

The Bee Line

Newsletter of the Oregon State Beekeepers' Association

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Rosanna Mattingly

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Image above: Honey bees assemble proteins just as we do, through the same dance that includes DNA, RNA, and ribosomes. It is an amazing process indeed. Yet, who would have thought that a ribosome might be hijacked? Life finds ways to live—even for a virus that manages to *live* only when it has the help of its host cell. The studies referenced in the front article are:

Genomic Study Yields Plausible Cause Of Colony Collapse Disorder. *ScienceDaily* (August 25, 2009). Adapted from materials provided by University of Illinois at Urbana-Champaign.

R.M. Johnson, J.D. Evans, G.E. Robinson, and M.R. Berenbaum. Changes in transcript abundance relating to colony collapse disorder in honey bees (*Apis mellifera*). *PNAS* published online before print August 24, 2009, doi: 10.1073/pnas.0906970106.

MOLECULAR MARKER FOR CCD

From: "A Single molecular marker found for Colony Collapse Disorder. Proteins are the key." *Catch the Buzz*, August 24, 2009.

If your ribosome is compromised, then you can't respond to pesticides, you can't respond to fungal infections or bacteria or inadequate nutrition because the ribosome is central to the survival of any organism. So says a report in *Science Daily*. "You need proteins to survive," says May Berenbaum, entomology professor and department head at the University of Illinois, along with being an affiliate of the Institute for Genomic Biology at Illinois. This observation is the result of work conducted there, funded and assisted by the USDA, with Reed Johnson, a University of Illinois doctoral student in entomology and first author on the study, and Gene Robinson, entomology and neuroscience professor at U of I, co-principal investigator, and Director of the Neuroscience Program at Illinois. Johnson was the recipient of the Eastern Apicultural Society's prestigious Student Award this year, presented at their annual meeting in August.

Their study, published in the *Proceedings of the National Academy of Sciences*, is the first to identify a single, objective molecular marker of the disorder, and to propose an explanation to the mysterious disappearance of American honey bees.

The study made use of the honey bee genome (only recently completed at U of I by Robinson and others) and a genome-based tool, the microarray, to look for differences in gene expression in the guts of healthy honey bees and in those from hives afflicted by CCD.

Berenbaum said that they saw that CCD bees suffered "more than their share" of infections with viruses that attack the ribosome, a finding reflected in the Penn State study released last week and reported on here.

These so-called picorna-like viruses "hijack the ribosome," she said, taking over the cellular machinery to manufacture only viral proteins, not those needed for the bee to survive or thrive. The list of picorna-like viruses that afflict honey bees is long and includes Israeli acute paralysis virus, which was once suspected of being the primary cause of CCD. The varroa mite is a carrier of picorna-like viruses, and is thought by most researchers to be a key in explaining the virus loads carried by US bees.

The researchers summed up—bees under stress would not be able to handle those stresses, or handle them as well when the ribosome functions were compromised and the proteins needed to compete were not being produced.

The Bee Line

The Bee Line is the official publication of the Oregon State Beekeepers' Association. The newsletter is published ten times a year, and subscriptions are included with membership in OSBA.

Please send news about your bees and your experiences in keeping them, as well as corrections, letters, comments, photographs and stories (old and new), interviews, and requests for advertising to: Editor, *The Bee Line*, 4207 SE Woodstock Blvd Ste 517, Portland OR 97206; e-mail: osba.newsletter@gmail.com.

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Please submit copy by the 10th of the month prior to publication. The next issue will be the October 2009 issue. Contact the Editor with any questions or concerns.

Many thanks!

MESSAGE FROM THE PRESIDENT

This year's honey is in the barrel, bucket, or jar as the case may be for each of us. Most beekeepers report a record crop from early flowers and crops like crimson clover. Later flows seem to be very spotty. Not a single beekeeper has told me their blackberry honey reached even near their typical average. Late flows also seem to be below average. Although poor forage conditions often lead to poor winter survival, most seem to think their colonies are large and look very good. Commercial beekeepers started to feed pollen substitutes in early August. I expect hobbyists were not far behind. To supplement the lack of available nectar, syrup feeding started earlier than usual.

Will this lack of a consistent nectar flow and available natural pollen cause poor nutrition for the bees going into winter? Dr. Ramesh Sagili, the research/extension scientist for apiculture at Oregon State University, is trying to answer that question with part of his summer and fall research. Dr. Sagili is taking samples of bees from all over Oregon and looking at their health. Of course, you can find out more about this at the Northwest Corner Beekeeping Conference this November in Seaside, Oregon. Fill out the registration form (see page 13 in this issue of *The Bee Line* or download from the OSBA Web site: www.orsba.org). Note that there is a discount for early registration. Early registration allows the various conference committees to complete part of their work before the last minute. You can imagine the stress Mark goes through when three days before the conference only fifty have registered and then two hundred show up.

