

# The JOY of DRONES



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My Farm neighbor Craig is learning queen rearing with me this year with the stated objective of producing mite-resistant, localized queens for local sale and use. Retired, and a small-scale beekeeper of 20 years, he still has a lot of enthusiasm over the project. When we are searching for a queen, he says to himself “that’s a drone.”

Few beekeepers acknowledge drones like this. In early April when drones are rare and just starting to appear in our colonies, it is a big deal. Come June it may be a bit tedious if he is mumbling “drone, drone, drone . . .” Perhaps he uses that as his mantra.

Depending on where you live in the Northern Hemisphere, drone populations rapidly increase and peak by May or June. There were drones in the colonies I’ve worked in Florida in January, but any drones in Michigan colonies in January have got quite a story to tell, and a colony that may be in transition, if not in trouble. Actually, it not unusual to find a few drones in perfectly healthy colonies in some hives in the Winter, but it seems like it goes against the normal organization and rules of the hive.

Vigorous, healthy colonies produce about five percent of the colony population in drones at the peak of the queen

replacement (swarming and supercedure) season that comes with the rapid growth and development of colonies in your local area. Swarming season moves North as Spring moves North, stimulated by growing daylength and abundant food. By the Summer Equinox the key stimulation of increasing day length slowly reverses during the Summer, but the drone rearing will remain present until September to November (depending on latitude). A strong incoming food supply will prolong drone production. Or it may be done by early June if the pollen and nectar supply has already dried up. This happens in parts of Florida and Texas, as well as other areas of North America. There may be a second cycle of drone production in the late Summer and early Fall to coincide with local nectar flows, if they happen. When the incoming food is reduced or stopped, worker bees become selective about the number (and age) of the drones they keep, even if they are their brothers. The colony rules!

I used the title **Joys of Drones** for a reason. First, there is a remarkable benefit in accepting normal drone populations in a colony as a reflection of a healthy colony. Second, it is nice to see that virgin queens in the area will be well served by your healthy and well-fed drones. Drones are suitable to give to small children and grand-



*This small corner of drone brood will not produce many drones. It should be used as a worker frame in the DHC.*



*This frame of worker brood has been reworked so some drones could be produced. It could provide both workers and drones for a DHC.*



Joe Calme and a frame of Pierco drone comb. If it has larvae it is to early to put in a DHC.



This photo by C.J. Harvey shows a frame of naturally drawn drone comb. It can be added to a DHC with workers, worker brood and a caged virgin queen. If possible, more these DHCs to a different yard for good drone saturation.

motherly types who want to handle a bee. Really! They are often warm from the heat of the hive, and fuzzy to touch. You can practice marking bees by using the drones from one hive and watch how they spread to other colonies in the area. Who knew you could both play with drones and use them as a science experiment?

Drones have been used extensively by beekeepers as a means of Integrated Pest Management (IPM) against *Varroa* mites. Instead of using as much (or any) miticide to kill *Varroa*, a huge percentage of beekeepers use drone comb removal as a method of reducing the reproductive upswing of *Varroa* populations. *Varroa* mites have a relatively low rate of increase on worker brood, perhaps a 10 to 20% increase with each brood cycle, so it will take several brood cycles to double the *Varroa* mite population if there is no drone brood in the colony.

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But add the drone brood (by adding the larger cells, or the bees building their own, which they will do in spite of your best efforts), and the *Varroa* mite population skyrockets. It is just a reflection of the longer developmental drones spend in the sealed brood stage, giving the mites several extra days to complete development. In one cycle of *Varroa* growth in a colony, entering the about-to-be-sealed drone larvae, there may be two to five times more mites coming out of the cells than went into them as foundress mites. Doing the math: it takes drones about 12 days in the sealed brood stage, that means that in 24 days there have been two cycles of mites come out of the emerging drone brood. No wonder *Varroa* mite populations can explode so quickly.

The IPM method mentioned above calls for the removal of the sealed drone brood and either freeze it (so the bees can suck out the juices from the dead brood), or scrape it into a bucket and feed the slurry to the chickens

or bury it as fertilizer on the garden.

For a large percentage of small-scale beekeepers, the integration of the drone comb with screened bottom boards offers two chemical-free opportunities to reduce mite populations, and all you had to do is kill a few thousand drones to do it!

But that defeats the purpose of having drones in the colony, doesn't it? We NEED virgin drones to mate with virgin queens. Colonies go out of their way to REPLACE removed drones. We know that it required 12 to 20 drones to mate with each queen, and for every drone that successfully mates, there are probably five to ten that never mate, meaning that there must be a very large number of drones in the air to mate with a queen during any mating flight. If you use drone comb removal or destruction and reduce the number of suitors for area queens this sud-

denly takes on a sinister tone, since a successfully mated queen will carry the sperm from the 12 to 20 drones for her productive life, and will NOT mate again once she starts egg laying.

