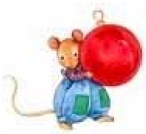
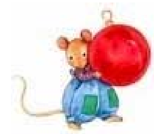
Washington State Beekeepers Association



Keep the "Bee" in Business



Publication of Washington State Beekeepers Association www.wasba.org December 2004

President's Message

Think about it. Our bees are put to bed for the winter unless you need to winter in California, and we have time to reflect on the past season and the next season. Looking at what worked and what did not work and what we want to change for next season.

I sure could do with fewer mistakes on my part. And of course we have the added problem for next year; how many of our honeybee pests are resistant to whatever we treated them with and won't know till spring. The reports out of California are not good and that has to concern us all. You have to be concerned also about packages for next season.

Our joint meeting with Oregon is on and we are in the planning stages now. We are planning on meeting in Oregon at Newport Oct 28-30, 2005. More info will be forthcoming. We will be at the Agate Best Western at Agate Beach.

January 8, 2005 at our executive board meeting will be at the Bar 14 restaurant in Ellensburg. My goal is to start at 10 AM with the different committees meeting until 11 AM to work on their issues and be ready to report at the Board meeting. I expect we will be having a Master Beekeepers Meeting, and several other committees. From 11 till 2 PM we will have our board meeting. You'll be able to order lunch to eat during the meeting. I'm looking forward to starting a new year with new ideas and energy.

Jerry Tate

2005 Convention Planned

Joint meeting in Oregon-Oct 28, 29 and 30 2005

In 2005 the convention moves from the previous joint meeting location in Hood River to the Oregon Coast at Newport Beach. The convention will be held at the Agate Best Western at Agate Beach. Rooms rates are reasonable and there will be a meeting room large enough for 400 people and a large area for vendors.

Speakers confirmed so far:
- Mr. Clint Walker
- Dr. Marla Spivak
- Dr. Eric Mussen

Washington State Updates

2005 Program Calendar for the Association.

JANUARY 8, 2005: WSBA Executive Board Meeting
Bar 14 Ranch House Restaurant
1800 South Canyon Road, Ellensburg, WA
10 AM to 2PM

MARCH 2005: WSBA Executive Board &
General Membership Meeting
LOCATION TBA

JUNE 2005: WSBA & WSU June Field day TBA

OCTOBER 2005: WSBA & OSBA joint meeting
Oct. 28, 29 & 30th in Oregon
Executive Board Meeting TBA

Alternating treatments
Exploring an IPM Approach for *Varroa* Control

By: Nathan D. Rice and Mark L. Winston
Dept. of Biological Sciences,
Simon Fraser University, Burnaby, B.C.

Beekeepers in Canada have been coping with the varroa mite since the early 1990's and have come to accept that management of this pest is a part of required beekeeping management. We have been fortunate to have the pesticide Apistan available for varroa control, and have come to depend on it to keep our colonies close to mite-free. However, through misuse, overapplication, and the lack of other control methods that are as effective and easy to use as Apistan, mite populations in North America are becoming resistant to the

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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. ***The ad will run for two (2) newsletters.*** (You may email your submission to plundy@seagen.com and mail your payment to the P.O. Box.)

International Updates

Canada

Formic Acid Registration

Formic acid and associated end-use products (NOD Formic Acid Pad and Mite-Away II(tm) Formic Acid Pad), for treatment of varroa mites and trachealmites in/on honeybees, are proposed for registration under Canada's Section 13 of the Pest Control Products Regulations.

The document is available for review in PDF format (166Kb file) from the Canadian PMRA website, at http://www.pmra-arla.gc.ca/english/pdf/prdd/prdd2004-05-e.pdf.

The 45-day comment period ends 20 December, 2004.

The Bee Masters' 2005 Short Course is set for February 28–March 4, 2005, at Simon Fraser University's main campus in Burnaby, British Columbia.

This is an advanced level course, and participants are expected to have kept bees and have some knowledge about bees and beekeeping. Topics include: spring, summer and fall management, wintering, queen rearing, swarming, bee behavior, hive products, adult bee diseases, exotic mites, nucleus production, bee brood diseases, pollination, and much more. Participation is limited to 50.

