THE BEE LINE

The Newsletter of the Oregon State Beekeepers Association

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Treatments using Juniper Wood, Screened Bottom Boards, Formic Acid for *Varroa* Control

By Dr. Lynn Royce, OSU

Participants: Dr. Lynn Royce, Dr. Mike Burgett, Debbie Delaney, Ray Varner, Ron Bennett, and Alex Kroeger

This study was set up to provide basic data that would lead to the development of alternative approaches to *Varroa* control. New methods are needed for integration with chemical methods so that better management programs can be developed.

Two years ago a pilot study was done in which hives made of juniper were compared to hives made of pine. Results from that study prompted this continued work with juniper. In this study we tried to find a practical way to apply juniper, because juniper wood is expensive and difficult to work with. We also examined the efficacy of formic acid gel packs and the effect of screened bottom boards on mite populations.

Method:

There were eight sets of four colonies (32 total) as follows: control, juniper wood bottom boards, juniper wood lids, juniper wood deep brood chambers, juniper chips in a frame, juniper chips in the lid, screened bottom boards, formic acid gel packs. Data was gathered monthly for four months

and included: square centimeters of capped worker brood, adult worker population, and number of mites on a drop board (as a result of natural mite drop). Data collection required examination of each colony frame by frame. At the time of the last data collection colonies were treated with Apistan, therefore the last mite count was from a "chemical drop" rather than the "natural drop".

The Hyslop Farm Apiary during a training session of sugar shake and bee population estimations

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Oregon State Beekeepers Association

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President's Notes
by Ray Varner

It's that time of year again. The bees are back from California and are on their second pollination set in Oregon and Washington orchards. The first shipment of package bees are in their new homes throughout the Northwest.

I spent Monday, April 9th helping Torey and Ed Johnson with package bees at Ruhl Bee Supply (Diane's always looking for a story!). Hundreds and hundreds of packages to unload and prepare for pickup by 10 am by their new owners, and also to ship to other parts of the country (see photo). People came from Eastern Oregon and Idaho to pick up packages and some packages were shipped north to Alaska. What a day! Just another fifteen-hour day in the bee business.

The Northwest Corner Fall Conference is shaping up. Dave Graber is lining up lots of great speakers for the event (see page 7 for more details).

Progress is being made on the web page. At the present time the pollinator pages are shut down. Many of the pollinators listed are no longer OSBA members or even beekeepers. The Executive Board will be determining a fee schedule for pollinators to be listed on the web. At the 2000 Fall Conference, OSBA members expressed their desires that the web page be self-supporting, and that those who benefit from the advertising bear the cost.

Two articles this month were contributed by Dr. Lynn Royce. The Juniper Wood story on page 1 and the *Varroa* Sampling story on page 3 were from posters presented at the Fall Conference that she converted to articles for us. Thanks, Lynn!

(cont. from page 1)

Comments:

Screened bottom boards may increase air circulation and therefore improve colony moisture control in western Oregon. They also facilitate placing and removing *Varroa* drop boards.

Mite growth curves show that to get the most benefit from fall chemical treatments they must be applied as soon as honey is removed (late July or early August.

Conclusions:

Juniper and formic acid require further study to get the application and dose correct.

Screened bottom boards are not effective *Varroa* mite reducers.

Mite populations show exponential growth.

Varroa Sampling Techniques

Poster Presentation by Dr. Lynn Royce, Dr. Michael Burgett, Debbie Delaney and Alex Kroeger at the November 2000 Northwest Corner Conference

Varroa live on adult bees and in cells with developing bee pupae. This means there are several techniques for sampling a colony of honey bees for this parasite. In this study we compare the use of: drop boards, sugar shakes, and brood dissection. We used each technique at the final sampling of the juniper research apiary at Hyslop farm.

Drop Boards:

These are light cardboard about 17" by 12" marked off in a grid of thirty 2" squares that can be slid in the entrance and positioned under the frames. A sticky surface is applied before placement (we used a light cooking oil in a spray can) and a piece of hardware cloth (8 wires per inch) folded under along the edges to give it more depth is placed over the top of the board.

If you are placing and counting a lot of boards it is useful to purchase pre-printed boards that have randomly excluded 2/3 of the board. You count only the white spaces.

