

The Bee Line

Newsletter of the Oregon State Beekeepers Association

Volume 37, Number 6

July 2012



Richard Temple

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Image above: A Portland Metro Bee Day under a blue sky? We now know that *anything* is possible!

May we find what's best for the bees in today's milieu of pesticides and their many sublethal impacts as well as research reports that are, too often it seems, difficult to interpret and assess. Thank goodness we have the guidance of so many fine honey bee researchers.

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ccbees@gmail.com

REVIEW OF SELECTED RESEARCH

Ramesh Sagili

Greetings!!

Just wanted to take this opportunity to very briefly review some honey bee research articles that have made some buzz in the past six months. I still get frequent inquiries on these publications and topics, as the media as usual makes them a bit dramatic. (Of course, I agree that such publicity and awareness are good for our bees that have been taken for granted for a long time.)

Phorid Fly (*so called zombie fly*)

Publication: Core, A., C. Runckel, J. Ivers, C. Quock, T. Siapno, et al. 2012. A new threat to honey bees, the parasitic phorid fly *Apocephalus borealis*. *PLoS ONE* 7 (1): e29639. doi:10.1371/journal.pone.0029639.

A question that I often get: Is this zombie fly causing CCD in honey bees?

This phorid fly (zombie fly) publication has created some buzz, but it is a little farfetched in the context of CCD. I don't think the level of parasitism that this phorid fly exhibits or is capable of can cause significant colony losses similar to those reported for CCD. This phorid fly has been reported in bumble bees and some wasps for a long time in many parts of the U.S., including Oregon, and is not a new discovery. The only new thing about this fly and the article is that now the researchers have documented this fly to parasitize honey bees as well. Phorid fly populations fluctuate a lot from year to year, similar to yellowjackets and other insect pests, and hence can cause some problems in certain years, but not to the extent of colony collapse.

Neonicotinoids

Study 1: Krupke C.H., G.J. Hunt, B.D. Eitzer, G. Andino, and K. Given. 2012. Multiple routes of pesticide exposure for honey bees living near agricultural fields. *PLoS ONE* 7 (1): e29268. doi:10.1371/journal.pone.0029268.

This study primarily elucidates some routes of neonicotinoid insecticide exposure for honey bees throughout the growing season that were not previously considered or have not gotten due attention. The authors of this study report that extremely high levels of two neonicotinoid insecticides, namely clothianidin and thiamethoxam, were found in planter exhaust material that was produced during the process of planting neonicotinoid-treated corn seed. They also found these insecticides in the soil of both planted and unplanted fields, and also on dandelions next to the treated fields. Pollen from corn plants from these fields contained clothianidin. The authors found that the dead bees they collected near hive entrances also had clothianidin.

Continued on page 10

MESSAGE FROM THE PRESIDENT

By the time that you are reading this, summer will be well on its way and, for many parts of Oregon, a new honey crop. What a magical thing to open hives in a beeyard after pampering the bees all year, and WA-LA! They have a full super of honey. They can take care of themselves. And sometimes they provide a surplus for us as well.

I don't know where the time goes. They say that happens "when you get older," but we are already planning and strategizing the fall conference for 2012. Please mark your calendar for November 1st thru November 3rd in Seaside at the Seaside Convention Center. Our hope is that the Honey Bee Lab at Oregon State University will WOW us with demonstrations again and teach us how to use a microscope. There's nothing like getting up close and personal with tracheal mites. Also, we are planning to repeat last year's raffles with new and similarly exciting items to raffle. Sue Hansen has very kindly agreed to donate one of her paintings for the raffle, and we also have a photograph taken by Randy Rasmussen from *The Oregonian* in Portland that is all framed and ready for the lucky winner.



A photograph that will be raffled during the upcoming 2012 fall conference in Seaside. It was taken at John Byers Orchard by Randy Rasmussen from *The Oregonian* while he was interviewing Vince and Jan in The Dalles. Jan adds, "Of course, is our little honey bee!"

Paul Andersen, our very capable Vice President, has lined up some amazing speakers. They include: Dr. James Tew, Dr. Frank Eishen (USDA), Dr. Larry Connor (author and owner of Wicwas Press), Sue Cobey (the only one I know crazy enough to try to inseminate a honey bee!), Dr. Clint Walker (a Texas beekeeper and now winery owner), and David Hackenberg (a very colorful Eastern beekeeper who knows from experience about CCD and has wonderful information—and recipes—for nutritional food for your bees and "food for thought" for you). We plan to include Dr. Ramesh Sagili and Dr. Dewey Caron so we can catch up on what is happening in the Pacific Northwest and at the OSU Honey Bee Lab. There will also be programs for the hobbyist beekeepers in our organization. We are still working on the program, but those are a few of the highlights. There will be plenty to educate you, plenty to entertain you, and plenty to make you scratch your head!

Enjoy your summer, and don't forget to smile!

