Washington State Beekeepers Association

Keep the "Bee" in Business

Publication of Washington State Beekeepers Association January 2003

President's Message

Well it's official, the New Year has arrived and it is 2004. We will be challenged with a whole new set of issues.

The meeting with the State on Bee Registrations went extremely well and per the current Revised Code of Washington (RCW) the money *"may be used for apiary-related activities of the department or funding research projects of benefit to the apiary industry that the director may select upon the advise of the apiary advisory committee"*. We have a little work to do to get everyone on board and Eric Olson and I are putting together a plan to do that. The other issue is getting the apiary advisory committee back up and running again. The first step in the process went well and now we need to finish this up. It looks very good for us to fund additional research.

We will be starting on planning for the field day at WSU, hoping to make it bigger and better. I'm hopeful that we can have more folks attend than we had last year so let's talk it up at our local association meetings.

Early reports are that queens and package prices will take a fairly large increase. I hate to see that, as I think it will affect new beekeepers getting their first hive or two. I expect a lot of folks will be looking at raising some of there own queens this year. Let's hope for the best. This might open up a market for local beekeepers to sell nucs.

Jerry Tate

Washington State Updates

2004 Program Calendar for the Association.

March- Meeting March 6, 2004, Ellensburg at the Cattlemen's Club, 10 AM. See map & directions in the back of the newsletter.

June- Field Day At WSU June (date to be announced)
June- WSBA Executive Board Meeting-WSU time tba

October- WSBA Convention, Spokane Oct 14, 15,16
October- WSBA Executive Board Meeting Oct 14, 4pm
October- WSBA General Membership Meeting Oct 15 4pm

Membership dues are due!!
Basic dues are still $15!
See the back of the newsletter for details.

Mite Treatments update:

- The WSBA wrote a letter to the WSDA in support of a section 18 exemption to WSDA so Washington State beekeepers can continue to benefit from the use of Coumaphos and now thymol + eucalyptus oil (Api Life VAR) for the control of Varroa mites. Subsequently, the WSDA submitted the exemption application to the Feds. This is a continuing program sponsored by your State Association.
- Dadant will have Sucrocide stocked by the end of January. If Sucrocide is right for you, Dadant says it's time to order! This is the sugar ester formula that the WSU Entomology department has developed. The following article is one of many scientific papers authored by your favorite WSU researchers. Published in the American Bee Journal, December 2003.

Use of Sucrose Octanoate Esters to Control the Parasitic Honey Bee Mite *Varroa destructor*

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Introduction

Throughout much of the native and introduced range of the honey bee, *Apis mellifera* L., the parasitic mite *Varroa destructor* Anderson & Trueman is a highly destructive pest. This is especially true in temperate regions of the world, where untreated honey bee colonies infested with *V. destructor* can perish within two years (DeJong, 1990). Historically, in areas where *V. destructor* is considered a problem, the predominant treatment regimes have involved the use of various synthetic pesticides or organic acids. However, the ability of the mite to develop resistance to various pesticides has led to a need to develop alternate strategies to maintain adequate control.

V. destructor was first detected in commercial honey bee colonies in the US in 1987 (Anonymous, 1987), creating an unprecedented need for mite control products. At present, there are two widely available pesticides registered to treat infestations of *V. destructor* in the U.S. One of these, the synthetic pyrethroid fluvalinate (Apistan®), became available soon after mites were detected in the US. However, mite resistance to fluvalinate, already known from Europe (Lodesani, et al. 1995), developed after about a decade of fluvalinate use in the US (Baxter et al, 1998; Elzen et al, 1998). As a result, an organophosphate pesticide, coumaphos (Checkmite +®), was registered in the U.S. in 1998 under an emergency use protocol (known as Section 18). Although coumaphos has yet to receive full registration by the U.S. -EPA, some *V. destructor* populations in Europe and the US have already developed resistance to this compound (Speafico et al 2001, Elzen and Westervelt, 2002).

Coincident with ongoing attempts to maintain effective chemical control measures, there have been efforts to import or produce improved honey bee stocks. The USDA-ARS imported, tested and released a strain of honey bees from far eastern Russia that exhibits improved tolerance to *V. destructor* (Rinderer et al 1999, 2001). Similarly, a USDA-ARS strain of honey bees (SMR) selected for the trait *suppression of mite reproduction* was recently released to U.S. queen producers. The commercially available versions of these new strains of bees provide some improved resistance to *V. destructor*, although chemical treatment is generally still required to prevent colony loss. In addition to genetic selection of honey bees, various cultural methods, such as drone brood trapping, have been reported to reduce mite levels. Both selective breeding of bees and cultural control measures will undoubtedly play an important role in the eventual adoption of an Integrated Pest Management (IPM) approach by beekeepers for *V. destructor*. Because the goal of IPM is to reduce the population of mites below damaging levels, rather than to eliminate mites completely, pesticides with lower lethality to the mites may be suitable. An obvious advantage is that such compounds may have lower risks to humans and bees as well.

