

Cotton Is Benefited By Bees

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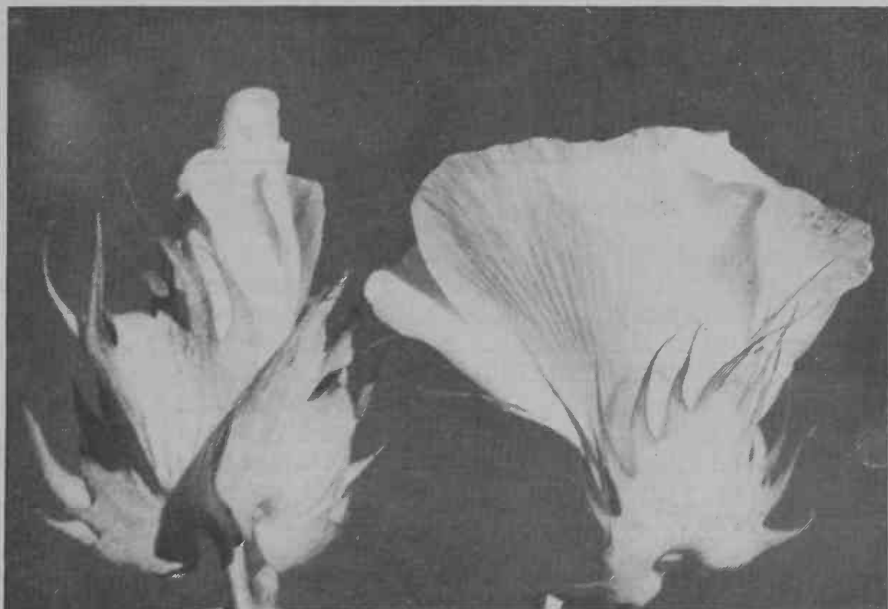
Production of Pima S-1 cotton caged with bees has experimentally produced about 25 percent more cotton than Pima S-1 with bees excluded. This increase in production was the result of more bolls being set with more seeds and lint per boll.

Similar tests with A-44 cotton showed no difference in total production, but bolls in the bee cages matured earlier. The first picking from plants in the bee cages was always greater than where bees were excluded, but later pickings offset this gain to even production. The bees help the plant set its maximum load earlier, but under a long flowering season it can eventually produce to its capacity without bees. In areas with a short flowering season, an increase in upland cotton production would probably be obtained with bees.

How Tests Made

These findings were from tests set up like this: Large plastic screen cages, each of which enclosed about 50 cotton plants, were used to exclude bees; and other cages enclosed bees with the cotton plants during the entire flowering period. The bees lived in regular hives in a corner of the cage which they soon learned as home and from which they flew to collect water from the feeders or nectar and pollen from the caged plants.

Bee-visited A-44 flower (closed, pink) and flower from which bees were excluded (open, white). Photo taken midafternoon of day flowers opened.



Bees Affect Flowers

When bees were present in the cages, pollen was scattered thoroughly over the stigma of the flower soon after it opened. By mid-afternoon the upland flower petals would begin to change from white to pink, and both the upland and the Pima S-1 flowers would begin to wither and close.

Flower stigmas from which the bees were excluded remained free of pollen above the anthers and the petals stayed turgid (distended) and unchanged until sunset. A stigma well covered with pollen by mid-morning, and flowers beginning to close, change color or wither by mid-afternoon, are good field guides for determining the presence of plenty of pollinators.

Sometimes honey bees show a preference for the nectar produced on the plant outside of the cotton flower when nectar is also present within. Under such conditions they are of no value as cotton pollinators, unless bees are so abundant that they need this second choice nectar in the cotton blossoms.

Self Polination Not Best

Research workers have shown that continued self-pollination decreased productivity of many varieties. Assuming that undesirable qualities would not be contributed by other nearby varieties, planting seed produced in fields where

pollinating insects are abundant should produce more cotton than seed from fields where pollinators are scarce.

Individually, some of the wild bees are highly efficient as pollinators of cotton, but there may not be enough of them. Fortunately, honey bees can be transported and established in any quantity to supplement lack of native pollinators.

With selection of the right insecticides and the use of proper precautions, harmful insects may be controlled without serious damage to pollinators. Sulfur, toxaphene, DDT and demeton (Systox) will control usual insect pests present on flowering cotton in Arizona. Most other insecticides are too toxic (poisonous) to be used with safety when bees are present.

Watch the Flowers

The effective range from the colony of bees drops sharply beyond one-fourth mile; therefore, the colonies should be placed in or adjacent to the field.* One colony per acre is the rule for many other crops that are benefited by bees and may prove adequate for cotton under most conditions. Frequent examination of the flowers throughout the season will tell whether enough bees are visiting the field.

*Present information does not warrant advising cotton growers to pay rental fees for colonies.

Bee-visited Pima S-1 flower (wilted, stigma covered with pollen) and flower from which bees were excluded (expanded, stigma bare). Photo taken midafternoon of day flowers opened. (Photo by William Nye, U.S.D.A.)