**Pile up the drones in a mite-controlled way.**

Since I have worked with queen rearing for a number of years and have started up a small operation this season, a simple management system can be used to provide healthy drones for mating as well as control mite populations in strong colonies. This is especially true if you use screened bottom boards and powdered sugar dustings.

In Michigan and other Northern locations, starting in late April or early May, remove frames of brood that contain large areas of sealed drone cells. If you find frames holding both workers and drone brood that is fine. If you added drone comb foundation (like the green plastic drone foundation) then the bees will draw out the comb and you will want to remove the comb only when the drone brood is largely sealed. This means that you will need to check your hives every 10 to 12 days to remove drone brood.

Rather than freezing or scraping out the drone brood, check for the queen and leave the worker bees, mostly nurse bees, and move the frame to a nucleus hive or full

eight or 10 frame hive body. Move a frame of worker brood too, picking one that has bees emerging from their cells. This will insure the success of the nucleus or colony when the drones finish development and emerge as adults.

Fill your nucleus or colony with more frames of drone brood and worker brood, making sure to check each frame for a queen or virgin. You will want to feed this colony, but drones may drown in a division board feeder, so use a jar feeder or some other system that keeps the drones from doing a backstroke. Drones need lots of protein from pollen or protein patties, so add a pound or so to a strong colony, and less for a nucleus.

You have now removed a huge percentage of the *Varroa* mites from the colonies that you harvest drones from, and protected them from a *Varroa* attack or a chemical treatment. Monitor the *Varroa* levels by using the powdered sugar dusting sampling method. This uses fine sugar, and the bees are not killed. Now, as the season progresses, continue to remove sealed worker frames and sealed drone cells on a regular basis. Make up new nucleus or full-sized colonies (do not combine the new drone brood with really old drones – or run the risk of losing all the old drones).

These drone-filled colonies are called Drone Holding Colonies, and they are a great way to keep a viable population of drones flying to mate with neighborhood queens, as well as offering a method of controlling *Varroa* mites. Let's summarize what we need for a good DHC:

2 to four frames of mostly sealed drone brood (from several hives)

2 to four frames of sealed and emerging worker brood (from several hives)

Abundant nurse bees to care for the brood

Check that you do not have any of the queens in the holder colony

Add frames with pollen and honey to keep these bees alive

Feed with sugar syrup in a sealed feeder so drones cannot drown

Feed with pollen or protein patties

Place a caged virgin in the holding colony, making sure she cannot escape and mate.

How many drones are in this DHC? If you average areas of drone brood that are 75 square inches per side (that is an area 15 inches wide by 5 inches deep), four frames of drone brood could generate a holder with about 10,000 drones in one hive. That is three to 10 times the number of drones found in many Spring and Summer colonies.

The addition of the unmated queen is something I learned from Dr. Bud Cale Jr over 30 years ago, and as he explained it to me, we have created the conditions found in a colony where normal queen replacement is underway: There is an unmated queen, no laying queen, abundant drones in the brood frames and on the combs, and adequate worker bees, mostly young nurse bees, to keep the colony running.

Drone Holding Colonies can be moved to a site near (but not in) the mating yard, if you have one, or just put in the home apiary if that is all you can do. Reduce the entrance but provide the colony with ventilation holes. Since there may be some young drone brood, it will be about three weeks before all the drones emerge. At that

time you can administer a powdered sugar dusting, using a sticky board to keep the mites from crawling back onto the hive. Every mite you capture is one more that will not be weakening your other colonies. Oh, the Joy of Drones!

Depending on the age of the drones you move, in four to six weeks most of the drones will be old or gone missing. At that time I would add a frame of emerging brood, replace the caged virgin queen with a laying queen, and set up the colony as a nucleus or a new increase colony. If you added the ratio of drone brood I suggested above, you should have lots of bees, and they will be in good shape since they have not had to raise much brood.

The use of DHC units is an excellent swarm prevention management tool, since brood and bee removal significantly reduces the chances the bees will develop swarming behavior. Think of it as making a split or nucleus during the earlier part of the season.

So, instead of cursing the presence of drones, put them to work as part of your *Varroa* mite control program as well as a method of keeping lots of good drones in the air to mate with queens. Even if you never raise queens, your colony or colonies will undergo routine queen replacement, so this is a great way to make sure that your boy bees are in the neighborhood doing their job. **BC**

*Drones and Drone Holding Colonies are discussed in detail in Dr. Connor's book Bee Sex Essentials, available from Wicwas Press and many bee book dealers. You can order at [www.wicwas.com](http://www.wicwas.com). That website also lists upcoming queen rearing courses being offered from Connecticut to Alberta, Canada.*

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