

JANUARY 1968



International Reputation Defended

... page 3

## *Do You Qualify?*

The seemingly endless war on hunger must be won or the world's burgeoning population will face widespread famine in less than 20 years. The hungry nations must learn to feed themselves and to stabilize their populations.

The soils of the world have to be inventoried and crops grown on either the soils best suited for them or on soils chemically modified for maximum productivity.

Up-to-date agricultural know-how must be put to work all over the earth to provide irrigation, drainage and reclamation, pest control, fertilizers, hybrid seeds, new plant strains, growth regulators and new tools.

The total of scientific and technological knowledge and information doubles in little more than a decade. We see more change in a year than our forefathers saw in a century. Consequently, it is no exaggeration to say that it is within our power to change the face of the world more in the next



33 years than it has been changed in the past 3,000—for good or evil.

This, then, is the challenge confronting the “new” agricultural student of today.

We must turn the scientific, technological and information explosions to the advantage of humanity, not to its destruction. To do this, we need in agriculture the most dedicated, innovative and far-visioned men and women we can find. We need them in all fields of agriculture—in production, in science, in teaching, in journalism, in agribusiness, in government.

Like to give it a try? Then enroll in agriculture at Kansas State—the ag school with an international reputation for excellence.

# KANSAS STATE UNIVERSITY AG STUDENT

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Our cover shows Nancy Mauderly, a freshman in the College of Home Economics, and one of her "special" friends. When Lee Halgren, a graduate student in entomology, wrote to the student newspaper criticizing wearing cowboy hats as a symbol of support for the K-State football team because they added to the "silo tech" image, she came to the defense of the ag college. Both letters are printed below.

Editor .....BILL BLAUVELT

Adviser .....LOWELL BRANDNER

## International Reputation of Kansas State Ag College...

### Criticized

Since coming to K-State three years ago, I have been impressed by the efforts of many to rid this campus of the "silo tech" image. Yet at every football game many of the fans, including the drivers and escorts of the homecoming queen and her attendants, have worn cowboy hats as a symbol of their support of the team and the University.

This is hardly conducive to changing K-State's image. We should either accept cowboy hats as a symbol of K-State or do something to change the image that they convey.

Lee Halgren, ENT Gr.

### Defended

Mr. (Lee) Halgren, aren't you proud of your University's image as a top-ranking agricultural education center? K-State is respected around the world for its agricultural studies and information by agricultural agents, farmers, ranchers and foreign people concerned about the task of feeding their nations.

Our University excels in other fields too, but since agriculture affects everyone (yes, even you because you eat food produced by agricultural people), we should be proud to attend "Silo Tech."

If you don't wish to wear a western hat, that is your problem, but don't criticize those who are trying to represent a good thing. If you wish to change the image of K-State, perform some miracle greater than helping to feed the nation. Then and only then will you have the right to degrade K-State's proud image.

Nancy Mauderly, HEX Fr



The NFO . . .

# Farmer Power Hits Agriculture

By John Gerstner

Fred Killian, Kansas NFO district field man, explains National Farmers Organization objectives to James Roeder, K-State dairy manufacturing senior.



**F**OR Doyle Emperley, dairy farmer near Topeka, the week of March 15, 1967, was an expensive nightmare. That was the week he publicly dumped more than 1,600 gallons of milk in a roadside ditch in public protest of sagging milk prices. It cost him \$700.

Emperley's action was only one part of a violence-filled campaign to shut off the flow of milk in more than 25 states.

The milk strike was launched by agriculture's answer to unionization, the National Farmers' Organization (NFO), a driving group of farmers bent on fixing what ails farming.

Some observers have called NFO the most explosive power in agriculture today. Others have described their program as "a failure, a flop, and a fizzle."

Regardless of the comments from the sidelines, the NFO is yelling out everything that's wrong with agriculture — and most critics agree they're gaining listeners.

At a news conference March 20, Orville Freeman, secretary of agriculture, described the milk-withholding campaign as one symptom of the "chronic sore" of farm income's lag behind that of other segments of the U.S. economy.

## Collective Bargaining Sought

Born in the price bust and widespread drought of 1955, the NFO aims to guide members in marketing together in sufficient volume to com-

mand a collective bargaining position with processors; ultimately they hope to raise farm prices and rescue farmers from their present price-squeeze.

Although not encouraging violence, the NFO's withholding actions are usually accompanied by force. Total membership is a secret, but it is usually estimated at between 200,000 and 300,000 which makes it one of four major farm organizations, along with the Farm Bureau, the Grange and the Farmers' Union. Headquarters is at Corning, Iowa. Membership is \$25 a year.

NFO-like organizations have bubbled to the top of the farm scene throughout agriculture's history of up-and-down prices. Similar violence caused widespread alarm in the "farm holiday" rebellion of the 1930's and the same militancy occurred when Mary Elizabeth Lease stormed across Kansas near the turn of the century encouraging farmers to "raise less corn and more hell."

Oren Lee Staley, middle-aged former farmer from Rea, Missouri, heads the NFO with the precision of a military general. On advice from a staff of grain, meat and dairy experts, a Washington representative, legal negotiator, and public relations department, Staley draws up battle lines and plans strategy.

### All Members Have a Voice

The NFO's official directives are issued through the National Board of Directors and must be ratified by two thirds of all members.

NFO is a force for change as well as a reflection of the economic upheaval now taking place on farms today, say observers. The members, the body and soul of the NFO, come in all economic classes and varieties but they have one common sharing: they're sold on the NFO, its goals and its programs.

According to Fred Killian, middle-aged farmer near Wamego, K-State ag graduate, and district field man for the NFO in Kansas, the typical NFO member sees the organization as "the answer to the farm price problem. Their belief is, in many cases, rooted in bitterness," he says.

### A Last Resort

They see the NFO as a last resort in the increasingly intense fight for their farms, says Killian. The staunchest NFO members are farm-

ers who connect the pinch of high costs and low prices with economic realities.

Still, he says, the loudest protests are not coming from the lowest-income group. Many are big, progressive farmers concerned about holding their position.