Special Guest Lecturers

Rob Currie, University of Manitoba
Keith Delaplane, University of Georgia
Tanya Pankiw, Texas A & M University
Stephen Pernal, Agriculture Canada

Local Speakers

Mark Winston, Simon Fraser University
Paul van Westendorp, BC Ministry of Agriculture & Food (Apiculture)
Margriet Dogterom, Crop Pollination Consultants

Registration Information

Conference Services, Halpern Centre
Simon Fraser University
8888 University Drive
Burnaby, BC V5A 1S6 CANADA
Telephone: 604-291-4910 or 604-291-3012
Fax: 604-291-3420 • Conference_Services@sfu.ca

Master Beekeeper Program, Certification Update

Master Beekeeper Certification Course: Category #8
Category: Pollen and Pollination

By: Louis A. Matej, BS Clin. Chem (Pierce County Beekeepers Association)

ABSTRACT

Pollen and Pollination

While carbohydrates provide the honey bee with necessary energy for heat, metabolism and movement, pollen provides the bee with essential nutrients for brood rearing, synthesis of needed metabolites, and maintenance of honey bee viability.   Not only does pollen contain all the 23 essential amino acids needed for protein production, it also contains at least 18 vitamins, 25 minerals, 59 trace elements, 11 enzymes or co-enzymes, 14 fatty acids, and 11 carbohydrates.   Pollen predominantly contains 25% protein, 48.5% carbohydrates, 9.9% fatty acids, 14.2% fiber and 3.5% ash.   Since it varies from one plant species to another, it is important for the beekeeper to understand the needs of the hive in terms of the availability of all nutrients for a healthy colony.

Pollen is a very elemental source of rich protein but also it is very low in fat while being easily obtained by the honeybee.   Since it is such a high protein source, body builders use honey to provide a rich source of protein with a low fat content.   Also, not only is pollen essential to the bee, it provides valuable vitamins, minerals, and other nutrients for building strong healthy bodies.   This makes it very profitable for the bee as well as for human consumption.

When pollen is scarce during the time of brood rearing, because of location or weather, the beekeeper has the option to move his bees to a pollen rich area or to provide a pollen substitute to the bees to allow for maximum build-up for the honey flow.   A pollen substitute or pollen supplement will not provide the same nutrition and brood rearing capability as normal incoming pollen, but it will provide needed nutrients to prevent a total shutdown of brood rearing and colony viability.

The value of honey bee pollination of agricultural crops amounts to around $6 billion dollars.   It is extremely important for the beekeeper who engages in commercial pollination to manage his colonies to meet the minimum standards required by the particular state where the hives are located.   Oregon and Washington have regulations which must be met in order to legally engage in commercial pollinations services.   The beekeeper must be aware of the quality of the queen, the health of the colony, the amount of brood present and the number of foraging bees available for each hive he wishes to hire out for pollination.

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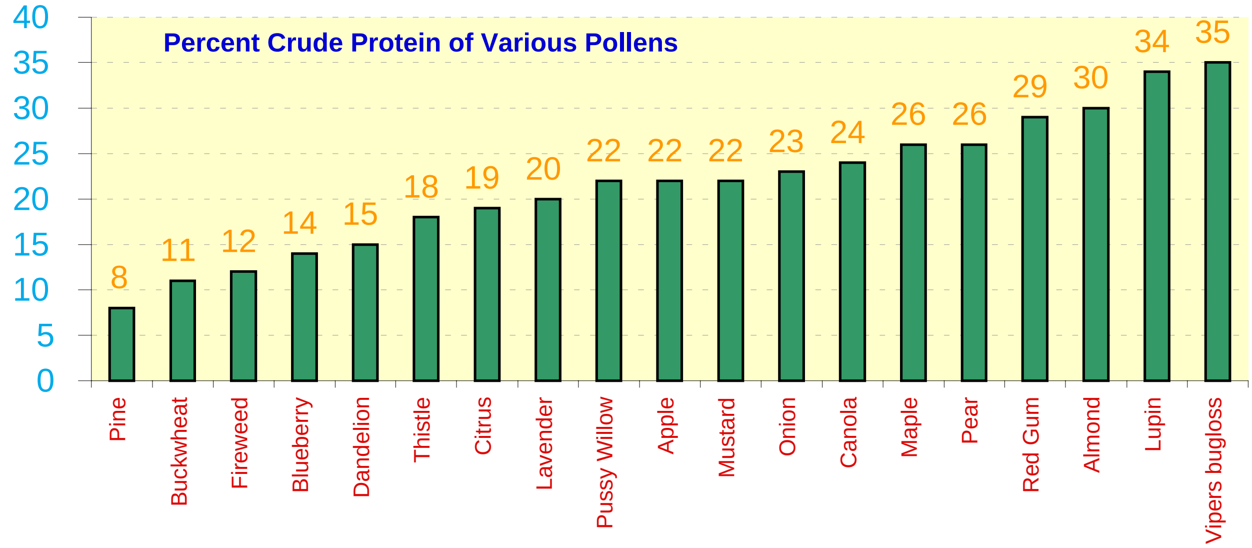
The Nutritional Value and Chemistry of Pollen from Various Sources, both for Colony Management and Human Consumption, to include the Assessment of a Colony for Commercial Pollination

The Chemistry and Composition of Pollen

Pollen is a very interesting and valuable food, providing a source for both energy production and protein synthesis for many insects. It is estimated that one colony needs a minimum of around 66 lbs. of pollen per year or in other words, one pound of pollen is needed to rear and support approximately 4,000 bees. Pollen consists of 8-40% protein, 15-45% carbohydrates, 1-15% lipids, minerals, vitamins, ash and other minor components. As opposed to anemophious (wind-borne) pollen, entomphious (insect-transferred) pollen is heavier, stickier, and more colorful coming in shades of yellow, brown, orange and red. The honey bee (*apis melifera*), obtains virtually 100% of it's protein as well as many nutrients and vitamins from pollen. As we can see from the chart below, not all pollen contains the same amount of crude protein.