As part of the effort to develop pest control compounds that are compatible with an IPM approach for *V. destructor* in honey bees, we report here the results of tests using a recently registered compound for mite control, sucrose octanoate esters (AVA Chemical Ventures, Portsmouth, NH). Sucrose octanoate esters (S.O.) belong to a class of compounds known as sugar esters. These compounds have a fatty acid chain attached to a sugar molecule, giving them somewhat "detergentlike properties in water" (Neal et al, 1994). Sugar esters are produced naturally by the leaves of some plants and it was the recognition of their pesticidal qualities that led to the original efforts to develop the material for use by agricultural growers. Sugar esters have been shown to be effective pesticides for a number of pest species, including aphids, psyllids, thrips and spider mites (Buta et al 1993, Neal et al 1994, Puterka and Severson 1995, Liu et al 1996; Nottingham et al 1996). This paper reports the results of some of the trials performed prior to registration to evaluate S.O. for *V. destructor* control in honey bee colonies.

Materials and Methods

Preliminary investigations

Prior to the field studies reported below, we conducted a number of preliminary tests to determine the toxicity of sucrose octanoate esters to *Varroa destructor* using different application methods. We set up control and test colonies to evaluate the effectiveness of S.O. fed to bees (both sucrose syrup and solid sugar/oil patties), placed on absorbent materials (sponge cloth) over the brood nest, in a fogger application and in liquid "drenches" (sprayed only from above and below the cluster of bees). With the exception of the drench, none of these methods resulted in significant mortality to the mite population. Mite mortality in drenched colonies was approximately 10-15%, but was deemed inadequate for further evaluation.

We also ran preliminary tests to examine the toxicity of S.O. to honey bees in a simple laboratory assay similar to that used by Koeniger and Fuchs (1989). In the laboratory cage study, small groups of bees were sprayed "to wetness" with differing concentrations of S.O. No mortality of bees was apparent until the concentration of active ingredient (*a.i.*) reached 1.2%. However, subsequent trials with full-sized colonies showed that some bee mortality occurred at concentrations as low as 0.75% *a.i.*. However, the recommended treatment concentration (0.25% *a.i.*) was well within the level tolerable by honey bees and still provided significant mite mortality (see below).

Field Experiments

Honey bees used in the field experiments were of mixed commercial origin and were maintained at WSU research apiaries in Whitman County, Washington. All colonies in each experiment were maintained in a common apiary, although different apiaries were used each year.

In the first experiment, a group of 12 full-sized two-story Langstroth hives were randomly divided into 6 treatment colonies and 6 control colonies. The trial took place on September 6, 1999, and brood was still present in the colonies. A solution of S.O.:water (0.30% active ingredient (*a.i.*)) was prepared in a household 1.5 gallon garden sprayer and the spray nozzle was set to provide a "mist" pattern (rather than "stream"). Treatment consisted of removing each frame from the hive and spraying with 2 or 3 passes of the wand. Each pass was 1-2 seconds in length and adjusted to provide complete "wetting" of the adhering bees, while producing minimal drip or runoff. The frame was then immediately replaced in the hive. Overall usage of material was one liter per 20 frames or about 1.5 ounces per frame (.75 oz./ side) (**see appendix 1**).

Treatment time for each two-story hive, including opening and handling, was approximately 5 minutes. Control colonies were treated in the same manner, except a sprayer containing only water was used. A sticky board protected by screen wire mesh was placed on the bottom board of each colony to collect falling mites. After 24 hours, the sticky boards were removed and replaced and coumaphos strips (one per 10 frames) were inserted into the colonies. Following an additional 24 hours of coumaphos treatment, the second sticky board was removed.

All mites present on the sticky boards were counted. Percent mite mortality was calculated as the number of the mites on the first sticky board divided by the sum of mites collected on both sticky boards. Since variances between control and treatment groups were not equal, a Mann-Whitney U test was applied to test for significant differences in mite mortality between control and S.O. treatment groups in each single year.

Two additional field trials were conducted using nearly identical methods, although the number of colonies varied (Exp. 2 – September 21, 2000, 9 control: 9 treatment; Exp. 3 – October 15, 2001, 10 control: 10 treatment) and the % solution of active ingredient was reduced from 0.3% to 0.25% and brood was removed in 2001.

