February 2012

W.A.S. Journal

The Journal of the Western Apicultural Society of North America

Visit the WAS website at groups.ucanr.org/WAS/

Message from the President

Welcome to 2012! We are moving forward with details for the conference, and have made a change in venue due to the larger estimated size of the joint conference with the Washington State Beekeepers Association.

The dates are October 4th thru October 7th and the venue is now at the Embassy Suites Hotel-Seattle Tacoma International Airport, 15920 West Valley Highway, Seattle, Washington, United States 98188 Tel: 1-425-227-8844 Fax: 1-425-227-9567. More information will be posted soon, so keep checking the WAS website for updates.

This conference will focus on Sustainable Colony Health and we are still developing the conference speaker list. If there is someone you would especially like to hear, let us know and we will see what we can do about bringing them in.

Stay tuned for more details. We look forward to seeing you in October!

Jim Smith

Editor's note: The hotel is located north of the airport, within easy access of most of Seattle's main attractions. There is an airport shuttle so a car will be necessary only if you plan on playing tourist.

Some of the attractions: Westfield Southcenter Mall - 0.7 mi, Starfire Sports Complex - 0.8 mi, Hydroplane and Raceboat Museum - 2.3 mi, Emerald Downs Racecourse - 9 mi, Pike Place Market - 11.3 mi, Space Needle - 12.2 mi, Museum of Glass - 16.7 mi.

See www.embassysuitestukwila.roomstays.com for more information. Remember to mention the WAS conference when booking your room, and that most hotels do not honor discounted rates if you book on the internet. Call them. Booking deadlines will be announced in the May issue of this journal.

Embassy Suites Hotel, Tukwila

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Each state/province in Western North America is entitled to elect one Director to the governing board of the Society. Directors meet before and after each annual general meeting and set policy and guidelines for the operation of the business of the Society. Throughout the year, they serve as the liaison between the Society officers and the members in their respective states/provinces. They are responsible for recruiting new members, keeping track of state/provincial concerns and advising the membership of their activities through this Journal.

Directors are appointed for a three year term. At the 2012 annual meeting, Colorado, Nevada and Saskatchewan positions come up for re-election.

Directors are currently needed for Yukon, Alberta, Montana, Idaho, Wyoming and Arizona.

More scenes for Conference 2011

Top: One of the tours visits a bee yard on the Hamakua Coast near Hilo on the east coast of the Big Island.

Middle: Comb in a top bar hive at Jenny Bach's bee yard.

Bottom: Sam Comfort entertains with a song at the end of his presentation. An article derived from the presentation will appear in the May WAS Journal, saving one of the best for last.

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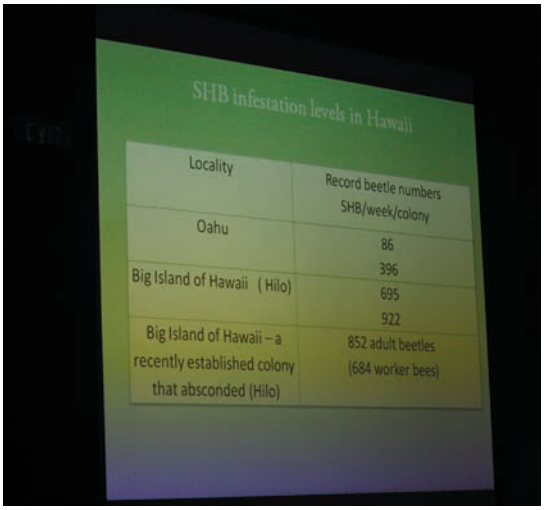

Left: Hawaii small hive beetles survey results.
Right: Dewey puts on his techie hat to manage the computer images for conference speakers.

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Keeping bees healthy

Presented by Randy Oliver, Grass Valley CA, article by Ian Farber and Jim Bach

Randy Oliver's presentation focused on giving Hawaii's beekeepers hope that their future with bees will be promising in spite of the devastating losses many Hawaiian beekeepers are currently facing. Being hit with both the Varroa mite and the small hive beetle in recent years has lead to massive colony losses on the Big Island of Hawaii. However, Oliver expects that in 6-10 years beekeeping in Hawaii will stabilize as 'survivor' colonies adapt to the presence of Varroa and the small hive beetle, and beekeepers learn new management methods. In the interim, he advises beekeepers to be diligent in monitoring and then treating to minimize the adverse problems these pests cause in bee hives.

General outlook:

Your bee management goal should be colony strength and bee morale. Colony strength should be the maximum colony size for your area, and bee morale is more subjective in the experience of the beekeeper. It is generally measured by quiet and cohesive colony behavior, with an attractive queen (12-15 workers in her retinue).

Selective breeding of survivor stocks should be a key component of rebuilding Hawaiian honey bee stocks. Queens must mate with 15 to 40 drones to maintain genetic diversity. Topographical elevation also affects colony behavior and success as do some nectar sources.

Four items affect colony health: a) chilling (not likely in Hawaii), b) nutrition (more opinion than measured), c) environmental toxins, and d) parasites – Small Hive Beetle (SHB), Honey Bee Tracheal Mites (HBTM) and Varroa. Regular analysis and measurement of these items is necessary to be successful.

Nutrition:

Pollen reserves in the hive are critical – they need to be substantial and from diverse pollen sources, Bees require 2 lbs. of pollen per 1 lb. of bees per season or 1/2 gal syrup and 2 lbs of pollen fed per week to keep brood rearing at its peak.

Small Hive Beetles:

Oliver advises beekeepers to place their colonies in the open in sunny, dry areas as the SHB thrives in cooler, more humid areas. SHB will fly into colonies between 6:00 and 8:00 pm, especially into younger colonies, and at twilight. They will also take advantage of the lower bee population after the bees swarm.

Keep hive populations as strong as possible. Manage hives so that all combs are protectively covered by bees. Use effective SHB traps until such time as honey bees adapt and begin to effectively co-exist with the SHB. Drone cell frames, oil reservoir traps and oil pans on a screened bottom board are somewhat effective.

Maintain hive cleanliness, and proper bee space (5/16"). Proper bee space prevents harbors for SHB to gather and multiply. Bees corral and then feed SHB in various places in the hive and we are starting to see bees beginning to drive SHB out of hive as a defense mechanism.

Use 2 sided corrugated plastic material on the bottom board for SHB gathering, remove every few days and shake beetles into soapy water.

Long term, bees must develop a tolerance level for SHB and also smell behavior for identifying SHB. Studies are needed on bee & SHB interaction to evaluate new control strategies.

Nosema ceranae:

Be mindful of Nosema ceranae loads. Take spore samples from bees at the hive entrance. If bees are stressed or suffering from a mite-introduced virus, Nosema ceranae may be a concern to the beekeeper.

Use a 400x microscope and a hemocytometer for counting Nosema spores and sample older forager bees at the hive entrance. Take a large sample for greater accuracy – few bees have high numbers of spores. Divide the number of spores by 5 to get an average count per bee.

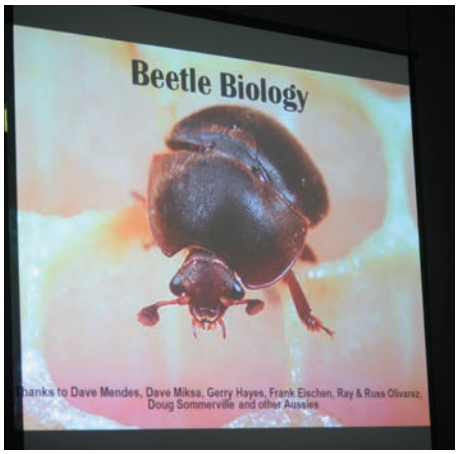
Oliver questions the impact of NutriBee on Nosema without data and questions the severity of Nosema impact on bees since populations are variable over time.

Varroa and viruses:

Oliver explains that Varroa management is only one aspect of maintaining colony immunocompetence and resistance to viruses. Varroa pierce a bee's exoskeleton and inject a chemical to keep the wound open. This allows viruses and bacteria to enter and any latent virus will explode in numbers.

Deformed wing virus is one example of a sick bee that is easy to spot by the beekeeper. When deformed wing virus is present, white spots can be seen on the top cell wall. Look at crawling bees to see the impact of deformed wing virus.

Spring colony quality is the best way to determine "healthy bees." Breed from those with 1 Varroa per 300 bees as best colonies. (Healthy bees are those with the largest spring colony size, bees are quiet on the comb and fully cover the comb surface, elliptical colony clustering shape at 55 F., with queen retinues having 12 to 15 bees. JC Bach)



Oliver is of the opinion that Varroa doesn't kill bees, it's the viruses that kill bees because the virus targets the bee's immune system. He also feels that dry weather results in less Varroa, wet weather more Varroa. Screened bottom boards don't control Varroa. He tried for five years, is now phasing out the boards.

Monitor your Varroa level: 6 Varroa per 300 bees (1/2 cup) = a 2% infestation of bees at hive entrance; 12 Varroa is 5% infestation which is too high. If you see signs of defecation inside the hive, this indicates a high Varroa load.