Pear nectar is very low in sugar content, however it's pollen is relatively rich in protein. On the other hand, fireweed is a very high honey producing plant here in the northwest, yet it's pollen is of poor quality. Alternatively, just because the percent crude protein of a particular pollen is high doesn't mean it is of high quality. Pollen is classified into four main groups depending upon the quality in providing longevity and broad development: Highly nutritious, Less nutritious, Fairly nutritious, and Poorly nutritious.

	%		ppm
Protein	23.7	Iodine	Trace
Carbohydrates	27.0	Fluoride	Trace
Lipids	4.8	Selenium	Trace
Phosphorus	0.53	Thiamine	Trace
Potassium	0.58	Niacin	Trace
Calcium	0.23	Riboflaven	Trace
Magnesium	0.15	Pyridoxine	Trace
Sodium	0.04	Pantothenate	Trace
	ppm	Folic Acid	Trace
Iron	140	Biotin	Trace
Manganese	100	Vitamin B12	Trace
Zinc	78	Vitamin C	Trace
Copper	14	Vitamin A	Trace
Nickel	4.5	Carotenes	Trace
Boron	Trace	Vitamin D	Trace
Chromium	Trace	Vitamin E	Trace
Molybdenum	Trace	Vitamin K	Trace

In addition to proteins which are broken down into amino acids, pollen contains a variety of vitamins and minerals as well as some lipids. Here is a chart listing the average amounts of substances contained in various pollens:
Vitamins and minerals are used by the bees to produce enzymes, pheromones, venom, and a variety of catalysts which aid in biochemical reactions involved in metabolism.

Since bees do not store fat as humans due, lipids are metabolized immediately. Some make their way into the biochemical pathways leading to the production of bees wax.

Having all of the essential amino acids available to the bees at all times and especially in the spring

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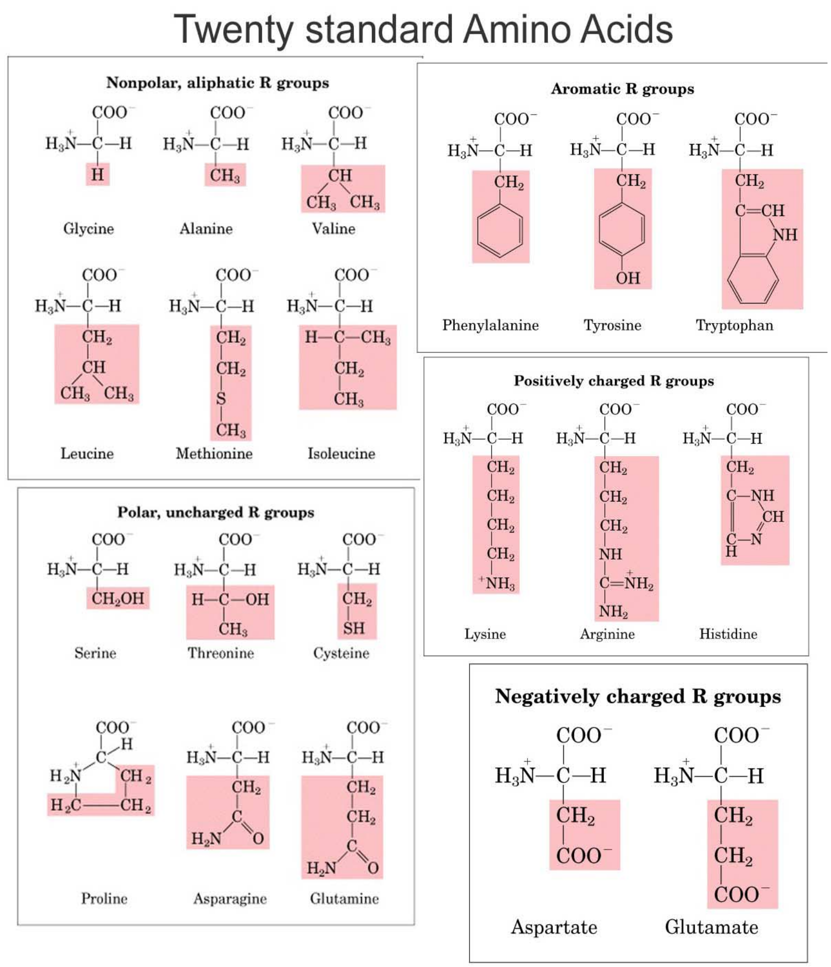
when brood rearing is in full gear is necessary for proper growth and survival of a colony. Amino acids and glucose are equally necessary for bee and if we feed sugar syrup to the bees in the spring we should also be aware of their need for a total essential amino acid supply.

