June 2017

PAm Monthly News and Updates

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Danielle's Discourse

Buzzing the Gauntlet: Improving Honey Bee Risk Assessment

With new annual colony loss data being released (see BIP Boxbelow) we are reminded of the four Ps that give our bees the most trouble for adecade now –they are Parasites, Pathogens, Poor Nutrition and Pesticides. Thoseof us working to improve bee health are concentrating on those four areas, andstakeholders have continued to step up to make a difference in the decade sinceCCD raised the alarm about honey bee health. Assessing the risks thatpesticides pose to bees and applying mitigations are critical challenges topesticide regulators (both federal and state), that can directly impact thebeekeeping industry.

High quality research takes time to plan and execute, andit can be quickly outpaced by the development of new chemistries, deliverymethods and applicator preferences such as mixing compounds. That is why it isimportant for our industry to keep pace with the latest research, includingsupporting studies that form the basis of the current understanding of risk tobees. We know that honey bees can forage up to several miles from their hives,often pollinating a variety of important crops, many of which might be treatedwith pesticides at various times. On these foraging trips, pollinators may beexposed to these pesticides. But what are the risks? There are many options to quantifyand mitigate exposure risks, but until recent years, mandatory risk assessmentsdid not include data from immature honey bee laboratory studies. It iscritically important in determining chronic and sub lethal effects to immature honeybees from compounds that may not affect adult bees the same way. In recentyears, beekeepers concerned about increased hive losses have been working withthe EPA and Registrant Companies to develop better methods of assessing pesticiderisks from pesticides.

The following article summarizes a collaborative global effort of academia, agrochemical industry, regulatory agencies and independent labs, to standardize a testing protocol which determines pesticide risk to honey bee larvae. As beekeepers, we know effects on any cohort can ultimately impact the colony, and effects to honey bee brood, including eggs, larvae and pupae (capped brood), are no exception. Ideally we would test all bees, in all settings, at all stages, to make the best decisions, but how do you eat an elephant? One bite at a time! This particular test; the 22-day chronic larval toxicity test, has been challenging to standardize, and as you can see from complete report, a huge effort was required just to be sure that laboratories can successfully complete the study. Independent labs across the world were invited to participate and 15 of them took on the task to generate these data. I invite you to take a look and see what goes into incremental improvements to a method like this, and appreciate the scientists who are dedicated to this kind of work. This is an example of cooperation by many stakeholders to advance our understanding of pesticide risk, developing new methods to protect pollinators.

Accordingly, Project Apis m. supportsadditional and continued research to determine what pesticide exposure levels couldresult in effects, and whether those effects match symptoms seen under fieldconditions. Following this approach, we have had great successes determiningpractices to minimize the potential harm to bees, including recent work by Dr.Reed Johnson, who has explored the role of specific tank mixes used in almonds whichwere harming bees- particularly honey bee larvae. (Very good web presentation here) This discoverywas promptly used by the Almond Board of California to refine managementrecommendations to protect bees. This is an example of how responsive appliedresearch can make a difference for all stakeholders.

Likewise, many groups are working todetermine how to test chemicals to best assess risks to bees, which can inform chemicalregistration and proper use. This month we are sharing an example of a laboratoryapproach for determining toxicity to honey bee larvae, which will serve as oneof the standard toxicity studies required for pesticide regulation in the U.S.(and most of the world).

Larval toxicity test, photo courtesy of University of Florida

Honey Bee Larval Toxicity Test Protocol Development SummaryDr. Dan Schmehl, Pollinator Safety Scientist, Bayer Crop Science

A recent effort by the Pollinator ResearchTask Force1 (PRTF) validated the use of a method for evaluating the chronictoxicity of a compound (*e.g.*, a pesticide) to an immature honey bee for use in a risk assessment. Substantialdata on the honey bee toxicity (*i.e.*, what level causes an effect) and exposure (*i.e.*, what concentration and amount they encounter in the environment) onboth the adult and immature stages of development are required prior toconducting a thorough risk assessment for a pesticide. Currently, establishedmethodology exists for measuring acute oral and contact toxicity of a pesticideon adult honey bees, and for measuring acute toxicity on honey bee larva. Developinga robust study design for evaluating chronic exposure of a compound to immaturehoney bee development has been challenging due to high mortality in thecontrols (control = no pesticide present).

