Swarm Management

Swarming is an instinctive desire of honey bees to increase their numbers by reproducing at the colony level, doubling their chances of survival. We don't fully understand this behavior, but we know of some contributing factors.

One of these is congestion in the brood area, which is related to population size and availability of space. Swarming also is associated with the production and distribution of chemicals the queen secrets. If there aren't enough of these secretions (queen substance), the bees make queen cells to prepare for swarming, or supersedure, where a daughter in the same hive naturally replaces an established queen.

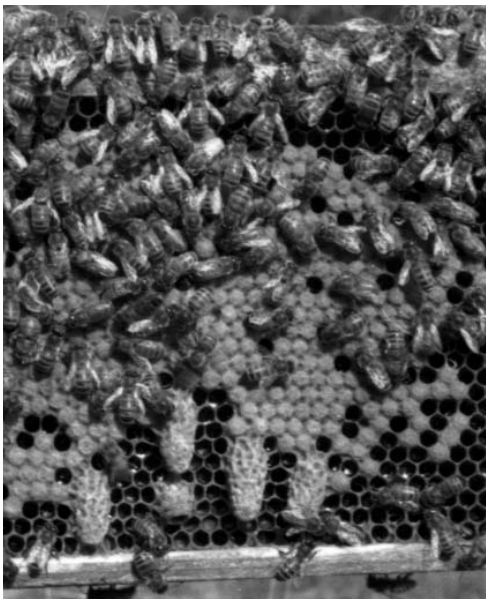
The weather may influence swarming. When colonies are strong and developing rapidly, good weather after some bad weather seems to heighten the swarming fever.

Other factors that contribute to swarming include poor ventilation, a failing queen, heredity, and an age imbalance in the worker bee population.

Most swarming occurs in April and May in Mississippi, and you need to check the colonies every 8 to 10 days during this season. Queen cells in the brood area are the first sign the colony is preparing to swarm or supersede its queen. Swarm cells are commonly on or near the bottom bars of the combs in the upper brood chamber(s), but supersedure queen cells generally occur on the face of the comb.

To check quickly for swarm cells, tip back the top brood chamber(s) and look up between the frames. Destroy all swarm cells. Unfortunately, cutting out queen cells seldom prevents swarming. It only delays it, since the bees usually build more cells in a few days. Once the bees cap a queen cell, they are committed to swarming.

Supersedure queen cells on the comb face.



Swarm cells near the bottom bar of the comb.

Mississippi State University Extension Service

Swarming Preparations

In addition to raising one or more queens, colony preparations for swarming include placing the queen on a diet, rearing more drones, and reducing foraging activity by the field force. Since the workers feed the queen less royal jelly during this period, egg laying declines, and the queen's abdomen shrinks, letting her fly with the primary swarm when it leaves the hive. Normally, the primary swarm is the old queen, a few drones, and 50 to 60 percent of the workers.

Just before coming out of the parent hive, the workers engorge themselves with honey and drive the queen out. Occasionally, other smaller swarms (after-swarms) follow with a newly emerged virgin queen. Colonies have been known to swarm so many times they actually swarm themselves to death. A swarm normally comes from the parent hive during nice weather, between 10 a.m. and 2 p.m., and settles on a nearby tree limb, shrub, post, or building. Swarms may stay there only a few minutes or several days before moving to a new, dark enclosure selected by scout bees.

Control and Prevention

Swarming must be controlled for successful beekeeping. Colonies that swarm rarely recover in time to produce a honey crop. Routine management in the spring usually reduces swarming. March and early April are generally the swarm-prevention months. Providing plenty of room in a colony for brood-rearing and the ripening and storage of nectar is essential.

In the spring, the queen is normally locked in the uppermost hive body, which limits the size of the brood area. Reversing hive bodies is valuable in preventing swarming. Moving the brood nest from the top of the hive to the bottom allows for brood-nest expansion and reduces congestion in the brood area.

Checking a colony for swarm cells.

Caution: Do not reverse the hive bodies until the weather has settled and there is little chance of a sudden big drop in temperature.

Equalizing the strength of your colonies also helps prevent swarms and makes management easier the rest of the year.

Following are ways you can strengthen weak colonies:

- Change their positions with strong colonies in the same yard;
- Add sealed brood from strong colonies;
- Add queenless booster packages;
- Unite two weak colonies; or
- Combine a queenless colony with a queenright colony.

When exchanging bees and brood between colonies, be sure the frames do not contain the queen and that the colonies are not diseased. When adding adult bees to an existing colony, separate them with a sheet of newspaper to let colony odors mix and to keep fighting to a minimum. Such precautions are not necessary for frames of brood. You won't gain much by adding unsealed brood to a weak colony, since the colony probably does not have enough nurse bees to care for the extra brood.

During spring inspections, determine the condition of the queen. The colony must have a young, healthy queen that can lay lots of eggs. A good queen lays a uniform brood pattern according to the strength of the colony, but a failing queen usually scatters her brood and lays drone eggs in worker cells. Colonies with queens more than a year old are more likely to swarm than those with young queens. Older queens produce less queen substance or enter a cycle with periods of lowered secretion, which contributes to swarming. So, regularly requeening (at least every two years) is an important part of swarm management. Even though fall requeening is best, you must do some requeening in every season.

