



## Beekeeping Insect Note 7B

### Cucumber Pollination

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Pollination is essential for good fruit production when growing cucumbers and the only reliable vector for cucumber pollination is an insect. Presently, honey bees are the only insects that are commercially available to supplement existing insect populations in an area, and the following are guidelines on the need and use of bees for cucumber pollination.

**Are Honey Bees Needed?** The answer to this question depends on the size of the cucumber field and the cultivation and pesticide use history of the surrounding area. A small cucumber field of less than three acres near undisturbed (non-cultivated) areas will probably have enough wild bees to adequately pollinate the cucumber crop. However, a larger field or a small field in an area that is extensively cultivated (with little natural areas for bees to nest) will probably require the use of extra honey bees.

**How Many Bees are Needed?** The general recommendation is one hive of honey bees per acre of cucumbers. A more specific figure is 30,000-40,000 bees per 30,000 cucumber plants. The number of adult bees in a beehive may be roughly calculated by noting that each frame of bee brood will have about 30,000 adult bees. Cucumbers require large numbers of honey bees for adequate pollination because each female blossom is only receptive to being pollinated for one day, and each blossom requires an average of 11 bee visits to set up a well-shaped cucumber.

**When Should the Bees be Moved into the Field?** Research has shown that it is best to delay the movement of the bee colonies into a cucumber field for at least 3-4 days after the first blooms appear. The delayed entry of honey bees allows the cucumber plants to develop more mature root systems that will result in the production of larger and more fruit per plant when pollination does occur.

**How Should the Beehives be Arranged in the Field?** The hives should be evenly distributed

around the edge of the field, in groups of four hives or less.

**Are There Any Special Considerations in Positioning the Hives?** When possible, it is best if the hive receives morning sun and afternoon shade. Place the hives away from traffic areas to minimize vehicular and pedestrian traffic in front of the hives. Locate the hives upwind of any pesticide applications whenever possible.

**How Long Should the Bees be Left in the Field?** For a once-over harvesting, six to seven days of good bee weather (temperatures of 70 degrees F or higher and little rain) are usually sufficient. For a hand-picked harvest, the bees should remain in the field until four or five days before the last harvest.

**What About the Effects of Irrigation?** It is often necessary for the grower to irrigate the cucumber field, but the effect on bee activity must be considered. Studies have shown that irrigation will reduce bee visits to the cucumber blossoms by 80 percent during the irrigation process, and that the return of the bees to the field after irrigation is still low for the remainder of the day. Since honey bee activity in the cucumber field naturally decreases after 2 p.m., the irrigation can be done anytime in the late afternoon or early evening with minimal impact on bee activity.

**What About Pesticide Use?** The presence of cucumber insect pests present the grower with a real dilemma. If he does not treat the pests, he may suffer fruit damage, but if he kills the bees in the process, then his fruit set will be reduced. This becomes more of a problem in the late summer and fall when insect pest populations reach their maximum. Before using a pesticide, consider the following: (1) is a pesticide really necessary, (2) if a pesticide must be applied, then use formulations and application equipment that will minimize pesticide drift; (3) apply any pesticide downwind of the beehives and select products of low toxicity to bees whenever possible, and (4) advise the beekeeper of any pesticide uses before application. REMEMBER, pesticides can kill bees and dead bees cannot pollinate anything.

**How Can I Obtain Bees for Pollination?** It is best to make your pollination plans in advance and contract with a local beekeeper or a commercial beekeeper who will move the bees to your area for your pollination needs. The rental fees will vary from area to area, but in general rental bees are less expensive in the spring and early summer than in late summer and fall because of the increasing usage of pesticides on cucumbers as the year progresses. Presently, North Carolina is under a honey bee quarantine and beehives may not be moved into North Carolina from any other state for any purpose including pollination. However, there are a number of N.C. beekeepers who will move their bees for pollination within the state. If you do not have a source of bees for pollination, then contact your local county Cooperative Extension agent or county beekeeping association for the names of beekeepers who provide pollination services. If additional help is needed, then contact the Extension Apiculturist (Dr. John Ambrose), Box 7626, N.C. State University, Raleigh, NC 27695-7626 (919-515-1660).