Since I wrote a while back about my bad luck/good luck theory, the number of beekeepers telling me their related stories amazes me. I think I could write a book. How about this one: A beekeeper had his honey extracted by a friend. The honey was put into four-gallon buckets for the truck ride home. He stopped several times to check the security of the buckets that were stacked three high on pallets. Later he was shocked to look into his passenger side mirror and see buckets of honey exploding as they hit the pavement. I think we can say that was bad. As he pulled over, cars going at least the speed limit were driving through the potentially dangerous honey spill. Where is the good? As he looked around, he was in front of a farm that uses his bees for pollination. Within minutes the farmer sent a water-truck to wash away the mess and possibly prevent a real disaster. Thirty-two buckets of honey that the beekeeper won't have to put into bottles.

It could have been worse. Use your imagination.

—Chuck

NORTH VALLEY/SOUTH VALLEY

It has been proposed that representation of the Willamette Valley as a whole be split into north and south regions. This change is necessary because the area involved is too large for full, adequate representation throughout. The split would require a change in Article V, Section 1, of the OSBA Constitution to add one additional regional director as an officer. In addition, the split would require alteration of the OSBA Bylaws, Article II, Section 4, for consistency in making this change. The proposed new wording of the sections would appear as:

OSBA Constitution

ARTICLE V – OFFICERS

Section I. Officers.

The officers of Oregon State Beekeepers' Association shall consist of president, vice-president, secretary/treasurer, and eight regional directors. These officers plus the outgoing president and all qualified directors shall constitute the executive committee.

(A) The eight regional directors shall be known as regional directors 1, 2, 3, 4, 5, 6, 7, and 8. Each shall have full voting privileges on the executive committee. All regional directors shall be current members of Oregon State Beekeepers' Association. The eight regional directors shall be elected from eight different areas over the state, as follows:

1. Southern Oregon (including Jackson, Josephine, Douglas, Klamath, and Lake Counties).
2. Eastern Oregon (all other counties east of the Cascades, except the Columbia Basin).
3. Columbia Basin (including the city of Bend north to Hood River and The Dalles).
4. South Coast (including the city of Florence and southward).
5. North Coast (northward of the city of Florence).
6. North Willamette Valley (northward of Albany).
7. South Willamette Valley (southward of Corvallis).
8. Portland metro area. (Multnomah, Washington, and Clackamas Counties).

OSBA Bylaws

ARTICLE II – DUTIES OF OFFICERS

Section 4. Regional Directors

Regional directors shall serve on the executive committee. The eight regional directors shall be

elected from different areas of the state and will be expected to be aware of the problems facing beekeeping in those areas and be responsible for bringing these problems to the attention of the executive committee and the members.

These proposed changes in the Constitution and Bylaws are to be voted on during the **business meeting at the annual conference**, November 20, 2009. Send any comments or considerations prior to the meeting to Herb Brasington at (503) 701-4180 or herb@hwbsystems.com.

COLONY COLLAPSE DISORDER: A Descriptive Study

Methods and Principal Findings

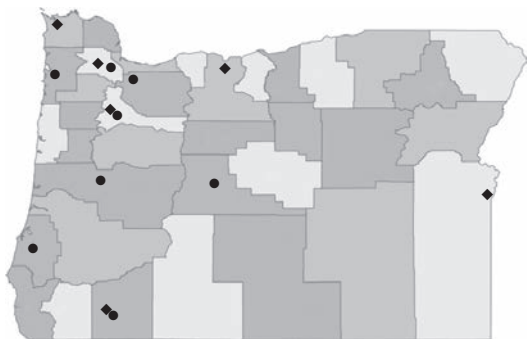
Of 61 quantified variables (including adult bee physiology, pathogen loads, and pesticide levels), no single measure emerged as a most-likely cause of CCD. Bees in CCD colonies had higher pathogen loads and were co-infected with a greater number of pathogens than control populations, suggesting either an increased exposure to pathogens or a reduced resistance of bees toward pathogens. Levels of the synthetic acaricide coumaphos (used by beekeepers to control the parasitic mite *Varroa destructor*) were higher in control colonies than CCD-affected colonies.

Conclusions/Significance

This is the first comprehensive survey of CCD-affected bee populations that suggests CCD involves an interaction between pathogens and other stress factors. We present evidence that this condition is contagious or the result of exposure to a common risk factor. Potentially important areas for future hypothesis-driven research, including the possible legacy effect of mite parasitism and the role of honey bee resistance to pesticides, are highlighted.

Note: This material is taken from the abstract of the study by D. vanEngelsdorp, J.D. Evans, C. Saegerman, C. Mullin, E. Haubruge, B.K. Nguyen, M. Frazier, J. Frazier, D. Cox-Foster, Y. Chen, R. Underwood, D.R. Tarpy, and J.S. Pettis. It is published at PLoS ONE 4(8): e6481. Visit: www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.000648.