Jan

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SUBLETHAL EFFECTS OF PESTICIDES IN WAX ON HONEY BEE BEHAVIOR

Louisa A. Hooven, PhD

Many pesticides are hydrophobic (repelled by water) and lipophilic (accumulate in fat), and so it is no surprise that agricultural chemicals accumulate in beeswax. Miticides such as tau-fluvalinate (Apistan® and Mavrik®), coumaphos (Checkmite+™), and amitraz (Tactic®) are commonly found even in new foundation, and many other pesticides are brought by foragers into the colony. Does long-term contact with this mix of chemicals in wax harm bees? A recent paper by Wu et al. showed that pesticide-contaminated wax does indeed affect brood development and adult longevity [1]. However, it is unclear whether a specific chemical or synergy between chemicals is responsible. There is also a broad range of concentrations of pesticides found in wax [2]. How much is too much?

Recent articles have reported that exposure to some pesticides affects learning, memory, and behavior in foragers. However, it is the brood, nurse bees, drones, and queen who spend their days in constant contact with contaminated wax. Could pesticides in wax also have sublethal effects on the social behaviors of bees within the hive? To investigate whether or not individual chemicals in wax affect honey bee behavior and immune function, our laboratory has developed some new pesticide-testing protocols.

By coating plastic honey comb (Perma Comb) with pesticide-free wax, and then coating the wax with specific concentrations of pesticides, we are able to focus on specific chemicals. As bees move normally across the comb, the environment in which pesticides potentially transfer from contaminated wax to bees is approximated. We have developed special disposable cages to fit around the comb. To measure effects on behavior, we first video bees under infrared light, which bees cannot see and mimics the darkness of the hive. Using special software (Noldus Ethovision, www.noldus.com/animal-behavior-research/products/ethovision-xt), we are able to track and quantify the behavior of bees. We are using this method to investigate the effects of pesticides on nurse bee and queen behavior.

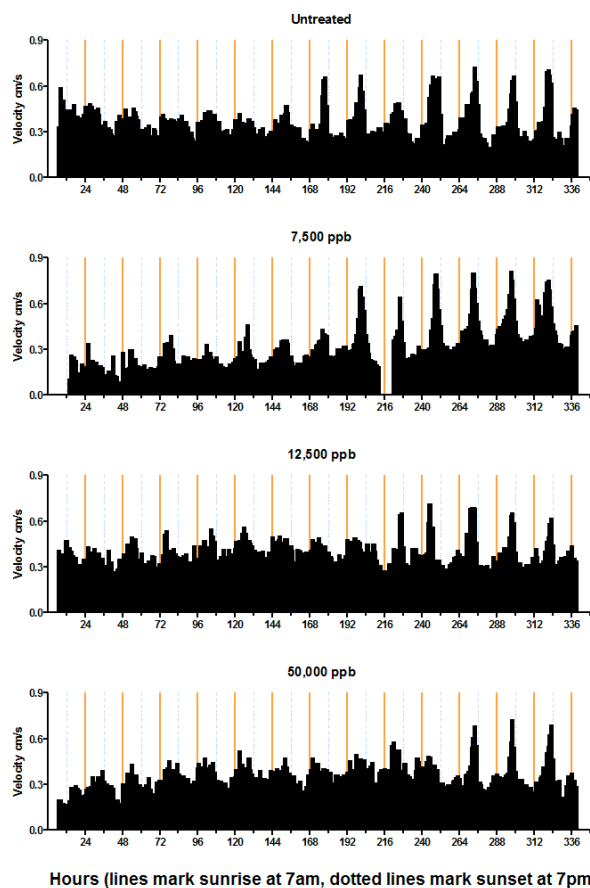
We have started our experiments with a mixture of some of the pesticides most commonly found in beeswax: tau-fluvalinate, coumaphos (miticides), and chlorothalonil (a fungicide). Interestingly, in addition to being a contaminant of wax, chlorothalonil has been associated



Noldus Ethovision analyzing the behavior of bees in eight separate cages.

with entombed pollen [3]. We are using a range of concentrations and proportions that are known to occur in beeswax [2]. Many additional insecticides, fungicides, and herbicides are found in wax, which we are also anxious to test.

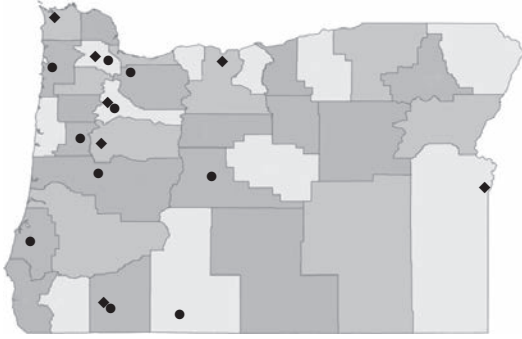
Preliminary results using these methods suggest that even the average amount of these three pesticides in wax has an effect on behavioral development of nurse bees. Foragers have marked patterns in their daily activity and are highly active during the day. In contrast, the daily activity of



When the behavior of untreated bees is tracked for 14 days, an increase in daytime activity begins on the 7th day after emergence. The onset of this activity pattern is increasingly delayed as pesticide concentrations are augmented.