Results and Discussion

Mite mortality in colonies treated with sucrose octanoate esters was significantly higher than in control colonies (Figure 1). Following a single treatment, mite mortality in treated colonies ranged from 38% to 87%, with a mean mortality for 1999, 2000, 2001 of 54%, 79% and 66%, respectively (Figure 1). Initial mite populations prior to treatment were highly variable, with mean mite counts per colony ranging from 314 (± S.E. 61) to 1779 (± S.E. 570) (Table 1). The presence of honey bee brood in the colonies quite likely resulted in underestimation of actual treatment mortalities, as mites that exited cells with emerging adult bees during the 24 hours prior to coumaphos treatment were counted against the % mite mortality attributable to S.O.. Nonetheless, results from these trials clearly support the potential of S.O. to reduce *V. destructor* populations in honey bee colonies.

Table 1

	1999		2000		2001	
	Sucrose Octanoate	control	Sucrose Octanoate	control	Sucrose Octanoate	control
mite fall after 24h	469±191	13±4	860±182	81±16	1233±410	44±13
coumaphos applied to all colonies 24 hrs after initial treatment						
mite fall 24h after coumaphos	577±336	641±311	304±120	233±58	565±168	1492±480
total mites	1046±526	734±293	1164±284	314±61	1779±570	1536±493

In controlled experiments over multiple years, overall mean mite mortality in singly treated colonies averaged 68% within 24 hours (Figure 2). While less effective than the pyrethroid, fluvalinate (Apistan®), or the organophosphate, coumaphos (Checkmite+®), the efficacy of S.O. should be well-suited for use in an IPM framework for mite control. Multiple applications would undoubtedly increase the mite mortality, as mites that emerge with adult honey bees are exposed to later S.O. treatments. Treated colonies that were highly infested with mites (>4000) showed percent mite mortality similar to colonies containing less mites, perhaps reflecting that the method of exposure (direct contact) is independent of mite density.

V. destructor populations in the US have adapted to the selective pressures of miticide treatment by beekeepers and developed resistance to fluvalinate, coumaphos and amitraz (a compound previously used for mite control in the U.S., but no longer available). Continued effective mite control with these chemistries over the long term seems unsustainable. It is likely that development of mite resistance to S.O. will occur much more slowly for two reasons. First, although the mode of action of sugar esters is not well known, it probably relies (at least in part) on properties related to physical disruption of mite respiration or membranes (Neal et al, 1994). In effect, the application method and recommended concentration take advantage of the size difference between mites and honey bees to deliver a dosage that kills mites but can be tolerated by bees. Thus, resistance mechanisms for synthetic pesticides that involve increased detoxification capacity or alternative biochemical pathways may not be easily co-opted to confer resistance to S.O.. Potential resistance mechanisms could involve selection

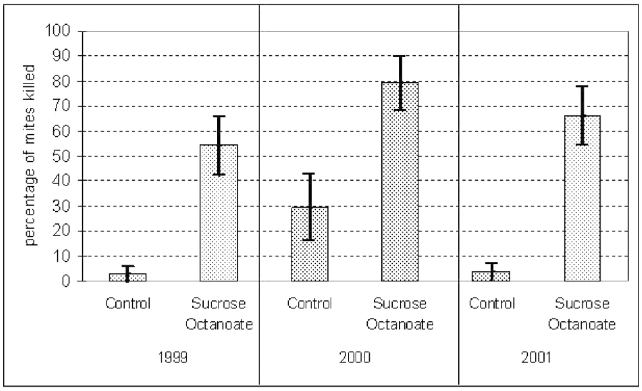

Figure 1: Average mite mortality in experimental colonies in the years 1999, 2000, and 2001. Error bars indicate standard deviations. The difference between mite falls in control and S.O. treatment was significant in all three trials (Mann-Whitney U test, p<0.001).

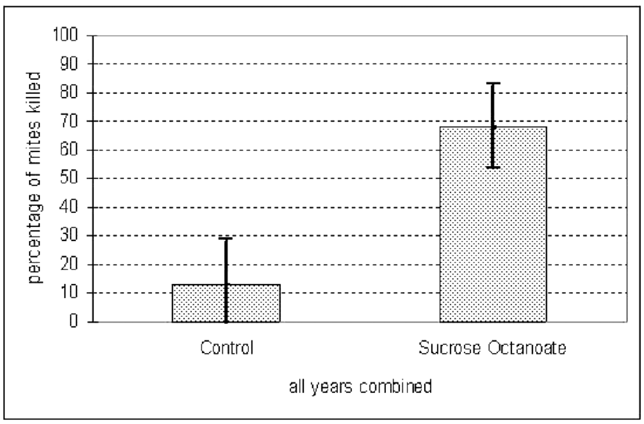

Figure 2: Overall mite mortality in treated colonies of all years combined.

