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Agricultural and Home Economics Experiment Station

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Try Gibberellic Acid on Dwarf Grain Sorghum

How GIBBERELLIC acid affects the emergence of seedlings and the growth of dwarf grain sorghum was studied at the Experiment Station in 1958 under the direction of F. P. Gardner.

The researchers report that gibberellic acid increased the rate of emergence, particularly at the deeper levels of planting, and increased seedling heights. Gardner adds, however, that the effects of the acid soon wore off, and repeated applications of the acid had no apparent effects on plant growth, yield or seed quality of the sorghum plants beyond the seedling stage.

Find More Facts On Downy Mildew Of Soybeans

A NATIONAL SURVEY to locate and identify races of downy mildew of soybeans has been conducted by John M. Dunleavy and V. D. Pederson of the Experiment Station. Various races of mildew attack different soybean varieties, just as some races of cereal rust infect certain cereal varieties but not others.

The survey was made in 24 north-central and southeastern states. Race 8 was most frequently found in Iowa and other soybean-growing areas in the north-central states.

Lack of information on downy mildew races has hampered efforts to develop mildew-resistant varieties. With the added knowledge of the races present in the soybean-producing states, however, development of disease-resistant varieties can proceed.

In current work, disease resistance to bacterial blight, bacterial pustule and stem canker is receiving the greatest attention because of the immediate potential danger from these diseases. But the new information on downy mildew better outlines the direction needed for the development of resistance to this disease.

Diseases Show Promise In Controlling Borers

THE USE of disease organisms to control the European corn borer continues to look promising in studies conducted by Experiment Station and USDA researchers. Results, however, are still too variable to justify recommendations for general farm use. Also, production of disease organisms is still on an experimental scale, thus limiting their use to small-scale plots. Though production is now limited, several large commercial concerns are already producing the bacterium Bacillus thuringiensis on a pilot-plant scale.

Further tests are planned to examine the effects of disease organisms for corn borer control with added emphasis on Bacillus thuringiensis. The possible synergistic action between insecticides and disease organisms will be tested. And field tests will be made of any disease organisms isolated and cultured at the Insect Pathology Laboratory at Iowa State.

Need Management Plan In Feeding Antibiotics

ANTIBIOTIC FEEDING programs for swine need a re-evaluation if we want to get the full benefits from the growth-permitting values of these wonder drugs, reports Damon V. Catron of the Experiment Station. Careful study of antibiotic feeding over the past 10 years has shown a gradual decrease of the response to antibiotics in gains and feed efficiency.

We'll have to use growth-permitting and antifungal antibiotics...
more efficiently for many years, Catron adds, to maintain efficient and profitable swine production.

He says experimental work indicates five main recommendations for effective antibiotic feeding to swine during different stages of the life cycle:

- The established growth-permitting antibiotics are aureomycin, terramycin, penicillin and combinations of bacitracin-penicillin.

- The recommended levels for feeding—in grams of antibiotic per ton of complete feed—are: pregestation, none; gestation, none; sows at farrowing time, 50 to 100 grams; lactation period, 50 to 100 grams; pre-starter for baby pigs, 100 grams; starter ration for young pigs, 100 grams; growing ration for pigs weighing 25 to 50 pounds, 50 grams; growing-finishing pigs at weights above 50 pounds, level fed depends on disease level, no antibiotics on farms where the disease level is low, up to 20 grams where the disease level is high.

- Rotate antibiotics of different action spectra from one stage to another in the life cycle. (The "spectra" of an antibiotic refers to the groups of disease organisms it controls. Change of spectra means shifting the attack to a different group of disease organisms.)

- Add an effective antifungal antibiotic whenever high levels of broad-spectrum antibiotics or combinations of antibiotics are continuously fed at high levels. In some cases there has been an increase in fungus growth in the gastro-intestinal tracts of the animals. These fungi include certain yeasts and molds. They increase where high levels of broad-spectrum antibiotics or combinations of antibiotics have been continuously fed to baby pigs and growing pigs for considerable lengths of time.

The factors known to influence the performance of antibiotics in swine nutrition are: the kind of antibiotic fed, the amount fed, the age of the animal fed, the nutritional adequacy of the ration, the "stress level" (including disease level) of the animal's environment and the duration (years) of feeding the same antibiotic in the same environment.

**Tapazole Ups Gains From Cattle Rations**

To test the value of adding Tapazole to the rations of fattening cattle, Experiment Station researchers conducted two cattle-feeding trials with a high corn fattening ration. Results of the first trial showed that Tapazole stimulated liveweight gains in cattle both in rations where stilbestrol was also fed and in rations which did not include stilbestrol. Results of the second trial again were favorable to Tapazole feeding, and rate of gain and feed efficiency were improved.

**special subjects**

**Why More Pheasants In Northern Iowa?**

**Southern Iowa** has traditionally had lower pheasant populations than northern Iowa, though the pheasant population has been increasing recently in the southern part of the state. Wildlife specialists at the Experiment Station are investigating factors which may be responsible for or which influence the difference in pheasant populations in the two parts of the state.

Once we know the most important factors limiting southern Iowa pheasant populations, it will be possible to make recommendations for aiding their increase, says Arnold O. Haugen and Eugene Klonglan.

**How Effective Is Vo-Ag Training?**

How effective is vocational agriculture training in high school? How much does such training benefit the students after graduation—both those graduates who enter farming and those who enter nonfarm occupations? These are some of the questions researchers at the Experiment Station are trying to answer with a series of studies of high school graduates from 20 communities which offered vocational agriculture and from 20 similar communities which did not offer such training.