Continued on page 11

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OSBA REGIONAL ASSOCIATIONS

Central Oregon Beekeepers
Meets 6:30 PM, third Tuesday
63211 Service Rd, Suite 130, Bend
President: Bindy Beck-Meyer
Treasurer: Allen Engle
For information, please contact John Connelly—
johncobka@gmail.com

Coos County Beekeepers
Meets 6:30 PM, third Saturday (except December)
Ohlsen Baxter Bldg, 631 Alder St, Myrtle Point
President: John Gardner—541.572.3847
Vice President: Shigeo Oku—541.396.4016
Secretary: Bobbi Gardner—541.572.3847
Treasurer: Jane Oku—541.396.4016;
janeoku1958@gmail.com

Klamath Basin Beekeepers
Meets 9:00 AM, last Saturday (except Nov/Dec)
OSU Extension, 3328 Vandenberg Rd, Klamath Falls
President: Tom Chester—541.850.8384; tlc1@well.com
Vice President: Chris Kerns—541.884.8664;
ker664@charter.net
Secretary: Donna Schmerbach—541.891.3066
Treasurer: Kathy Nelson—541.882.3141
Website: www.klamathbeekeepers.org

Lane County Beekeepers
Meets 7:30 PM, third Tuesday, Trinity United
Methodist Church, 440 Maxwell Rd, Eugene
President: Judy Scher—541.344.2114;
judyscher@gmail.com
Vice President: Rita Ostrofsky—541.685.2875
Secretary: Barbara Bajec—541.767.9086
Treasurer: Nancy Ograin—541.935.7065;
woodrt@pacinfo.com
Website: www.lcbaor.org

Linn-Benton Beekeepers
Meets 6:30 PM, fourth Wednesday, South First
Alternative Co-op Meeting Room, 1007 SE 3rd, Corvallis
President: Linda Zielinski—541.929.4856;
llz50@peak.org

Vice President: Zach Welch—541.754.3069;
zw@superlucidity.net
Secretary: Marie Laper—541.760.9838;
mlaper@peak.org
Treasurer: Suzi Maresh—541.967.9607;
sjomaresh@msn.com

Portland Metro Beekeepers

Meets 7:00 PM, second Thursday, Clackamas Community College, Clairmont Hall, Room 118, Oregon City
President: Nancy McFarlane—503.260.3930;
nancymariemcfarlane@yahoo.com
Vice President: Jim Barlean—503.659.9718;
jbarlean@msn.com
Secretary: Kat Yeager—503.452.5010;
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Treasurer: Rex McIntire—503.720.7958;
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Southern Oregon Beekeepers

Meets 7:30 PM, first Monday, Southern Oregon Res & Ext Ctr, 569 Hanley Rd, Central Point
President: John Jacob—541.582.BEES
john@oldsolenterprises.com
Vice President: Floyd Pawlowski—541.482.4797;
fmpawlowski@ashlandwireless.net
Secretary: Michele Bashaw—541.512.0155;
hapistitch@earthlink.net
Treasurer: Ron Willing—541.582.9694;
rwilling@charter.net

Tillamook County Beekeepers

Meets 7:00 PM, second Tuesday, Art Space Hwy 101 & 5th St, Bay City
President: Bob Allen—503.322.3819
Vice President: Terry Fullan—503.368.7160;
tfullan@nehalem.tel.net

Tualatin Valley Beekeepers

Meets 7:30 PM (7:00 PM to socialize), last Friday
Cameron Public Svcs Bldg, 155 N First Ave, Hillsboro
President: Mike Van Dyke—503.642.5338;
mvand581@gmail.com
Vice President: Andrew Schwab—503.538.7545;
beesbuzzin@gmail.com
Secretary: Paul Andersen—503.649.5089;
paulande@easystreet.net
Treasurer: Jerry Maasdam—503.648.7906;
jmaasdam@mac.com

Willamette Valley Beekeepers

Meets 7:00 PM, fourth Monday, Chemeketa Community College, Building 34, Room A, Salem
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: Patricia Swenson—pkswenson@gmail.com
Website: www.wvbatoday.com

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sagilir@hort.oregonstate.edu

REGIONAL NEWS

Regional Representatives

North Willamette Valley

Is beekeeping really similar to holding on to a tiger by the tail? If so, how about holding a tiger by the tail while on a roller coaster ride?! Such was the spring of 2012. Super strong, healthy hives managed between periods of record warm and record cold periods. Overall, comments continue to be very positive about the prospect of a banner year for honey production. Hives supered well in advance produced a decent maple crop in some locations. Beekeepers with meadowfoam contracts enjoyed one of the best crops ever this year after two wash-out years.

