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MAAREC

Bee AWARE

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WHAT'S INSIDE:

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Focus on: Integrated Pest Management (IPM)

Beekeepers prior to the 90's identified pesticides as a problem and considered pesticides detrimental to bees. Beekeepers today have a different relationship with pesticides. In ten years, beekeepers have learned to rely on pesticides to keep healthy, productive honey bee colonies. Bee mite and small hive beetle control includes placement of a pesticide directly into the bee colony to avoid unacceptably large losses in number of hives.

Are there alternatives to maintaining a relatively pest-free and healthy bee colony without the use of pesticides? For hobbyists and professional beekeepers the answer is an emerging yes – it is adoption of IPM.

IPM or *INTEGRATED PEST MANAGEMENT* is an effective and environmentally sensitive approach to pest management that utilizes a combination of common-sense practices. A goal of IPM is to manage pest populations by keeping their populations below an economic injury level. IPM means not relying on a single pest control scheme. A good IPM program involves selection, integration and implementation of a mixture of biological, cultural and chemical pest control strategies.

IPM is not biological control, although biological control is a useful tactic. IPM is not an organic program although we may integrate organic materials into our control tactic. Nor is IPM anti-pesticide, but generally it attempts to reduce chemical dependency with a mix of control tactics. IPM allows beekeepers to adopt a more balanced approach to mite and disease control that is safer for the beekeeper, bees, hive products and the environment.

The success of an IPM program hinges on good monitoring of pest levels. If we are to reduce our chemical dependency for bee mite control, survey methods must be developed that allow us to determine the proper threshold levels on which to base control decisions. The ether roll method is not reliable as all the mites in our sample of adult bees, which can vary from as few as 100 to more than 500 bees, do not show up on the glass container. Washing the sample with alcohol or

soapy water and then filtering through two meshes to trap mites is time consuming but a bit more reliable. Opening and examining drone brood (pupae) cells, like the ether roll technique, tells us if mites are present but we do know what numbers should indicate the need for control. All these methods are destructive resulting in dead bees/brood.

MAAREC research programs are focusing on sticky boards as a more reliable method of monitoring populations of Varroa mites. A Georgia/S. Carolina study reported a treatment threshold of 117 mites/day (natural fall) using sticky boards to monitor mite fall. MAAREC studies (at Delaware) reveal 40 mites/day of natural mite fall might be a better threshold basis.

Once threshold levels have been exceeded, IPM measures should be taken to lower numbers below that injury level. Pesticides can do this rapidly. One IPM strategy is to utilize pesticides with more specificity and lower toxicity. Fluvalinate (Apistan) is such a chemical relative to Coumaphos. Although resistance is present, and spreading, Apistan, used as directed on the label, should still be considered the best chemical treatment to ensure colony survival if threshold numbers are exceeded. Another chemical, formic acid gel, is nearing registration and it should prove useful for bee mite control. A number of essential oils (biospecticides) have been tested by Penn State, the MAAREC project and by other researchers such as Jim Amrine of West Virginia. Several have been found that may be effective but delivery and dosage levels have yet to be determined.

Use of other techniques might help keep mite levels from reaching injury (threshold) levels. The sticky board technique, useful to monitor mite numbers, may also be a means of reducing bee mite numbers when sticky boards are used continuously. Modification of the bottom board may also be a means of reducing mite numbers to reduce dependency on chemical pesticides. A promising area of study points to management of bee colonies that involve removal of drone brood or an interruption in the brood cycle via caging of the queen. One variation is to place all colony brood in a select few colonies for treatment with Apistan and then redistribution to colonies. This limits the number of colonies exposed to the pesticide.

Drone brood trapping is an IPM technique that shows some promise though it is labor-intensive. This technique requires that brood in bee colonies be removed and only combs with drone brood cells used for a period of two weeks. Mites invade preferred drone brood cells during this broodless period. The drone brood combs are removed at the end of the period and put in a freezer to kill all mites. Another useful IPM technique is to use bee stock resistant to or tolerant of Varroa mites. The Baton Rouge USDA lab has tested bees from Russia which show some real promise and stock will be released this year. Scientists at the USDA Tucson Lab and some larger beekeepers have been selecting for colonies with fewer mites using only natural selection. Working with a commercial beekeeper, colony populations of Varroa mites initially at 120 mites/100 bees have decreased to 6 mites/100 bees in the Tucson project. One problem is the bee stock is at least partially Africanized, so exporting these to other parts of the country seems unlikely. Hygienic bee populations that are more diligent house cleaners, may also be useful stock.

Beekeepers need not “reinvent the wheel” – it is still possible to forsake the “pesticide treadmill” of more and more and stronger and stronger chemicals leading to mite resistance of legally available pesticides. Spot pesticide treatments, only when and where mite populations exceed threshold numbers, and vigorous use of the entire arsenal of control tactics in an integrated pest management approach will best serve beekeepers, our bees, and our clientele in the long run.

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