Although more vocal than most, Killian is typical of NFO members everywhere. He's convinced that the NFO can save the farmer and he's diligently working toward that end.

When Killian isn't farming he travels throughout Kansas attending county NFO meetings and seeking new members. He hears the same story from almost every farmer he talks to: "Something has to be done."

He says Wabaunsee County has 190 paid members out of approximately 800 farmers. Jackson County has 375 members and Marshall County has 400 members.

### Farmers Skeptical of Unions

Killian says the reason more farmers haven't joined the NFO is because they are skeptical of anything approaching unions and "have been took" too many times in the past.

The most recent action by the NFO was in August when more than 35,000 members made a one-day pilgrimage to Des Moines, Iowa, and roared approval of a program keyed to the slogan, "No price—no production."

The members empowered Staley and the NFO Board of Directors to call "all-out holding actions on any or all major commodities when they feel such moves will be most effective."

Staley indicated that the holding actions might operate either as unannounced "holds" of two to three days, or broader, longer actions similar to earlier NFO price-raising efforts.

### All-out Holding Action Possible

Staley declared, further, that if processors do not meet NFO price goals, the organization will build for an all-out holding action "that will shut down the agricultural plant of America."

NFO's goals include a 2-cent-per-quart increase in milk prices to farmers, and floor prices of \$1.50 per bushel on corn, \$2.00 for wheat, and \$3.00 for soybeans. He said long-standing goals of \$22.45 per hundred

on hogs, \$32.45 on choice cattle and \$29.45 for lambs might be raised.

By its very nature, the NFO is a much discussed and cussed group. Old-line farm groups criticize the upstart NFO for violence and militant holding actions. Some consumers deplore the prospect of farmers gaining enough power to price their own products.

For example, the St. Louis Post-Dispatch in an editorial described the NFO goal as a "monopoly of a peculiarly unacceptable kind because food is the first essential of life."

### NFO Embroiled in Controversy

And the observers that count the most, the farmers themselves, don't agree on the virtues of the NFO.

Some farmers think the NFO can't work and therefore won't support it. Some won't join but secretly applaud the NFO's work and support its programs. Others are hard-core members of the Farmers' Union or Farm Bureau and are antagonistic about the NFO taking over the leadership of farm power groups.

Adding to the controversy is the fact that getting farm bargaining power is critical right now.

Big processors and chain stores are growing stronger; integration and contract operations are controlling more farm supplies; outsiders with large amounts of capital are moving into farming to compete with the "family farm," and urban groups and consumers are getting more vociferous as farmer strength slips.

Behind the scenes of the struggle for "farmer-power," agricultural officials view the NFO as a definite movement in agriculture.

Roger H. Wilkowske, K-State extension specialist in dairy marketing, says he sees a trend in farmers' organizations. He believes dairy cooperatives are becoming more and more militant. Although farmers are generally against unions, he believes the differences between farmers' organizations and labor unions are becoming increasingly less.

### Lack Total Cooperation

"The NFO is simply trying to do what they can to improve farm prices. Their limited success has been due to lack of total cooperation by all farmers. They must get substan-

(Continued on page 11)





The combination of decomposable material, adequate water and oxygen plus a dynamic microbial population is needed to produce high-yielding crops like this corn.

## Importance of Soil Microbes Increasing

**E**ACH spoonful of arable Kansas soil contains millions of living microscopic organisms. The living bacteria alone in an acre of soil of average fertility weigh as much as a medium-sized dairy cow.

Soil fertility is governed to a great extent by the balance among the various types of microorganisms that play a major role in the carbon, nitrogen and other mineral cycles.

Activities of soil microorganisms benefit the soil in many ways, according to Dr. T. M. McCalla, research microbiologist for the USDA at the University of Nebraska. They decompose crop residues, mineralize soil organic matter, synthesize soil organic matter, nitrify, fix nitrogen, immobilize mineral nutrients and form organic substances that may stimulate or be toxic to plant growth, depending on concentration. Organic substances formed by microorganisms may stabilize soil structure.

Many cropping and tillage practices are effective because they influence microbial activity. For example, soil tillage may improve aeration and aeration favors organisms that oxidize nitrogen, sulfur and iron.

### Soil Management Effects

Every soil management system influences microbial activity which, in turn, influences soil structure, decomposition of plant residues and availability of nutrients. And all those factors influence crop growth.

McCalla says microorganisms also increase soil structure stability and water intake. "Microorganisms eat at the first table. They are in contact with almost every particle of soil. Plant roots are not. Without micro-organic life, soil—the dynamic perpetual system that sustains terrestrial life—would become an inert mass incapable of providing food. Microorganisms decompose organic material

and release elements and organic food for repeated use."

Since 1941, microbiological and related studies by the U.S. Department of Agriculture and the Nebraska Agricultural Experiment Station have been related to crop residues in Nebraska, the Corn Belt and the Great Plains. Many of the data for this article are from those studies.

Decomposing organic matter is teeming with soil microorganisms, indicating that organic matter provides an energy source for the active microorganisms.

### Help Maintain Soil Fertility

The combination of decomposable material, adequate water and oxygen plus a dynamic microbial population helps maintain soil fertility to support crops and other higher plant growth.

Since soil microorganisms produce and secrete enzymes that break down

most materials that are added or are present in the soil, the soil is virtually a huge digestive system.

For example, if a material like wheat straw, which is largely cellulose, is added to the soil under favorable moisture and temperature conditions, it is rapidly broken down to sugars. The sugars are readily used by another group of microorganisms that either decompose sugar into carbon dioxide and water or convert it into other chemical compounds.

Temperature, moisture, aeration and acidity or alkalinity influence the number and activity of soil microorganisms.

Microorganisms are most active during the warm part of the year. When the soil temperature drops below 60° F, microorganisms slow down considerably. At soil temperatures of 40-50° F, some activity takes place, but when soils freeze, the activity virtually stops.

Water is essential for growth of microscopic plants and animals. When soil moisture content is comparable to or lower than the wilting point of higher plants, activity of most microorganisms ceases.