With honey prices at an all-time high, honey supers are flying onto hives like dominoes for the main flow that is now upon us.

Reports of Varroa levels vary, as usual. With an unexpected loss of certain Varroa treatment options, beekeepers are well advised to take positive steps *right now* to determine their fall treatment program.

Mark your calendar! The Willamette Valley Beekeepers Association picnic will be held on July 22 in Salem.

ALL OSBA MEMBERS ARE INVITED!!

Location: 1861 Park Ave NE Salem. Bring a dish to share, bring your own chairs. We eat at noon. See you there!

—Harry Vanderpool

Regional Associations

Lane County Beekeepers

Blackberries are in full bloom in Lane County, and bees are taking advantage of warm sunny days to make surplus honey. Thanks to LCBA member Adam Lawless, LCBA

hosted a booth at the Mt. Pisgah Arboretum Wildflower Festival. Ken Ograin's demonstration hive was a show-stopper and encouraged unsuspecting visitors to become future beekeepers. Fingers crossed for good weather for LCBA Field Day on Saturday, June 23. Linn-Benton Beekeepers Association will join us at the OSU Oak Creek Facility for hive demonstrations and a picnic lunch. Our June meeting is on "Pests and Diseases" by Morris Ostrofsky. —Judy Scher

Portland Metro Beekeepers

Vice President Jim Barlean opened the meeting with a welcome to first-time attendees. Paul Andersen announced that Pollinator Week at the Zoo begins June 18. There will be observation hives in a booth, and a free zoo admission will be given to beekeepers who staff the booth and answer questions from visitors. Paul also noted that the state convention will be held November 1, 2, and 3 with a special session dedicated to small-scale beekeepers and their interests. Larry Connor, author of *Bee-entials: A Field Guide*, will be a featured speaker.

August will be a busy month, so plan ahead. Saturday, August 2, will be the club picnic held at Molalla River State Park in Canby. Zenger Farms in SE Portland is hosting a Tour de Hives, Saturday, August 18, from 1 PM to 4 PM. Call them or see their website for more

information and opportunities to help. Paul Hardzinski shared in-depth information about preparing entries for competition in the Oregon State Fair. Put *Oregon State Fair 2012* into an online search engine; find the Farm, Garden and Floral Department; on pages 16 and 17 of that section, see the Honey Division with specific categories that can be entered. Entry forms are due by June 29. Paul had some good hints for preparing extracted honey for competition. He suggested buying a dozen 12-ounce queenline glass jars and getting a double set of caps. Although only three jars of honey are needed for a fair entry, jars must be inspected for glass imperfections that might seem like bubbles in the honey when a light is shown on the jar. Fill six jars of honey produced by your bees this year, and then choose the best three of those jars. Do a sanitation wash of the jars in the dishwasher; once the jars are washed, don't handle them without a lint-free towel as finger prints will show. Extracted honey must be well strained to eliminate any inclusions. Extraction and straining will introduce air into the honey, so filled jars must stand a number of hours to allow the air to escape. If there is difficulty getting the air out of the honey, do not heat the honey to over 140°F (90–120°F is better, with the lower temperature being preferred). Jars must be filled to as exactly the same height as possible. When jars are taken to Salem for fair entry, put on a new cap after



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you've placed the jar on the shelf. Consult the fair book for judging criteria. Good luck!

After refreshments and some lively conversation among attendees, there was a brisk roundtable discussion punctuated with Jim Barlean's beekeeping tips and tales. Reminders: honey supers should be on; keep an eye out for foulbrood, both American and European; watch for mites; enjoy your bees.
—*Barbara Derkacht*

Tillamook County Beekeepers

Attendance for June was spare as members must be taking early trips before schools adjourn. We did cover swarm prevention and talked at length about swarms that have been hived during May. Tricia Kauffman was most successful, with five swarms this season. Comb honey and chunk honey were explained.

An announcement was made of a workshop on "Attracting Native Pollinators" with Eric Mader of the Xerces Society in Nehalem on July 6. The public is invited. Contact information at 503.368.3203. Eric will share best practices for encouraging native polinators in home landscaping and domestic gardens. Beekeepers on the Coast report a strong showing of blackberry fruit set this year!
—*Terry Fullan*

Willamette Valley Beekeepers

Our booth at AgFest was very popular, including Richard's observation hive with a queen donated by Harry. Ken Vial (AgFest Coordinator) advised that a larger booth may be needed for next year. A thanks to Ken, Patricia, Bruce Roller, Bunny, Fred and others who answered questions and helped the kids. Swarm season is (was) at its peak with upwards of a half-dozen calls each day. As noted in previous years, most calls at this time are from the immediate Salem area. Calls outside Salem come later in the season.

From: WVBA Secretary's Report, June 2012.

KEEPING BEES IN JULY

Torey Johnson



July is the start of a transition period for beekeeping. During the first weeks of July, make sure you are keeping up with the honey flow. If honey supers are heavy with bee activity, be sure to add more supers. If the honey is capped, you can pull and extract, but you must replace the honey-filled super with another.