Oliver advises beekeepers to use an alcohol wash instead of the less reliable sugar shake test which requires far too many applications to be efficient.

To use the alcohol wash method – take bees from brood nest frames, shake into Rubbermaid tub and scoop out 1/2 cup of bees to wash, shake jar vigorously, shake Varroa through a screen and reuse the alcohol.

If mite loads exceed 6/300 bees in an alcohol wash test, initiate treatment protocols. Rotate treatments to lessen the chances of mite resistance.

- Thymol – Apiguard – 50 gr. patties, use 25 gr. patty in middle of brood nest.
- Formic acid – Quick Strips: high colony response variability, use single strip in hot weather.
- Oxalic acid: in sugar solution when little or no brood is present. Use acid resistant gloves.
- HopGuard: Use as one of 4 treatments with Thymol, Apiguard & Formic acid.

Avoid persistent synthetic miticides such as Apistan and Checkmite.

Place one drone comb in each hive, remove after 4 weeks, uncap and remove pupae to check for mites.

Making splits and nucs can introduce a broodless period and break the mite and virus reproduction cycle. Shook swarms break the mite brood cycle very effectively. These will become your honey production colonies in the first or second year.

Randy posts all his articles on ScientificBeekeeping.com, where you can read about the above in far more detail.

Lessons from feral honey bee colonies

By Serge Labesque, Glen Ellen CA

Eric Mussen introducing Serge

When we inspect feral bee colonies and observe how the bees utilize the space they occupy, we can gather information that is valuable to us as beekeepers. We first notice that honey bees nest in cavities of various sizes and configurations, which demonstrates their flexibility. Therefore it is not surprising that beekeepers can successfully keep colonies in all sorts of hives.

Looking inside a natural bee nest. Under normal circumstances, exposing the inside of a natural bee nest cavity reveals a brood nest, including areas of drone brood at certain times. Directly above the area occupied by the brood and to a lesser extent alongside it, we see areas where stores are kept. For most of the year, one notes variable amounts of empty drawn comb above and below the tightly coupled nest and stores. Beyond the combs, the top and the bottom of the cavity also deserve attention. Unlike the walls of the nest cavity, its top and bottom are seldom propolized, particularly where the wood is rapidly decaying. This material acts as a moisture-absorbing blotter, a water pump that keeps the nest cavity dry.

Debris produced by the bee colony accumulates on the bottom of the cavity where it decomposes along with the rotting wood. This lower part of the cavity is an area that is usually not visited by the bees. A sizeable separation typically exists between the bottom of the hollow space and the lower edge of the comb.

Our man-made hives are often oversimplified nest cavities that seldom function as well as hollow trees. Oftentimes, they are moisture traps. Hive management practices frequently restrict the usable space strictly to the brood nest and honey.

Drone comb is rarely tolerated. In spite of the wide array of hive designs available, we are forced to recognize that there is presently no perfect hive. We need to identify the shortcomings of the equipment we use and compensate for them. This can be done by modifying our hives and our hive management practices.

We know that bees suffer in damp environments. Their metabolism can be an important cause of elevated in-hive humidity when their nest cavity fails to eliminate excess moisture. Addressing this and other issues in our equipment is an important step towards improving the health and productivity of our colonies. I use ten-frame Langstroth hives in my apiaries. But the addition of a few simple features and some modifications have noticeably improved the quality and functionality of this otherwise standard beekeeping equipment as living quarters for the bees. None of these details is a panacea, but together they make a noticeably positive difference.

The upper parts of the hives I use have a screened ventilation slot that allows some of the excess moisture to be eliminated. Top feeders with moisture absorbing materials catch condensation and prevent water from dripping down onto the clusters.

Probably just as important and making a significant and beneficial difference in my apiaries is the use of follower boards. These simple pieces of beekeeping equipment provide great flexibility in the management of the hives and they increase the ease of frame manipulation. Most importantly they visibly improve the in-hive conditions for the bees. Using follower boards in place of outer frames in all supers creates air gaps next to the sides of the hive. During periods of cold weather, warm moist air rises from the brood nest and some of it is evacuated through the upper ventilation slot. The balance of the moisture-laden

air is drawn downwards into the lateral gaps created by the presence of the follower boards, where the water vapor condenses on the sides of the hive. This air convection effectively pumps the excess moisture out of the brood chamber. During periods of hot weather, the air that is in contact with the sun-heated side of the hive rises and is evacuated through the upper ventilation slot. This hive configuration produces several benefits: In winter, the colonies are less subjected to diseases that result from damp in-hive conditions; the winter losses are reduced, and the colonies are healthier and stronger in the spring. In summer, the colonies do not have to waste energy to cool the brood nest and the outer frames are better utilized by the bees. Overall, colony health and productivity can be markedly improved.

Screened hive bottoms keep the bees separated from hive debris and pathogenic elements that fall naturally from the nest, as in a natural nest cavity. They can also prevent the accumulation of moisture on the hive floors.

Bees do not need our sheets of foundation to build serviceable comb. Allowing our colonies to build their comb entirely and according to their needs presents numerous advantages. Foremost is that the comb wax does not contain residual pesticides, antibiotics or pathogens that may be found in man-made foundation.

The observation of bee colonies over extended periods of time shows that they are not static on their comb. Given an empty cavity, honey bees will create and control their environment. The areas of the comb occupied by the brood nests and by the stores expand or contract and move gradually under the influence of many factors. Regardless of these changing conditions, the nests need to remain in contact with stores. The “expansion spaces”, areas of empty comb that are found above the stores and below the brood nest of a colony, allow the nest and the stores to move and to expand. Depending on what factor is dominant, be it stores accumulation or consumption or brood production, either the brood nest or the stores recedes and the other fills the void thus created along the boundary area.

Hive management - To a large extent, hive management amounts to providing adequate hive space. Most beekeeping procedures and hive manipulations alter the contents and the spatial organization of the hive. To keep their bees healthy, strong and productive, beekeepers should be sensitive to their colonies’ needs in terms of available in-hive space and the organization of its contents. This is particularly important in placing or reversing supers or when the hives are being prepared for winter.

Bees that live in natural nest cavities do so in the absence of any treatments for pests or diseases. Here the process of natural selection is at work as it has been for 40 million years. Bees are not domesticated animals and should not be considered so!

We must not substitute ourselves for the process of natural selection. The direct implication of this statement is to NOT treat hives for pests or diseases in ANY way. Beekeepers who treat their hives contribute to the weakening of the species by keeping alive colonies that would normally be eliminated by the process of natural selection and therefore allowing them to spread their deficient genetic material.

Keeping bees healthy without treating them for pests or diseases does not mean neglecting our hives. Beekeepers can successfully achieve this goal by keeping colonies in sound equipment, by respecting bee biology and by not being vectors of pathogens. One of the key points in the management of bee colonies along these lines is to respect the natural periods of broodlessness, as they allow the colonies which possess effective grooming behavior to gain control over Varroa mites, for example. Keeping tools and equipment sanitized prevents the spread of bacterial and fungal spores, bacteria or other pathogens between colonies. The shipping of bees or honey bee germplasm can also rapidly spread honey bee pests and diseases over great distances. Consequently, these practices are to be avoided.

Unmanaged feral colonies can survive and thrive only as they adapt to their local environment. This ability is of prime importance. It is one that no queen producer can provide. The process of natural selection guarantees it. A bee strain that has proven to be of excellent quality in a particular area of the country carries no guarantee of performing as well in a different area.

The overall strength of the honey bee species, like that of any species, depends on its genetic diversity. Preserving it in the honey bee requires that the genetic identity of local bee populations be maintained. The traffic of queens, bees or bee germplasm and the introduction of foreign genotypes all destabilize local bee populations and homogenize the species. The controlled mating of queens also limits the available genetic palette. Consequently, beekeepers should use only their local stock and propagate it. The propagation of our own untreated hives results in naturally strong colonies that are suited to our local conditions and in the durable strengthening of the species.

As beekeepers, we must make the species as a whole and its future our priorities. This is more important than our own individual hives or our immediate personal or business-driven interests. This can be implemented by following the simple guideline to not interfere with the process of natural selection and its two main corollaries:

- Do not treat hives for pests or diseases.
- Use and propagate only local bees.

