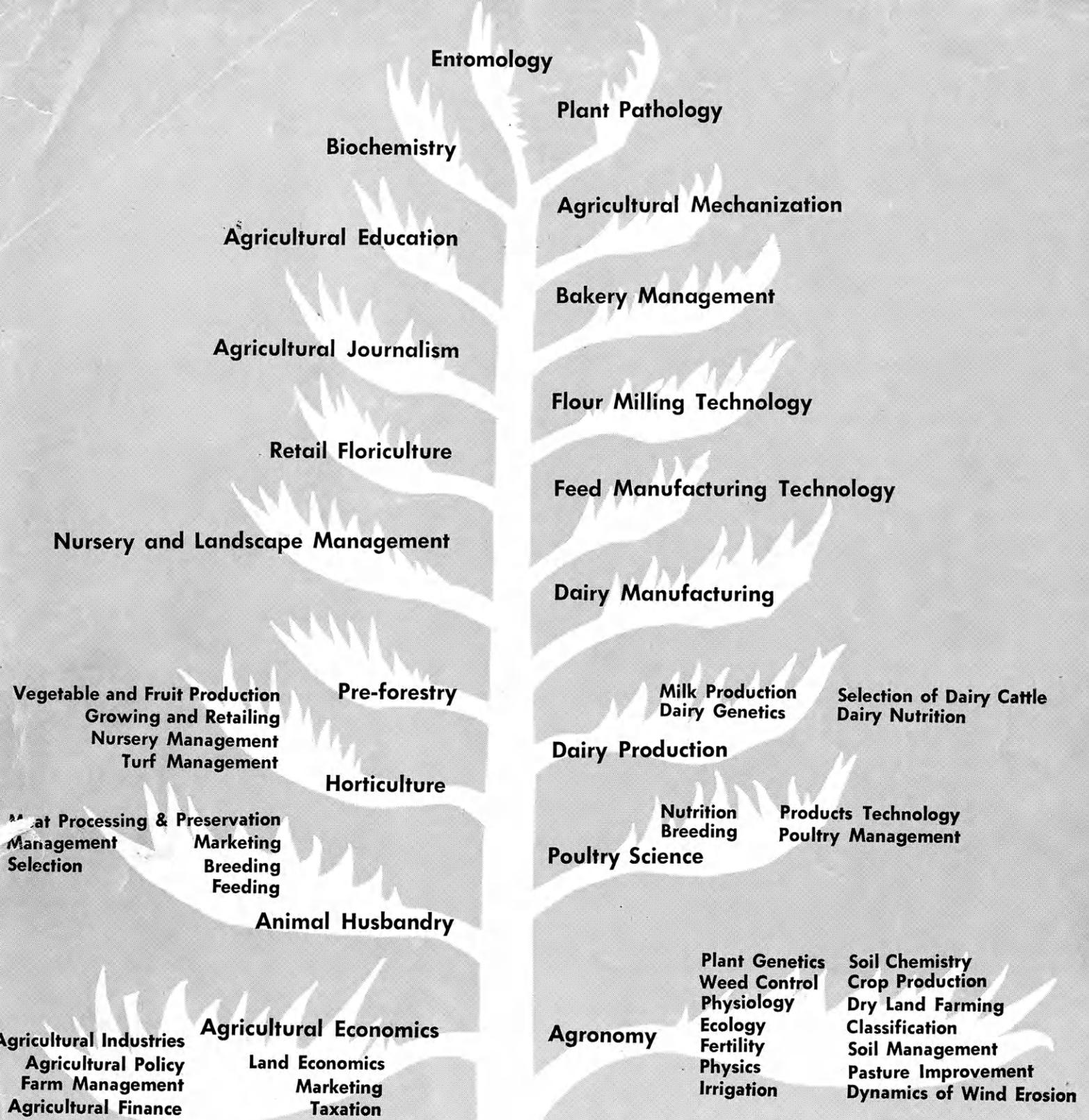


Data revised since originally published indicate that the 66 shaded Kansas counties above send a lower percentage of high school graduates on to college than average for the United States.

How Does Your County Rank?

Latest U.S. figures on percentage of high school students who go on to college show that Kansas has dropped from her former traditional rank near the top to below the national average.

The map above is based on government data revised since the last U.S. Census was published. None of the shaded counties equals the U.S. average. If you live in a shaded county, you might help improve its rank by using information on the next page to help explain opportunities for high school graduates at Kansas State University's College of Agriculture.



AGRICULTURE

What does "Agriculture" mean? The above "tree of opportunities" shows major areas of study in agriculture at Kansas State University in Manhattan. Of course, it doesn't mean even a small fraction so much at any other college or university in Kansas. That's the reason students interested in agriculture should attend the one land-grant university of their state.