At this point in time, you should start re-queening hives that have become queenless with nucleus hives ("nucs") that were previously raised. A nucleus hive will immediately improve a hive that has been queenless for a period of time. Three- or four-frame nucs would be needed for these hives; just pull three or four frames from the queenless hive, shake the bees off, and replace the frames with the nucleus frames. Be sure to do this before the end of summer. If re-queening is not done by August or September, the colony will be very small upon the arrival of winter, increasing the risk of the hive failing.

During the last two weeks of July, the honey flow will begin to taper in the Willamette Valley, depending on weather conditions. Heat will dry up the honey flow, and wet conditions will prolong it. Treat hives accordingly with honey supers. Medication should be ordered in July in preparation for August treatments.

QUESTION OF THE MONTH

Question

I opened a hive recently for the first time in three weeks and saw queen cells from which queens had already emerged. I did not see any sign of a queen or eggs, though. The colony is populous and appears to be healthy. I don't want it to go queenless and would like to requeen it with a purchased queen. I don't want to risk having an introduced queen killed if there is a queen already in the hive, however, nor do I want to risk having the colony develop laying workers if it goes queenless for too long a time. Short of introducing a frame of eggs from another hive to see if the bees will make emergency queen cells, is there a way to determine quickly whether the hive has a queen, either virgin or recently mated?

Response

Dewey Caron: The frame of open brood is always a good option, for a quick answer—so, if you see developing queen cells on re-inspection the next day, you have your answer that bees lack a queen. Otherwise, you need to look and see if you see eggs (newly mated queen) or see if there is an area being reserved for a queen (an area of polished cells on adjacent faces of two combs without pollen or nectar). You might look again for a queen (which is difficult in populous colonies) using little smoke and concentrating on the frames of the brood area (if there is one). If on a decent forage day you see an abundance of pollen foragers entering the colony, you can conclude that they are probably okay.

A WORKSHOP QUESTION

Dewey M. Caron

While discussing mite control options at a North Coast [Bay City] Beekeepers workshop in mid-May, a beekeeper asked about use of *arrest* for mite control. He said he knew a beekeeper in South Dakota who used this method and had 100 percent control. Do you know what *arrest* is, and have you tried it for *Varroa* mite control?

I thought this might be the mite-control option known as *queen arrest* in which the queen is temporarily confined to a single brood frame or queen cage. Making up queenless nucs (using queen cells), requeening mite-infested colonies that include queen removal for a week broodless interval, or temporarily confining the queen (i.e., queen arrest) are all reasonable methods of reducing mite population levels.

Such techniques are highly interventive and not for the casual management beekeeper. They are best utilized during the summer when other hive activities are reduced. If brood interruption is combined with replacement of the queen, not merely “arrest” of her egg-laying but her actual replacement with a hygienic/survivor queen or a queen cell reared from the “best” colony, the beekeeper can get a “2-fer”—two combined techniques to help achieve improved mite resistance and young queen stock to keep mite populations below injurious levels.

On further follow-up, however, the individual was saying that he was supplementing his colonies using *Arrest*—a nonchemical, nonantibiotic, nonpesticide *natural* product. A website (www.ranchwise.com) says *Arrest* is

“backed by over 300 university research trials in multiple species showing proof positive effectiveness against immune challenges” and that it “decreased death loss of bees from 15% to less than 4%” and there was a “121% increase in honey production.” Sounds almost “too good” to be true!!

I have not tried it, nor have I seen any controlled study backing up the natural product *Arrest*. It appears to also be used on cattle. I could not find a single study to back up the website claims, let alone over 300 trials. The material is a powder, so it must be a chemical, and the website says since it can eliminate *Tylan*® it functions as an antibiotic. Because it is natural does not mean it is necessarily harmless (think *nicotine* from tobacco plants, for example, a powerful pesticide, or the extract from chrysanthemum flowers we know as the insecticide *pyrethrum*). If it eliminates mites, it must kill or repel them, so it is a pesticide, although sold as a supplement. Thus, I do not know the basis for the claims. Stating that it is not a chemical, not an antibiotic, and not a pesticide is clearly not valid.

Arrest is one more of the rapidly expanding line of bee products sold as honey bee supplements/biostimulants. They are generally claimed to make bees healthier and are usually natural products as oak bark extract (= *Nozevit*®), beet & molasses extract (= *Vita Feed Gold*®), bio-active marine compounds from Western Ireland (= *HiveAlive*®), essential oils (= *Honey B Healthy*®, the original), vitamins/amino acids (= *ApiGo*®), to name but a few. There is very, very little independent research-based supporting evidence for most of them. If not necessarily helpful to honey bees, trial and error would suggest



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that they might not be harmful. If you find one of these products helpful, by all means continue to use it, but I do suggest caution in use of untested bee supplements. If you want to utilize such additives, I recommend you do your own “experiment” by treating a subset of your colonies and then carefully evaluating the results. If it works, share the results with the rest of us.

