The Southwestern Bee Culture Laboratory

Unit of USDA Bureau of Entomology And Plant Quarantine Is at U of A

By LAURENCE A. CARRUTH

Agriculture in Arizona and neighboring states will benefit from the recent establishment of the Southwestern Bee Culture Laboratory at the University of Arizona. This laboratory is a unit of the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture and is maintained in cooperation with the College of Agriculture and the Agricultural Experiment Station of the University of Arizona.

The staff includes Frank E. Todd and S. E. McGregor, two research entomologists with wide experience in investigational work related to the beekeeping industry. Both men are familiar with Arizona agriculture. Todd was engaged in work in entomology in the Yuma area for a number of years. McGregor was stationed in Arizona between 1945 and 1947. At that time he established that cotton could be adequately dusted with DDT without serious injury to pollinating insects when reasonable precautions were observed.

Honey Bee Is a Pollinator

The honey bee has long been appreciated as a honey producer, although its importance as a pollinating insect, capable of substantially increasing seed-crop yields, is still not fully recognized in the southwest. For the present, the experimental work of the new laboratory will be concerned largely with the honey bee as a pollinator of crops of major importance. This will represent a continuation of the type of work Todd conducted at the U. S. Legume Seed Laboratory at Logan, Utah, immediately before coming to Arizona.

Before an alfalfa blossom can be feltilized and seed developed, each individual flower must be "tripped" to release the stamens and pistil from their original enclosed location within the keel petals. Work in Utah has established that, because of inadequate numbers of native wild bees, and large, concentrated plantings of alfalfa, the honey bee is responsible for most of the flower tripping of the commercial seed-producing acreages.

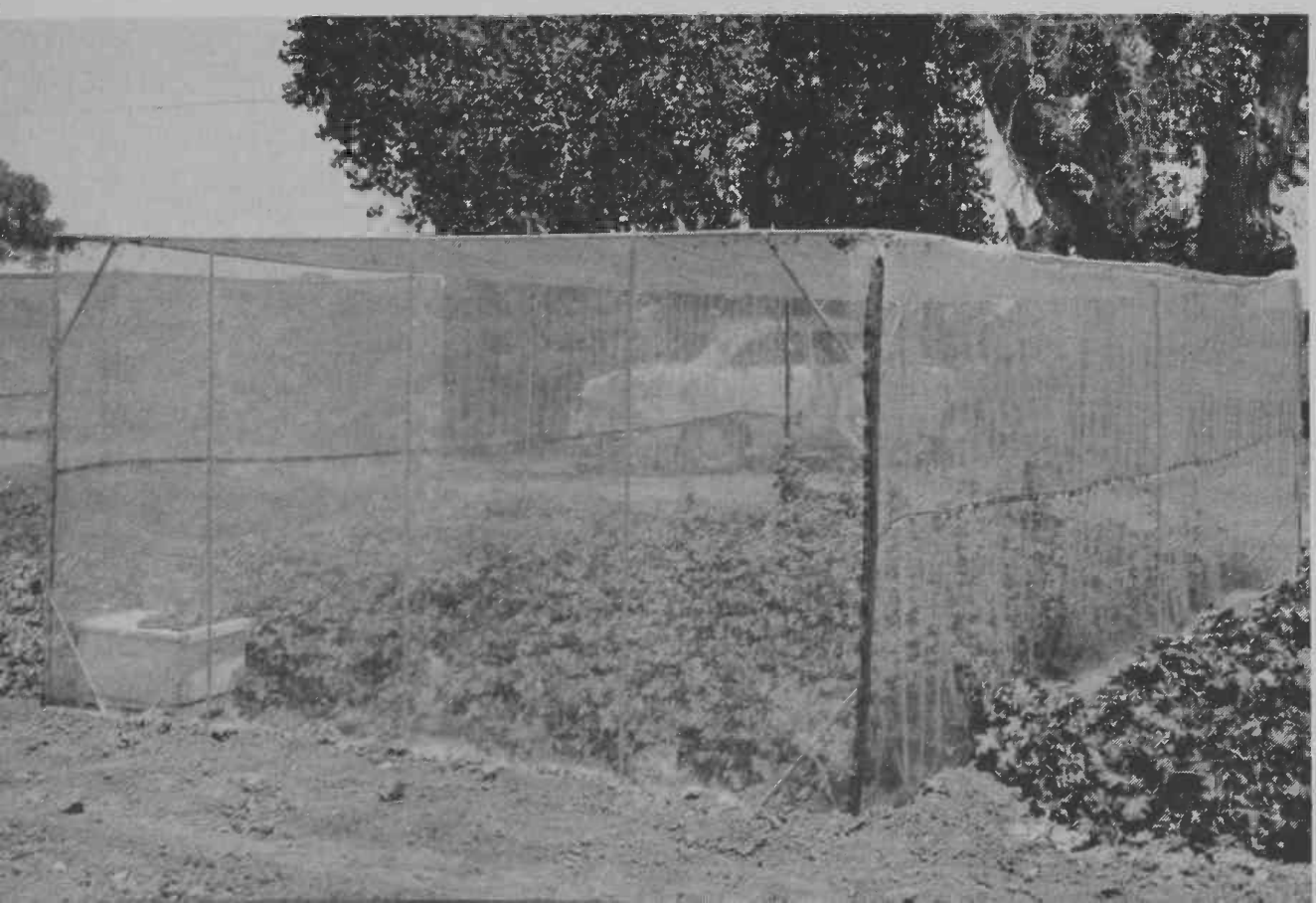
In an early experiment, where injurious alfalfa insects were controlled by dusting, plots caged to exclude all bees produced 16 pounds of seed per acre. Nearby plots receiving random natural pollination produced 163 pounds, while other caged plots containing bees averaged 321 pounds of seed per acre.