Where to purchase: Great Lakes IPM glipm@nethawk.com. Cost is $1.25 per board in quantities of l00 or less. These boards do not come with screens.

Advantages of drop boards	**Disadvantages of drop boards**
They detect low mite levels	On warm days pushing them in and pulling them out annoys the bees.
Easy to use	In large colonies the bees clean off the boards

There are two ways to do drop counts: natural drop (board is left in hive for three days) and chemical drop (a pesticide strip is placed in the hive and the drop board and strip are left in for one day). The chemical drop is more work but it decreases the problem of bees cleaning off the board.

Sugar Shake:

The sugar shake is a spin off from ether roll or using alcohol. The sample of bees are placed in a canning jar (wide mouth pint jar works well) with wire (again use 8 mesh hardware cloth) covering the mouth, held in place by the screw on rim. A tablespoon of powdered sugar is dumped through the hardware cloth onto the bees. The jar is shaken for a couple of minutes. The bees must be thoroughly covered with the sugar. The mites fall off the bees because the sugar prevents them from holding on.

Marshall Dunham doing a sugar shake to find the number of Varroa per adult bee

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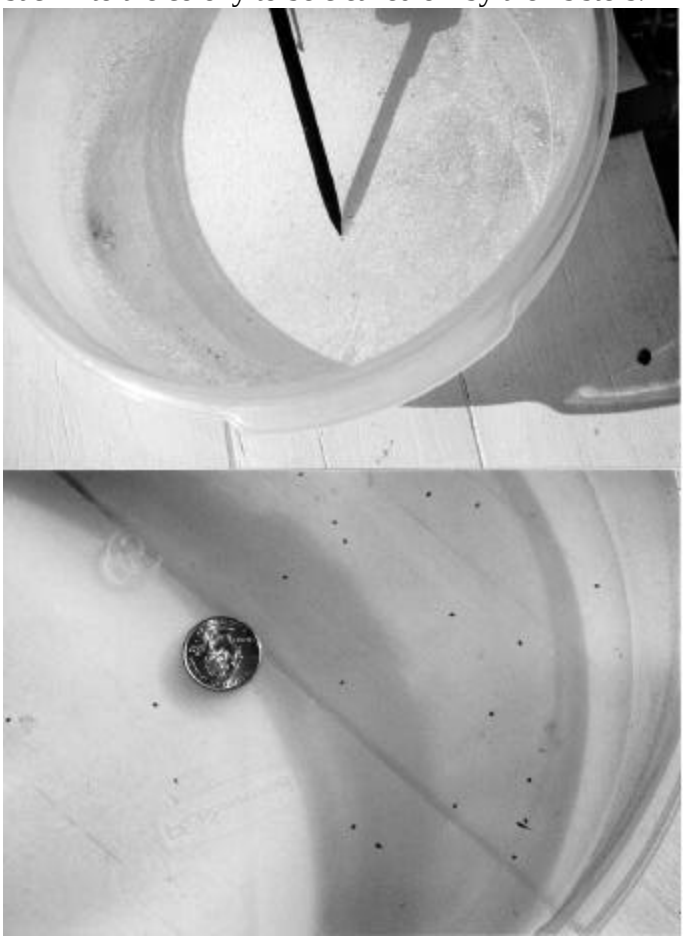
The mites are then shaken through the screen top into a white plastic container and counted. The mites become easier to see if a small amount
(enough to dissolve the sugar) of water is added to the container with sugar and mites. Once the mites have been shaken out of the jar the bees may be released back into the colony to be cleaned off by their sisters.



Varroa in sugar water (coin is US quarter for scale)

Bees being released at hive entrance after sugar shake

Advantages of Sugar Shake

Easy to use
Nontoxic to bees and handler

Disadvantages of Sugar Shake

Cannot detect low levels of mites
Difficult to count high levels of mites
May give false negatives

Brood Sampling:

A frame of capped brood is selected from the colony. A section of the capped brood is cut out of the frame; one square inch of brood contains about 100 capped cells (50 on each side). It is easier to cut brood from a frame that has no plastic in the foundation. At least 100 cells should be sampled.
The frame is returned to the colony; a strong colony will repair the damage to the frame within a few weeks, but the replaced cells will be drone cells. The sample may be frozen for future dissection or dissected while the brood and mites are still alive. Carefully remove caps and lift out pupa or prepupa. Check both inside the cell and on the pupa or prepupa for mites.