Note: A quick googling of *arrest* and *bees* yields all manner of reports, including an *Arrested Development* episode, arrest for bee snatching, arrest of Bee Sting..., but, as Dewey indicates, nothing relevant to the claims listed on the Ranch Wise website. A visit to the site is a little “telling” though, as it states that “ingredients in Arrest” (instead of Arrest itself) are backed by the trials (and, as Dewey says, on *multiple* species). Yet, the page also has *Breaking Spring News*—“USDA Spring 2011 Inspection report: Arrest supplemented hives received a rating of ‘Zero’ (none present) for mites, parasites, and viruses. No use of antibiotics or mite treatments. Hives were only supplemented with Arrest!” There’s no link to the report, and it hasn’t turned up yet in searches on the USDA website, but still looking.... Their Facebook page states that Arrest is their product, new in March 2011, contains “Bio-Mos,” and is being mixed and sold. All very curious, indeed!

OREGON STATE FAIR 2012

We will have an educational booth at the Oregon State Fair, August 24–September 3. To sign up for a very fun time working the booth, contact Marjie Ehry by email at marjehry@hotmail.com or phone 503.434.1894. For competitions, please submit entries *as soon as possible!* See the *Farm, Garden & Floral Handbook* (link at lower right of website, www.oregonstatefair.org) for guidelines, and complete the preliminary entry form. Also, see again the Portland Metro group’s report, page 6, this issue!



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SUB-LETHAL EFFECTS OF IMIDACLOPRID

Judy Wu

Judy Wu swaps bee stories with Ramesh Sagili during a break at the 2011 fall conference in Seaside.



This is a short description of the project I introduced last year at the OSBA fall conference and am currently finishing up this summer: The aim of our research is to assess sub-lethal effects of neonicotinyl insecticides (imidacloprid) on honey bee queen fecundity and brood viability. To do this, small colonies in observation hives were fed imidacloprid (0, 20, 50, 100 ppb) in sugar solution. Queen egg-laying and locomotive activities were evaluated, and larvae and pupae were quantified after 3 weeks of exposure to assess impacts on brood production. Adult workers that developed during imidacloprid exposure were counted and weighed to assess effects on larval development. Preliminary data suggest adverse effects of imidacloprid exposure on queen egg-laying ability and locomotive activity as well as on brood production and worker bee weight.

UPCOMING EVENTS

Oregon State Fair: August 24–September 3. Salem.

WAS Conference: October 4–7. Seattle. Information at: http://ucanr.org/sites/was2/Conference_Information/

OSBA Fall Conference: November 1–3. Seaside. *Save the date!*

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Research Review—Continued from page 1

Study 2: Henry, M., M. Béguin, F. Requier, O. Rollin, J.F. Odoux, P. Aupinel, J. Aptel, S. Tchamitchian, and A. Decourtye. 2012. A common pesticide decreases foraging success and survival in honey bees. *Science* 336 (6079): 348–350.

In this study, the authors tested the hypothesis that sublethal exposure of honey bees to a neonicotinoid will indirectly increase hive mortality via homing failure. They used radio frequency devices (RFID) to monitor 653 forager bees during this study. Individual bees in this study were fed a field-realistic dose of 1.34 ng thiamethoxam and were released away from their respective colonies. Each bee had a microchip glued to the thorax and RFID readers were placed at the hive entrances to monitor their arrival back to their respective colonies. The authors conclude that homing is impaired by thiamethoxam intoxication and hence might contribute to colony collapse.

Study 3: Lu, C., K.M. Warchol, and R.A. Callahan. 2012. *In situ* replication of honey bee colony collapse disorder. *Bulletin of Insectology* 65 (1): 99–106.

The authors of this study hypothesized that the “first occurrence of CCD in 2006/2007 resulted from the presence of imidacloprid in high-fructose corn syrup fed to honey bees as an alternative to sucrose-based food.” Several different concentrations of imidacloprid claimed to be realistic doses were fed to experimental colonies mixed in high fructose corn syrup. The authors report that after 23 weeks 94 percent of imidacloprid-treated colonies died and all the dead hives exhibited symptoms consistent with CCD.

This study got a lot of press, but there are several apparent flaws in this study. The primary flaw is the hypothesis itself, as there is no evidence that high fructose corn syrup has toxic concentrations of imidacloprid. Further, the symptoms described as CCD in imidacloprid-treated colonies do not match the set of symptoms that have been generally described for CCD. The dosages of imidacloprid used in this study do not represent the realistic field exposure. Also, the sample size of this study is not robust enough to make valid conclusions.

Question: Are neonicotinoids killing bees and responsible for CCD?