Give colonies extra space (supers) in the spring before they need more space. There must be enough good combs available for brood-rearing and storage of honey. Add empty combs to the brood nest. A super is usually needed by the time of fruit bloom, and a strong colony in late spring may need the equivalent of three deep hive bodies just to provide enough room for the adult bees.

Prevention Methods

One of the best ways to prevent swarming is to divide or split colonies in late March or early April. Split a strong colony into two smaller colonies of about equal size. A queen cell or new queen may be introduced into the queenless portion at the time of the split. Move the new queen and her colony to another location at least 2 miles away.

A second approach is to remove four to six frames

of brood with adhering bees from the strong colonies and place them in separate hives (nucleus colonies). Provide them with a queen or queen cell, additional food, and bees. You can place each split near the parent colony, but they will do better if you move them to a new location. The parent colony rarely swarms after such treatment if given enough space, and the new division usually becomes a productive unit when established early in a year with a good nectar flow.

Swarm Control

Once a colony is committed to swarming (queen cells are present), more drastic action is required to control swarming. The best way to treat a colony with queen cells is to make a division or split the colony within the same hive by using a double screen. Place the old queen with three to five frames of unsealed brood in the bottom brood chamber. Add an extra hive body with empty combs and honey. Place the double screen on top of the second hive body with the entrance facing the rear of the hive. Above it put the second brood chamber containing five or six frames of brood, mostly sealed, and two combs of pollen and honey on each side. Shake additional bees from the lower hive body into the upper portion, since the field bees will return to the lower brood chamber.

Bees in the lower hive body destroy any queen cells, while the bees above the double screen raise a new queen. Colonies treated in this manner rarely swarm. After the swarming season, reunite the two units by removing the double screen. This is an excellent way to requeen the parent colony. You can move the top hive body with the new queen to make a new colony or strengthen a weak hive.

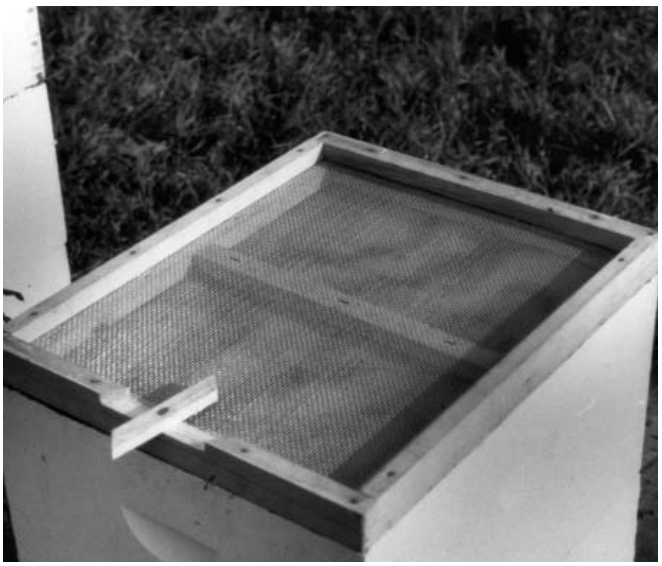
Using a double screen is also an excellent way to split colonies before the swarming impulse develops. When you use this technique to make divisions early in the spring, introduce a new queen or ripe queen cell to the upper portion.

Another technique to stop swarming is the Demaree methods, separating the queen from the brood. This lets rapid colony growth continue but takes a lot of hard work and time. Examine all frames of brood in the colony, and destroy all queen cells. Place the queen in the lower brood chamber and all frames of uncapped brood (eggs and larvae) in the upper brood chamber. You can keep capped brood in the upper or lower brood chamber. Place one or two hive bodies full of empty combs between the original two brood chambers. Before adding the middle supers, place a queen excluder (metal or plastic device with spaces that permit the passage of workers but restricts the movement of drones and queens to a specific part of the hive) on top of the bottom hive body.

The colony is now at least three supers high:

- The first super contains the queen, empty combs, and some capped brood;
- The middle hive bodies contain empty combs and perhaps a frame or two of capped brood; and
- The top super contains the young, uncapped brood frames.

Under the Demaree procedure, the uncapped brood in the top super attracts most young nurse bees away from the old brood nest in the bottom super, which relieves the crowding. Also, the empty comb in the bottom hive body provides plenty of space for the queen to continue laying. More space opens up as the capped brood emerges. In 7 to 10 days, return to inspect the colony and destroy any new queen cells that may have developed in the upper hive bodies.



A double screen is a wooden frame holding two layers of wire screen, usually 8–mesh, about 1/2 inch apart, to separate bees in the hive.

By **Dr. Clarence H. Collison**, Head and Professor of Entomology and Plant Pathology

Publication 1817
Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. VANCE H. WATSON, Interim Director (POD-05-06)