The optimum moisture content for maximum nitrification is about 60 percent of the water-holding capacity of the soil, according to McCalla. Nitrification nearly ceases at low moisture content. However, if the soil is too wet, as during prolonged wet weather or overirrigation, nitrates may disappear from the soil by denitrification. Since nitrates are water soluble, they may also be leached to depths below plant roots.

### Require Oxygen

All soil microorganisms require oxygen in some form—either free as in the atmosphere or combined with some substance as in plant or animal materials.

Acidity greatly decreases the activities of most microorganisms.

Many organisms are involved in decomposing crop residues and soil organic matter before the nitrifying bacteria can go to work. Several groups are involved in breaking down the complex organic nitrogenous substances in the soil to simpler nitrogen compounds, which then are broken down into ammonia nitrogen.

McCalla says nitrifying organisms are present in all cultivated soil but their numbers vary from a few to

many thousands per gram. They usually are confined to the top 18 inches of soil.

### Inoculation Attempted

Since microorganisms naturally play such an important role in soil fertility, many attempts have been made to increase soil fertility by inoculating the soil with microorganisms.

In the Soviet Union and several eastern European countries, soils are inoculated with bacteria that apparently increase the availability to plants of native and applied soil phosphorus. It is estimated that about 25 million acres were so treated in 1958.

While the Russians claim to have been successful, most American soil scientists doubt that inoculation of soil or fertilizers with microorganisms is likely in the United States on a large scale in the foreseeable future.

Cu-Fe-Co Manufacturing, Inc., of Kearney, Nebraska, has started marketing a microorganism product called Bio-Act. The corporation claims that applying Bio-Act mellows the soil, makes it retain moisture better and hastens decomposition of organic residues. They say Bio-Act will not replace fertilizers but will increase the efficiency of fertilizers so less fertilizer is needed.

The manufacturer has informed the Ag Student Magazine that actinomycetes are the primary microorganisms in its product.

Actinomycetes are designated as bacteria by the International Code of Nomenclature of Bacteria and Viruses. The characteristic odor of newly plowed soil in the spring is from the activity of actinomycetes.

### Actinomycetes Used in Inoculum

Actinomycetes use a wide range of organic compounds. Besides the usual carbon sources such as sugars, starch, hemicelluloses, proteins and numerous other substances, compounds generally less easily decomposed also are attacked by some actinomycetes, reports E. Kuster of University College, Dublin, Ireland, in his chapter on Actinomycetes in the 1967 book, *Soil Biology*, by Academic Press.

Actinomycetes produce vitamins, pigments and antibiotics—in some cases to such an extent that they are used industrially.

“Actinomycetes undoubtedly are of great importance in respect to the

dissolution of soil organic matter and the liberation of nutrients therefrom. Apparently, they reduce to simpler forms even the more resistant compounds such as lignin,” report Professors Harry Buckman and Nyle C. Brody of Cornell University.

“The capacity of actinomycetes to simplify humus is important, especially in respect to nitrogen. Considerable amounts of this element seem to be tied up in complex humic forms and might long remain unavailable to higher plants. The actinomycetes apparently have the unusual ability of putting it in circulation again.”

According to Kuster their concentration in the soil varies widely. The percentage of microorganisms that are actinomycetes ranges between 10 and 70 percent.

Kuster says that under natural soil conditions some carbon- and/or nitrogen-containing substances in soil residues are attacked and largely decomposed by actinomycetes.

### Cultivation Disturbs Equilibrium

Any soil that is a natural habitat for microorganisms possesses its own well-balanced and typical microflora. The microbial equilibrium depends on all the factors that characterize a particular soil. Kuster says that cultivating a crop disturbs the equilibrium, particularly some types of actinomycetes. However, the equilibrium will be naturally restored.

Dr. John Harris, K-State bacteriologist, doubts that adding “special” cultures to the soil would have any chance of success. He said a few pounds of introduced bacterium would not be likely to survive when competing against the tons of live cells already present and established.

If soil environments are hostile, no amount of inoculation will introduce a new strain, he said.

Dr. Larry Murphy, assistant professor of agronomy, questioned that Bio-Act would work but said it should be tested under Kansas conditions before being completely discounted.

K-State has not tested Bio-Act. Consequently the Ag Student Magazine recommends that any interested farmer try only a little.

The 1968 Kansas State University Ag Science Day and Little American Royal will be Saturday, March 30.





This rumen fistula of an animal fed green legumes shows how poloxalene prevented rumen foam from being created. Compare with top photo opposite page.

# BLOAT

## Complete Control

## Seems Possible

By Jerry Engler

**B**LOAT, an expensive, old enemy of dairymen and cattlemen, may be nearing its end. Complete control of legume bloat now seems possible, research continuing on feedlot bloat.

Dr. Erle E. Bartley, professor of dairy science at Kansas State University, was one of the main figures in the discovery of a bloat preventive agent, poloxalene. Poloxalene has effectively prevented legume bloat in studies at K-State, Iowa State University, Mississippi State University, Louisiana State University and the University of California.

### Legume Pasturing Pays

Research at the Southeast Kansas Branch Experiment Station shows that using poloxalene makes it economically sound to pasture legumes. Three ten-cow groups of grade Holsteins averaging 1,215 pounds each were tested there. One group was turned on alfalfa pasture, one on brome pasture and one was fed alfalfa hay for 56 days. The average daily milk production per cow was 48.3 pounds for the alfalfa pasture group, 46.5 pounds for the brome group and 43.0 pounds for the hay group.

In another study Holstein calves on alfalfa pasture gained more than calves on alfalfa hay. Gains of the pastured calves resulted from body and skeletal growth, while gains of

calves on hay were more fat accumulation.

### Proteins Cause Bloat

Soluble proteins in legumes are one of the chief bloat-provoking agents. Bartley said normally cattle rid themselves of gas-produced fermentation in the rumen by belching. When they eat bloat-provoking rations, ruminal material consistency increases so it traps the gas in a stable foam. The foam further inhibits belching. Pressure builds up, and the abdomen distends. Death may result by smothering from pressure on the lungs. However, chronic bloaters are usually animals that are unable to belch because of anatomical defects, Dr. Bartley explained.