OREGON STATE BEEKEEPERS' ASSOCIATION RESOURCES



◆OSBA REGIONAL REPRESENTATIVES

Columbia Basin: Deb Morgan
3800 Benson Rd, The Dalles; (541) 298-5719

Eastern Oregon: Jordan Dimock
2635 Mitchell Butte Rd, Nyssa; (541) 372-2726

Portland Metro Area: Herb Brasington
1881 NE Ashberry Dr, Hillsboro; (503) 701-4180
herb@hwbsystems.com

North Coast: Thom Trusewicz
90041 Logan Rd, Astoria; (503) 325-7966
ccbees@gmail.com

South Coast: Open

Southern Oregon: Floyd Pawlowski
415 Pompadour Dr, Ashland; (541) 482-4797

Willamette Valley: Harry Vanderpool
7128 Skyline Rd S, Salem; (503) 399-3675
shallotman@yahoo.com

◆OSBA REGIONAL ASSOCIATIONS

Central Oregon Beekeepers
Meets 6:30 PM, third Tuesday, Bend
Deschutes Public Library, Hutch Rm
President: Dennis Gallagher
(541) 389-4776
Secretary/Treasurer: Glenda Galaba
(541) 383-1775

Coos County Beekeepers
Meets 6:30 PM, third Saturday (except December)
Olsen Baxter Bldg, 631 Alder St, Myrtle Pt
President: Shigeo Oku; (541) 396-4016
Vice President: John Gardner; (541) 572-3847
Secretary: Bobbi Gardner; (541) 572-3847
Treasurer: Jane Oku; (541) 396-4016
jane_oku@hotmail.com

Lane County Beekeepers
Meets 7:30 PM, third Tuesday, Eugene
EWEB Meeting Rooms, 500 E 4th Ave
President: Katharine Hunt; (541) 607-0106
cwhunt@uoregon.edu

Vice President: Judy Scher; (541) 344-2114
judy_scher@catdreams.com
Secretary: Chuck and Katharine Hunt
(541) 607-0106; cwhunt@uoregon.edu
Treasurer: Nancy Ograin; (541) 935-7065
woodrt@pacinfo.com
Web site: www.lcbaor.org

Portland-Metro Beekeepers

Meets 7 PM, second Thursday, Oregon City
Clackamas Comm College, Clairmont Hall, Room 118
President: Kerry Haskins
(503) 632-8448; kh251@aol.com
Vice President: Jim Mellis; (503) 631-4622
Secretary: Paul Hardzinski; (503) 631-3927
Treasurer: Barbara Derkacht; (503) 631-3063
bderkacht@yahoo.com

Southern Oregon Beekeepers

Meets 7:30 PM, first Monday, Central Pt
So Or Res & Ext Ctr, 569 Hanley Rd
President: John Jacob; (541) 582-BEES
john@oldsolenterprises.com
Vice President: Floyd Pawlowski
415 Pompadour Dr, Ashland; (541) 482-4797
Secretary/Treasurer: Julian Lewis
(541) 535-5817; lewis_adams_00@yahoo.com
Web site: www.southernoregonbeekeepers.org

Tillamook County Beekeepers

For meeting and other information about the
group, please contact:
President: Bob Allen; (503) 322-3819

Tualatin Valley Beekeepers

Meets 7:30 PM, last Friday, Beaverton
OSU Ext, #1400, 18640 SW Walker Rd
President: Herb Brasington; (503) 701-4180
herb@hwbsystems.com
Vice President: Paul Anderson
paulanderson@tritektsolutions.com
Secretary: Jerry Maasdam; jmaasdam@mac.com
Co-Treasurers: Brigitte and Michael Hendrickson
mdhendri@gmail.com

Willamette Valley Beekeepers

Meets 7 PM, fourth Monday, Salem
Chemeketa Comm College, Bldg 34, Rm A
President: Richard Farrier; (541) 327-2673
Vice President: Harry Vanderpool; (503) 399-3675
shallotman@yahoo.com
Secretary: Mike Rodia; (503) 364-3275
drodia@yahoo.com
Treasurer: Gordon Kroemer; (503) 538-2307
kroemer2@verizon.net

REGIONAL ASSOCIATIONS

Lane County Beekeepers

Nancy Ograin writes in the minutes: Ken Ograin presented on “Getting Bees Out” of the hive so you can remove the supers to extract honey at the August meeting. He discussed the pros and cons of bee brushes, bee escapes, fume boards, and bee blowers. Ken then talked about storing honey supers. He does not think it is a good idea to put out frames for the bees to clean up as this can attract yellow jackets and bee robbing. You can, however, put them back in your hive, but be sure to place them above an inter-cover and only leave them in for a couple of days. Before storing frames, place them in a freezer for 2 days to kill any wax moth eggs. If not possible, then use para-moth (paradichlorobenzene), not naphthalene moth balls. Store frames in containers that have tight-fitting lids or stack supers with layers of newspapers between the top and bottom. If you use moth balls, be sure to air out frames for a couple of days before putting them back in the hive next season. You can also store frames wet. Be sure to leave 45 pounds of honey on the hive for the winter.