for behavioral changes in the mite that minimize exposure on the adult honey bee. However, the selection pressure for the development of resistance is also likely to be lower with S.O.. As currently formulated, the compound is only effective when placed in direct contact with mites. Thus, there is no residual or persistent exposure of mites across multiple generations from a single application. We speculate that the development of mite resistance will occur more slowly than with compounds released in a persistent manner inside the hive, such as plastic strip formulations of fluvalinate and coumaphos.

In the EPA registration process, S.O. is classified as a bio-pesticide. Biopesticides are certain types of pesticides derived from natural materials, such as animals, plants, bacteria, and certain minerals. The advantage of this classification is that, since biopesticides are considered to pose fewer risks than conventional pesticides, the registration process is streamlined. The EPA "promotes the use of safer pesticides, including biopesticides, as components of IPM programs" (http://www.epa.gov/pesticides/biopesticides/whatare-biopesticides.htm). As a result, S.O. now has "full registration" (Section 3) and should be available to beekeepers relatively soon.

In conclusion, S.O. appears to be a relatively benign material that, if used carefully, provides safe and effective treatment for *V. destructor* in honey bee colonies. In the application method we tested (spraying individual frames) about twelve 2-story hives can be treated per hour by two people, an investment of time most readily acceptable to beekeepers with a limited number of colonies. However, even beekeeping outfits with tens of thousands of colonies may be able to use S.O. effectively if treatment can be coordinated with existing operations where individual frames are handled, such as during colony set up, splits or disease inspections.

The greatest likelihood for successful mite management with S.O. is as one tool in a well-developed IPM program. Experimentally-based treatment thresholds have been estimated for the southeastern and northwestern regions of the U.S. (Delaplane and Hood 1997, Strange and Sheppard 2001), although as honey bees with a genetically-based tolerance for mites become more widely used, numerical thresholds for mite treatment will likely increase. Meanwhile, there remains a need for further research on mite and honey bee population dynamics in different portions of the country to optimize mite treatment thresholds to regional conditions. Until then, the innovative use of manipulative practices to reduce mite levels, monitoring to assess mite population growth and treatment by S.O. (or other compounds) when mite populations reach published thresholds, provides a starting place for implementation of an IPM program for individual beekeeping operations. The observant beekeeper will then have a basis to evaluate recommended thresholds and make adjustments for local conditions.

Figure 3: Typical spray pattern when using sucrose octanoate esters and a household garden sprayer

Acknowledgements

We thank Tom Unruh for originally sharing information regarding the toxicity of sugar esters to spider **mites**, stimulating discussions and comments on an earlier draft of this manuscript. Gary Puterka encouraged our initial tests with honey bees, as tangential to his cooperative agreement to develop sugar esters to control tree fruit pests. Tony Barrington of AVA Chemical Ventures supplied material for testing and kindly shared information on the process leading to EPA registration of Sucrose Octanoate. Support for this research came from the Washington State Commission on Pesticide Registration, the Thurber Endowment and the Washington State Beekeepers Association.

Practical Calibration of Household/Garden Sprayers for the Application of Sucrose Octanoate Esters

Household garden sprayers are highly variable in the output of their spray nozzles. The following protocol provides a method to deliver the recommended amount of S.O. to each frame regardless of the sprayer used.

At the recommended dilution (0.25% active ingredient), the amount per full frame of bees required by the label is approximately 1.5 ounces (0.75 ounce/each side of frame). To calibrate the sprayer, first determine a mark for a known liquid measure in a disposable cup. For example, fill the cup with 6 ounces of water and then mark the fill location on the side of the cup. Next, adjust the sprayer to deliver a broad fine mist (Figure 3). Using the marked cup – determine the number of seconds required to fill the cup to the mark. To determine the spray rate for your sprayer, divide the number of seconds by the number of ounces. For example, if it takes 16 seconds to fill a cup to the 6 ounce mark, then the sprayer is delivering 1.5 ounces in 4 seconds. To deliver this recommended amount to a frame using this sprayer, each side of each frame should be sprayed for 2 seconds. The distance should be adjusted (typically 9 –12 inches) and the movement of the spray wand across the frame timed to maximize the spray coverage of bees. After being treated the bees will look very "wet" and appear rather bedraggled. However, within a few hours, the bees will again appear normal.