Other plant products produce stable foams, and some stabilize foam once it is formed in the rumen.

Saliva is the main natural anti-foaming agent. Bartley said an animal may secrete twice the amount of saliva when eating alfalfa hay as when eating fresh alfalfa. Therefore cattle are not as susceptible to bloat from hay. Cattle that naturally secrete less saliva (usually due to heredity) are more susceptible to bloat. Bloat may be induced when mucin, the antifoaming agent in saliva, is broken down by bacteria in the rumen.

Bartley recognized that foam de-

veloping in the rumen was the main problem, and that the best approach to control bloat, therefore, would be through an antifoaming agent.

He said bloat is a complex condition in which at least three factors interact simultaneously—the plant, the animal and the microbes in the rumen. Eliminating the effect of any one of those three factors would be difficult and probably would lead to inefficient animal production.

Bartley tested compounds for seven years at K-State, trying to find one that would meet all of these criteria:

1. It must effectively prevent bloat at least 12 hours;
2. act within 10 minutes;
3. be palatable;
4. cause no ill effects on health, reproduction, rumen function, feed intake, or quality or quantity of milk;
5. not be eliminated in milk;
6. not be found in body tissues five days after administration;
7. be economical.

Identical twin cattle were used in experiments to eliminate the heredity factor. Poloxalene was found effective, and met all requirements.

### Poloxalene Blocks Approved

In March, 1966, poloxalene was approved as a top dressing on feed



# AT Control ossible



Unless an escape route is provided the foam and gas formed in the rumen may push against the lungs, causing suffocation.

for dairy animals by the Food and Drug Administration. It was marketed by Smith, Kline and French under the tradename, "Bloat Guard." More recently the Food and Drug Administration has approved incorporating poloxalene in a molasses-salt block. A. E. Staley Manufacturing Company makes and sells the blocks under the tradename, "Sweetlix Bloat Guard Block." The blocks have proved effective in tests at the universities named earlier.

A block contains 33 pounds of molasses-salt with 30 grams of poloxalene per pound. Cattle on legume pasture should consume one half pound of block each. For a 1,000-pound animal the estimated cost is 7 cents a day.

Good management with the blocks is important. The manufacturing company recommends these practices:

- Put blocks before cattle 48 hours before they go on legume pasture.

- Place the blocks in areas of the pasture where animals congregate.

- Use at least one block for every five head, more if the pasture is large.

- Put out new blocks as old ones are partially consumed, to insure sufficient intake by each animal.

- Do not feed salt or minerals free-choice.

- The blocks also result in a better balanced ration. Molasses in them

provides energy, and the salt is a mineral supplement.

### **Now Approved as Food Additive**

In November, 1967, the Commissioner of Food and Drugs gave final clearance for poloxalene as a feed additive, permitting it to be sold in mixed feeds. That should make it simpler to feed poloxalene before turning cattle on legume pasture. It can also be used to treat bloat by putting it in water, and by giving it as a drench or through a stomach tube.

Poloxalene also has been tested at K-State to prevent feedlot bloat. So far it has been only partially effective.

Its effectiveness increased when increased amounts were fed. Ruminal foam is produced in feedlot bloat because of the high ratio of grain to roughages. The foam is from grain different from that produced by legume bloat, so many new compounds are being tested in feedlot experiments.

Bartley said more research is needed to determine the various causes of bloat. Ruminal flora change. Also management and feeding practices change, so more research is needed. Studies of the mechanics of poloxalene may provide insight to all three areas of bloat: legume, feedlot and chronic or inherited, he hopes.

Foam and gas build up tremendous pressure in an untreated animal and shoot out when given an escape route.



# Quail Prefer Sunflowers to Milo

By Donald Zimmerman



**A**LONG THE EDGES of fields throughout Kansas bobwhite quail are often seen feeding. Do they do any damage or is their feeding of any economic importance to the farmers?

Probably not because they usually feed on weed seeds (preferring sunflower seeds) and crop seeds that have fallen to the ground. A six-year study of bobwhite quail food habits on the Fort Riley, Kansas, Military Reservation showed sorghum grain was most important in volume but only 18.3 percent of the quail diet. Sunflower seed was found in less quantity but in 37 percent of the birds. Dr. Robert J. Robel of Kansas State University was in charge of the study.

A wildlife management program was begun at Fort Riley in 1959. One management practice was planting of food plots, either corn and sorghum or corn, sorghum and wheat. The early food plots were from one half to two acres while later plots were in narrow rows up to two miles long.

## Collected 591 Quail

Five hundred and ninety-one quail were collected during the research project, with firearms used to kill the quail and bird dogs to locate and retrieve cripples. The birds usually were collected in late afternoon, with no more than two quail being taken from one covey.

Data collected included the age, sex, weight, and fat content of the quail carcasses, and crop contents and collection site.

Crop contents were evaluated by two methods: the volume of food items in each crop and by the number of birds' crops containing the food item.

Although the volume of sorghum was 18.3 percent, sunflower seeds were found more often in 36.9 percent of the quail. Animal matter (mostly insects made up 7.5 percent of the crop contents by volume) was found in 27.8 percent of the crops examined. Grass seeds contributed



9.7 percent of the volume and were found in 29.6 percent of the crops.

Studying the crop contents and kill sites, Robel determined that quail traveled about 875 yards to feeding areas during the winter and early spring months. Quail crops collected farther than 985 yards from the food plots during the late winter and early spring contained no food plot grains.

Quail collected within 660 yards used the food plots as a major source of food during January through April. Birds collected within 660 yards of a food plot had more food in their crops, maintained a higher body weight and had a higher body fat content than birds collected beyond the food plots.

### Food Plots Needed

Results of the study indicate that food plots as part of the wildlife management are justified at Fort Riley.

Wildlife management has developed in several steps. They have included harvest regulation and bag limits, predator control and raising of birds to be released later.