Keep Reading

Danielle Downey,
Executive Director

Dr. Dan Schmehl, Pollinator Safety Scientist,
Bayer Crop Science

Read the Full Report: Results of the Honey Bee (Apis mellifera L.) Toxicity Following Chronic (Repeated) Exposure International Ring Test Performance

Read more from Danielle here...

The BIP Box

BIP National Loss Survey results

BIPNational Loss Survey results
April is a busy time for us at the Bee Informed Partnership.Many of our tech teams are sampling for the first time in some regions and itis also the month where we put much of our focus toward the launch and analysisof our Annual Loss and Management Survey. The preliminary loss results are inand, as usual, they are interesting.

For the 2016-2017 winterseason, 4,963 beekeepers in the United States provided validated surveyresponses. Collectively, these beekeepers managed 363,987 colonies in October2016, representing about 13% of the country's estimated 2.78 million managedhoney producing colonies. An estimated 21.1% of colonies managed in the UnitedStates were lost over the 2016-2017 winter. This represents an improvement of5.8 percentage points compared to the previous 2015-2016 winter, and is belowthe 10-year average total winter loss rate of 28.4% (Figure 1). **These winter losses were the lowestrecorded since the survey began in 2006-07.**

The Bee Informed Partnership reports total loss, or aweighted loss rate. ***Total loss*** treats each colony the same or more simply stated, ***"Onecolony one vote."*** This means that the total loss rate is morerepresentative of commercial beekeeper loss as they manage a large majority ofthe colonies in the survey. The ***average loss*** rate, which we nolonger report in our preliminary summary, is an unweighted rate where wecalculate the loss rate for each responding beekeeper and average these rates. Soaverage loss, more simply stated is, ***"One beekeeper, one vote."*** As thereare many more backyard beekeepers than commercial beekeepers, average lossrates are more influenced by these smaller beekeepers.

Because the BIP winter loss results are presented as onenumber (21.1% total winter loss), it does not show the huge variability in whatcommercial beekeepers (and other operational sizes) report as their losses. Consistentlyacross all BIP survey years, commercial beekeepers reported having fewer winterand annual losses compared to backyard

Beekeepers not only lose colonies in winter(October – March) but also throughout summer (April – September). The 2016summer colony loss rate was 18.1%. When all the survey results were combined,beekeepers lost 33.2% of their colonies between April 2016 and March 2017. **This is the second lowest rate of annualcolony loss recorded over the last 7 years**

We did see, on average, lower *Varroa* mite levels last fall than in previous years and this may attribute to the lower recorded losses this year. You can read the full report at our website but we want to take this opportunity to explain the survey and the results. Before BIP started recording losses, there were no other numbers to compare what "normal" losses are for beekeepers and what is excessive. We are also trying to make the results more accessible every year by improving our website.

beekeepers. For this year, Figure 2 illustratesthe variation of losses across operation types from the BIP survey.