Mike Harrington spoke to the Oregon League of Conservation Voters on backyard beekeeping and the benefits of bees for the community. The turnout was excellent and relaxed with 70 or so attending along with seven local elected officials.

—From: August 2009 *LCBA Newsletter*

Portland-Metro Beekeepers

The group held its annual Summer Picnic on August 15th. The place this year was Atkinson Park in Oregon City, with a pleasant hilltop grove of tall hardwoods and an open-sided picnic shelter with tables and grills. The day was uncharacteristically cool for the season, which may have accounted for the relatively small turnout, about 24 of mostly the hard-core cadre of the club’s membership and some of the newer members.

Elbert Lowry brought a sample of pollen he collected this season, and many at the picnic tried it. Elbert reported that he collected 150 pounds of pollen from ten hives both last year and this. He had given a talk on pollen trapping at the last club meeting. In addition, Helga Moll, one of the club’s

lifetime honorary members, reported very low honey production and emphasized the importance of making sure colonies have enough supplies in the hive bodies before taking all the honey in the supers. Jim Barlean said that colonies he has just brought home from pumpkin pollination had no stores at all, and he has had to start feeding them already.

This year much of the talk was of the season’s surprisingly light honey harvest, especially in view of the relative lack of beekeeping problems, healthy colonies, and apparently favorable conditions during the blossoming of blackberries. One idea with which several beekeepers agreed was that this year the blackberries bloomed when it was hot and dry, which may have reduced the nectar by evaporation. Nevertheless, beekeepers whose bees do not depend on blackberry also reported reduced honey crops.

The meeting portion of the picnic was brief. Two principal items were discussed: (1) There will not be an OSBA beekeepers’ booth at either the Oregon State Fair or the Clackamas County Fair this year. (2) The club’s executive committee resolved to discuss a proposal to sponsor passes for three members (in addition to the one pass already to be provided to the club by the state association) to attend the Northwest Corner Beekeeping Conference this coming Fall in Seaside and present a proposal at the group’s September meeting. —*John Holderness*

Willamette Valley Beekeepers

Again Suzie’s place provided the perfect location for our annual picnic. The weather was ideal, the attendance was great (about 50 members and family or friends), and the food plentiful and tasty. Dr. Dewey Caron spoke on “Reading the Frame” and “Looking for Evidence of the Queen.” After passing a two-sided sheet with a picture of a frame and a series of questions, Dr. Caron asked members to check the boxes on their sheets if they could see certain things and/or draw some conclusions. This was most instructive and tested our ability to consider and analyze what we could see. Some of it was easy, such as identifying brood, but some of it was hard, such as deciding if the frame showed a pollen dearth or heat spell if no pollen was evident. Even some of the old-timers couldn’t answer all the questions and/

Continued on page 6

The Region—Continued from page 5

the old-timers couldn't answer all the questions and/or did so incorrectly. This was so educational that it could be done again at a monthly meeting and/or with another topic.

Besides a box of deep wax foundation, the silent auction included a two-level nuc box, an old (collectible smoker), and several other items. There were a number of door prizes, including bottom boards, a queen excluder, frames, a complete deep hive kit (Terry Adams got it), hive tools, moth balls and a syrup feeder. On display were the usual solar melter (it worked great because it was warm) and honey melting oven. Jeff Milligan brought a frame assembly jig with copies of the plans.

—**From:** August 2009 *TVBA Newsletter*

KEEPING BEES IN SEPTEMBER

Todd Balsiger

September beekeeping activities are a continuation of what we started in August: nest consolidation, pest and disease control, feeding, and winter preparation. Colonies should be in winter configuration. Too much space is a liability now.

- ❖ Check hives to make sure they are queenright, healthy, and have populations sufficient to overwinter. Small hives can be united.
- ❖ Check for adequate food stores by hefting hives (i.e., tilt one side up). They should be noticeably heavy. If not, feed for weight: heavy sucrose syrup, 60 percent sugar by weight. Make sure that at least your last “weight” feeding contains Fumidil-B for *Nosema apis* and *N. ceranae* control. This should be in late September or early October. The idea is for the bees to store rather than immediately consume this medicated syrup. Feed two gallons.
- ❖ Finish bacterial brood and *Varroa* treatments. Retest for *Varroa* to ensure efficacy of treatments. Always be on the lookout for American foulbrood.
- ❖ Ensure that lids are water tight and that there is an upper ventilation hole. Dry bees can endure cold and survive; cold and wet bees from leaky lids and/or condensation may not.

