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For Your Interest

Agricultural and Home Economics Experiment Station

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FOR

YOUR

INTEREST

poultry

Two Square Feet Is Sufficient Space For a Laying Hen

LAYING HENS can be crowded considerably more than has usually been recommended for hen houses. This conclusion is based on a 2-year Experiment Station study involving 2,700 birds. As an average, it was found that production declined only 1 percent when floor space per bird was decreased from 3 square feet to 2 square feet. At the same time, mortality in the flock increased only 1 percent.

These differences in perform-

ance, say A. W. Nordskog, R. E. Phillips and L. T. Smith, are not sufficiently large to justify as much as 3 square feet of expensive housing facilities per bird. Housing space, the researchers add, can be used more profitably by keeping more birds on a given floor space than has been recommended before.

These management experiments were part of a larger study on breeding economically important characters in the fowl. Main traits under study in the breeding program are egg production, body size and egg size.

Chicken Body Louse Cuts Egg Production

THE CHICKEN body louse, *Menacanthus stramineus*, is an

important factor in reducing egg production in an infested flock of hens, report Earle S. Raun and H. M. Harris of the Experiment Station.

Twelve pens of five hens each were infested with the chicken body louse, while twelve pens of similar hens were not infested. At the end of a 14-week test, there was an estimated average of 25,000 lice per infested hen.

Egg records over the 14-week period showed an over-all loss in egg production of 15 percent because of louse infestation. Infested hens produced 26 percent fewer eggs than the noninfested hens during the last 10 weeks of the test and 84 percent fewer eggs during the final week of the test period.



Experiment Station tests involving more than 2,700 birds have indicated that laying hens can be crowded considerably more than has usually been recommended in the past and still maintain production.

forages

List High-Yielding Red Clover Varieties

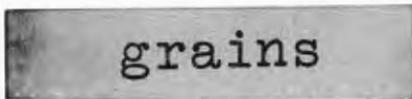
KENLAND, DOLLARD and PENNSCOTT red clover varieties produced satisfactory hay yields and were superior to most other varieties in two trials conducted by the Experiment Station. A new Maryland variety — Chesapeake — was also tested. Chesapeake yielded well, but it's too early to tell whether this variety has sufficient winterhardiness for Iowa conditions.

Test Herbicides for Weed Control in Alfalfa

DALAPON and 2,4-D,B were

tested for the control of annual weeds in alfalfa in 1958, using the same techniques developed earlier for weed control in birds-foot trefoil. Spray applications of Dalapon at 4 pounds per acre plus 1/2 pound of 2,4-D,B were made 4-5 weeks after alfalfa emergence to control annual grass and broadleaf weeds.

The results showed this technique to be essentially suitable for alfalfa. The level of weed control was good, and the injury to alfalfa appeared slight, say D. W. Staniforth and J. M. Scholl of the Experiment Station.



Equipment Tested For Borer Treatments

TO DEVELOP improved methods of combating the European corn borer, agricultural engineers under the direction of W. G. Lovely are working to improve equipment for applying insecticide treatments. The engineers also are testing application procedures for borer control.

Laboratory studies with various granular applicators showed that there was very little difference in the actual delivery rate of granular material when the hoppers were full or almost empty. Eight different types of granular applicators were also tested in the field. These tests indicated that the eight were equally effective for application of granular

DDT. Aerial application of granular insecticides gave fair control of the first brood.

Second-brood studies indicated that using five spray-nozzles per row gave better control than the use of four nozzles. When four nozzles were used, 40 gallons of spray gave slightly better second-brood control than 20 gallons of spray. This wasn't the case, however, when five nozzles were used.

Hawkeye Most Popular Soybean Variety in '58

OF IOWA'S 1958 soybean acreage, 54 percent was planted to the Hawkeye variety, reports C. R. Weber of the Experiment Station. The remaining acreage was planted to: Blackhawk, 18 percent; Chippewa, 11 percent; Adams, 8 percent; Clark, 3 percent; Lincoln, 2 percent; and others, 4 percent. In total, Weber says, more than 95 percent of Iowa's acreage was planted to superior varieties.