Bag limits and harvest regulations have prevented overexploitation of wildlife. Usually the predator control and stocking programs do not significantly increase wildlife populations.

The newest wildlife management technique is habitat improvement. Unlike stocking programs of 15 years ago, habitat management increases wildlife populations by increasing the carrying capacity of the land but the increase is less obvious to sportsmen than are stocking releases of pen-raised birds.

### Provide Food and Shelter

Habitat management programs simply provide food and shelter for wildlife. Habitat improvement increases escape and nesting cover and provides winter food. Late winter is one of the most critical times for wildlife, with the least cover and lowest food supplies.

Cover is not green and heavy as during the summer months, so provides little protection from winter snow and ice storms.

During such critical times wildlife must have food readily available near adequate cover. That is why habitat improvement programs show promising results.

## Farmer Power Hits Agriculture

(Continued from page 5)

tially more control of the market to be effective," Wilkowske says.

He says that any time there is a period of low farm income and dissatisfaction, the rise of some organization bent on helping the situation is apt to appear.

The logical next question, then, is whether farmers are in a period of low farm income.

Nationally, farm prices—including livestock prices—are seven percent below mid-September, 1966. They are at the lowest parity ratio in 30 years.

Farmers today receive the lowest share of the gross national product, the consumer dollar, the food dollar, the smallest return on capital investment and the least on gross sales—less of each of these than they received in 1960.

### Living on Depreciation

The story of Bob Jensen, a 38-year-old dairy farmer near Farmington, Minnesota, is typical, as reported in The Minneapolis Tribune:

"Fifteen years ago, I was milking 15 to 20 cows and clearing \$1,600 a year. Since then, I've tripled my herd, mechanized and gone to irrigation. I've done everything I could, but last year I still cleared only \$1,600. I am handling thousands of dollars more, but still I am no better off.

"I'm living on depreciation—money I've got to have some day to replace my buildings and equipment. I'm not trying to get rich, but I'm entitled to a decent income."

What's behind today's low farm income? Farming, today, is characterized by efficiency and abundance of production. New technology, which farmers must employ to keep up, adds more surpluses and the vicious circle continues, explains Wilkowske.

Also, farm products have a market of inelastic demand. That means consumers will buy only so much food. It doesn't take much overproduction to depress prices substantially.

Secretary of Agriculture Freeman recently explained the farmer's plight like this:

"When the farmer goes to buy a refrigerator, he says, 'What will it

cost me?' But when the farmer goes to the market place, he says, 'How much can I get?'"

Discussing the sharp rise in farm production costs, he added: "It comes right down to bargaining again. The farmer has to pay these costs, but he has no way to pass them on as a manufacturer passes them on to consumers.

### Is the NFO Significant?

What is the significance of the NFO to agriculture? Glenn H. Beck, vice-president for agriculture at K-State, credits the NFO with calling attention, in a dramatic way, to the economic plight of the farmer.

Beck says it would be difficult to measure the benefits of the NFO to agriculture—or the approach being employed by the NFO.

"I would question anything associated with violence and wonder if this will lead to a solution. But I think labor unions have gone too far in this respect also," Beck says.

Are farmers getting ready to leap off their tractors and hop on the union-bandwagon? Beck doesn't believe the movement toward total farmer unionization has reached trend proportions.

Most farmers are still opposed to any stifling of their freedom but they may be forced to join the rest of the economy if something isn't done.

"But for the NFO to be effective in raising farm prices, it needs the membership of a high percentage of farmers. This can't be forced; the program must be made so attractive farmers will automatically participate," Beck says.

As for the farmer's plight, Beck agrees the disparity between farm income and the returns in other professions is the greatest in history.

"The problem is accented because today's farmer requires much more capital investment and must take greater risks for the same profits he was getting years earlier," Beck says.

### Have the Right To Bargain

Most agricultural officials agree that farmers have the right to bargain collectively. They realize, however, that farmers will have a rough job in trying to unite.

(Continued on page 15)

# Experts Predict . . .

## More Hogs in Kansas

*By Bob Stallbaumer Jr.*

**K**ANSAS HAS the potential to compete with the Corn Belt in swine production.

The feed supply is more than adequate, the climate is ideal, and markets are available for swine Kansas produced. Manpower is the only thing lacking.

K-State experts agree Kansas is capable of increased swine production. By developing new methods and expanding the old ones, they feel Kansas swine producers can go as far as they desire in swine production.

A growing trend of thought is that Kansas could and should expand its swine production.

### **Grain Production Now Sufficient**

Production of feed grains, including grain sorghums and corn, has in-

creased in recent years. In 1955, 2,770,000 acres of grain sorghum produced 32 million bushels for an average yield of 11.5 bushels per acre. In 1965, 3,380,000 acres of grain sorghum produced 137 million bushels for an average yield of 45 bushels per acre in Kansas.

Frank Bieberly, extension agronomy professor at K-State, said the introduction of hybrid grain sorghums in the latter 1950's accounted for part of the increase. Hybrids permitted grain sorghums to be grown in areas previously restricted by insects, particularly chinch bugs. Along with hybrids, increased use of commercial fertilizers and increased farmer know-how have given bigger yields.

Grain sorghum is not the only Kansas source of feed for swine which

has increased in recent years. In the same period, total corn production doubled from 31 million to 62 million bushels a year.

A shift in grain sorghum and corn production from the eastern part of the state to the western part was noted by Bieberly.

### **Best Potential in Western Kansas**

In addition to development of grain sorghum hybrids, expanded irrigation was given as a reason for the shift from the east to the west.

Wendell Moyer, agricultural extension specialist at K-State, said, "It would be very economical to increase hog production, particularly in western Kansas, as the demand for pork increases with the population expansion, requiring about one-half million more hogs per year. Western Kansas has a surplus of grain sorghum, corn and other feed grains, along with an ideal climate for swine production."

Kansas has a good start. It has increased or at least maintained its swine production in recent years while national pork production has not increased, Moyer said.

Swine production has shifted from the "in-and-outers" to large specialized producers, Moyer said. More capital is invested in equipment, buildings and breeding by fewer producers. More than two million market hogs are marketed in Kansas each year.