Other tests, in Utah and elsewhere, have shown seed yields ranging from 500 to 1000 and more pounds of alfalfa seed per acre when adequate numbers of bees were present and injurious insects were properly controlled. Arizona is a prominent alfalfa-seed-producing state and can profit greatly from the practical use of this information.

Most experimental work with bees as pollinators has shown that satisfactory crop yields may be expected only when proper attention also is given to the control of the injurious insects affecting the particular crop involved. It is usually possible to obtain satisfactory insecticidal control of injurious insect pests without a

(Please turn to page 11)

Tests are now in progress to determine the importance of honey bees as pollinators of melons. Comparisons are being made on sets of fruit on melon vines exposed to an abundance of bees (below), no bees, and casual pollination by bees from other sources. This picture was taken in test plots near Phoenix.



Progressive Agriculture IN ARIZONA

Vol. II July-Aug.-Sept., 1950 No. 2

Published quarterly by the College of Agriculture, University of Arizona, Tucson, Arizona; Dr. P. S. Burgess, dean of agriculture. Reprinting or quoting permitted with proper credit.

Entered as second-class matter March 18, 1949, at the post office at Tucson, Arizona, under the act of August 24, 1912.

Arizona farmers, ranchmen, and homemakers may have their names placed on the mailing list to receive **Progressive Agriculture** at no cost by sending a request to the College of Agriculture, University of Arizona, Tucson, Arizona.

What Does DHIA Mean to Arizona?

(From page 7)

cow. Also, a study was made by comparing the herds on test for one year against those on test for 5 years or more. The difference was 36 pounds of butterfat per cow year more for the herds on test five years or more. Undoubtedly the increase in production is due to the use of the DHIA records to cull out the low producers, feed the better cows more and the development of a sound breeding program.

High-producing cows convert feed into milk and butterfat more efficiently and profitably than do low-producing cows. More production per pound of feed consumed means lower feed costs and greater returns above feed costs. For example, the average cow in the nation produces 200 pounds of butterfat with an income of $110.00 over feed cost and $.66 to produce a pound of butterfat. Whereas, the average dairy cow in DHIA in the nation produces 350 pounds of butterfat with an income of $223.00 over feed cost and $.47 to produce a pound of butterfat.