This approach to bee stewardship certainly does no harm to the species. Can we say as much of conventional bee breeding

Learning and memory in honey bees

By Dr. Patricia Couvillon, Bekesy Laboratory of Neurobiology, Department of Psychology, University of Hawaii, Manoa

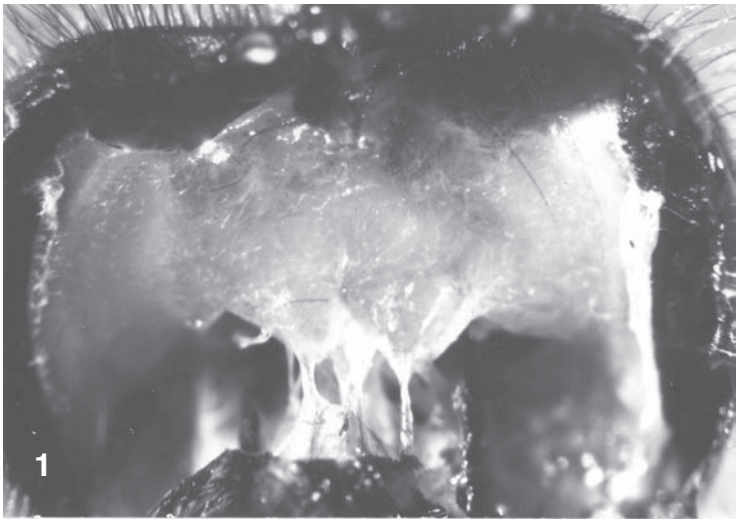
President Jenny Bach introducing Dr. Couvillon

In 1981, my former mentor and colleague, comparative psychologist Dr. M.E. Bitterman, was awarded Germany's Humboldt Prize. The award included extended visits to the laboratories of German honeybee researchers. Bitterman used that opportunity to acquire techniques for working with honeybees in order to study their learning and memory. Together we set up a laboratory at the University of Hawaii at Manoa for the purpose of extending the study of learning to an invertebrate species in a formal and systematic way.

At that time, all that was known about invertebrate learning was that most species could learn. It was widely known that honeybees could learn, but for comparative psychologists, the more important question was whether honeybee learning in any way resembled vertebrate learning. For classically trained psychologists, the question might be rephrased: Do honeybees learn in the same way and to the same extent as laboratory rats?! Our quest was to understand learning in the honeybee.

We expected that the learning of honeybees would be very different than the learning of a vertebrate like the rat. Why? First, the honeybee brain is very different than the vertebrate brain. [See the photograph of the honeybee brain in Figure 1.] Second, the evolutionary relationship between honeybees and vertebrates is very remote; their common ancestor lived a very long time ago and was a very simple creature. [See the pictorial representation of their evolutionary relationship in Figure 2.] However, the approach of science is to do the experiments first and then to evaluate the results. We use two major techniques for studying learning in honeybees.

The proboscis-extension reflex (PER) procedure, developed by Frings, uses restrained honeybees. The PER procedure is the analog of Pavlov's familiar procedure for studying the conditioned salivation reflex in dogs. Foraging honeybees are captured from the hive, cooled, and harnessed in small tubes with the antenna and proboscis free to move. A drop of sucrose touched to



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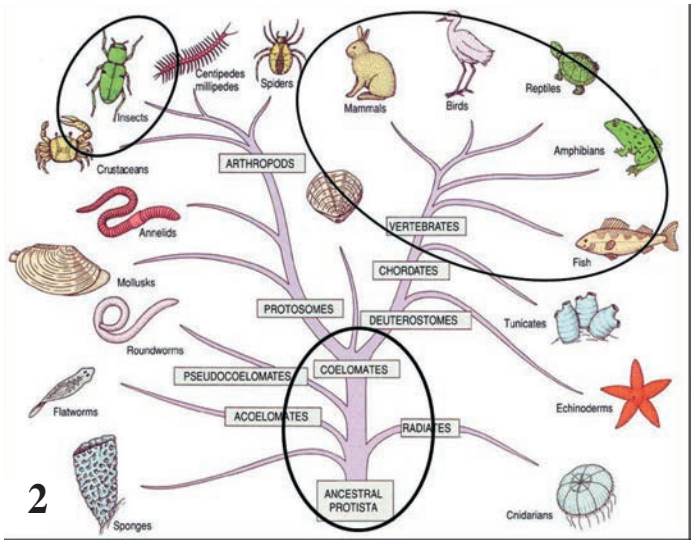

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the antenna with a syringe needle elicits vigorous extension of the proboscis, the PER, and if the sucrose drop is offered to the extended proboscis, the bee will feed readily. [See picture of restrained bee with proboscis extended to a drop of sucrose in Figure 3.]

In a typical experiment, an odor (for example, peppermint) is blown across the antenna for several seconds. It is followed immediately by a touch of sucrose to the antenna which is then followed by feeding a small amount of sucrose to the extended proboscis. After only a few such pairings of odor and sucrose, the proboscis-extension reflex is elicited by the odor before the sucrose is applied. This learned reflex results from the association of the odor with the sucrose. If, on some of the trials, another odor (such as jasmine) is blown across the antenna but is not followed by the sucrose, the bees learn to extend the proboscis only to the peppermint odor and not to the jasmine odor. Nearly all of Pavlov's original experiments with dogs have been conducted with honeybees using the PER procedure. Amazingly, the results are virtually identical!

The free-flying procedure was exploited initially by von Frisch to study the sensory capabilities of foraging honeybees. Foragers are recruited to a high-concentration (50%) sucrose feeder and then the concentration is reduced (10-15%) to maintain a small number of bees for experiments. Bees are trained one at a time. A bee is captured in a matchbox at the feeder, brought to a window shelf in the laboratory, and released on a feeding target containing a drop of 50% sucrose. The target can be a colored or scented stimulus, an image projected on an inverted flat-screen computer monitor, a 3-D object, etc. The forager, while feeding on the target, is marked for identification with a drop of nail polish. The marked bee leaves the feeding target and flies back to the hive to unload the sucrose. The marked bee tends to return to the higher concentration sucrose on the feeding target rather than to the lower-concentration sucrose feeder.

In choice experiments, the bee returning from the hive must choose between two or more feeding targets labeled with colors, odors, patterns, shapes, etc. Usually one contains sucrose while the other contains water. [See picture of a bee that chose between blue and yellow feeding targets in Figure 4.] The bees cannot detect the difference between drops of water and sucrose without tasting first. If the bee first chooses the target containing the water, it can correct its choice and find the sucrose target. The bee drinks to repletion, flies to the hive to deposit the sucrose, and returns within a few minutes for

another training trial. The interval between trials is the time required for the bee to fly to the hive, unload, and return, usually 1-5 minutes. Each bee has a series of training trials, and choices are recorded on each trial. Performance for a group of bees trained in the same experiment can be plotted as the average number of correct choices over training trials. A gradual increase in correct choice as training proceeds is evidence that learning is taking place.

We and other bee researchers have conducted dozens and dozens of experiments with free-flying honeybees that were inspired by experiments with vertebrate species. The results are dramatic and compelling! Honeybee learning matches that of the standard vertebrate species in experiment after experiment. Very few differences have been found to date.

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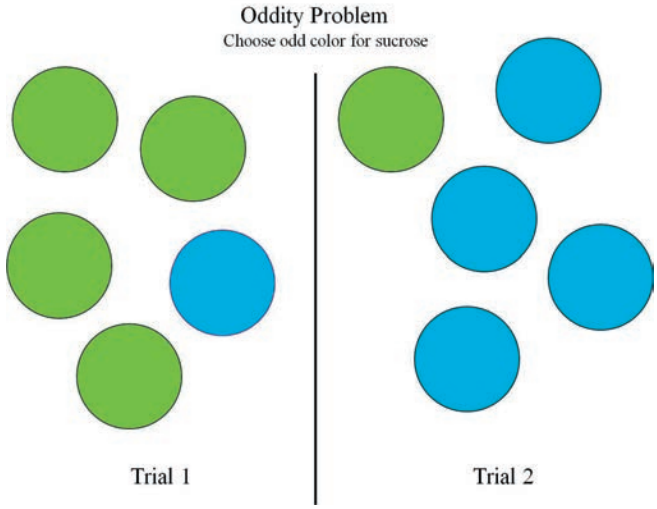


The strategy now is to push the research to increasingly difficult learning problems in order to explore the limits of honeybee cognition. Some current experiments offer challenges to the honeybees' memory. Other experiments require the bees to categorize visual stimuli in order to obtain sucrose. Still other experiments are designed to determine if honeybees form concepts and use rules. For example, can bees learn to consistently choose the odd color from an array of colors when the color and position of the odd color change from trial to trial? [An illustration of an oddity problem is shown in Figure 5.]

While the pace of research on honeybee learning and cognition has accelerated, it is important to keep in mind a fundamental question. If the learning of honeybees is functionally the same as that of vertebrate species, to what extent is this due to common biological and psychological mechanisms and to what extent is it a dramatic case of convergent evolution?

The Small Hive Beetle: the Jekyll and Hyde persona of a honeybee pest

By Dr. Ethel Villalobos, UH Bee Project, University of Hawaii at Manoa

In the 1880s novella "The Strange Case of Dr Jekyll and Mr. Hyde", a single character displays two opposite personas: Dr. Jekyll a morally upright and friendly physician, and Mr. Hyde, his evil self unleashed by a mysterious potion.

The Small Hive Beetle (SHB), Aethina tumida, is indigenous to South Africa where it attacks Apis m. scutellata colonies. In its native habitat the SHB targets mostly weaker hives and as such is not considered a serious concern, nor does it require beekeeper intervention.