Karen Rennich, Executive Director
The Bee Informed Partnership

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www.bip2.beeinformed.org

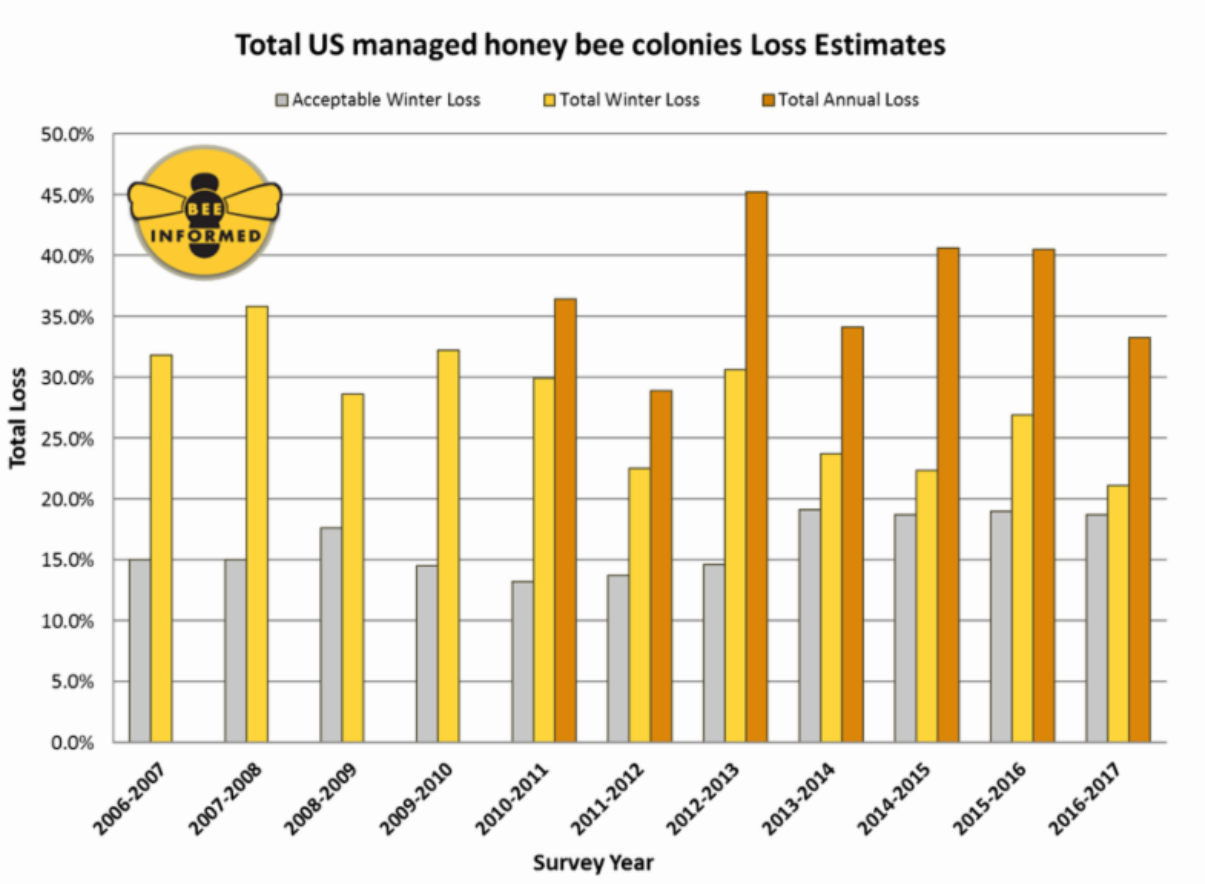

Figure 1: Summary of total overwintering colony losses in the United States acrosseleven years of conducting the winter loss survey (yellow bars; October 1 –April 1) and across six years of conducting the summer (April 1 – October 1)and annual loss survey. Total annual loss values (orange bars) include totalwinter and total summer losses. The acceptable winter loss rate (grey bars) isthe average