- ❖ Add entrance reducers/mouse guards.
 - ❖ Try to have winter yards that are protected from low-lying pockets of cold air, protected from winds, and exposed to the sun. Face hives entrances towards the sun and away from prevailing wind. Tilt hives so that water drains away from entrances.
 - ❖ Try to prevent robbing. Avoid keeping hives open for long.
 - ❖ Protect extracted supers from wax moths.
 - ❖ Lastly, once the colony is set for winter, don't keep popping the lid off. When the temperatures get cold and the bees become inactive, the bees may not be able to adequately glue the lids down again. If in doubt, take care to secure the lids with rope or heavy object.
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URBAN BEES AND URBAN BEEKEEPERS

Bee Culture Magazine and www.thedailygreen.com want to celebrate the incredible explosion of City Beekeepers. We want all urban dwellers with beehives and beesuits, with hive tools and smokers, with supers and covers and frames galore to stand and be counted, to be recognized and noticed. We want everyone who uses five frame, eight frame, ten frame or top bar hives to raise their hands to the sky and shout! We want every and all of America's backyard, roof top, window box, fire escape, empty lot, and anywhere else in the city honey makers to join the hive and let the world know you're alive. Let's get everyone with every hive, in every large or small, crowded or sparse asphalt landscape around the towns and the cities, the suburbs and gardens of America's everywhere and anywhere to share what they do, show what they grow, and feel pride in their work, their passion and their hobby. It's no matter if you just started out or are already seasoned in city bees. And if it's not Kosher to keep bees where you are, we won't tell, we won't share because we don't care...we want the world to know there are thousands who are working to make the bees at home....

If this is you..., send a high-quality photo, 50 or so well chosen words about your specific, or general location and operation...depending on you and your neighbors and the law of the land where you are.

We need contact information so we can get back to you (an e-mail is just fine) if there's a question so we get it right the first time. Please send all this to Dan Shapley...at Dshapley@hearst.com. He's a whiz at making all this work. When you send your photos and descriptions, you give The Daily Green and *Bee Culture* the right to publish the material and share it with its partners. For details, visit: www.thedailygreen.com/bee-photos.

POWDER SUGARING BEES?

Dewey M. Caron

Using powdered sugar for *Varroa* mite control has been recommended as an IPM tool—to knock mites off workers, to help monitor mite levels, and as a means of controlling mite buildup in the colonies themselves. Monitoring mite numbers with powdered sugar is an relatively easy and helpful tool (see tutorial on the MAAREC Web site: MAAREC.psu.edu), but a newly published 6-month study suggests that adding powdered sugar to a colony to control mites might not be providing the perceived benefit. The study was unable to document any mite reduction from powder sugaring bees every other week.

In nine years of surveying backyard beekeepers in the mid-Atlantic states, I found only a small number of beekeepers (about 10 percent) using powdered sugar for mite control while over 50 percent of beekeepers (who indicated they were monitoring mite levels) preferred to use the powdered sugar roll to determine mite levels. The numbers using powdered sugar to control were fairly consistent over the survey years, but there has been an increase in the use of powdered sugar as a monitoring tool. (Survey results are published on the MARREC Web site and in the Delaware bekeepers' newsletter, NEWSY BEE.)

In a recent comparison survey of 100 Oregon backyarders, i.e., those who filled out a survey form during April local association meetings, 65 percent of the beekeepers who had no overwinter losses indicated that they used powdered sugar as a control scheme in contrast to 38.5 percent of beekeepers who did have winter losses (57 of the 100 had a loss; 43 had no loss). The total loss rates in Oregon and Delaware/Maryland in 2009 were similar—25.8 and 24 percent, respectively. (Only about a third as many

beekeepers responded to the Delaware/Maryland survey, however.)

The new study conducted in Florida by Amanda and James Ellis (University of Florida) and Gerry Hayes (Florida Department of Apiary Inspection) compared mite numbers, adult bee numbers, and brood area of colonies treated with powdered sugar for mite control to untreated controls. Colonies were dusted every other week for 11 months with 120 g of powdered sugar. The study found no differences in adult bee populations or amount of brood between treated and control colonies, but also no differences between numbers of mites, numbers of mites prorated to adult bee numbers, and mite numbers per capped brood cells in treated versus untreated colonies. Although the initial (24 hour) mite drop following dusting was significant, the results of the study noted no overall reduction in mite numbers.

Their conclusion: “Dusting colonies with powdered sugar did not significantly affect colony strength or mite populations... We did not find this method of dusting colonies with powdered sugar to effectively control varroa mites.”