The SHB arrived to Hawaii in 2010 and within a year it has spread to four of the five major islands, has exhibited explosive population levels and caused large colony losses among commercial honey producers, queen breeders, and hobbyist beekeepers. The obvious discrepancy in the impact of this parasite between the two environments suggests that there are potentially new elements that have unleashed a more destructive parasite-host interaction in Hawaii.

The University of Hawaii Honeybee Project was funded in 2008 to respond to the arrival of the Varroa mite to Hawaii. The UH bee team has since expanded its goals to address issues relating to honeybee health and agricultural sustainability on the islands, and the SHB is the most recent problem for the local beekeepers. Since its detection in Hawaii, the SHB has displayed a "Mr. Hyde personality", aggressively attacking weak and strong hives, and consequently we are taking a fresh look at the possible factors that may be involved in the success of this parasite.

Our goal is to answer a simple but crucial, question; "Why are the densities of SHB so high in Hawaii?" The answer to that questions is at the core of the problem, and will help us find practical solutions to this new invasion. The UH bee team is presently collecting long term data on the population levels and seasonality of SHB infestations on the island of Oahu. Through our work we hope to understand whether the larger SHB impact observed in Hawaii can be attributed to a single reason, or more likely, a combination of different elements including environmental conditions, colony dynamics, management practices, and honeybee genetics.

For example, we know that the beetle's success appears to be related, at least in part, to climatic conditions. In the continental United States, regions with marked seasonality experience relatively little beetle damage during the winter months, when beetle reproduction is greatly reduced. However, the subtropical climate of Hawai'i allows bees to raise brood year-round, thus providing continuous resources for the beetle. The warm, humid weather is likely to make pupation possible in most of the Hawaiian landscape and to shorten the duration of immature stages.

It is conceivable that the release from climatic constraints typical of temperate regions, may be a factor contributing to the explosive beetle population levels recorded on the Hawaiian Islands.

Through our weekly sampling method we have also learned that although climatic conditions in Hawaii are relatively constant, local colonies appear to respond to subtle microclimatic changes in rainfall and floral resources. The ensuing variations in colony strength appear to be detected rapidly by the SHB, resulting in significant changes in the beetle numbers caught in traps from one week to the next. We are working with local beekeepers to assess what aspects of honeybee colony growth cycles may promote higher SHB levels among these colonies, and to develop management techniques for more efficient control of this pest.

Efficacy of in-hive oil traps, which are commonly used in Hawaii, can be greatly improved if beekeepers are able to identify critical periods and tend their beetle traps and colonies more frequently. Increasing effectiveness of these trapping methods helps reduce not only the threat of SHB but also exposure of honeybees to synthetic chemicals used for beetle control.

In addition, the UH team is working directly with local beekeepers to change hive management techniques that can "open the door" to the SHB. For example, before the arrival of the SHB, Hawaiian beekeepers were able to over-super their colonies without any negative consequences. The warm climate and frequent rains make for prolonged honey flows and having honey boxes on the hive was a way to ensure that the colony could begin to store honey without much intervention.

Small hive beetle on cover

Small hive beetle larvae burrowing

Picking up beetles

Andres Saguibo, one of the small scale farmers we have taught beekeeping doing his weekly check of the oil traps he uses for SHB control. Photos Dr. Ethel Villalobos

Unfortunately for the local beekeepers, the ability of worker bees to detect and respond to SHB invasions is greatly improved when the bee population is high and worker bees cover most of the comb surfaces, consequently, the cultural tradition of over-supering is no longer appropriate under the current conditions.

In summary, the rapid expansion and high population numbers of the SHB in Hawaii has had serious consequences for beekeepers and farmers that plant bee dependent crops. Although more basic research is needed to fully understand the unique trends observed in Hawaii, we are, nevertheless, encouraged by the success of small scale farmers and beekeepers that have managed to keep their hives thriving in spite of the arrival of this new pest, and we hope to continue to collaborate with the local beekeeping community in the development of management techniques for SHB in Hawaii.

For more information on the University of Hawai'i Honeybee Project, please visit http://www.ctahr.hawaii.edu/wrightm/Honey_Bee_Home.html. Dr. Ethel Villalobos can be contacted at emv@hawaii.edu.

Epidemic of bee losses

By Dewey Caron and Ramesh Sagili, Affiliate & Research Professor, Dept of Horticulture, Oregon State University, Covalllis, OR

A season of elevated risk in beekeeping is the overwintering period. Beekeepers have always had to face over winter colony losses, but recent seasonal losses have been unusually high. At least some of the recent elevated colony losses include the major field symptom of CCD, no adult bodies, although this may occur also with Nosema and virus diseases. Substantial regional colony losses with somewhat similar characteristics, labeled with a variety of names such as spring dwindling, autumn collapse, May disease, have occurred over at least 100 years of US beekeeping. Many of the reported instances involved symptoms that included the disappearance of large numbers of bees. One early documented loss, referred to as 'disappearing disease', occurred in 1915 in Portland, Oregon.

National colony losses have been documented the last five years with an annual national survey conducted by Bee Informed with the Apiary Inspectors of America (AIA) in cooperation with the USDA. 2010 and 2011 were National electronic surveys conducted in the first 2 weeks of April. The 2010 survey report received responses from 4027 beekeepers (managing an estimated 17.7% of total managed bee colonies in the US), and reported a rate of 34.4% loss rate while the 2011 survey tallied losses from 5441 beekeepers (managing an estimated 11.5% of total colony numbers) reporting 29.2% total losses.

In the Pacific NW, Burgett et al. (2009) reported that prior to the appearance of the two honey bee mite parasites Acarapis woodi and Varroa destructor in the mid to late 1980s, beekeepers typically had winter losses of 10-15% or less. The introduction of bee mites caused loss rates to increase substantially—a ten-year study (1989–1998) of Pacific Northwest (PNW) beekeepers, reported an average annual loss rate of 22.6% among commercial beekeepers.

Burgett, et al (2009) documented average bee losses for the winter of 2007/2008 of 14 commercial and 11 semi-commercial beekeepers (owning an estimated 68% of the total colonies in Oregon and Washington) as 30%. Caron, et al (2010) analyzed 34 mail responses (12 commercial and 22 semi-commercial beekeepers) using the same Oregon and Washington beekeepers list for the 2008-2009 winter, (representing 43% of the estimated managed colonies) and found a 21% respondent loss rate, considerably lower compared to the previous year.

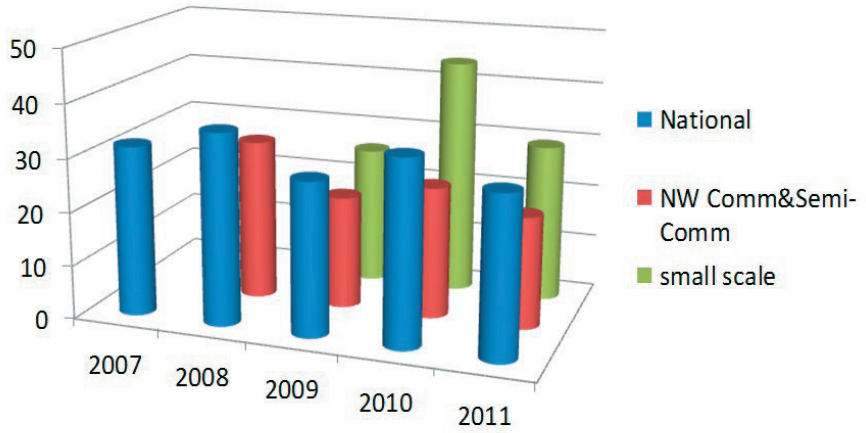
An extensive survey conducted in spring 2010, 22 OR and 12 Washington commercial beekeepers (beginning winter with 107,804 colonies) had similar losses (9091 colonies lost in OR =24.5% loss rate and 17,278 lost colonies by the WA commercial beekeepers = 24.4% loss rate.). Semi-commercial beekeepers (owners of 50 to as many as 500 colonies) had higher losses; seven OR and 6 Washington beekeepers reported 31.8%. Combined weighted commercial/semi-commercial losses (n=47 beekeepers) for the 2 states were 24.6%. The number of bee colonies included in surveys was equal to 80% of USDA, NASS estimated colony numbers in the 2-state region. Survey forms were returned from approximately 44% of those queried.

Additionally, 125 Oregon & 36 Washington small scale beekeepers provided loss estimates from mailed surveys (Washington) and local association meeting surveys. This group had the largest adjusted loss rate of 45.3% (492 colonies lost of 1085 starting winter), nearly double the losses of larger scale beekeepers.