Proteins are synthesized in the ribosomes of cells and consist of chains of amino acids. There are 22 known amino acids. Although honey bees need all 22, especially for growing brood, 10 of these are highly essential to the honey bee for survival. How is a pollen analyzed for it's nutrition? Two factors are important in a good pollen: 1. High in percent crude protein and 2. High in quantity of the 10 essential amino acids necessary to the bee. They are: Arginine, Histidine, Lysine, Tryptophane, Phenylalanine, Methionine, Threonine, Leucine, Isoleucine, and Valene.

Here is a chart showing the chemical structures and differences of 20 amino acids:



When assessing a natural pollen source, the beekeeper should be aware of the quality of the pollen. If the bees do not have access to other pollens, one source of pollen may not provide adequate nutrition for the bees. Bees generally prefer a mixture of many different pollens because not all pollens are equal.

From the chart below you can see that pollen from blueberry flowers are sufficient in providing Arginine, Leucine and Valine, but are deficient in Histidine and Tyrosine. On the other hand, Sunflower is sufficient in Histidine and Leucine, but deficient in Arginine:

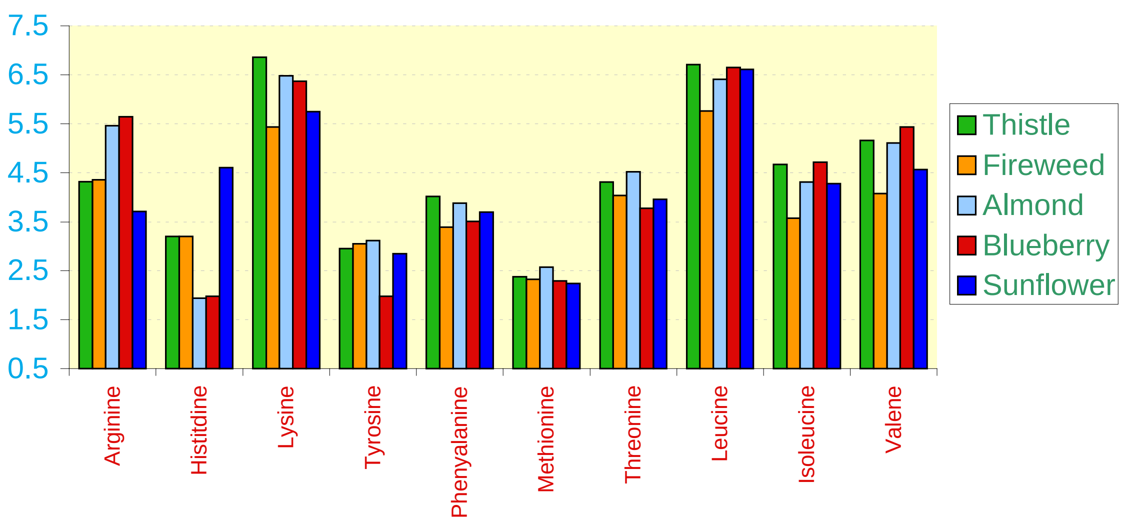


Chart:
% of each Amino Acid (Arginine, Histidine, Lysine, Tyrosine, Phenylalanine, Methionine, Threonine, Leucine, Isoleucine and Valine) to Total Amino Acid Content in Thistle, Fireweed, Almond, Blueberry and Sunflower Pollen

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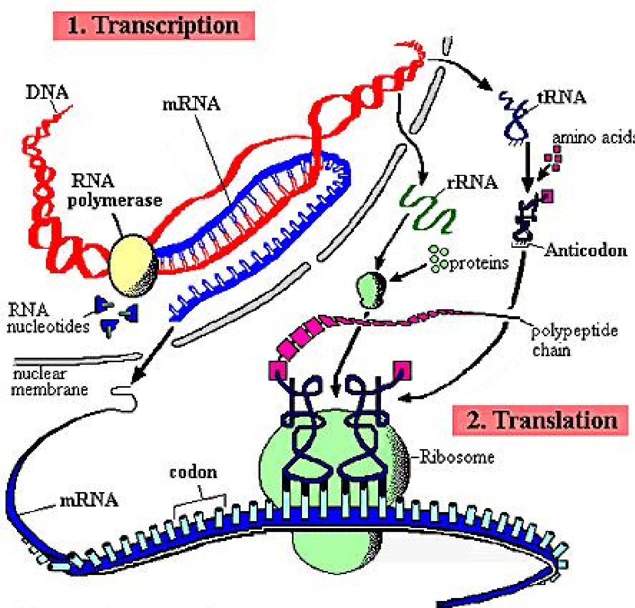
The utilization of pollen by the honeybee for metabolism and brood production