Whether a different method of applying the powdered sugar, such as the newly available powder sugar duster, would modify the conditions sufficiently to improve overall mite control is unknown. The initial report of mite control using powdered sugar (by Nick Aliano in his PhD studies with Marion Ellis at the University of Nebraska) utilized the labor-intensive method of shaking adult bees off their comb and powdering them in a separate box, similar to our monitoring method technique.

Read these results and the parameters of this study in the 2009 *Journal of Apicultural Research & Bee World* 48(1): 72–76.

Note: The journal article that Dr. Caron references is titled “The efficacy of dusting honey bee colonies with powdered sugar to reduce varroa mite populations.” It is available at: www.ibra.org.uk/articles/20090217_5. Although the article itself has a fee, the abstract is offered at no cost. As he states, other methods of applying the powdered sugar may yield different results. In addition, the time of day and number of treatments during certain time periods could affect the outcome. Some of Randy Oliver's work may be relevant here? Your observations? Experiences? Call (503) 772-3485 or e-mail me at: osba.newsletter@gmail.com.

CERTIFICATION FOR HYGIENIC QUEENS

Matt Bewley

FERGUS FALLS, Minn.—She really doesn't care whether they are Western, Russian, Caucasian, or Golden Italian honeybees. Their behavior is what interests University of Minnesota bee researcher Marla Spivak. If they are exceptional housekeepers, then she wants to be able to certify their queens and put them to work breeding more like them in hives around the country.

Sound odd? Not in the least, when you consider the worker bees these queens produce work hard to rid their colonies of disease and parasites—all serious threats to bee colonies and considered by some experts to be contributing to Colony Collapse Disorder, the mysterious anomaly that is killing off colonies all over the world.

“This is a totally new and innovative project—never been done,” the researcher says. “People have tried to certify races of bees. This is not about that. I don't care what the race of bees is, I just want to see if it has certain characteristics.”

Hygienic bees

In beekeeping vernacular, those characteristics are called “hygienic behavior” and are something of a marvel of nature.

About 10 percent of all honeybees, regardless of race or lineage, carry the genetic trait that compels the worker bees to maintain clean broods, the honeycombed cells in which bee eggs grow until they are mature enough to emerge and go to work as nurses, workers, drones or pollen gatherers.

Pathogens like American foulbrood, a bacterial disease, and chalkbrood, a fungal disease, take hold of and feed on the larval bees while they are growing inside the brood cells. Parasitic mites, aptly named “*Varroa destructors*,” also attack the larvae, feeding on them and growing to reproductive maturity in the brood cells.

Chemical treatment of colonies became accepted practice for the diseases and mites, but even those were suspected as adding to the stress within colonies that may have been contributing to Colony Collapse Disorder, besides costing more time and expense to beekeepers.

But the hygienic worker bees take care of their colonies by themselves. They sense diseased and parasitized larvae in the brood cells and immediately open the cells, remove and discard the larvae, effectively cleaning out the diseases and parasites with them.

It's possible that nature eventually would have selected the hygienic bees for survival over nonhygienic bees, but with one-third of all US food crops depending on healthy bee colonies for pollination and ominous colony collapses occurring everywhere, Spivak decided to give the Darwinian process a little help.

Spreading good hygiene

In 1994, she and colleague Gary Reuter began breeding hygienic bee queens. Working with Minnesota and North Dakota beekeepers, they were able to demonstrate that these queens established colonies that “rarely, if ever, displayed clinical symptoms of American foulbrood or chalkbrood, and had significantly fewer *Varroa* mites,” she says.

Contrary to early suspicions by honey producers that propagating hygienic behavior would somehow lead to aggressive bees with less interest in making honey, the Minnesota bees turned out to be both gentle and productive honey-makers.

“I've been giving queens to the Minnesota honey producers and then they would auction them off every summer. These are artificially inseminated breeder queens,” Spivak says.

The bees became known as the “Minnesota Hygienic” bee, and several beekeepers began buying them. They noticed an overall improvement in the health of their colonies and kept going back for more.

The Minnesota Hygienic now is one of the top lines of bred queen bees in the US. Several apiaries have programs that promote and advertise Spivak's queens to beekeepers.

But some of the breeders were failing to ensure that their new queens were actually passing on the hygienic gene to their new colonies. The gene is recessive, so the hygienic queen must mate with a drone bee that also carries the gene. This is not always the case.

“As a result, the colonies produced by those queens

are not showing the hygienic traits,” she says. “If the queens mate with 20 males, at least half the males need to have the genes for hygienic behavior.”

Spivak says some California breeders are not ensuring this, so the “Minnesota Hygienic” queens they sell may or may not lay hygienic eggs. The queens she’d been supplying were not able to do their job, that is, create colonies of hygienic bees for those who wanted to buy them.

“Last year, I decided I’m not doing that anymore,” she says.