Most of the neonicotinoids are highly toxic to honey bees and should not be sprayed when the bees are foraging on

the bloom. Unfortunately, existing research is inconclusive with respect to effects of neonicotinoids on honey bees, as some studies have reported negative impacts and some studies have failed to report any negative effects. Studies showing negative impacts have reported that sublethal levels of neonicotinoids have a negative effect on learning and memory of bees, thus compromising their foraging ability. More research is needed with respect to quantification of neonicotinoid residues in pollen, nectar, and wax, and more importantly on determination of realistic field exposure levels for bees. There is also an urgent need to investigate sublethal effects of these neonicotinoids on bee behavior. Neonicotinoids may not be directly responsible for colony losses, but they can potentially compromise the immune system of bees and hence make them more susceptible to existing pests and pathogens, especially viruses transmitted by Varroa mites.

Genetically Modified Crops

Study: Hendriksma, H.P., S. Härtel, and I. Steffan-Dewenter. 2011. Testing pollen of single and stacked insect-resistant Bt-maize on *in vitro* reared honey bee larvae. *PLoS ONE* 6 (12): e28174. doi:10.1371/journal.pone.0028174.

In this study, the authors tested the effects of pollen from two cultivars of Bt-corn expressing a single protein and mix of three proteins, respectively, on honey bee larvae. Three-day-old larvae were fed a realistic dose of Bt-corn pollen and were observed for five days until the prepupal stage. The authors conclude that pollen from Bt-corn does not affect larval survival or prepupal weight.

Question: Are genetically modified crops responsible for colony declines?

To date, there is no conclusive evidence that GMO crops (especially Bt crops) have a negative impact on honey bee health (both larval and adult health). Some also argue that GMOs are extensively grown in the Midwest (Illinois, Indiana, Iowa, etc.); hence, logically the bee colonies in that region should be impacted more, but there are no reports of significant differences in colony losses between the Midwest and other regions of the U.S.

Wishing you healthy bees,

Ramesh

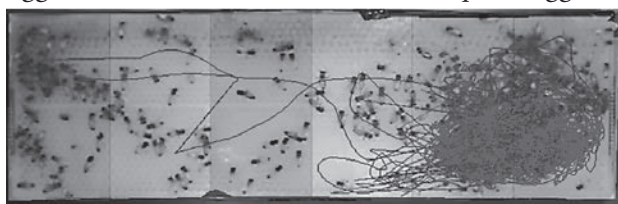


Pesticide Impacts—Continued from page 3

newly emerged bees is almost the same day and night. This 24/7 work schedule is necessary as bees clean cells and feed and warm brood. On about their seventh day of life, bees develop significantly more activity during the day. Bees can initiate this 24-hour rhythm earlier in life if more foragers are needed, or later if additional workers are needed for brood care. This is one way the superorganism synchronizes internal needs with external environmental changes. By measuring the average movement over time of bees (centimeters per second), we were able to compare the differences in daily behavior between pesticide treatments.

We were surprised to find that as we increased exposure to the pesticide mixture, the onset of the expected increase in daily behavioral activity was delayed by up to six days. We are currently confirming this result, and testing whether it is the miticides, fungicide, or both together which have this effect. If true, our result implies that these pesticides affect social behavior within the colony. This could affect the ability of bees to respond to internal needs or environmental changes.

We also observed the behavior of the queen. In control experiments, without pesticides, the queen invariably spent the majority of her time on the right side of the frame. We applied a gradient of the pesticide mix to the frame, beginning with none on the left and a high concentration on the right. When we reintroduced the queen and followed her behavior for 48 hours, in two out of three trials she avoided contact with all but the lowest concentrations of pesticide. In the third trial, she avoided the highest concentration and did not lay eggs there. These results indicate that queen egg



In three control trials with no pesticide, the queen's path resembled the top panel. In two out of three treatments with a gradient of pesticide mix (0 to high, left to right in six steps), the queen spent the majority of her time on the side of the frame with the least amount of pesticides, similar to the bottom panel.

laying may be affected by the level of pesticides in wax. We are currently confirming these results both in the lab and in field experiments. In the field, we will also follow the development of the eggs laid by the queen in contaminated wax.

In both of these sets of experiments, we used a range of pesticide concentrations similar to those reported in beeswax in the literature [2]. The greatest effects we observed were at or above concentrations similar to extremely contaminated hives. However, even at concentrations close to the average found in hives, we observed subtle effects. The miticides tau-fluvalinate and coumaphos are ubiquitous and persistent contaminants of wax, already known to act synergistically. They will be very difficult for beekeepers to avoid completely if we find they are responsible for the effects we observed. While chlorothalonil is currently considered to be low in toxicity for foragers, it is toxic for some other invertebrates, and its effects on other castes and life stages of bees are not known. If our work shows that this fungicide is responsible for behavioral changes in bees, avoiding exposure to fungicide products such as Bravo[®], Echo[®], and Daconil[®] may reduce the buildup of chlorothalonil in beeswax.