Protein Production

Why is it important for bees to have access to all amino acids? This is because when protein synthesis occurs in the ribosomes of cells, all amino acids and especially the 10 most important amino acids must be randomly available or protein synthesis will not occur or it will be slowed down. Honey bee larva grow at a very fast rate and protein synthesis is occurring rapidly. A lack of available amino acids will slow or even stop brood growth and survival. Below is a diagram of the protein synthesis on a cellular level. Transcription of genetic information occurs in the nucleus of cells. Messenger RNA (mRNA) carries this information to the ribosomes where translation occurs and proteins are produced. Proteins are chains of amino acids. Pollen is the only source of these amino acids for honey bee protein synthesis. Notice the random amino acids needed for protein synthesis to occur:



Protein synthesis

Here all 22 amino acids are needed randomly to allow needed proteins to be synthesized in the cells of honey bees and brood. Millions of different proteins are synthesized from the amino acids derived from pollens.

Proteins are synthesized by connecting amino acids through polypeptide bonds. The sequence is derived from messenger RNA (mRNA) transcribed from the DNA sequence in the nucleus. This protein synthesis is called Translation and happens in the ribosomes of all honey bee cells.

So you can see without pollen or a pollen substitute, bee brood cannot grow since translation cannot occur.

Amino Acid Metabolism (Catabolism)

Amino acids from pollen, like nectar, are also used by the honey bee to produce energy. The metabolism of amino acids involves 2 basic step common to all the different amino acids:

1. Transamination of Amino Acids

   In this step amino acids are converted to glutamate and Keto acids. Keto acids are used up to produce energy and for the synthesis of carbohydrates.

$$\text{Amino Acid} + \text{a-ketoglutarate} \xrightarrow{\textit{transaminase}} \text{Keto Acid} + \text{Glutamate}$$

2. Oxidative Deamination of Glutamate

   This final step converts glutamate to a-ketoglutarate which enters the Kreb Cycle (Tricarboxylic Acid Cycle) and is utilized for the production of stored chemical energy (NADH), which the bee needs for movement and heat. NADH is transported to the mitochrondria of various cells (such as the bee wing cell) and through oxidative phosphorylation is converted to energy to provide movement and heat. You will also notice that a-ketoglutarate is recycled for use in the above reaction.

$$\text{Glutamate} + NAD^+ \xleftrightarrow{\textit{Glutamate dehydrogenase}} \text{a-ketoglutarate} + NADH + NH_3$$

Even though honey is used as the major source of energy, we can see that the honey bee also uses pollen for energy and heat production in addition to it's main use in protein production.

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WASHINGTON STATE BEEKEEPERS ASSOCIATION
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 $____________________

NOTE: Annual renewal for membership is due by March 30th each year. ***New memberships are accepted any time***. Keep your dues current in order to vote on issues presented at State meetings and to remain on the mailing list for the WSBA NEWSLETTER.

§ § § § § § § § § § § § § § § § § § § §

Name:____

Address:____

City:__________________________________State:___________Zip:___________

Phone: (_______) _________________Total Enclosed________________________

E mail address____

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

Master Beekeeper Program, Certification Update

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An Analysis of Pollen Substitutes

When pollen is scarce, pollen substitutes aid honey bees in providing the needed protein, vitamins, minerals, some carbohydrates and fatty acids for survival and growth of the colony. It is important to know that a pollen substitute enhanced with pollen itself becomes what is termed a pollen supplement. A pollen supplement adds to the nutrition as well as the attraction of honey bees. These supplements should be given 6 to 8 weeks prior to the honey flow and have been shown to increase honey production up to 38%.

Depending on how much a beekeepers is willing to spend, there are a number of pollen substitutes which vary in nutrition, ease in use and availability.

Over the years, brewer's yeast has been used as a pollen substitute. More recently soybean flour and wheast (a combination of low-lactose whey and yeast) have been used. These are made by adding 3 parts brewer's yeast, soybean flour or wheast and 3 parts of sugar to 2.5 parts of water forming a patty. When adding pollen you should use a 3:1 mixture of brewer's yeast or wheat flour to fresh natural pollen. Add this to 2 parts of a sucrose syrup (for brewer's yeast 6:1 sucrose/water; for wheat flour 2:1 sucrose/water).