"Western Kansas is in a very strong competitive marketing position for swine because of its central geographic location, freight rate structure and cost of production," said Dr. John McCoy, K-State professor of economics.

### **Pork Shipped Through Kansas**

Pork is shipped from the Corn Belt to the West coast through Kan-

Swine production is shifting from the small "in-and-outers" to large specialized producers.





sas. Kansas swine producers should be producing a greater portion of this pork, McCoy said.

A general lack of interest in swine production on the part of veterinarians and lack of management know-how are reasons McCoy gives for the small number of swine in western Kansas.

Previous attempts at swine production have resulted in diseased herds in many cases, McCoy said, but improvements are being made and a general upward trend in Kansas is now evident.

McCoy said areas in western Kansas are showing high percentage increases but it must be remembered that these areas have had very few hogs previously and so high percentage increases do not give an accurate picture of the situation.

### **Sponsor Swine Improvement**

Moyer feels that the Kansas Swine Improvement Association (KSIA) offers a way to improve swine production in Kansas. KSIA was organized in 1956 to promote and improve pork production in the state.

The association, established at Kansas State University by a group of Kansas swine producers, says Kansas pork production will increase as:

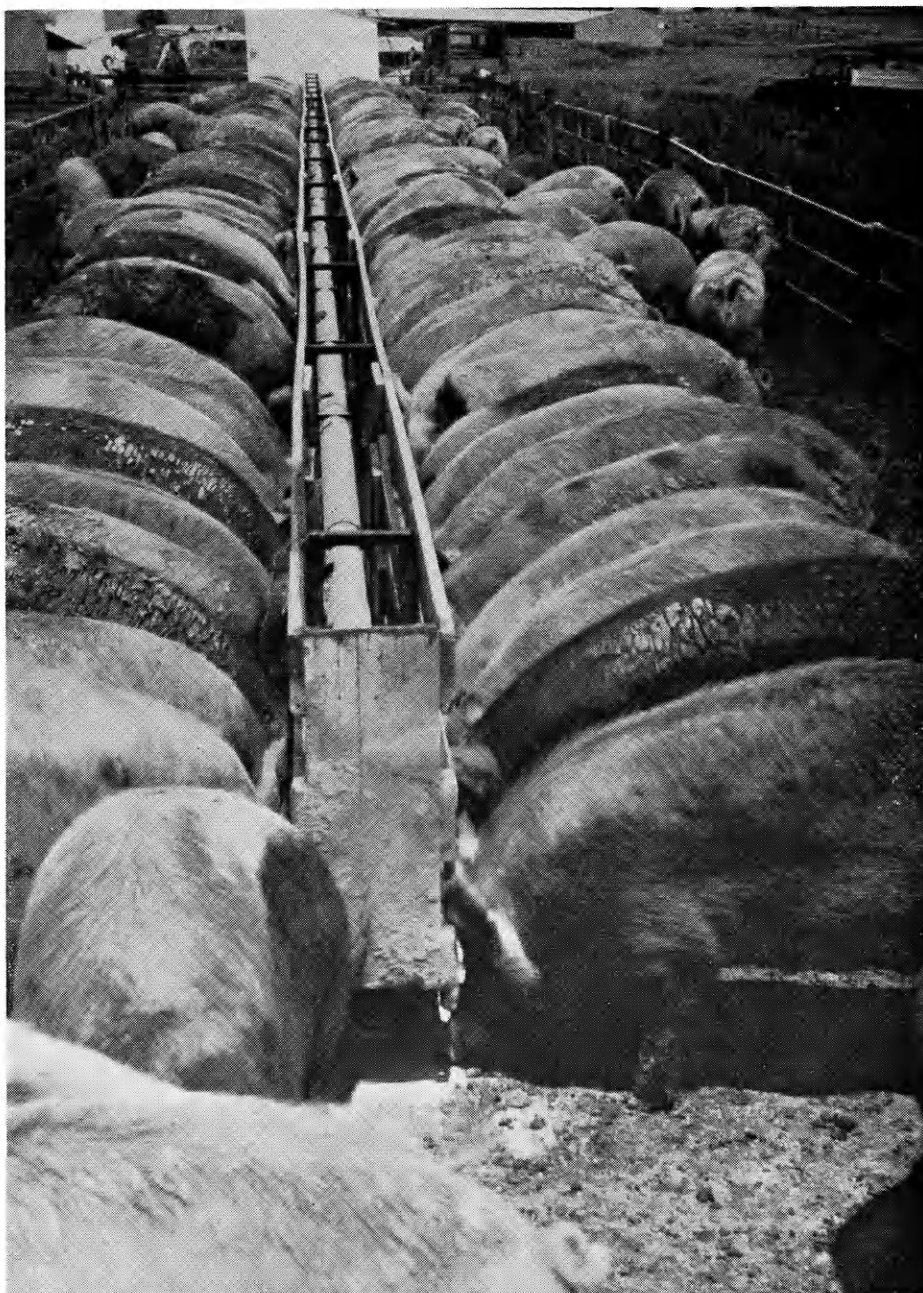
- Production efficiency is improved.
- Disease control programs are adopted.
- Product quality is improved.
- Marketing systems are extended.
- Nutrition and management problems are solved.

KSIA is doing its part by sponsoring swine improvement programs. The association financed and built the swine testing station at K-State. Purebred swine at weaning age are sent to the station to be fed out and subjected to various tests.

Each littermate group (two boars and one barrow or one boar and two barrows) is penned together and self-fed a complete pelleted ration. Pounds of feed required for each 100 pounds of gain are determined from starting weight until the pen average weight is 200 pounds.

### **KSIA Evaluates Swine**

Average daily gain is measured until each boar weighs 200 pounds. Each boar is probed for average backfat at 200 pounds.



Kansas swine production is becoming a specialized operation with more capital being invested in equipment, buildings and breeding.