Although S.O. is a relatively safe material, it is possible to kill bees with it if higher than recommended concentrations are used. Likewise, although no test results are currently available, prudence would dictate that treatments should be delayed during times of colony stress due to high or low temperatures. In very hot locales, treatments should probably take place in morning or evening when temperatures are moderate. Similarly, when bees are actively clustering due to low temperatures, it is unlikely that the S.O. will adequately reach many of the mites and the danger of disrupting the cluster and harming the colony may negate any benefit from treatment.

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2004 Spokane Conference
OCTOBER 14, 15 & 16

Date: October 14, 15, 16, 2004
Where: DoubleTree, Spokane, WA
Inland Empire Beekeepers contact's for the conference:

Chairman	509-924-1001	Colette Lehinger
Thursday Night Wine Tasting and Hospitality	509-455-4110	John Pierce & Katuska Kohut
Suppliers Booths		Ted Swenson
Programs for all day Friday and Saturday Morning		Frank Seiler & Jack Knox
Friday Night Auction		Still open
Advertisement		Still open

Regional Updates

The annual survey of pollination economics in the Pacific Northwest (PNW) for 2001 – 2002 by your favorite OSU researcher Michael Burgett will be in the next newsletter.

Studies show
Honeybees still best pollination bet

Capital Press January 2, 2004
John Schmitz Freelance Writer

HOOD RIVER, Ore. – What honeybees lack in pollination efficiency they more than make up for in numbers.

This was one of the sales points University of Georgia entomology professor/extension agent Keith Delaplane wanted to leave with Oregon and Washington beekeepers gathered here for their annual convention recently. Delaplane told his audience that while honeybees are not known for many desired traits — such as alternate visits to pollen donators and pollen receivers, high flower visitation frequency and the ability to work long hours — they offset these inadequacies with sheer force of numbers.

Delaplane cited one honeybee-devastating study done in Alabama in the early 1990s in which honeybees and other bee species were tested for their efficiency in pollinating Southern highbush Rabbiteye blueberries.
In the study, pollination visits were controlled so that only one visit per flower per bee species was allowed. Afterwards, the efficiencies of the pollinations were calculated based on the amount of fruit set.

While single visits by the queen bumble bee and the southeastern blueberry bee both resulted in fruit sets of 30 percent, single honeybees allowed only one visit to one blueberry flower produced only 1 percent fruit set.

"And to add insult to injury, those flowers that had no visits had more fruit set (than those visited by the honeybee)," Delaplane said. Because of the studies, which were highly publicized, blueberry growers in the South began to greatly shun honeybees for a number of years "by the droves," Delaplane said.

Despite their poor individual performances, honeybees are still the best pollinators,Delaplane said.

"The key advantage that honeybees have is colony size and that they can field a large foraging force," he said. "This is an advantage that aphis (Aphis millifera, U.S. honeybees that were brought here from Europe years ago) has over any other pollinator."

Delaplane said that repeat visits by different honey bees coming from colonies of 60,000 bees "gets the job done." To prove his point, Delaplane and a graduate student conducted their own study in which Rabbiteye blueberry bushes were exposed to multiple honeybee visits in a controlled tent study.

During the study berry bushes were first subjected to varying amounts of honeybees and later analyzed for fruit set. In the untented control, about 70 percent of the fruit buds set berries. In the tented hives exposed to varying amounts of honeybees, tents containing from 3,200 to 6,400 bees produced fruit sets at higher levels than the control.

Unlike some bee species, honeybees are not specialist but rather generalist pollinators, Delaplane said. "They're posed and ready to visit whatever is blooming."

Honeybees are also found working over a much longer time period compared to other pollinators.

Delaplane said that the reason many growers of pollinated crops are not achieving maximum yields today compared to several years ago, before the arrival of bee mites, is that there are fewer "background pollinators out there."

Background pollinators are feral, or wild, honeybees that in the past augmented commercial hives in orchards and fruit and vegetable fields. Varroa and tracheal mites have since all but wiped out these background bees, resulting in poorer pollinations.

Delaplane said it's tough convincing growers who are not happy with the job bees are doing to bring in even more.

"That just goes against the grain."

So what are the signs of a good pollinator? Insects that will visit both pollen donators and pollen receivers alternately, Delaplane said.

"We'd like to see honeybees go right down the rows, between a pollinizer variety to a main variety," he said. Insects that work long hours and quickly are also prized.

Delaplane was one of several respected honeybee experts who spoke at the Oregon State Beekeepers Association's fall Northwest Corner Conference.