2011 losses

A 2011 spring survey of 25 OR commercial beekeepers (owning a total 57,022 colonies in the fall) and 6 Washington commercial beekeepers (beginning winter with 23,909 colonies) had somewhat different overwintering success – OR beekeepers lost 9315 colonies = 17%, while WA commercial beekeepers lost 7859 colonies = 33%. Semi-commercial beekeepers (owners of 50 to as many as 500 colonies) had higher losses; seven OR beekeepers (155 average apiary

Figure 1. *Summary of National and PNW losses for PNW beekeepers. Figure compares National losses with those suffered by PNW beekeepers. In 2011, front row represents losses of 5441 nation-wide beekeepers (29.9% loss), middle column represents losses of 71 commercial and semi-commercial PNW beekeepers (22% loss rate) and 3rd column shows losses reported by 187 PNW small scale beekeepers (29.5% loss rate).*



size) reported a 24% loss (261 of 1088 going into winter) and 8 individuals in WA (74 average apiary size) had a loss of 37.3% (220 colonies lost of 590 fall units). Combined weighted commercial/ semi-commercial losses for the two states (n=46 beekeepers) were 21.4%.

A mail survey included responses from 16 Washington small scale beekeepers and 50 from local association meetings (n=66). These beekeepers overwintered 459 col. 40 reported losses of 124 colonies while 16 beekeepers had no losses (24%). Total weighted average loss was 27%. (range 1-12, 0-100%).

In Oregon, 59 of 102 small scale beekeepers (=58%) that completed a survey form at local association meetings reported losing 158/493=32% weighted loss rate, range 1-18; M=2, most common =1). See Figure 1.

To date, no single factor has been identified as the reason for the elevated losses documented since the winter of 2006/2007. Although pathogens (Nosema and viruses, some transmitted by Varroa mites) are actually killing the bees, the reasons why honey bees appear to be so susceptible to the pathogens is a source of considerable debate and study.

A federally funded CAP project, reported monthly in ABJ, describes such research and a second BEE INFORMED survey effort has recently been funded. Clearly such loss levels are of great concern and unsustainable in the long run.

Latest News from Project Apis m.

January 2012

Project Apis m (PAm) - A non-profit organization focused on finding realistic solutions to beekeepers' challenges by supporting practical, results-oriented in-field research.

Happy New Year! - From the board members, scientific advisors and staff at PAm. We wish our subscribers and supporters a healthy, happy and productive New Year in 2012.

Jerry Hayes takes position with Monsanto - Jerry has a new position with the company who recently purchased Beeologics and their RNAi technology. He will be leaving the Florida Department of Agriculture as Chief Apiary Inspector. In his position with Monsanto, he will be working on products and tools that will ultimately help beekeepers. Congratulations Jerry. PAm looks forward to our continued collaboration.

The Almond Board Conference - held December 7 – 8th at the Modesto Doubletree for the last time. Growing a 2 billion pound crop was this year's conference focus with an eye on the future. The forecast for 2016 is 846,000 almond bearing acres which will need almost 1.7 million honeybees to pollinate this projected crop alone. PAm had a booth to distribute brochures on Best Management Practices for Almond Growers and Guidelines for Bringing Honeybee Colonies in CA for pollination services. Both were well received by the over 2,000 visitors that attended the 2-day conference. PAm invited Dr. Chip Euliss, USGS, to speak on the 'Influence of Ag Land Cover Trends in the Northern Great Plains on Almond Pollination' and PAm Board Chairman, Dan Cummings, gave the audience a report on almond acreage, pollinations fees, weather trends, Blue Orchard Bees, self-fertile almonds, and honeybee research that the CA Almond Board and PAm are co-funding. Growth dictates change and The Almond Conference's 40th Anniversary will be in a bigger venue next year – the Sacramento Convention Center. It will also be 3 days instead of 2, from December 11th – 13th, 2012.

Honey Report Saved! - Last month PAm reported the elimination of the NASS Annual Honey Report, however, funding had been given to the USDA Ag Statistics Service to continue some reports and beekeepers were urged to contact NASS. Your letter and emails saved the annual report. Data collection will begin January 23rd and the Report Date is March 30th. Thank you for taking the time to save this important tool for our industry. "I never worry about action, but only inaction." – Winston Churchill

Almond Pollination Season Update - For the newest summary of California's 2011 almond production, market prices and shipments, visit PAm's Cummings Report http://projectapism.org/content/view/64/49/ Last posted on November 16th, this in-depth report continues to receive a large number of website hits.

Bee Status Report - View the observations of beekeepers in Northern and Central California, North Dakota, Wisconsin and Montana. Overall insights are given on the impact of honey bee forage of the past year and the 2011 summer experience. http://projectapism.org/content/view/93/49/

The updated November 16th report indicates that it was not a particularly good year for forage however; colonies looked to be in good shape heading into the fall but more dependent than usual on supplemental feeding.

Forage Update - Visit PAm's forage resource site http://projectapism.org/content/view/142/61/ to find links to seed mixes that provide floral diversity and nutrition for honey bees in your area. In addition, Project Apis m. now has 4 California county forage demonstration plots underway. As commercial beekeepers bring their colonies to the state, the goal is to have nectar sources available to honey bees post-almond bloom. The Stanislaus County demo plot will be the site of a forage field day in March 2012. Stayed tuned to the PAm website for details.

Pollinating Paramount Pomegranates? - If you brought honeybee colonies into Paramount Farming Co. pomegranates during the 2011 pollination season, please consider a donation to PAm for those colonies. Paramount will generously match your contribution to PAm, dollar-for-dollar. Write your check to PAm, send it our address below, and include a note that you were a Paramount beekeeper. "A buck a hive" becomes two bucks and will go a long way to help resolve our many bee challenges. Do your part, and Paramount will help! This goes for almond pollination too!

PAm Website highlights upcoming bee meetings - For a list of 2011-2012 meetings, conferences and dates, go to the 'Events' section of Project Apis m's website. http://projectapism.org/content/blogcategory/100/37/

Best Management Practices - Brochures and Fact Sheets are available for your bee club meeting. Contact Meg Ribotto projectapis@gmail.com. BMP's can also be accessed on PAm's website. http://projectapism.org/content/view/48/43/ PAm received a 2009 CDFA Specialty Crop Block Grant to develop these BMP's.

Donate now to PAm! - Why? Because PAm funds bee research that is selected and guided by beekeepers. Send your tax deductible contribution to: Project Apis m, P.O. Box 3157 , Chico, CA 95927 . Visit us at www.ProjectApism.org.

B-WAS: Have you experienced it?

By Dewey Caron

How are your bees doing this winter? Have you had an attack of B-WAS? I had never heard of B-WAS until I read the January issue of the CCBA Newsletter. Jan Cauffman, a registered nurse and president of the Chester County Beekeepers in suburban Philadelphia, defined B-WAS as "Beekeeper-Winter Anxiety Syndrome". B-WAS, in her words, is "... the all-too-familiar seasonal panic attack that can set in during the months of Dec through March for beekeepers at all levels of experience. It occurs while waiting to see if your bees will make it through to April and not starve or die in spite of all of your efforts, including leaving plenty of honey behind, applying timely mite treatments, diligently feeding in the fall and generally encouraging strong buildup in the fall." [she called it WBAS – I modified it for WAS].

How can we "cure" B-WAS? Many backyarders like to periodically heft the back of their bee colony. Others thump on the side and listen for the reassuring sound of bees buzzing. Other methods beekeepers use for winter assessments include removing the bottom sticky board to see the position of the cluster and evidence of activity, lifting the covers gently and peering down between the frames or merely visiting the winter apiary on a sunny afternoon to check that some bees are flying (and sick bees are escaping to die outside the entrance). However you do it, hefting, thumping, lifting, checking sticky boards or watching the entrance, all are proactive "reality checks" to "cure" B-WAS!

What can be done to improve overwintering success and ease the anxiety? One proactive management would be to ensure the bees vent excess moisture. Many have said it: It is not the cold, but the moisture inside the hive that kills the colony. Active management should include checking the cover/inner cover for signs of moisture accumulation. If moisture is not properly venting, you will see evidence of water staining or even water droplets at the colony covers. Good air circulation with the frames at the edge of the food chamber (upper box) positioned slightly away from the hive sides and the bottom board screened helps upward ventilation. Leave a small opening at the top if you suspect moisture, You can add additional space at the top of the colony and even add absorbent material.

Poor or inadequate winter stores are another challenge for the overwintering bees. If spring is delayed this year, as is was over much of WAS territory in 2011, what is your plan B?

Winter feeding (now) should be with dry product. There is too much water in the hive already to add sugar syrup. Additionally, sugar syrups in a winter hive are a negative in that they might cause body cooling of bees already near their cold temperature limit and perhaps critically chill adult bees due to the fact that syrup will stay colder longer than the air temperature. Some beekeepers prefer feeding drivert sugar over crystallized or powdered sugar but there is not much evidence that one is superior to the other (but beware that some powdered sugars have starch which may cause compaction in the bee's digestive tract and thus should be avoided during winter confinement).

However you "worry" your colonies through winter, combat B-WAS to improve overwintering success. I wish you success and hope spring brings better foraging and you have strong colonies ready to expand to do your bidding once foraging conditions return, however soon or late for your bees.