The acreage survey is conducted as a part of the over-all research in the development of superior soybean strains under the direction of Weber and John M. Dunleavy at the Experiment Station. The work is in cooperation with the Crops Research Division, USDA.

In this work, Ford, a new variety adapted to north-central and south-central Iowa, was selected and developed over a 13-year period. Wide testing for adaptation of Ford was done cooperatively by a number of experiment stations in the north-

central region. Iowa was joined by the Nebraska and South Dakota experiment stations in the increase, release and distribution of this variety to certified seed growers in the respective states in 1959. Ford is expected to replace all Lincoln acreage and some of the Hawkeye, Adams and Clark acreages. Ford is superior to Lincoln in yield and lodging resistance and is slightly earlier in maturity.

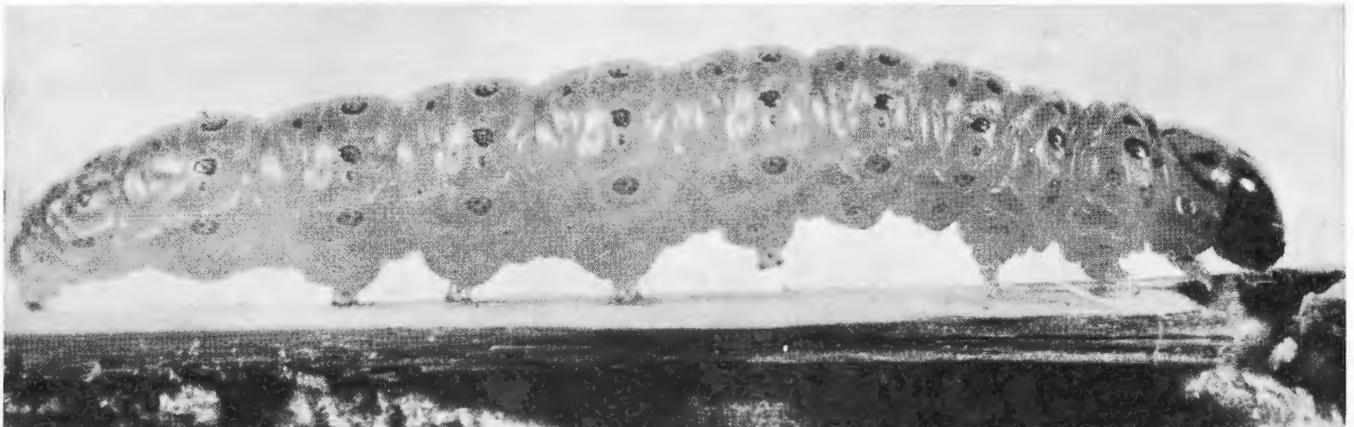
Seek Varieties Resistant to Borer

INBRED LINES of dent corn, popcorn and varieties of sorghum are currently under study at the Experiment Station to discover lines and varieties resistant to the European corn borer.

In an evaluation of 393 experimental inbred lines of dent corn, 32 percent of the lines were graded highly resistant to the borer. An additional 26 percent were graded as having a satisfactory level of resistance. Only 4 percent were highly susceptible.

Promising resistance to first-brood borer infestation also was found in several inbred lines of popcorn. The extensively grown high-quality hybrids Iopop 6 and Iopop 7, however, were susceptible.

European corn borer infestation in grain sorghum is a problem in some years—particularly in midseason and late varieties which head out during the second-brood moth flight. Tests to determine the susceptibility of different varieties to attack by



Sources of resistance to the European corn borer in inbred lines of dent corn and popcorn and in varieties of sorghum are being sought in cooperative studies by the Experiment Station and USDA.

the borer showed that, in general, the varieties of Kafir and Feterita parentage were less susceptible than those of predominantly Milo parentage.

One important problem to be solved in this search for resistant lines is to discover the chemical nature of resistance. Why are some varieties resistant and others susceptible? Future plans for this study call for increased emphasis on different aspects of the nature of resistance through studies on the feeding behavior of larvae on the plant structure of resistant and susceptible inbred lines. This information is essential for interpreting the genetics of resistance and for studying the chemical nature of resistance.