A two inch square of brood was cut through a comb so that the sample would total four square inches of cells and we could open at least 100 cells to count mites

Advantages of Brood Sampling

Gives an accurate account of what is happening in brood

(cont. on page 5)

(cont. from page 4)

Disadvantages of Brood Sampling

Requires more manipulation of colony than other techniques

Is destructive to brood frame, although bees will repair

May result in false negative

Number Comparisons:

Because there was no correlation between the different sampling techniques it is difficult to relate numbers between techniques. It has been suggested and our experience concurs, that a total count of 100 or more varroa on a drop sheet suggests that a colony could succumb to mites if not treated immediately. Mite counts of 10 or more in a sugar shake of about 300 bees is probably of similar concern as would 5-10 mites found in a sample of 100 brood cells. **Keep in mind that sugar shake and brood samples can give false readings because of the nature of mite distribution in a colony**.

Conclusions:

Drop boards are most accurate way to assess colonies for *Varroa* mite loads.

Sugar shakes are an easy alternative but may result in false negatives: that is, you may find no mites when there are mites present in the colony.

The lack of correlation between these techniques suggests that mites are neither randomly nor evenly distributed on bees and within the brood, rather their distribution is clumped.

Northwest Beekeeping

May - Crops in bloom producing nectar and/or pollen: Maple, clover, fruit trees, meadowfoam.

- Don't let colony stores get below 15 lbs. or three full frames of honey. Continue feeding as in April if foundation is being drawn or colonies are small.
- Supply water.
- Examine colonies every ten days. Lift off the supers, tilt up the second story and look for queen cells along the bottom of the brood comb. **IF you find** only eggs and larvae in the queen cells and the hive is crowded with bees, remove all cells --- top and bottom. Put the hive body containing mostly worker eggs or larvae on the bottom board, and the other containing mostly sealed brood on top. Add supers to provide 10-18 empty full-depth combs, or their equivalent. **IF you find** sealed or ripe queen cells, or possibly hatched ones, divide the colony. **NOTE:** queen mating is always dependent on decent mating weather and the supply of drones this time of year. **IF you find** eggs and no attempt to

rear queens, and the hive is full of bees, examine the supers and add more to provide 10 to 18 empty combs or their equivalent.
- If the bees seem reluctant to work in the supers through a queen excluder, reverse the two hive bodies. This causes them to rearrange their stores and they will have to move through the excluder. Some colonies need training to go through the excluder.
- Continue to be on the lookout for American and European Foulbrood.
- Remove and extract the supers containing well ripened honey.

Northwest Corner Fall Conference News

By Dave Graber

Preparations for the 2001 Northwest Corner Fall Conference are well under way. We have a number outstanding speakers confirmed. Registration forms will be available in the August issue of *The Bee Line*. Mark your calendars for November 8-10. The Conference will once again be held at the usual location in Hood River (details to follow).

Dr. Rob Currie from the University of Manitoba will speak on *Bee Nutrition*, our own George Hansen of Foothills Apiary will speak on *Commercial Pollination*, and Dr. Joe Wilson will speak on *American Foulbrood Resistance to Terramycin* and the *ARS Lab Research Tax Dollars: Where does the money come from and what's done with it?* We will hear from Dr. Steve Sheppard from Washington State University. Dr. Jerry Bromenshank from the University of Montana is a tentative speaker, and there may be a presentation on marketing hive products.

It's not too early to be thinking about auction items. We need items for both the oral and silent auctions.

Bee Expert: Hygienic Queens can Help Hive

By John Schmitz *(reprinted from the Capital-Press with permission)*

Hygienic queen bees have been known to the beekeeping industry since the 1940's, but few American beekeepers use them.

That's unfortunate, said Keith Delaplane, Professor of Entomology at the University of Georgia, because hygienic queens can be very useful to beekeepers.

Hygienic queens are queens that have a tendency to rear worker bees who are good at identifying and cleaning out abnormal brood cells before diseases and pests spread. Originally, they were touted for their control of American Foulbrood, a bacterium that invades brood cells.