The focus at this year's event was development of mite resistant queen bees and pollination

Miticides having adverse effect on queen, drone bees, research shows

Capital Press January 2, 2004
John Schmitz Freelance Writer

HOOD RIVER, Ore. – Leading honeybee scientists in America strongly suspect the very miticides that have saved the beekeeping industry from almost total destruction are now interfering with the health of queen bees and drones.

"The use of such compounds for control of varroa and tracheal mites has become an almost universal practice, but relatively little work has been done on the effect these compounds have on bees," said Virginia Tech entomologist Richard Fell in an interview.

"Recent reports have documented that both Apistan and formic acid (varroa miticides) can affect drone production and survival, and have suggested possible effects on reproductive ability," Fell said.
He added that the chemicals are also suspected of causing physiological and/or reproductive problems with queens, which can disrupt queen acceptance and lead to supersedure.

Supersedure occurs when the queen weakens and the hive replaces her with one of her daughters.

"We tend to look at these compounds, test them and don't see immediate bee kill or damage to brood, but that doesn't mean there are still not other effects that we have not seen," Fell said.

Fell, who earned a master's and doctorate in entomology at Cornell University, decided to investigate the miticides after he received numerous complaints from Virginia beekeepers a few years ago that they were either losing queens or the queens were not producing offspring well.

One of the most eye-opening findings so far is that miticides could very possibly be interfering with the ability of drones to produce sperm.

"We found with some of the chemicals (specifically fluvalinate, the active ingredient in Apistan) sperm reduction in drones over 50 percent. We've not seen any significant effects (of Apistan) on the queen."

Fell said that while declines in sperm production in drones is also found with coumaphos (check-mite), the tests are incomplete because coumaphos has been found to inhibit the production of drones.

"And it inhibits the production of queens," Fell said. "When we put coumaphos in colonies and tried to rear queens, we could not get queens produced, and drone production was down to about zero."

National Updates

National Honey Board

New clip art images are available from the National Honey Board. Graphic images present honey and bees in various market sector settings including beverages, research, sports, fine dining and school. The clip art below the President's message is an example. Download images at http://www.nhb.org/download/clipart/index.html.

American Beekeeping Federation

2004 4-H ESSAY CONTEST ANNOUNCEMENT AND RULES

The essay topic for 2004 is "Swarming." A swarm of honey bees is fascinating - and it can be frightening for non-beekeepers. For the general public, seeing a swarm fill the air, then pitch on a limb - or even a car - is their introduction to the world of honey bees. Every seasoned beekeeper can relate a tale of an unusual swarm. What are the reasons for swarming? What does swarming accomplish for the bees? What is the effect on the beekeeper? One (only one) humorous - or otherwise interesting - swarming incident is a welcome addition to the essay.

ABF 4-H Essay Awards

Cash Prices to 3 Top Winners:
1st Place $250.00
2nd Place $100.00
3rd Place $50.00
Each State Winner, including the national winners, receives an appropriate book about honey bees, beekeeping, or honey.

Students interested in writing should contact their local 4-H offices for contest details. The state selection will be done through the 4-H system.

Food and Drug Administration

Booklets Available on Registration Information

FDA has published the two booklets, ***What You Need to Know About Registration of Food Facilities*** and ***What You Need to Know About Prior Notice of Imported Food Shipments***, which cover the key points of the two new interim final regulations for manufacturing/processing, packing and holding facilities, and for importers, filers, and brokers of imported food. Copies may be requested by calling the FDA at 1-800-216-7331.

You may also get the booklets electronically at: http://www.cfsan.fda.gov/~dms/fsbtbook.html

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- The newsletter is printed the 1st week of the month published.
- Copy, art and payment submitted by the 15th of the month previous to publication.
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"Dead Bees in the Snow" from Bee Tidings From University of Nebraska *Marion D. Ellis*