F. F. Dicke, D. B. Leuck, L. H. Penny, W. A. Russell, W. I. Thomas and R. E. Atkins are working on an evaluation of the resistance of commonly used and experimental lines and varieties. The studies on the chemical nature of resistance are being conducted by Boyd George, James Orr and Ernest Wenkert. The entire program of research for varietal resistance to the borer is sponsored cooperatively by the Experiment Station and the USDA.

special subjects

What Causes Resistance To American Foulbrood?

SOME HONEYBEE colonies have shown resistance to American foulbrood disease, while other colonies do not have this resistance. The aim of research on American foulbrood at the Experiment Station is to divide the over-all resistance displayed by a colony unit of bees into its component mechanisms of resistance. Each mechanism of resistance discovered is to be studied individually to learn its genetic basis.

In the course of this work, it was learned that elimination of American foulbrood diseased larvae from the brood comb is a two-step process. Some colonies will perform the first step (uncapping the wax cell containing

the larva) but will not perform the second step (removing the dead larva). Some colonies will carry out the second step if the first step is done for them. Some colonies will do both steps; some will do neither.

From these studies, it appears that hygienic behavior—a mechanism of resistance to American foulbrood—is due to the expression of two recessive genes. One of these is concerned with uncapping the cell, and the other is concerned with removing the larva. If this explanation is confirmed in future study, says Walter C. Rothenbuhler, these findings will take their place as one of the first known cases of comparatively simple genetic control of an extensive, biologically useful behavior pattern.

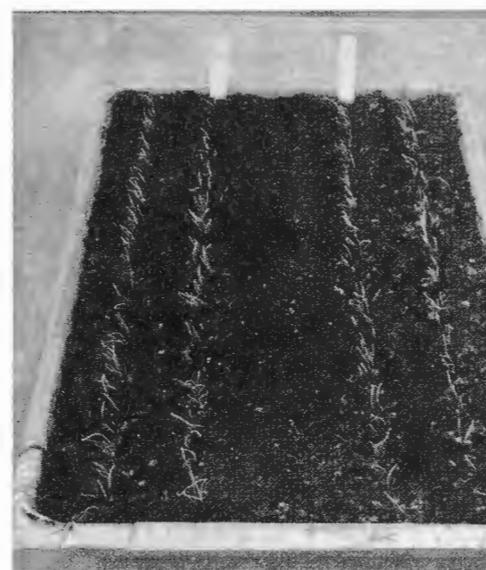
Test Packaging Materials For Storage of Seed

IMPROVED PACKAGING for better storage and marketing of seed is the goal of an Experiment Station study conducted by Duane Isely and Robert Brown. Kentucky bluegrass, creeping red fescue, onion and cabbage seeds were stored at varying temperatures and three moisture levels. The packaging materials used were paper, three types of sealed plastic bags, laminate bags, cloth bags and tin cans.

Results after 9 months' storage showed that the germination of Kentucky bluegrass seed stored in tin cans at 7 percent moisture and 43°C. decreased from 80 percent to 44 percent. Under all other conditions, regardless of packaging material, the germination only decreased 10-12 percent.

The germination of creeping red fescue decreased 0-10 percent under all temperature and moisture conditions, regardless of the packaging materials used.

For onions, there was little drop in germination at the 3-percent and 5-percent moisture levels, regardless of the temperature or packaging material. At 7 percent moisture and 43°C., seed in tin cans had a 50-percent decrease in germination. There was no decrease in germination with other packaging materials at the 7-



Packaging and storage conditions have marked effects on seed germination. These photos illustrate some of the results in Experiment Station germination tests described in the item at left. The top photo shows the results of a germination test for cabbage seed stored under different conditions. The lower photo shows results of a similar test made on stored onion seed.

percent moisture level and 43°C. temperature.

Germination of cabbage, stored at 5 percent and 7 percent moisture, decreased more rapidly when the seeds were stored in tin cans than in other packaging materials. The germination of cabbage seed at 3 percent moisture, at all temperatures and in all packaging materials, remained relatively high.