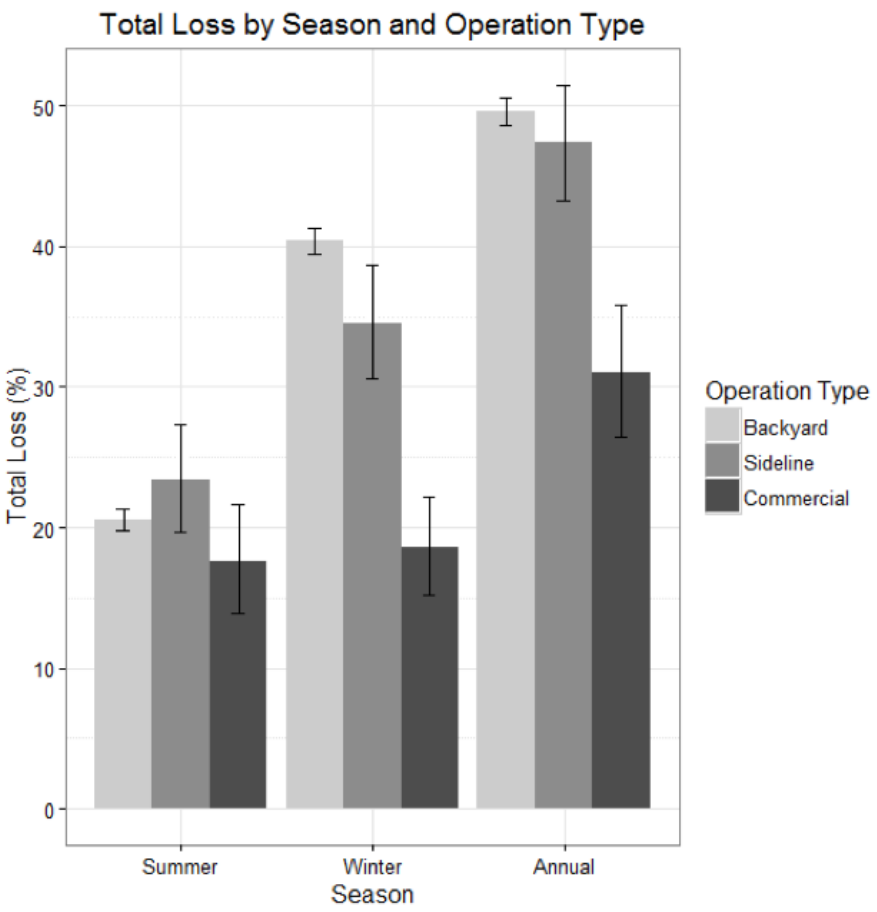

Figure 2: Preliminary Total Losses byOperational Size (Backyard<50 colonies, Sideline<500 colonies andCommercial>500 colonies)

Read more BIP Box here...

We thank our recent supporters!

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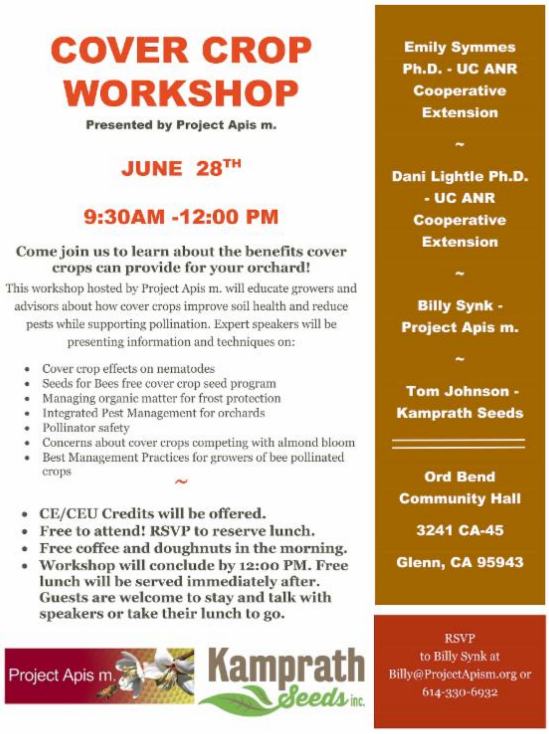
Billy's Blog

Take Cover!
June 28th Workshop

The work we do at Project Apis m.enhances the health and vitality of honey bees while improving

cropproduction. Farms and orchards depend onbee pollination, and bees need the nutritional resources these spaces provide. Setting up meetings and events thatfacilitate an exchange of knowledge is the best way to engage with the growingcommunity in a collaborative way. It'simportant to remember the honey bee is a creature native to Europe. Here in the United States, the managed rowcrops, trees, and weeds of the countryside are its natural habitat.

Dr. Emily Symmes, Area IPM Advisor with University of California Cooperative Extension, will start by explaining the role of Integrated Pest Management (IPM) in orchard systems. Orchard systems advisor, Dr. Dani Lightle, will be speaking about how some cover crops affect and suppress nematodes. Tom Johnson, Agronomist at Kamprath Seeds, will explain the timing and techniques associated with good cover crop management. I will be speaking about cover crop effects on water use, pollination, and bee health. I will also address how cover cropping fits under the umbrella of sustainable farming and how that might translate to increased business opportunities. Taking place in Glenn County, California, the event is free to anyone who would like to attend. Free lunch will be provided to all those that RSVP to Billy Synk at Billy@ProjectApism.org.