Why would a honeybee leave a nice (relatively) warm, safe environment--to die in the snow? Snow-covered apiaries always bring interesting questions. A white blanket surrounding the apiary makes some aspects of the bee's annual life cycle more apparent to the observer. When apiaries are surrounded by grass, leaves and twigs, dead bees and bee feces are not easily observed. It is not unusual for a colony to loose 2/3 of its population from late summer to the following spring when brood rearing begins in earnest and populations begin to grow. This means that individual colonies can have 30,000 or more bees perish in winter as part of their normal colony life cycle. Without snow, the dead bees are scattered among grass and leaves. When snow is present, the deceased are readily apparent, and beekeepers who are unfamiliar with this aspect of colony life assume that a catastrophic event has befallen their colonies. Likewise, as with dead bees, bee feces are not apparent on grass and leaves, but they are readily observed on snow. Bees accumulate waste in their hindgut during cold weather. When temperatures rise enough to permit flight, large numbers of bees take to the air to relieve themselves. Nosema and high moisture honey can exacerbate the need to defecate. Both can cause an abnormal amount of feces to be deposited around the hive entrance and abnormal winter mortality. Why do bees leave their colony to die in the snow? There is not one answer to this question. Bees need occasional flights in winter to void their waste. If they become chilled on their "cleansing flight," some otherwise healthy bees may not return. Bee's thoracic muscle temperature must be greater than 90 degrees F. to sustain flight. On sunny days they can raise their thoracic temperature by basking in the sun. In cool weather bees rely on the collective metabolic heat of their nest mates and shivering to raise their thoracic temperature. Bees stressed by diseases, parasites or dysentery are less likely to complete the round trip. Like any other organism, bees have a limited life expectancy. In the summer bees live 5-6 weeks. However, fall bees build up their fat bodies and live longer than their summer-born compatriots (in insects, fat bodies are a good thing!). Diseases and parasites can increase the rate of winter mortality. Nosema, tracheal mites and Varroa mites are frequently implicated in abnormal winter mortality. Many of the dead bees observed in snow died in the hive and were carried out by their nest mates.

International Updates

Canadian Honey Council

Checkmite registration for Canada delayed

The Pest Management Regulatory Agency announced that its work plans for April 2003-June 2004 include a re-evaluation of all food use organophosphates. The list includes Coumaphos which is the active ingredient of Checkmite +. While the re-evaluation is in progress, the PMRA will not accept any new registrations. This means that no submission can be made by the manufacturer Bayer Crop Science, until June 2004. It is unlikely that Checkmite will have full registration before 2006. In the meantime each province has to run expensive testing programs to prove that they have fluvalinate resistant mites in order to have PMRA approval for emergency use permits.

Europe sets MRL for Oxalic acid

The process for establishing an official Maximum Residue Level for oxalic acid in honey has been completed in Europe. Dr Eva Rademacher, Berlin University, Germany reports that the CVMP (meeting of 9-10 December 2003) agreed to recommend the inclusion of a MRL for oxalic acid in honey without further questions.

New Zealand & Australia

Nitrofuran in Argentine Honey
InFARMation.com.au reports 11 Dec 2003
(from Queensland Country Life, 11/12/2003):

Media reports of nitrofurans in Argentine honey imported into Australia are highly exaggerated. Imported honey meets standards.

Nitrofurans are antibiotics widely used to treat cystitis in women, with a typical daily dose being 50 mg. Nitrofurans also are veterinary medicines banned from use in food-producing animals in the EU. This is due to concerns about the possibility of an increased risk of cancer if people are exposed to low levels of Nitrofurans over a long period of time.

A person would have to eat 250,000 jars of honey containing 1 ppb of nitrofuran to get the same therapeutic dose. Mr. Ware said in fact, according to Food Standards Australia New Zealand, you could eat 70 jars of honey containing 1 ppb of nitrofuran every day for the rest of your life without any negative effects.

Honey imported into Australia meets local and overseas regulatory requirements, despite a TV program suggesting to consumers that the presence of the antibiotic nitrofuran in the honey is being covered up. The Australian Honey Bee Industry Council says the program actually indicated that most of the honey tested fell well within internationally accepted limits.

Most of the tests reported were below one part per billion, which is the European Union's Maximum Residue Limit for nitrofuran in food, AHBIC's Stephen Ware said. Four of the five tests gave results below 1 ppb while the fifth test was marginally above 1 ppb. This clearly means that honey on Australian shelves is completely safe for consumption.

GM PLANTS SAFE FOR BEES
From Rural News (New Zealand) 9/17/03 E. Tankersley

Studies have shown genetically modified plants have little or no impact on bee health, says HortResearch scientist, Louise Malone. However, bees still need to be taken into account when GM plants are considered for field trials or release.

Malone, who spoke at the Foundations for Success conference in Wellington, says bees contribute $2.7 billion to the New Zealand economy each year, playing an important role in the pollination of clover in pastures and also of vegetables, seeds and fruit, especially kiwifruit. The New Zealand beekeeping industry makes $57m a year from honey, live bees, pollen, wax and propolis.

Malone says of the crops grown in New Zealand for which GM varieties are or may one day be available, some, including white clover, kiwifruit, apples, canola, seed brassicas, eucalyptus and seed onions, are important honey species or require bees for pollination. Potatoes, maize and ryegrass can be visited by bees if there is no better forage available.