There are currently available at various prices commercial brands such as Bee-Pro and Feed-Bee. These are more expensive but they have been formulated to give maximum nutrition for honey bees.

It was determined that the effectiveness of pollen substitutes was attributed to their high attractiveness to the bees, which means that if you add natural pollen to any of the above, their effectiveness is increased.

A good pollen substitute should contain all amino acids and the B vitamins: thiamin, riboflavin, niacin, pyridoxine, pantothenic acid, folate, biotin and vitamin B-12. Many trace minerals including chromium and selenium must be present. Para-aminobenzoic acid and myo-inositol are other important ingredients necessary for a good substitute.

Remember that no pollen substitute or pollen supplement can take the place of pure natural pollen in providing necessary nutrition for the bees during brood rearing. They are used to help bridge the gap in times of initial and heavy brood production when good pollen sources are not available.

Evaluation of a Colony fit for Commercial Pollination

Although it is important for the farmer to determine how many bee colonies to use to adequately pollinate his crop, it is also important that he be provided by the beekeeper with strong hives. This is important not only for the crop pollination itself but also for legal reasons since the beekeeper is receiving pay for providing pollination.

It is interesting to note that Washington and Oregon have different regulations on the requirements for a colony used for pollination. This is because Oregon has 2 grades of colonies due to 2 different types of pollination requirements: Grade B: Field and Grade A: Orchard. Since fruit trees bloom early the requirement is less; this is because hives are not at their peak and are still building up from the winter.

A good hive for pollination should have lots of brood. This is because brood needs to be fed and maintained. Furthermore, the more bees that are born, the more bees can be transitioned into foragers.

1. Amount of Comb:
   Although a one deep-hive body hive meets the minimal requirement in Washington State., it does not meet the requirements in Oregon. Typically in both states a colony should contain 2 standard deep hive bodies or one deep and an additional western hive body.
2. Amount of Brood:
   The very minimum amount of brood necessary is 750 square inches, which is about 4 frames; however, for a Grade B colony there must be 1,000 square inches of brood. This amounts to around 5 or 6 frames of filled brood.
3. Amount of Worker Bees
   The number of worker bees needed to qualify as meeting the requirements in Oregon for commercial pollination is 6 (Grade A) to 10 (Grade B) frames full of well covered frames. This equates to around 15,000 to 24,000 bees. Notice that the Grade B Field colony is stronger than the Grade A Orchard colony. In Washington you must have 6 frames which are 2/3rd covered with bees at 65º F. This equates to around 10,000 bees. However, at 65º F there would be about 1/3 of the bees foraging so the number of total required bees would be around 15,000 per hive.
4. Food Requirement:
   There should be about 10 pounds of honey in each hive to provide the bees with food to maintain healthy bees and queen.

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Master Beekeeper Program, Certification Update

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In conclusion, it is very important for the beekeeper and the commercial grower to know the requirements of a colony fit for pollination. The commercial grower has the right to be shown frames from random colonies to insure proper minimum requirements are met.

In Washington State a colony which meets the minimum requirements must have at the very minimum 1 deep hive body with about 15,000 bees and having at least 6 frames which are 2/3rd covered with bees at 65º F and containing about 10 lbs. of honey.

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Classified Ads

Other News

Journal of Economic Entomology
2004, vol. 97, no. 5, pp. 1500 - 1508

Effect of Formic Acid Formulations on Honey Bee (Hymenoptera: Apidae) Colonies and Influence of Colony and Ambient Conditions on Formic Acid Concentration in the Hive

David J. Ostermann; Robert W. Currie

Abstract
The interaction between the effects of varroa, *Varroa destructor* Anderson & Trueman, and formic acid treatments on colonies of honey bees, *Apis mellifera* L., were examined in two field experiments.
In experiment 1, colonies with low varroa levels were exposed to two different slow-release formulations and compared with untreated colonies. In experiment 2, colonies inoculated with varroa and uninoculated colonies were exposed to a slow-release formulation, a pour-on formulation, or were left untreated.
The effects of treatments, hive temperature, and hive relative humidity on formic acid concentration in hive air also were examined. Slow-release formic acid application improved colony development in colonies that had been inoculated with varroa. However, in uninoculated colonies where the mean abundance of varroa was low, slow-release formic acid application suppressed colony development. The pour-on application did not have a negative impact on worker population growth in uninoculated colonies, but also it was not as effective as the slow-release treatment in improving population growth in varroa-inoculated colonies.
Equivalent volumes of acid applied in pour-on and slow-release formulations provided the same cumulative dose in hive air but differed in the daily pattern of formic acid release. Colonies that were not inoculated with varroa had higher concentrations of formic acid in hive air than colonies that were inoculated with varroa on three of the five pour-on application dates.
The data suggest that reductions in worker population and/or activity caused by varroa can interact with ambient conditions to affect the volatilization or sorption of formic acid in the hive.