She will focus her efforts on supporting three Minnesota breeders, Jeff Hull, Mike Rufer, and Mark Sundberg, who have been carefully managing their hygienic queens for several years now. Spivak says the hygienic trait now is fixed in their populations.

“When these guys go down south to raise their queens, and they raise daughter queens and they let them mate naturally with their drones in that area, those queens are encountering drones from other hygienic colonies,” she says. “The workers she produces carry the hygienic trait. Therefore, the colonies are hygienic.”

Best of the best

Spivak’s goal is to have them propagate the line themselves without artificial insemination.

“They’ve been using my queens as breeders for so many years that the trait is what I would call ‘fixed’ in their population of bees,” she says.

To ensure this, she sent a team of her students to each of the three apiaries to test the level of their hygienic behavior.

“They identified really good colonies that [the breeders] could use as breeder stock,” Spivak says.

The final data have not yet been compiled, but she is confident that the three Minnesota breeders will be able to provide genuinely hygienic bees to their buyers.

And the testing will continue, she says.

“That’s how we’re going to be doing some quality control. Every year we can be testing their colonies and then identifying breeder stock for them so we can keep the high level of hygienic behavior in there and improve it,” she says.

Spivak will “certify” these as Minnesota Hygienic bees, which she hopes will be able to create healthier colonies anywhere honeybees are used in commercial operations.

Note: Reprinted from *Agweek* (July 6, 2009) with permission. The title is shortened from the original, “Minnesota bee experts launch pilot certification program for hygienic queens.”

CCD PROGRESS REPORT

Compiled by *Dewey M. Caron*

With unexplained heavy losses of US honey bee colonies [Colony Collapse Disorder (CCD)] USDA’s Agricultural Research Service (ARS) and Cooperative State Research, Education, and Extension Service (CSREES) developed a collaborative CCD Action Plan in July 2007. In June 2009, Kevin Hackett, USDA administrator, released an Annual Report of the CCD Action Plan as mandated under the 2008 Farm Bill. Major findings and work underway, organized under four topic areas, were identified as follows:

Topic I: Survey and (Sample) Data Collection: Several survey and data collection efforts are underway (including here in OR & PNW) to provide baseline data for CCD, resulting in establishment of a better definition of CCD field symptoms (no lab confirmation currently is available—research has suggested some “markers”), better documentation of increasing honey bee losses (now 30%+ is “normal”), and evidence of increased pathogen and pesticide levels in colonies with poor health.

Topic II: Analysis of Existing Samples: Analysis of bee samples collected from both CCD- and non-CCD-affected colonies has failed to demonstrate consistent differences between healthy and non-healthy colonies. Unhealthy colonies have a higher number of viruses (20+, including new mite virus VDV-1) and other pathogens (including unexpectedly high levels of *Nosema ceranae* here in PNW), and considerable pesticide contamination (to date from the 700+ samples analyzed, 73 pesticides and 9 metabolites—an average of 6 residues per colony

Continued on page 10

CCD Report—Continued from page 9

metabolites—an average of 6 residues per colony sample—have been found). Non-CCD colonies have fewer infections but not less pesticide residues. Markers for CCD could include virus with *Nosema ceranae* (as suggested in a U of Montana study) or rRNA ribosomes (from a recent study at U of Illinois (See *ScienceDaily* for review). The evidence indicates that a combination of stress factors likely sets off a cascade of events in the colony where weakened worker bees, more susceptible to pests and pathogens, are unable to maintain the social condition. See August PLoS (Public Library of Science) article in by Dennis vanEngeldorp and multiple CCD investigators “CCD: A Descriptive Study” for an in-depth explanation of sample analysis.

Topic III: Research to Identify Factors Affecting Honey Bee Health, Including Attempts to Recreate CCD Symptomology:

Because survey and analysis results indicate that many pesticides, parasites, and pathogens may be involved in CCD, efforts are continuing to explore the role and interplay of such negative factors. Findings to date indicate there are sub-lethal effects of the in-colony common miticides used by many beekeepers for mite control. Additionally, synergistic effects of pesticides, including presumed relatively harmless herbicides and fungicides, are being closely scrutinized. Studies have also confirmed suspected links between poor colony health and inadequate diet [for example, feeding of HFCS, in part due to elevated HMF levels, is harmful compared to feeding of sucrose] and long distance transportation [10 percent higher brood mortality in migratory colonies]. Evidence mounts that both supplemental protein/natural pollen diets and sugar feedings can increase colony strength and offset the negative impacts of stresses such as pests, pesticides and transportation.