Acknowledgments: This project was funded by generous support from the National Honey Board. Ramesh Sagili and the Oregon State University provided abundant help and advice, and the use of their apiaries. Kate Taormina helped prepare experiments.

1. Wu, J.Y., C.M. Anelli, and W.S. Sheppard. 2011. Sub-lethal effects of pesticide residues in brood comb on worker honey bee (*Apis mellifera*) development and longevity. *PLoS ONE* 6 (2): e14720. doi:10.1371/journal.pone.0014720.
2. Mullin, C.A., M. Frazier, J.L. Frazier, S. Ashcraft, R. Simonds, et al. 2010. High levels of miticides and agrochemicals in North American apiaries: implications for honey bee health. *PLoS ONE* 5(3): e9754. doi:10.1371/journal.pone.0009754.
3. VanEngelsdorp, D., J.D. Evans, L. Donovall, C. Mullin, M. Frazier, et al. 2009. "Entombed Pollen": A new condition in honey bee colonies associated with increased risk of colony mortality. *Journal of Invertebrate Pathology* 101 (2): 147–149.

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VANILLA ICE CREAM!

- 2 cups milk
- 1½ cups honey
- ½ teaspoon salt
- 6 cups half & half
- 1 tablespoon vanilla

Scald the milk, remove from heat, and add the honey. Stir until honey dissolves. Stir in half & half and vanilla. Cover and refrigerate for 30 minutes. After mixing the ingredients and cooling, follow the directions on your ice cream maker. Makes 4 quarts.

This recipe can be adjusted, depending on your taste. You can make it richer by substituting whipping cream for some of the half & half. You can reduce fat by substituting milk for some of the half & half. Add a bit more honey if you like it sweeter.

I have used this recipe at the farmers market as a cooking-with-honey demonstration. The ice cream was a hit, and there was follow up discussion from market shoppers on the market Facebook. It always tastes fine on a hot summer day.

From: Lynn Royce. (Just in time for warming days!) Do you have a recipe to share? Please send it.

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Public events such as the recent AgFest coordinated by Ken Vial show us over and over again that people of all ages are "taken" by honey bees. What's not to love?! (Photo by Richard Temple)

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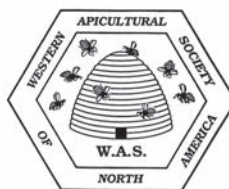
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See you in Seattle!



BEE GUM HIVE

Joy Markgraf

Early pioneers in America used hollow tree trunks to house honey bees, since the heartwood of black gum in the South and bigleaf maple and white oak in the East, North, and West, decayed first leaving some of the trees hollow. The example you see here was spared from being used as firewood when it was felled. According to Eva Crane, "Hives made of logs already containing a bee's nest when they were



Bee gum hive created by Joy in 2011.

cut from the tree probably greatly outnumbered the labor-intensive and less durable skeps."

The following excerpt from *Foxfire 2* explains how a hollow section of a tree was prepared for a honey bee colony: "Hollow sections of the tree would be brought home and the inside rounded out smooth and uniform with a long chisel. 'Middleways' of the gum, four holes would be bored—one at each point of the compass—and two sticks run horizontally through the gum at right angles to each other. These sticks acted as supports from which the bees would suspend their brood combs. The bee would automatically save the top half of the gum for their honey and would hang those combs from the plank lid, or 'head,' that was set over the top of the gum."

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Reminder: Please send your questions, stories, and photos of your bees to osba.newsletter@gmail.com.

We all learn from one another this way!



Oregon State Beekeepers Association Membership Form

The **Oregon State Beekeepers Association** is a nonprofit organization representing and supporting all who have an interest in honey bees and beekeeping. Membership is open to anyone with an interest in bees and beekeeping. You do not need to own bees or reside in Oregon to join. Membership includes the ongoing work of the organization on behalf of the honey bee and beekeeping, a vote in OSBA elections, discounts on publications, placement on the swarm call list, and an annual directory and subscription to *The Bee Line*. For new memberships and renewals, please send check made payable to OSBA with this completed form to:

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Pesticides and Honey Bees: State of the Science is a 22-page report recently released by the Pesticide Action Network. In addition to providing annotations for recent studies, the report contains links to papers, many of which are referenced in this issue of the newsletter. To download the report, go to:

www.panna.org/sites/default/files/Bees&Pesticides_SOS_FINAL_May2012.pdf

The Bee Line

The Bee Line is the official publication of the Oregon State Beekeepers Association. Annual subscriptions to the newsletter are included with membership in OSBA.

Please send news about your bees and your experiences in keeping them, as well as your corrections, comments, questions, photographs and stories (both from “old” times and “new”), interviews, recipes, and points of view to: Rosanna Mattingly, *The Bee Line*, 4207 SE Woodstock Blvd Ste 517, Portland OR 97206; email: osba.newsletter@gmail.com.

The next issue to be printed will be the August 2012 issue. The deadline for submitting copy is July 10, 2012.

Thank you!

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