Delaplane discovered the value of hygienic queens while conducting a study of chalkbrood, a fungus that gains entrance to brood cells and kills bee larvae that eat the fungus. In his study, he inoculated brood cells from colonies of different ages with chalkbrood.

Colonies with hygienic queens tallied far fewer larval mummies, and he concluded that hygienic queens played a key role in keeping chalkbrood at bay.

"I think we ought to encourage our queen producers to produce more hygienic queens," Delaplane told the Oregon State Beekeepers Association. "It's fairly easy to select for them."

To identify queens that will produce worker bees who are good at cleaning house, a square of sealed brood is cut out of the hive and frozen.

After freezing temperatures have killed the larvae, they are returned to the hive still inside the capped cells.

"Those colonies that have removed the dead brood within 48 hours are considered hygienic and the breeder will graft from those queens," Delaplane said.

Delaplane said that there are at least two queen breeders who advertise hygienic queens in national trade magazines.

One reason more American beekeepers aren't using hygienic queens is that they've become more dependent on chemical solutions, Delaplane said. Hygienic queens cost about $1 more than normal queens.

Websites and Emails

From our friends at Hi-Bee News, the newsletter of the Hawaii Beekeepers Association:

Apiservices: www.beekeeping.com
Hawaiin Queen Co.: www.hawaiianqueen.com
International Bee Research Assn.: www.of.ac.uk.ibra
Mead Makers Digest: mead-request@talisman.com
USDA,ARS (Federal research): www.sun.ars-grin.gov/ars/beltsville/barc/psi/brf
USDA, APHIS Plant protection and quarantine: www.aphis.usda.gov/ppg/pra/honeybees
New Zealand Beekeepers Assn.: www.nba.org.nz

From our friends at Southcentral Alaska's newsletter:

Three sites we know of for listing your honey and hive products on the internet:

www.honeycombers.com
www.LocalHoneyForSale.com
www.honeyonline.com

The first two addresses are free services. The third one charges $12 per year for listing your products.

Marketing Tips

A University of Memphis Exercise and Sport Nutrition Laboratory reasearch study, sponsored by the National Honey Board, showed that honey is a great pre-workout exercise source. As part of a three-phase clinical trial, honey is being studied against other forms of carbohydrate gels when ingested just prior to doing exercise. The study shows that honey can help aid an athlete's endurance during a workout or race.

Now, the Honey Board is racing to share the news! By distributing honey use tips and information at major marathons and informing the health media about the research study, the National Honey Board hopes to create a new value-added use for honey.

To give your sales a boost, join us in spreading the news to athletes and others interested in healthy eating:

- Distribute sweet race day tips at local racing events

- Set up a "honey for your health" display at local health, running or sports club
- Contact school coaches and booster clubs. Provide honey at halftime to the team, cheerleaders and marching band members.
- Encourage athletes in your life to add honey (about a teaspoon) to water bottles.

To order a **free summary of the National Honey Board's latest research, sweet race day tips and reprints of recent honey and health publicity,** just call 1-888-421-2977 and press 8 or visit the industry visitor's desk at the National Honey Board's web site at www.nhb.org. Let your customers know that honey is a winner for their health!

Apiary License Application

Oregon Department of Agriculture
635 Capitol Street NE
Salem, Oregon 97310-0110
(503) 986-4620

LICENSE EXPIRES MAY 31

Business Name_____ Phone No._____

Licensee Name_____ Fax No. _____

Mailing Address_____

_____

City State Zip

Circle one of the following: NEW LICENSE RENEWAL ADDITIONAL INFORMATION

**********APIARY REGISTRATION**********

Fill in number of colonies.

TOTAL NUMBER OF COLONIES_____

LICENSE FEE SCHEDULE

Basic license fee (for 5 COLONIES OR MORE) $10.00

Please note: Registration not required for 1-4 colonies. AFTER JULY 1, THE FEE WILL RAISE TO $20 DUE TO LATE REGISTRATION.

IF NEW OWNER, PRINT FORMER OWNER'S NAME_____

Signature_____ Title_____ Date_____

RETURN THIS APPLICATION WITH YOUR REMITTANCE PAYABLE TO OREGON DEPARTMENT OF AGRICULTURE

For Credit Card Charges Complete Information Below

_____VISA _____MasterCard Expiration Date _____/_____ Total Charges $_____

Card Number _____ Signature
_____Date_____