CATCH THE BUZZ...

Remove toxic talc, say Purdue researchers

By Alan Harman

Purdue University scientists are calling for the bee-killing talc being used to aid the planting of corn and soybean seeds coated with neonicotinoid insecticides to be limited or eliminated.

Their research found the insecticides clothianidin and thiamethoxam are present at high concentrations in waste talc is exhausted from farm machinery during planting.

Christian Krupke, associate professor of entomology and Greg Hunt, a professor of behavioral genetics and honeybee specialist, say the talc ends up with extremely high levels of the insecticides - up to about 700,000 times the lethal contact dose for a bee.

"Whatever was on the seed was being exhausted into the environment," Krupke says.

"This material is so concentrated that even small amounts landing on flowering plants around a field can kill foragers or be transported to the hive in contaminated pollen. This might be why we found these insecticides in pollen that the bees had collected and brought back to their hives."

Krupke says efforts are needed to limit or eliminate talc emissions during planting. "That's the first target for corrective action," he says.

"It stands out as being an enormous source of potential environmental contamination, not just for honeybees, but for any insects living in or near these fields. The fact that these compounds can persist for months or years means that plants growing in these soils can take up these compounds in leaf tissue or pollen."

Analyses of bees found dead in and around hives from several apiaries over two years in Indiana showed the presence of the neonicotinoid insecticides.

Clothianidin and thiamethoxam were also consistently found at low levels in soil - up to two years after treated seed was planted - on nearby dandelion flowers and in corn pollen gathered by the bees, according to the findings released in the journal PLoS One this month.

"We know that these insecticides are highly toxic to bees; we found them in each sample of dead and dying bees," Krupke says. Other bees at those hives exhibited tremors, uncoordinated movement and convulsions, all signs of insecticide poisoning.

The neonicotinoid insecticide coatings are sticky and to keep seeds flowing freely in the vacuum systems used in planters they are mixed with talc. Excess talc used in the process is released during planting and in routine planter cleaning procedures.

"Given the rates of corn planting and talc usage, we are blowing large amounts of contaminated talc into the environment," Krupke says. "The dust is quite light and appears to be quite mobile."

Krupke said the corn pollen that bees were bringing back to hives later in the year tested positive for neonicotinoids at levels roughly below 100 parts per billion.

"That's enough to kill bees if sufficient amounts are consumed, but it is not, Hunt, who is continuing the research into the sub-lethal effects of neonicotinoids, says that for bees that do not die from the insecticide there could be other effects, such as loss of homing ability or less resistance to disease or mites.

Regional Reports 2011

British Columbia - *Ian Farber*

There continues to be a steady demand for local food products, and honey is no exception. People are interested in the plight of the honey bee and often ask beekeepers, "What is happening to our honey bees?" Research still has not given us a definitive answer but the pieces to the puzzle are being identified slowly.

As beekeepers we collectively worry about honey bee survivability. In the central interior of BC, winter is always an unknown factor on beehive health. In Kamloops, we had record high temperatures in January accompanied by little snowfall or precipitation. Without a significant snow pack our non-irrigated fields will be dry and the fire threat may be high very early in the spring. This unusually mild weather may also result in the bees eating their winter stores of honey and there may be the need for supplemental feeding.

In the background, there is the threat of the small hive beetle entering the province. Varroa is still a problem accompanied by Varroa vectored bacterial and viral diseases. Treatment protocols keep changing, as established treatments no long prove to be effective. New research information reported in Eric Mussen's newsletter concerning oxytetracycline use in bee hives is both informative and alarming. One research study has shown that prior use of oxytetracycline lessens the bees' ability to detoxify both coumaphos and fluvalinate.

We do what we can to keep our bees healthy over the winter so in the spring we can don our gear and work towards a productive season as our honey bees pollinate both agricultural and urban crops.

Saskatchewan - *Alvey Halbgewachs*

Saskatchewan experienced a very cool and wet spring until late June. However, the sun came out in July in most areas of the Province and many beekeepers produced a good crop. There were pockets where there were large spring hive losses and slow build-up of colonies for summer production and some parts remained under flood conditions throughout the summer. We had a very open, warm and dry fall and now there are concerns that there may be drought conditions on the west side of the Province in 2012 due to the warm winter and very little snow.

Honey production in 2011 was approx 15,750,000 lbs and average production per hive approx. 175 lbs. There are 90,000 colonies and 20,000 Nucs going into winter, operated by 150 commercial and many hobby beekeepers.

2011 was a year of surveys and research in Saskatchewan. Surveys covered productive colonies, pollination services, origin of queens for hives, fall management, treatment for varroa mites, method of feeding bees, type of sugar-based feed, type of treatments used for mites and diseases, and status and number of hives going into winter. Research was related primarily to the Saskatraz project. (See page 22 for project report).

In November, the Regina and District Bee Club entered two Booths at Canadian Western Agribition, The Agriculture Education Booth and the Trade Show Booth. Pierre the Bear was there to charm the crowds.

The Saskatchewan Beekeepers Association (SBA) Annual Conference and Tradeshow took place November 30th to December 2. Randy Oliver, Dr. Rob Currie and Dr. Albert Robertson (Saskatraz) were the main speakers. It was great to see beekeeping friends and discuss the year of activities.

Wink Howland, a very active and long time member of the SBA executive passed away in 2011. He is greatly missed by all.

THE SASKATRAZ PROJECT 2012

THE SASKATRAZ RESEARCH TEAM 2012 : Tom Robertson1, Neil Morrison1, Mohammad Mosterjeran1, Syed Qasim Shah1, Wayne Connor2, Sanjie Jiang3, Philip Griebel2, Xiao Qiu3, Albert Robertson.*1

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The Saskatraz project was initiated in 2004 - 2005 with the objective of breeding productive, gentle bees with tolerance to mites and brood diseases. This was approached by selecting productive colonies with excellent overwintering ability in Saskatchewan and Manitoba. Fourteen queen breeders provided 35 colonies to the program. Two breeders provided Russian stock re-selected for performance in Saskatchewan, to introduce mite tolerance. The Russian stock was previously shown to demonstrate some tolerance to varroa and tracheal mites by the USDA, Baton Rouge, LA, U.S.A .

Natural selection was used to select the best colony phenotypes (honey production, wintering ability, varroa tolerance, brood diseases, etc.) at an isolated apiary designated Saskatraz (Meadow Ridge Enterprises). Selected phenotypes are continually out crossed, back crossed and subjected to repeated recurrent natural selection, to enrich for economic colony phenotypes. For a detailed history and updates on the Saskatraz research program visit www.saskatraz.com

Since 2006, 17 colony phenotypes have been selected and more than 6000 queen cells and 150 breeder queens released to Canadian beekeepers and queen breeders.This has returned $119,000 to the Saskatchewan Beekeepers Association between 2006 and 2010, and $35,000 directly to the Saskatraz research project since 2010. Stock sales revenue assists research and stock maintenance at Meadow Ridge.

The Saskatraz project currently operates 4 natural selection apiaries at Meadow Ridge Enterprises Ltd. and collaborates with scientists at the Veterinary Infectious Disease Organization and Food and Bio products, University of Saskatchewan (U of S), Saskatoon, Saskatchewan.

In 2007 methods for testing honey bee pathogens (viruses, nosema, etc.) by PCR technology were initiated at the U of S We performed 25 case history studies for beekeepers experiencing higher than normal colony mortalities as of October 2011. This service has been provided free since 2007 for Saskatchewan and will continue until October 2012.

In 2011 Meadow Ridge Enterprises contracted VIDO (Drs R. Brownlie and Philip Griebel) and NRC, Montreal to help build a comprehensive diagnostic microarray chip to screen for honey bee parasites and pathogens (viruses, microsporidia, bacteria, mites and crithidia). This was made possible by collaboration with Charles Runcle and Dr J. DeRisi, Howard Hughs' Medical Institute, Betheseda, Maryland and UCSF, USA. We are currently testing these microarray chips for screening bee pathogens.

Extensive research has been performed in the search for molecular and morphological markers to assist selection of important traits (honey production, mite tolerance disease resistance). We have identified 20 informative microsatellite markers for distinguishing between Canadian, Russian and German bee populations in collaborative efforts with the SRC. Recently we have identified about 200 transcripts differentially expressed in honey bee worker pupae from colonies showing varroa tolerance, in collaboration with Food and Bio products and VIDO, U of S. These should be valuable selection tools in identifying breeder queens with varroa tolerance. We have also continued our studies on management of varroa population growth with Saskatraz breeding stock and selective treatment strategies. Our focus is currently on organic acids and thymol. We hope to eliminate the need for synthetic chemical miticides with these treatments and varroa tolerant stock.