The quickest and surest way to improve the inherent producing capacity of a herd is through the use of a series of good herd sires. In one generation the herd sire contributes 50 percent to the genetic make up of the new heifers in the herd. By the fifth generation 97 percent of the genetic makeup of the new heifers in the herd is based on the sires selected. On an average, for every sire that improved the herd there have been two others that either failed to improve the herd or actually reduces practically all the improvement made by the good sire.

In order to get more basic information which will enable the dairymen to make better herd sire selection, the Bureau of Dairy Industry, in cooperation with State Extension Services began collecting individual lactation records in 1935 to "prove" large numbers of association sires. The records are also used in analyzing the breeding progress that is being made in many individual herds, with a view to finding improved strains and families from which desirable breeding stock may be selected.

Arizona herds in Dairy Herd Improvement Associations may be looked upon as a part of a mammoth breeding herd of national importance—one that is being improved constantly and one from which breeding stock is gradually disseminated to improve the thousands of other herds that make up the nation's dairy cattle population.

—W. R. Van Sant is Extension Specialist in Poultry and Dairying.

Southwestern Bee Laboratory

(From page 2)

serious loss of beneficial honey bees if proper precautions are taken. This important problem will receive major attention as a part of the research program of the new Arizona laboratory.

Study Pollination of Melons

Todd and McGregor are now engaged in a study of the role of the honey bee in the pollination and set of melons grown in the Salt River Valley in cooperation with the Arizona Vegetable Growers Association and Orin A. Hills of the U. S. Department of Agriculture, Vegetable Insect Research Laboratory at Phoenix. Pollination and insecticidal factors which may favor an earlier and heavier set of fruit are being investigated. When this study is completed, the results will be of interest to all growers and shippers of melons.

A close, cooperative relationship is being created between the Southwestern Bee Culture Laboratory and the Department of Entomology of the University of Arizona. This will be reflected in cooperative research work and the sharing of laboratory facilities.

Beekeepers to Meet in Arizona

Because of the increased interest in beekeeping in relation to the pollination of agricultural crops in the southwest, the University of Arizona has invited the American Beekeeping Federation to hold its annual conference on pollination on the campus at Tucson during the last week of October 1950. This will be a national meeting with prominent speakers to discuss problems common to the beekeeper, farmer, and seed producer. All interested persons are invited to attend. Further details concerning the program will be released later.

—Laurence A. Carruth is Professor of Entomology and Head of the Department.

Chlorosis in Arizona Affects Many Crops

(From page 6)

fur must hit a certain percentage of the roots. In old trees a large part of the root system has retired to the subsoil where it is difficult to reach them.

Field tests with sulfur-manure mixtures have given excellent response on chlorotic sorghum and pinto beans. In these tests the sulfur-manure mixture was applied at rates of 250 and 500 pounds per acre. In the case of field crops it may be best to delay the treatment until the chlorosis develops, because the fields are usually spotted with green and chlorotic plants and in such cases it is not advisable to go to the expense of treating the entire field.

For old trees where the roots cannot be reached, a cure has been effected by plugging an iron salt into the trunk of the tree. Tests of this nature have been conducted in Santa Cruz, Cochise, Pima, Yavapai, Maricopa, and Graham counties on chlorotic apple, peach, and pear trees and for chlorotic grape vines in Yavapai county. A heavy irrigation immediately preceding or following the injection of the iron salt into the trunk promoted a quicker response. In one case the leaves greened up in 10 days.

It should be mentioned that all yellow leaves are not chlorotic leaves. Yellowing may result from a nitrogen deficiency, nematode injury on the roots, and other causes. In these, the yellow color is usually spread quite uniformly over the leaf. In chlorosis the veins are green and the area between the veins turns yellow to form quite distinctive patterns.

—W. T. McGeorge is Agricultural Chemist.

What Is "Crude Fiber?"

(From page 4)

The present method of feed analysis involving the crude-fiber determination is unsatisfactory. For research purposes this determination has been replaced by a detailed analysis of the various chemical fractions occurring in the feed. However, these analyses are long and expensive so are not suitable for routine use.

The perfection of a suitable method of analysis to replace the crude-fiber determination for commercial and general use is one of the big problems confronting animal nutritionists at the present time.

—B. P. Cardon is Associate Animal Husbandman and Associate Animal Pathologist.