This research article is available free in pdf format from the Journal of Economic Entomology at; http://dandini.esa.catchword.org/vl=1042639/cl=54/nw=1/rpsv/cw/esa/00220493/v97n5/s3/p1500

IPM from page 1

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single most important tool we have in controlling this devastating pest.

There are other means of treating varroa. For example, formic acid was recently developed in Canada to control both varroa and tracheal mites, and there is a wealth of information available on cultural practices that can be used to lower mite infestation levels. In addition, the organophosphate coumaphos was recently registered for emergency use in the United States to control the varroa mite and the small hive beetle. The registration of coumaphos, however, is a temporary solution, as beekeepers will soon be faced with the same pesticide resistance treadmill that has become all too common in agriculture generally, and now beekeeping. Farmers are forced to apply more and more pesticides to control pests that are becoming increasingly resistant to the chemicals already being used.

The beekeeping community is currently in a unique decision-making position about this chemical dependency. Do we hop onto the treadmill with so many other agricultural systems, or do we adopt a pest management ideology that may be more time consuming, but will allow honey and other bee products to keep their "natural" reputation? We've already taken the first steps down the pesticide pathway, and they have been useful steps. What we need to decide now is how much farther down the path we want to go.

The idea of Integrated Pest Management, or IPM, may provide the balance between pesticide use and overuse. IPM has the potential to allow beekeepers to keep their operations relatively chemical free and also has the power to prolong the life of existing pesticides such as Apistan. IPM relies on multiple control methods as the best approach to pest management. If only one pesti-

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IPM, continued

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cide is being used to control a pest, there is an excellent opportunity for resistance to develop. The goal of IPM is not to eliminate chemical use, but to reduce the amount and frequency of pesticide applications.

The varroa problem is a perfect candidate for IPM. We already have several different control methods available to us: Apistan, formic acid, drone comb trapping, hygienic queen selection, modified bottom boards, essential oils such as thymol, and others. What we need to determine is how these control methods can be used in concert, and compare them to Apistan.

My research is comparing an IPM treatment (thymol + modified bottom boards + hygienic queens) to Apistan to determine if the IPM system could provide similar varroa control. The three control methods I am combining are simple and have been used separately by beekeepers. Thymol is a natural insecticidal substance found in plants of the Thymus family, including such familiar kitchen spices as thyme, basil, and oregano. Modified bottom boards prevent mites that have fallen off of bees from returning to the hive using a screen over a dead air space so that mites fall through the screen into the empty space below, are unable to hitchhike back into the colony, and eventually starve. In addition, some lines of bees are genetically predisposed to be more hygienic that others. All bees will clean out dead, or diseased brood, but hygienic bees do it more quickly and thereby can prevent mites from completing their reproductive cycle. Using a simple brood kill method, a colony can be tested for hygienic behavior and new queens from that colony can be cross-mated with drones from a separate hygienic colony. Those new queens produce offspring that expresses the hygienic behavior.

I also am testing alternating Apistan with thymol in fall and spring treatments, since alternating compounds can eliminate one of the main causes of resistance, repeated application of a single substance.

I measure four variables: brood population, adult bee population, honey production, and mite population, to determine colony health and what effect these treatments are having on colonies. To date, there has been no statistical difference in the adult bee or brood population in any treatment during the experiment (Figs. 1, 2), nor has there been any effect on honey production (Fig. 3). Thus the treatments are not detrimentally effecting adult bee or brood levels, and honey production is not compromised.

What about the mites? Treatments that received Apistan in the fall have significantly lower mite levels than those that received thymol in the fall or had the IPM system in place (Fig. 4). However, since there is no difference in adult bee levels, brood, or honey production all of the systems are maintaining mite populations to levels below an economically important threshold. Apistan alone may be the best for mite control, but the other systems are good enough and have the added advantage of reducing the likelihood of resistance. There may not be a need to eradicate mites, but only to keep them below the economic threshold.

This is only the first set of data in a long-term experiment, but if the trends shown in the first year continue throughout subsequent years it may call into question some of the mite control methods currently being practiced, especially the emergency registration of chemicals such as coumaphos. Apistan is a useful tool, but it is a chemical pesticide and needs to be respected as such. The boom in organic food production illustrates a trend among consumers towards more natural products, as does the popularity of products designed to remove pesticide and chemical residues from fruits and vegetables. Bee products have always enjoyed the reputation of being natural and it is important to maintain that image. We need to ask ourselves if the application of even more pesticides is the way to do this.

We are at a critical juncture. The decisions we as beekeepers make now will have far-reaching effects. We need to ask ourselves if we want to continue on the pesticide application treadmill that has proven so costly for other agricultural commodities, or if we want to be the vanguard of a new pest management ideology. We are set up to be a perfect example of how IPM can and does work to control pests. With a little extra time and commitment for all of us, we can succeed at reducing pesticide use in bee management.