In 2012, we will be producing a limited number of Saskatraz hybrid production queens produced in northern California with selected Saskatraz breeder queens, for distribution into Canada. Some of this stock will be available in May and June this spring. We have not yet developed an acceptable export protocol to Chile, but will be re-addressing this initiative in the near future. Our disease diagnostic microarray chip may be useful in achieving this goal. We have also continued our collaborative efforts with Australian queen breeders and will have commercial queens available again from Australian stock re-selected in Saskatchewan in May, 2012. This spring Saskatraz queen cells and breeder queens will be available from our best colony phenotypes, from late May onward.

Comments and suggestions on our Saskatraz research project objectives and results are welcome.

ACKNOWLEDGEMENTS: Financial support from Saskatchewan Agriculture (Agriculture Development Fund), Agriculture Council of Saskatchewan, Meadow Ridge Enterprises LTD is gratefully acknowledged. We thank all collaborating Canadian beekeepers, and those purchasing Saskatraz stock from the breeding program. Past support (2007-2008) of the SBDC and SBA and CBRF (2006-2010), and continued tracheal mite analyses by the provincial apiculture lab (John Gruszka and Geoff Wilson) is appreciated. We thank the SBA for administration of ADF Saskatraz research funds on a fee for service basis.

Alaska - *Joe Carson*

Alaska is being inundated with snow - as much as 29 feet in some communities and cold weather is covering the state. Our village is having -50 F. degrees and colder four weeks earlier than usual. Any and all hives wintering over are going to be in serious condition should this weather pattern continue. Hives in two of our apiaries are buried in snow so deep you would not know they were there. 60 to 80 pounds of honey feed, candy boards, hive wraps, insulated lids, are just a few of the requirements to have a hive survive through April. We hear of cool weather in the lower 48 states and their snowy weather and how hard it is to raise bees. Our response is hmmmmmmm.

California - *Archie Mitchell*

I spoke with several beekeepers on the Central Coast recently regarding their plans for this New Year. Most of the beekeepers on the Central Coast are preparing for another big year pollinating the almond crops.

One of the largest commercial bee keepers in California, Matthew's Honey with 15,000 hives, is giving back to his community in Lindsay, California by supporting families of those soldiers who have deployed. Mathew's Honey also supports cancer patients through donations to www.aspoonfulofsugar.org. This is a non-profit organization empowering those facing life's challenges with a positive attitude.

George Jones, my predecessor as the Director for California, has retired from the San Diego County Entomologist technical assistant position and is looking forward to receiving his Kona Queens, pending delivery in April. George won the queens during a drawing at our 2011 WAS Conference on the Big Island of Hawaii.

The owner of the California Bee Company, Jeremy Rose provided these comments regarding 2011 and 2012: Happy New Year! I have about 320 hives now, with record low fall losses of only 3 or 4 hives. Right now my bees are stable and have loads pollen and fresh nectar. I still see some spotty brood patterns and a little disease but things look okay. 300 will go to almonds. If we do not get tons of rain in February and March we will not make honey in spring. My main priority is to re-queen all my hives with mite resistant stock in March and start selling queens next year. I also plan to offer multiple beekeeping classes in the spring and to increase to 700 hives next year if I can keep my bees healthy, as well as run a treatment free survivor yard next fall to aid in my selection of mite resistant breeder queens for 2013. I had major problems this year so I am hoping for a good 2012 in order to stay in business.

Colorado - *Beth Conrey*

The Colorado State Beekeepers Association (CSBA) had a productive year. The Winter Meeting at the Colorado Agricultural Leadership Foundation's (CALF) Lowell Ranch at Plum Creek in Castle Rock was extremely well attended by nearly 100 people! Jerry Hayes, Florida Apiary Inspector and author of "The Classroom" in ABJ was the featured speaker.

Several additional presentations were made by Brooke Fox, President/CEO of CALF; Beekeeper Michael Hall introducing the new CSBA logo; Beekeeper Tim Hardy introducing the new CSBA website; Thia Walker with CSU Extension conducting a survey for the Colorado Department of Agriculture regarding the proposed implementation of Driftwatch; Grant Grigorian with Grampa's Gourmet Honey on a proposal for a CO Honey Festival and Beth Conrey, CSBA President, on the "State of the State". A Constitution and set of Bylaws were approved.

The first "Big Money Honey Contest" was held with approximately 60 entries for the 7 categories. First Place winner was Doyen Mitchell; Second Place was John Hartley; Third Place went to Paul Limbach. Photos from the event can be found on the CSBA website and our Facebook page.

Goals for the upcoming year were set with particular focus on removing bee bans from more CO communities, funding a speaker series to be shared by the regional associations, completing the acquisition of non-profit status; and pursuance of a CO Honey standard.

The Summer Meeting of the CSBA will be held in Silt at the home of Vice-president Paul Limbach on June 16th. I will be at the American Bee Federation meeting in Las Vegas actively seeking speakers for the meeting and for the series.

Hawaii - *Jenny Bach*

Hawaii was once a beekeeping paradise with it's year round nectar flows, lack of bears and honeybee pests (besides exterminators), and it's healthy diverse ecosystems. Now it seems we have a bucket of problems with beekeeping, and that's not a bucket full of honey.

Since our 2011 WAS conference in Hawaii we saw many local beekeepers having to re-learn beekeeping because of the recent arrival of mites and small hive beetle and resulting losses. Luckily the conference brought speakers who shared their knowledge after 20+ years of experience with the same issues. What are the long term solutions to the current plight of honeybees? Are they feasible? Here in Hawai'i we are forced to import everything that is not made or grown here (80-90% of the food comes from the continental US or other parts of the world). With rising fuel costs this makes shipping miticides and beekeeping supplies very expensive and unsustainable. Selecting for hygienic, varroa tolerant bees are proving to be a solution for many beekeepers worldwide. Our intense pest pressure seems to be making this selection process go quicker.

Many of our challenges in beekeeping are not subject to a "quick fix" or "one size fit's all" management regime. Diversity in keeping bees, from management strategies to alternative hive designs, are topics that spark interest. Looking at long term solutions to our common problems will allow us to lean toward local breeding programs, and selecting for bees that can tolerate pests with vigor, thus reducing dependency on treatments. Innovative ideas that ultimately support the genetic diversity of honeybees is an essential component for present and future beekeeping success.

New Mexico - *Melanie Kirby*

Bee season 2011 proved extremely marginal and challenging throughout the entire state. Low snowpack from the previous winter, paired with dry and extended windy periods, proved a rough spring for colony build up. Extensive summer wildfires, bears, and a late rainy season didn't add to the bees' progress.

Southern beekeepers share that the honey season was very short as the drought had an effect on production. Irrigation from the Rio Grande was cut off in July: the shortest watering season on record for this area. More time was spent feeding than pulling honey: the worst season in the past 20 years.

Centrally located beekeepers (including urban beekeepers in the Albuquerque metro area) experienced similar conditions. ABQ has a very active club (www.abqbeeks.ning.com).

Highlights from the 2011 Spring Survey:

• 83% of respondents do NOT use any chemicals in their hives.

• 73 of new hives started by respondents were created using LOCAL resources (swarms, splits, queen breeders in NM)

• 59% of respondents had 100% of their hives survive one of the coldest winters on record. (compared to only 21% in 2010)

Northern beekeepers report difficulty getting new hives to build up whereas established hives seemed to maintain (and make a little honey). Many beekeepers had to offer supplemental feed throughout the entire season. Late rains prompted a fair fall flow, allowing established colonies the ability to gather enough winter stores from chamisa, aster and golden beard blooms. Spring feeding is anticipated once temps rise.

Despite forecasts predicting a similar 2012 season, heavy snowfall across the state over the holidays has helped to curb this past year's drought. Up to 4 inches of snow was reported in southern counties with more inches reported north, to date. Beekeepers are hopeful that the winter moisture will continue and give rise to a glorious spring bloom.

NM Beekeepers Association will be holding their annual meeting Jan. 27-28th in Albuquerque. Agenda includes local speakers with presentations on bear fencing and organic vs. naturally grown standards. NMBKA plans to host Michael Bush in the coming summer. Visit www.nmbeekeepers.org for more info.

ZQB in cooperation with the Santa Fe based Sangre de Cristo Beekeeping Club will once again host their 3rd Annual Northern NM Rocky Mountain Sweet Spring Sting Symposium for Bee Enthusiasts this coming spring. More info soon at www.ziaqueenbees.com/zia.

Oregon - Dewey M. Caron

Oregon beekeepers gathered for their annual meeting the weekend before Thanksgiving at Seaside to nearly perfect sunny seashore weather after a winter storm passed on Thursday. The program included a beginning bee school and a dual track program on Saturday. Debbie Delaney 'returned' for the first time since beginning the UD Apiculture position and Randy Oliver and Tom Rinderer were special guests. Attendance was good with over 100 registrations. Next year the meeting will return to Seaside Convention Center November 1-3.

The OR Master Beekeeper program was launched at the November convention. Patterned after the Washington MB program, the OR MBer program will be organized on 3 levels with the Apprentice level so far established. To become Apprentice Beekeepers, Individuals need to have one year of experience, keep a Journal, satisfactorily complete field work with a mentor in each of 4 seasons, pass a basic beekeeping knowledge test using 1st Lessons by Dadant, earn education credits (attend meetings, bee schools, etc) and pay $100. There will be instruction available by program certified instructors and mentors (who have already had workshops and bee school training.)