Topic IV: Mitigative and Preventive Measures:

Efforts to mitigate the honey bee crisis have started. The ARS Areawide Project on Honey Bee Health and a CSREES funded \$4 million Cooperative Agricultural Project (CAP), includes demonstration apiaries (one of 7 is at Washington State in Pullman) to monitor colony health and test various hypotheses related to poor bee health (see review of CAPS first year progress in August *Bee Culture* magazine by editor Kim Flottum). Promising

investigations include the development of new, varroa-mite-resistant bee stocks, a new strategy to reduce pathogen levels (gamma irradiation of comb from colonies with poor health had double the survival rate), brood pheromone role toward improving bee health (including studies underway by Ramesh Sagili at OSU), and investigations toward developing several alternative pollinators to honey bees. Progress has also been made toward developing new detection capabilities for pests and pathogens, integrated control strategies for varroa mites, and a set of comprehensive Best Management Practices (BMPs) that will provide beekeepers with specific guidelines to improve the health of their bees. A new Web-based extensive data base on bees and pollinating insects from the CAPS grant is up and being prepared for fall launch.

During the past two years, numerous causes for CCD have been proposed and investigated. Although the cause of CCD is still unknown, research has lent credence to the hypothesis that CCD may be a syndrome caused by many different factors, working in combination or synergistically. Studies ahead will focus increasingly on combinations and synergistic effects of factors in causing CCD.

This modification includes portions of the USDA Executive Summary report released by Kevin Hackett, USDA National Program leader for Bees and Pollination—full report available at: http://www.ars.usda.gov/is/br/ccd/ccd_progressreport.pdf.

Note: This article includes some repetition from this and last month’s issues of the newsletter. It is printed as submitted, at Dr. Caron’s request because he has worked the material specifically to meet the needs of beekeepers in the Pacific Northwest.

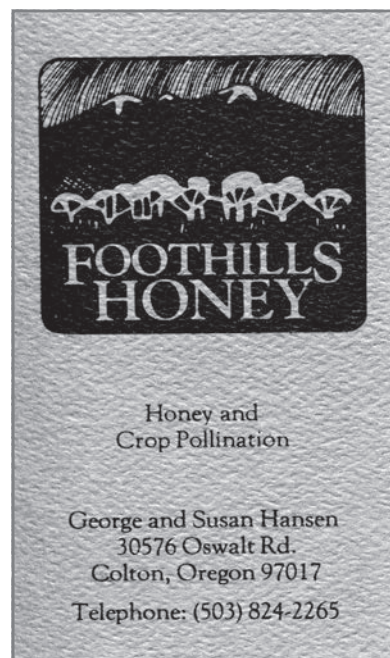
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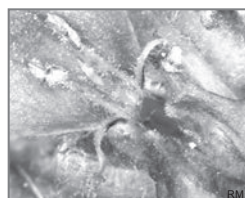
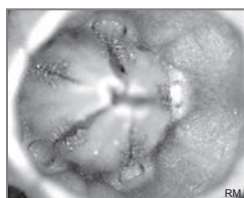
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Happy Autumn! —RM



Northwest Corner Beekeeping Conference



Preliminary Line-Up of Presenters and Presentations

(To be updated in the next issue and as information becomes available at: www.orsba.org.)

Dr Michael Burgett – Northwest Beekeeper Survey
Professor Emeritus, Oregon State University

Dr Dewey Caron – Bee Losses, Colony Natural History
Visiting Professor, Oregon State University

Frank Eischen – TBA
Research Entomologist, USDA, Weslaco TX

George Hansen – Banquet Presentation – TBA
Member, National Honey Board
Chair, Foundation for the Preservation of Honey Bees

Pat Heitkam – Panel Discussion: Pollination of Almonds in California
Heitkam's Honey Bees, Orland CA
Past President (2003–2004), American Beekeeping Federation

Derek Olson – Overwintering Indoors
Commercial Beekeeper, Albany OR

Dr Ramesh Sagili – Current Research and Extension
Assistant Professor of Apiculture, Oregon State University

Others – TBA

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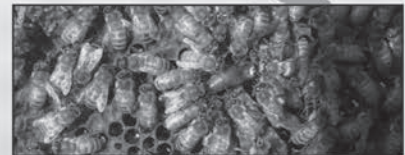
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President: Chuck Sowers
26730 S Hwy 170
Canby OR 97013
(503) 266-1740
sowers@canby.com

Co-Secretary/Treasurer: Patricia Swenson
11665 SE Webfoot Rd
Dayton OR 97114
(503) 864-3096
gazing@onlinenw.com

Vice President: Mark Johnson
16032 NW McNamee
Portland OR 97231
(503) 621-3137
honeybez@juno.com

Webkeeper: Herb Brasington
1881 NE Ashberry Dr
Hillsboro OR 97124
(503) 648-9118
herb@hwbsystems.com

Co-Secretary/Treasurer: Lynn Royce
30807 Decker Ridge Rd
Corvallis OR 97333
(541) 929-5337
mitebee@peak.org

Editor, *The Bee Line*: Rosanna Mattingly
4207 SE Woodstock Blvd Ste 517
Portland OR 97206
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