Acknowledgements

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12/2/2004

ILLEGAL USE OF SODIUM CYANIDE

The United States Environmental Protection Agency (EPA) and state departments of agriculture have recently been alerted that some beekeepers have been using **sodium cyanide compound** to control pests in their honey bee colonies/hives. Specifically, apiarists have been purchasing and using a **sodium cyanide compound** as a fumigant in beehives to destroy or mitigate wax moths[1] including the caterpillar and larvae, as well as to cull out weaker hives. These practices are illegal and have the potential for serious harm to human health and the environment.

All pesticides distributed in the United States must be registered by the EPA. The Federal pesticide law [the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)] defines "pesticide" to include any substance intended for controlling, mitigating or destroying pests. A substance is a pesticide and requires registration as such if the person distributing the substance (1) makes claims, either expressed or implied, that the substance can be used as a pesticide or (2) distributes the substance with the knowledge that the substance will be used to control pests. **Any individual selling or distributing sodium cyanide compound for mitigating any pest, including the wax moth, caterpillar and larvae, or any other pest for use in bee hives or colonies is selling and distributing an unregistered pesticide and subject to penalties of up to $6,500 per violation under FIFRA.**

Currently, there are no sodium cyanide or similar cyanide compound products registered by the EPA for pest control in honey bee colonies/hives. Also, there are no established residue tolerances for any cyanide compound in honey or beeswax. Honey analyzed and found to contain any cyanide compound residue would be considered adulterated under the Federal Food, Drug and Cosmetic Act, and could be seized. The seizure of honey due to adulteration with a highly toxic chemical would be detrimental to the entire apiary industry.

Further, use of **sodium cyanide** in an apiary setting can be extremely dangerous. The compound is highly toxic to humans and other warm-blooded animals, and it is a Toxicity Category I compound - EPA's highest toxicity level for pesticides. This rating indicates the greatest degree of acute toxicity for oral, dermal, and inhalation effects. It is highly corrosive to the skin and eyes. Cyanide can be absorbed through the skin and its vapor is absorbed extremely rapidly via the respiratory tract.

Beekeepers who are currently in possession of the highly toxic, unregistered sodium cyanide compound or related products should contact their state agricultural agency for instructions on proper storage and disposal of the product. The state agricultural agency can also provide information on registered pesticides, such as paradichlorobenzene and aluminum phosphide products, that are legal to use to mitigate pests in honey bee colonies/hives.

[1] Wax moth includes both the Greater Wax Moth, *Galleria mellonella*, and the Lesser Wax Moth, *Achroia grissella,* both of which are sometimes referred to the wax wing moth.

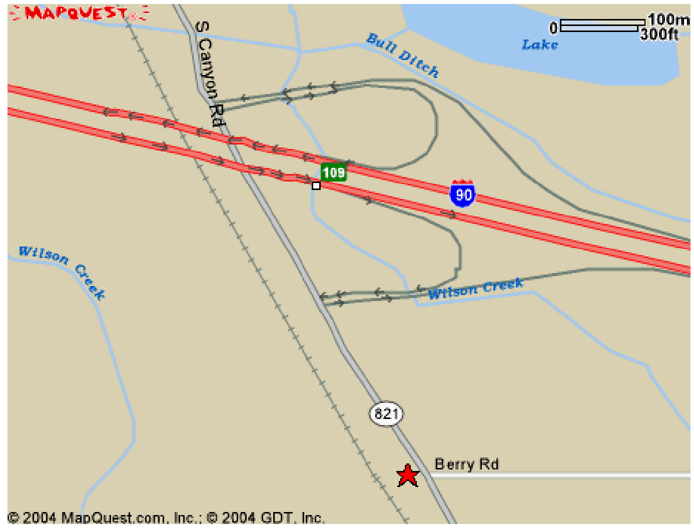
JANUARY 8, 2005

The next WSBA Executive Board Meeting will be held at the:

Bar 14 Ranch House Restaurant
1800 South Canyon Road, Ellensburg, WA
Phone: 509-962-6222

10 AM to 2PM

Everyone is welcome.



Master Beekeeper Certification Committee meets from 10 AM to 11 AM.

Topics include:

- Survey results
- 2005 plans for growth
- Correspondence certification program

Directions from Seattle via I-90:
At exit 109, turn LEFT onto Ramp towards Canyon Road / Ellensburg. Turn LEFT (South) onto Canyon Rd (0.3 miles).

Directions from Spokane via I-90:
At exit 109, turn off onto Ramp towards Canyon Rd. / Ellensburg. Turn LEFT (South) onto Canyon Rd.

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