The Oregon Standards of Identity for Honey had a final hearing on December 19th. The Standards bill passed the Oregon Legislature and recent activity has including formulating the rules. The committee has agreed on the Standards to date and held a final public hearing on Dec 19th. The final language has yet to be reviewed by Legislative Counsel and then filed with the Secretary of State. It was to have become law on January 1, 2012 but final date is still to be determined. Several city ordinances banning beekeeping were modified during the past 2 seasons and there are current efforts in at least one more. The state and local associations offer experts to address city councils/legislative committees and strongly encourage such cooperative efforts to totally remove bans versus efforts instituting restrictive substitutions. Bee school registrations are again very strong for spring bee schools offered by several of the local associations. Fall/winter conditions were generally decent up to the New Year.

Washington- *Jim Bach*

There are various reports of bee management success coming from Western Washington for 2011 and some local reports from the Yakima Valley of eastern Washington. The common thread is that the bees generally did poorly, both as colonies and in their honey production. From comments in two W WA newsletters for August – October I read that:

Members had poor honey crops requiring early fall feeding to ensure bees had winter stores, and

Some colonies sitting close together had widely different success rates – some produced winter stores, others produced "absolutely none."

My own bees (10 colonies) in the Selah area, became eight going into winter (20% loss), with another three (= 5 or 50%) that had poor queen retinues (5-10 bees) instead of 12 to 15. These colonies were noisy, i.e. they did a lot of fanning during minimal manipulation. Colony noise should be 50 decibels but these produced 65-80 dB. These colonies won't winter well and they will eat more honey. They will shrink their colony size over the winter, down to maybe 4-5 combs. That isn't much for a spring colony in late February or early March. The cause is the reduction in queen pheromone levels.

My colonies are headed by swarm queens, offspring from queens purchased last year, and one that was purchased in the late summer. I'm interested how this one will look come late February. I raised ten queens with swarm cells and supercedure cells in late May 2011 but most failed after laying for 30 days. Some died in late fall so I combined the colonies.

Reports of annual bee losses I heard in the fall ranged from 25% to 60% over the last three years, with some reporting in September early October of up to 50% in 2011. More colonies will die over the winter here so we're not at the smallest number of colonies yet.

One beekeeper is trying out indoor wintering this year so it will be interesting how the air exchange systems and Co2 levels will look. He has recording devices on the warehouses so he will have good records come spring. I wish him much success. The Canadians and some northern tier state beekeepers have been indoor wintering for quite a few years. Room temperatures are kept at 40 F with continuing slow air exchange with fans to take the Co2 off the floor of the rooms.

Let's see what happens by the next issue of this Journal.

UBC Bee Research Update

Happy New Year all! In the last edition I told you about a new project we have started in collaboration with Steve Pernal, Liz Huxter, Heather Higo, Rob Currie and others to develop new tools for IPM in bees. We are now analyzing data from last summer's work and planning a huge selective breeding project for this year, so no reports yet, but perhaps I will take the opportunity to explain what we're planning to do in the project.

You may recall that there are two major foci, marker-assisted selective breeding and RNA interference (RNAi). As the RNAi work will come later, I will leave that discussion for later too. I have spoken and written about marker-assisted selective breeding several times over the past few years but I will review our plans here.

For the past three years we have been trying to identify molecules we can use to diagnose whether a colony will be hygienic or exhibit Varroa-sensitive hygiene (VSH). We have some good candidate molecules so this past summer we collected bee samples from BC, AB, SK and MB. At the same time we measured the levels of hygiene and VSH in those colonies. In about one month we will know how well the levels of our molecules correlate with hygiene and VSH, and in May we will take the most hygienic colonies and cross-breed them. We will then look at the levels of our candidate molecules in the offspring from those crosses, selecting those that have the highest levels for a further round of breeding before field trials to test their performance at honey production, pollination or whatever, as well as whether they are able to survive disease. Here's hoping they show improved survival and at least as good economic production!

Research from the rest of the world

I was trying to decide what to write about for this section when the 'zombie bees' headlines hit the news, and I couldn't resist! Once again, the public's attention has been captured by sometimes outlandish reports of a previously unknown infection of bees that has, appropriately or not, been linked to Colony Collapse Disorder. A group from San Francisco (Core et al., (2012) A new threat to honey bees, the parasitic phorid fly Apocephalus borealis. PLoS One 7.1: e29639) reports detection of a fly that can parasitize honey bees and cause them to behave like zombies. Thankfully, they did not actually use the term 'zombie' in their scientific article, but in interviews with the press the authors likened the behaviour to that of a zombie. However the bees are behaving, it is perhaps not too surprising that they found this fly in honey bees since it is a known parasite of bumble bees. In the experiments reported, the authors state that when the flies infect honey bees, the bees tended to leave the colony at night -- strange behaviour for sure. About seven days after infection, eggs that the flies laid inside the bees hatch and kill the bees. On the surface, this would appear to be a serious issue since they found these flies in 77% of apiaries tested. If this fly is jumping over from bumble bees, as seems likely, such a high prevalence is not too surprising since bumble bees are spread across North America. What is hidden in these numbers is that the actual number of colonies and bees infected is likely extremely low and since there is as yet no evidence that the fly can jump from one honey bee to another, I do not believe we're looking at the next Varroa mite here. In fact, the authors of the study have communicated to the professional apiculturist associations around North America that they do not believe this fly is a cause of CCD. What this does highlight is the importance of continued research into emerging and re-emerging diseases of bees since the sooner we know about something like this, the sooner we can re-direct resources towards fighting it.

Beekeepers' Calendar

Jan 26 - 28: Canadian Beekeepeing Convention, Manitoba Beekeepers AGM, Canadian Honey Council AGM, Fort Garry Hotel, Winnipeg, Manitoba. Info honeycouncil.ca/index.php/events

Feb 2 - Mar 1: Alberta Beekeepers Association/Alberta Agriculture and Rural Development workshops on safe use of agricultural chemicals. Sessions 9 a.m. to 3:30 p.m. cost $25 which includes coffee and lunch. Pay at the door but please register (call 1-800-387-6030) at least 5 days prior as seating is limited.

Feb 2 - Lethbridge Centre, 5401 - 1 Ave. South
Feb 16 - Sawridge Inn, 9510 - 100 St., Peace River
Feb 22 - CDC North, 17507 Fort Rd NW, Edmonton
Feb 28 - St. Lina Community Hall, St. Paul
Mar 1 - Westlock Inn, 10411 - 100 St, Westlock

Feb 20 - 24: Bee Masters 2012 Course, Univesity of British columbia Campus. Info www.agf.gov.bc.ca/apiculture/beemasters or www.beemasters.ca/beemasters.

Mar 2 - 4: 5th Annual Organic Beekeeping Meeting, Oracle, Arizona. Info & registration: Dee A. Lusby, c/o Organic Beekeepers, HC 65 Box 7450, Amado Arizona 85645, phone 520-398-2474.

Mar 3: Presentation - Colony Collapse Disorder or Human Collapse Disorder?, Canoe Club, 6449 Crowchild Trail SW, Calgary, Alberta, Canada. Info www.backyardbees.ca/courses.

Mar 16 - 18: British Columbia Honey Producers Association Semi-Annual Meeting & Education Sessions, Holiday Inn & Suites, Kamloops. Info Ian Farber 250-579-8518 or ian_farber@telus.net,

Mar 19 - 25: 2nd World Congree on Organic Beekeeping, San Cristóbal de Las Casas, Chiapas, Mexico.

Apr 16 - 27: 2012 Pollination Biology Field Course, Missouri Botanical Gardens, St. Louis, Missouri. Info Sarah Bates (sbates@uoguelph.ca). Deadline to enroll Feb 15th.

Oct 4 - 7: Joint WAS/WSBA 2012 conference, Embassy Suites, Tukwila, WA. Info www.groups.ucanr.org/WAS/WAS_Conference

For more Beekeepers' Calendar of Events items, visit the Global Beekeeping Calendar, courtesy of the Florida Beekeepers Association & Malcolm Sanford at http://floridabeekeepers.org

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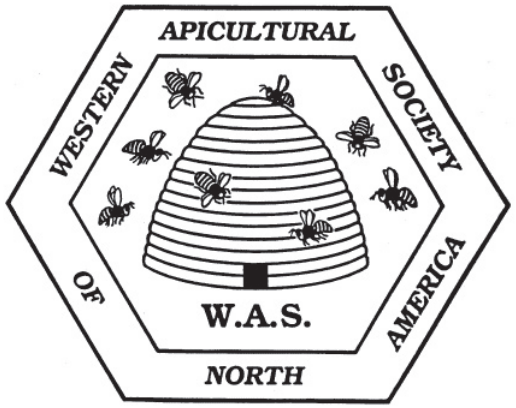

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