Boars are also evaluated on the basis of the following:

- A boar must gain 100 pounds body weight on 310 pounds of feed or less in the winter and 295 pounds of feed or less in the summer.
- A boar must gain 1.6 pounds or more per day while on test.
- A boar must show an average measure of 1.25 inches or less backfat when it weighs 200 pounds.

Barrows are evaluated and data published on average daily gain. The

barrows are slaughtered at approximately 210 pounds live weight. Carcass information reported includes backfat thickness, length, loin eye area and percent ham and loin. The purebred breeders pay the bill for the operation of the station and testing programs.

Moyer, field secretary and treasurer for KSIA, said the group's immediate goal is to get 1,000 members representing 30 percent of the hogs produced in the state, so they can implement more self-help and self-financing programs for pork producers.

# The Missing Dust Mystery ...

## K-State Scientists Find Texas Silt in Topeka

*By Bob Stallbaumer Jr.*



Dust traps like this one were used in the study reported here.

ONE March morning last year Topekans found a thick layer of dust on their cars. Later, K-State scientists trailed the dust to its origin.

Unique weather conditions had transported a tremendous amount of dust into the area from southwestern Kansas, the Oklahoma and Texas Panhandles and northeastern New Mexico.

In 1963, K-State scientists established 15 dust-trapping stations east of the Rocky Mountains to study the

amount and quality of dust deposited and how it is transported. Also investigated were the relationships of amount of dust deposited to climate, surface earth material, land use and geographic location.

A standard 8-inch nonrecording rain gauge was used to trap the dust. Depending on the season, either water or antifreeze was kept in the gauge to trap the dust. Screens used to prevent contamination by birds, insects and plant fragments were re-

Dust from Kansas, Oklahoma, Texas and New Mexico was deposited in Topeka the night of March 2-3, 1966.



Photo courtesy Perry Riddle, Topeka State Journal



moved during the snow season so they wouldn't cap the gauge when snow fell.

The traps were exposed in vegetative areas, as free as possible from local dust sources.

Dust suspensions were removed each month, and sent to Kansas State University to be processed.

In the laboratory, colors and quantities of oven-dry dust, pH and relative percentages of clay, sand and silt were determined.

### Small Quantities Collected

Usually only small quantities of dust were collected, so it was not necessary to obtain daily or even weekly measurements.

However, during certain weather situations large quantities of dust were collected. Early March, 1966, was such a period.

At that time barometric pressure was low over southeastern Colorado. Southerly and southwesterly surface winds over Texas, Oklahoma, eastern New Mexico and Kansas increased considerably during the daytime and blowing dust was reported over portions of these areas.

The dust was carried northeastward by strong upper air. Blowing dust and wind gusts up to 50 m.p.h. were recorded at Dodge City, with visibility reduced to 2.5 miles.

A surface cold front moved across Kansas, reducing the wind and depositing considerable dust over northeastern Kansas.

In the study, a site near Tribune, Kansas, was selected to represent the "dust bowl" region of the Great Plains. Parts of three or four states with soil and weather similar to those at Tribune may be the source for much of the dust that settles over Central and Eastern United States.

During 1963-1966, monthly dust deposited at the 15 sites ranged from 15 to 410 pounds per acre. Deposition was significantly lower during late fall and winter. The greatest dust deposits were at Tribune.

### Lowest Deposition in Ohio

Tribune's deposition was as high as 3,616 pounds per acre (May, 1964) and as low as 2 pounds per acre (November, 1965). Coshocton, Ohio, had the lowest average deposition of the 15 sites.

Dust deposition was correlated with certain weather variables. It

correlated closely with average monthly wind velocity.

Rainfall correlated positively with dust deposition at most of the stations, suggesting that appreciable earth material floating or suspended in the air is "washed down" by rain.

Dust deposition also correlated positively among the 15 stations. Weather variables producing different dust deposition rates at North Platte, Nebraska, probably caused part of the variation at Manhattan, Kansas.

Indications are that dust deposition is large enough to be of agricultural, historical and scientific interest.

Measuring dust deposition with a network of stations for an extended time likely will contribute to a better understanding of soil genesis and soil renewal. Also, a procedure to identify the source of the dust deposited may be developed.

Dust is not a total liability. Dust carries micronutrients needed by plants. So it's much better to have dust settling on your land than taking off for Topeka or Coshocton, Ohio.

Information obtained from Merle J. Brown, U.S. weather bureau climatologist, Manhattan, Kansas; Roland K. Krauss, U.S. soil scientist; R. M. Smith, U.S. soil scientist.

## Farmer Power Hits Agriculture

(Continued from page 11)

"Certainly farmers have the right to bargain as labor but their job is much more difficult. One of the problems of trying to increase prices through withholding is that you must have a virtual monopoly on production to be effective," points out Wilkowske.

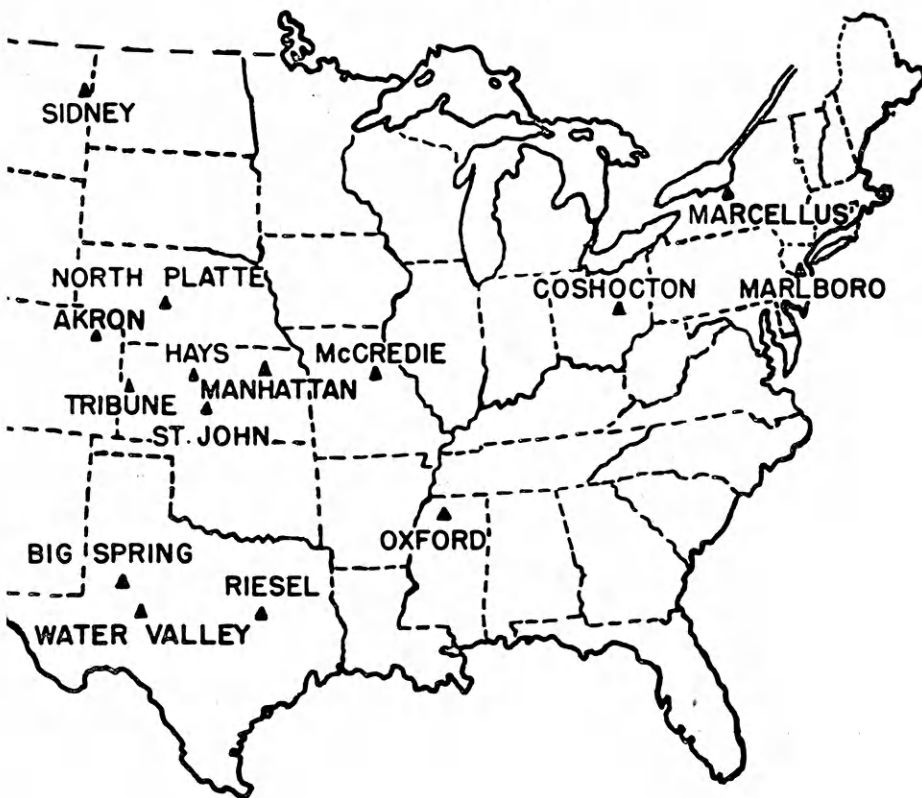
"In farming, that means all production must be marketed through the bargaining source; all farmers have to cooperate so they do not sell when their neighbors are holding."