Billy Synk
Director of Pollination Programs

View event flyer here

Read more Billy's Blog here...

The Sounding Board

Beeconomics 101

John Miller is Past-President of the California State Beekeepers Association (CSBA). John is a fourth-generation beekeeper. He has kept bees for over 40 years. He owns Miller's Honey Farms, Inc. based in Blackfoot, ID with branches in Gackle, ND and Newcastle, CA. He also owns Miller Honey Mandarins of Newcastle, CA where he grows seedless Owari-Satsuma Mandarins. John is a partner in En-R-G Foods, Inc. of Steamboat Springs, CO, manufacturers of honey-based energy bars, gels, protein bars and energy chews. He is a former 2-term chair of the National Honey Board. As the subject of The Beekeeper's Lament by Hannah Nordhaus, John epitomizes the American migratory beekeeper and 'how one man and a half a billion honey bees help feed' a nation. He is married to Professor Jan H. Miller, Microbiology, American River College. They have four children and 10 grandchildren.

Project Apis m. (PAm) is dedicated to bee research andforage. We don't have a lot ofmoney. We work hard to make the most ofdonations and opportunities from great companies and groups like National HoneyBoard, who now entrusts their bee research assessment budget to Project Apism. We are grateful for the trustbestowed upon Project Apis m. and we work hard to keep it.

How does Project Apis m. fit into the well-being of American beekeeping? We fund research to improve hive health. We support the Bee Informed Partnership project and the work they do documenting hive health. PAm makes a difference in cover crop decisions growers make to improve the health of the soil and water penetration in orchards, and of course, also to improve nutrition for the bees pollinating the crops. Big Ag is moving into forage as

The past thirty years in beekeeping, globally, have beentumultuous. A number of trends continue – making this a fascinating time to bein beekeeping. Across the planet, people live longer, enjoy better health, havemore access to better food than any time in history. As diets improve, demand forinsect-pollinated food grows.

Beginning in the 80's, beekeepers experienced a breathtakingchange from honey producers who did a little pollination work to pollinationexperts who do a little honey production on the side. In 2017; over 700,000 beehives will crowd into North Dakota and produce about 50 pounds of harvestable honey per hive – for a total of about 35 million pounds – keeping North Dakota secure as the #1 honey producing state in the nation.Ask large commercial operators the primary purpose of being in North Dakota…they won't say honey- they will tell you its to prepare for the rigors of 2018 pollination season. The income earned from 700,000 hives in the almonds dwarfs the income from 35 million pounds of honey.

a productivity tool. PAm has an important role to fill in forage and productivity.

We have a lot more to do. We have great opportunities on the horizon. We are in the prime position to work with other groups promoting hive health and forage efforts. It takes money and collaboration. It would be great to see breakthroughs in *Varroa* control, to see annual losses reduced, and to see American honey production back above 250 million pounds per year. When these things happen, PAm will be involved.

John Miller
Project Apis m. Board Member
and Chief Financial Officer

Read more from The Sounding Board here...

May Bee Husbandry

- Be aware that strong colonies in mid-summercan be highly infested with varroa mites and can crash in late-summer and fall.
- Check often for mites. At least a few hivesfrom each apiary should be tested.
- Use the appropriate methods to suppress mitepopulations when honey supers are on. Always read the label.
- Exercise judicious treatment and try usingsofter chemicals. Use your most effective treatment in the fall. Followrecommended label instructions.
- Rotate treatments to prevent resistance.
- Recheck for efficacy. Don't assume yourtreatments are working.
- Make sure your hives remain cool. Place in afternoon shade and/or change toscreened bottom boards. Always provideclean water.
- See Project Apis m.'s eLearning module andYouTube video on varroa control here.

Project Apis m. is a 501 (c) (5) non-profit organization.

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