Malone says HortResearch has looked at the possible impacts of GM plants on bee health since 1995, working closely with overseas scientists. Because bees only eat pollen, nectar, resins and honeydew of plants, a bee can only be affected by a GM plant if the plant expresses a new protein in these parts. That protein, in turn, must have some biological activity against the bee.

The HortResearch team has developed a system where the possible effect on honey bees can be studied without actually using GM plants. Adult and larval bees are fed purified proteins -- at a range of concentrations -- identical to those produced by GM plants. Malone says the team choose proteins designed to control insect pest populations because these are the most likely to affect bee health.

The trials found Bt toxins (designed to control caterpillars) and biotin-binding proteins (for general insect control) had no effect on bee health. Protease inhibitors (used for caterpillar and beetle control) had a slight effect on bees at high concentrations, shortening their life-span by several days.

Malone says overseas studies, where it is easier for researchers to work with flowering transgenic plants, have found most GM plants produce only minute quantities of new proteins in pollen and none in nectar. They have also found no negative effects on bees on plants modified to be insect, herbicide or disease-resistant.

Malone says researchers in Canada are beginning a four-year study on pollinator diversity on conventional, organic and GM canola and sweet corn crops.

From your editor

The first *e*copy of the newsletter was published in December. I have gotten tremendous support for more of the same. I will continue to work on the format as I get feed back from you. Email me pictures and I'll print them in the newsletter!

If you would like to receive your copy of the newsletter via email please call or write and I will add you to the *e*list! My email address is plundy@seagen.com.

I am always interested in hearing your opinions so please do write me. Dang, did I just sound so very lonely?

Paul Lundy

Electric fence is good for bees & bad for the bears!

NEXT MEETING!
WSBA Executive Board Meeting
March 6, 2004 Starting at 10AM
Cattlemen's Club at
1301 N. Dolarway Road, Ellensburg, WA 98926
Everyone is Invited,
especially your local Association Presidents.

Directions from I-90:

From West: Exit 106 follow road over overpass, at the four-way stop turn right.*

From East: Exit 106 take a right at end of off ramp. At four-way stop turn right.*

*After right turn, Cattlemen's is the next building after the 76 station.

In The Next Newsletter;

- Local, Regional and National updates.
- Want more? Write me with your suggestions.
- The annual survey of pollination economics in the Pacific Northwest (PNW) for 2001 – 2002 by your favorite OSU researcher Michael Burgett will be in the next newsletter.

Even if you elected to receive the email version of the newsletter, you will receive a print version of this newsletter in the mail.
If you owe dues for 2004 the mailed newsletter will have a bright **ORANGE DOT** on the cover. The dot means you need to pay dues for 2004!!

WSBA Beekeeper Classified Ad Form

Classified ads are $5 per insertion, for a maximum of 30 words. (***FREE for WSBA Members***).
To place an ad, please fill out and mail this form, with payment made out to:
Washington State Beekeepers Association
c/o Newsletter Editor
P.O. Box 1331
Kingston, WA 98346-9301
Fax: (425) 527-4251
Please CLEARLY PRINT your ad below. Don't forget to include your contact information (phone, fax, e-mail).

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Your ad will run in the next printing of the Newsletter when received by the 15th of the month prior to publication.
(You may email your submission to plundy@seagen.com and mail your payment to the P.O. Box.)

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WASHINGTON STATE BEEKEEPERS ASSOCIATION
2004 MEMBERSHIP APPLICATION

The fees listed below cover WSBA membership for one person. Additional persons from the same operation may join for $7.50 each.

Check one category:

___0 to 50 colonies................$15.00	___1,501 to 2,000 colonies..............$90.00
___51 to 150 colonies...............$22.50	___2,001 to 3,000 colonies............$120.00
___151 to 300 colonies............$30.00	___3,001 to 4,000 colonies............$150.00
___301 to 500 colonies............$40.00	___4,001 to 5,000 colonies............$180.00
___501 to 1,000 colonies..........$55.00	___5,001 to 6,000 colonies............$225.00
___1,001 to 1,500 colonies.......$70.00	___6,001 or more colonies...............$250.00

___Industrial/Supply Member $50.00

Your contributions to our research and scholarship funds are much appreciated:

ROY THURBER SCHOLARSHIP FUND $___________________

CARL VANWECHEL RESEARCH FUND $___________________

ALVINA TIMMONS SCHOLARSHIP FUND $___________________

Name:____

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Phone: (_______) _________________Total Enclosed_________________________

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Send annual dues to: Washington State Beekeepers Association
P.O. Box 1331
Kingston, WA 98346-1331

NOTE: The annual membership fee is payable in advance. Keep your dues current to remain on the mailing list for the WSBA NEWSLETTER.