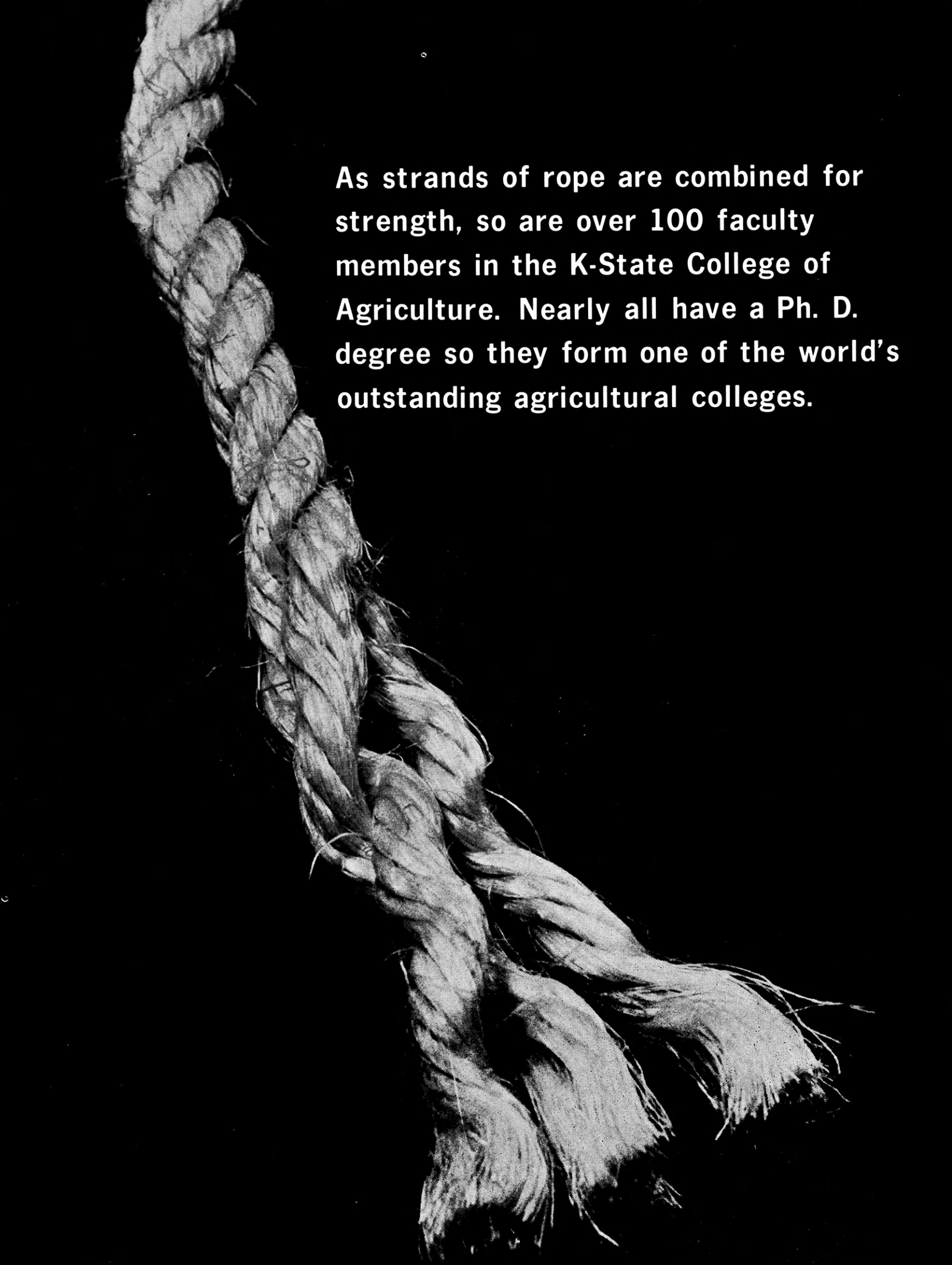
Wilkowske recalls an old phrase that could well serve as the key to successful farm bargaining: "If you withhold, withhold the bulls from the cows and the boars from the sows."

"Farmers can't just say they want more per unit; they must do as industry does: set a price tag and produce only the amount consumers will buy at that price," he adds.

And so Doyle Emperley gritted his teeth as he watched the milky stream slowly seep into the ground. It was his small role in forming the NFO fist to defend rural America from being squeezed out of existence.

Location of dust-collecting stations.



A thick, braided rope, likely made of natural fibers, is shown against a solid black background. The rope is positioned diagonally, starting from the top left and extending towards the bottom right. It has a complex three-strand braid pattern. The bottom of the rope is frayed, showing the individual fibers. The lighting highlights the texture and three-dimensional quality of the braid.

**As strands of rope are combined for strength, so are over 100 faculty members in the K-State College of Agriculture. Nearly all have a Ph. D. degree so they form one of the world's outstanding agricultural colleges.**