Here are a few preliminary conclusions from these studies:

- Farm operators who had completed 3 or more years of high school vocational agriculture had higher crop and livestock production and higher total gross products from their farms than did high school graduates who hadn't received such training. Vo-ag trained operators also used a greater number of improved production and management practices on their farms than did graduates without vo-ag training.

- Farm operators who had lived on larger home farms when they graduated from high school operated larger farms with more crop acres and produced more total gross products than did high

The best time to count pheasants is in cold and stormy winter weather when they flock in farm windbreaks.
school graduates who had lived on smaller home farms.

- Vocational agriculture training proved to be as valuable to graduates who entered nonfarm occupations as other high school courses which might have been substituted for vocational agriculture.

- No difference in the occupational status of high school graduates in nonfarm jobs was found between those who had had and those who had not had vocational agriculture training. The measures of status were: annual earned income, degree of expressed satisfaction and score of their occupation on a scale of occupational prestige.

- The top yearly earned income for the high school graduates was attained at age 35. This information was compared with information from an earlier study of Iowa State agriculture graduates. The total lifetime earnings for high school graduates was about $238,000, for the college graduates it was $360,000. The college graduates reached their top income at age 53. The average yearly earned income for high school graduates was $5,062, and for college graduates was $8,370.

Key personnel in this over-all examination of the effectiveness of vocational agriculture training are: Clarence E. Bundy, Duane Nielsen, Duane Blake, James Hensel, Forrest Bear, Robert Applegate, Carl Wells, Richard Bittner, Don Christensen and Melvin Salmeia.

**horticulture**

**Seek to Maintain Freshness of Berries**

Fresh berries don't keep very long—even in refrigerated display cases. To learn whether it's possible to prolong the extremely short shelf-life of berries is the goal of a study by John C. Ayres and E. L. Denisen of the Experiment Station.

Various antifungal sprays and dips for strawberries, raspberries and cranberries are being tested to see whether they can slow down the development of mold on the fruit. Treatments are being tested both in the field and after harvest.

Results so far indicate that berries dipped in solutions containing myprozine had lower microbial counts after storage than did untreated berries. Also, as the concentration of the antifungal was increased, there was a larger proportion of sound berries. Ayres and Denisen warn, however, that the antifungals tested have not yet been cleared by the federal government for use on food. Practical use of these agents in food is not permitted at the present time.

Also being studied in relation to the keeping quality of fresh berries are various selected packaging materials. The researchers found less spoilage of strawberries and raspberries when plastic containers were used than when the fruit was stored in wooden berry boxes—especially if the boxes had been used before.

Cellulose acetate was considered the most promising film for wrapping strawberries and raspberries. The other films tested didn't allow enough water vapor transmission. But the situation was different with cranberries. In all tests where cranberries were stored for 30 days or longer, color and firmness were most satisfactory if the fruit was packaged in Mylar, Saran or polyethylene, rather than in more permeable films.

**Field and Sweetcorn Respond Differently To Broadcast Fertilizer**

In certain seasons, field and sweetcorn harvested at the canning stage may not respond alike to broadcast nitrogen, phosphorus and potassium fertilizers. This conclusion is based on the results of a study conducted by K. W. Johnson, C. C. Acker and J. T. Pesek of the Experiment Station. Though there were no major differences in the top yields between
the two types of corn, comparable yields were achieved with somewhat different rates and combinations of nutrients.

This study suggests that an increase in the level of one nutrient relative to that of another might have a negative effect on plant response, particularly where another uncontrolled factor—such as temperature, moisture or stand—limits yields. In such cases, it often appears that the ratio of nutrients applied or available to plants is more important than the actual fertility level for any individual nutrient or combination of nutrients.

Fertilizer application did have an effect on plant composition. Nevertheless, the level of N, P or K in the plant was not consistently increased when more fertilizer was applied. Differences in the relative composition of sweetcorn and field corn gave further indication that their requirements may differ.

In a demonstration planting in Harrison County, ground squirrels or mice apparently killed 75 percent of the ponderosa pine trees in a 2-acre area. The trees were completely stripped of needles and bark. Mice girdle trees up to 4 inches in diameter at the base, rabbits nip off the terminal and lateral shoots and gophers cut off the larger roots.

Growth of a number of species on the tree adaptation plantation has continued to be satisfactory. These species are mainly: red cedar, Rocky Mountain juniper, ponderosa pine, Austrian pine, European larch and Scotch pine. During 1958, Douglas fir, which in the past grew slowly, started to grow at a satisfactory rate.

**Study Costs, Returns From Farm Woodlots**

Costs and values in connection with logging various tree classes in small farm woodlots are being studied at the Experiment Station under the direction of N. J. Hansen and A. L. McComb. There are two major purposes for studies such as this one: (1) To study marketing opportunities for low-grade materials from deteriorated farm woodlots and to learn of the problems involved in processing and marketing small quantities of low-grade wood. (2) To find out whether enough revenue can be obtained from harvesting the low-grade woods to pay part or all of the cost of rehabilitating the woodlot.

White oak stave operations have been carried out during the last two winters. Split stave bolts and heading were sold during the past winter at the roadside for an average price of 80 cents per chord foot (one chord foot is equivalent to 10 board feet). Average logging costs (labor plus equipment operation and depreciation) amounted to 46 cents per chord foot. So profit or stumpage value was 34 cents per chord foot. (This didn't allow for such costs as management, protection and road construction.)

This study will be continued in future years to gain more experience with this type of operation and to obtain more information on costs and returns.