

MISSOURI STATE BEEKEEPERS ASSOCIATION
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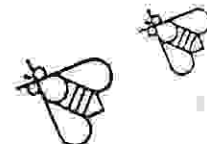
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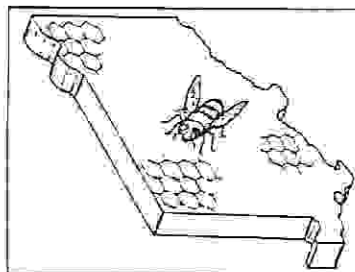
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COMING EVENTS

June 5	Funday	Olathe, KS	Joli Winer	
Aug. 12-22	State Fair	Sedalia, MO	Ed Levinskas	edward.j.levinskas@boeing.com
Aug. 31	Last day to submit articles for newsletter		Pam Brown	
Sept. 1	Nominations due		Art Gelder	
September	National Honey Month		NHB	800-553-7162
Sept. 12-18	Apimondia	Vancouver, BC		604-681-2503
Oct. 1	Agenda topics must be submitted for 10/9 meeting		Ian Brown	
Oct. 9-10	Fall Meeting	Lake of the Ozarks	Larry Hensley	
Nov. 10	Missouri Day at American Royal	Kansas City, MO		
Dec. 13	Govenor's Agriculture Dinner	Tan-Tar-A	Ian Brown	
Jan. 22-23	Ozark Food Show	Springfield	Rosalie Bealer	573-751-6808





Missouri State Beekeepers Association June 1999

April 1999

President's Column

WOW! What a great spring we have had, the temperature, and rain have cooperated and the plants have all bloomed on schedule and beautifully, I might add. The hives are over flowing with bees, hopefully you made splits and had very little or no swarming. The bees have been busy making comb and many hives already have supers.

It doesn't seem possible but the state fair is just around the corner and plans have to be finalized. We are seeking bids to provide our honey and to ask people to commit to working at the fair in order to arrange the manning schedule. Please complete the forms in this newsletter and return ASAP. Thank you.

Jan

Honey of a Verse

Bees in Wet Weather

The beehives look weathered and wet.
I hope the bees are okay. It's not
That much longer till something blooms,
Pussywillows, maybe in February.
Worried about them, all these storms lately,
I go out to the hives, lean down
And put my ear against the wood.
I smell the wax and the honey.
I hear them.
Like a song a child makes to itself
Humming on a comb.

Barbara Drake
Copied from *The Bee Line*
The Newsletter of the Oregon State Beekeepers Association

For Your Funny Bone

NEW AND EXCITING WAYS TO
FEEL MORE BITES!



Nude Beekeeping

A Bit of History

Honey was a vital commodity for the ancient Egyptians, who used it as a food, as an offering to their gods, and as an ingredient in embalming fluids. During the First Dynasty in Lower Egypt, around 320 BC, the bee became the symbol of the pharaoh and was used to represent his kingdom. From then on, the bee was regularly used to symbolize royalty in the hieroglyphs of the time. It is not hard to understand how people felt about the bee and its capacity to create something in such quantity from very little. In the days before biology and botany were understood, people must have thought it was a special kind of magic that turned flower nectar into honey.

Beeswax was also of great importance — it was used for cosmetics and embalming as well as for writing tablets

was then applied with a knife to a suitable surface. Heat was applied to set the colors and make the paint permanent. Encaustic painting was much used by the Egyptians, particularly for decorating the life-size portrait of the face on wood that was laid on the face of a mummy. The Egyptians sometimes paid taxes in honey and beekeepers were taxed on their bounty. Great quantities of it were used as sacrifices, gifts to the gods and as grave goods to accompany kings to the afterlife. Records show that in the twelfth century BC, the king of Egypt, Rameses III, sacrificed 15 tons of honey to the Nile god Hapi — a staggering amount. Honey was also baked into special honey cakes, which were used as offering to placate the gods throughout ancient Egypt. A painted relief from the tomb of Rekmire built around 1450 BC, shows a line of Egyptian bakers making the cakes and putting them in a clay oven. Some uneaten cakes from this period have been found.

A Taste of Honey By Jane Charlton & Jane Newdick published by Cartwell Books, Inc. Page 21

DRAPERS SUPER BEE

We offer fast and courteous service to all beekeepers.

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Address: **DRAPERS SUPER BEE**, 914 S Street, Auburn, NE 68305.

Director's Digest

Glenn Davis, Directorship Expires 2001

No report received by press time.

We want to extend our condolences to Joann and Glenn Davis, on the loss of their 35 year old daughter and to pray that Glenn's good health returns to him. Due to the illness and death of his daughter and the worrying about her children, his heart condition has returned. Any monetary contribution of condolences can be made towards the education of their grandchildren.



We will be voting on a proposed change in Article 4, Section 1 of the Missouri State Beekeepers Association by-laws. "The dues shall be ten dollars (\$10.00) per individual or fifteen dollars (\$15.00) per family, each with voting rights." This change to the by-laws will be voted on at the fall meeting.

1999 State Fair Report

Ed Livistkas, Over All Manager



If you have not received your 1999 Premium Book of Official Rules and Regulations, contact 660-530-5600 or contact an officer of your local association. Information regarding Apiculture can be found on pages 119 & 120.

Please complete the attached bid sheets and return to the designated individuals and return ASAP. Thank you. We need to borrow the following items: freezer, book display rack, brochure display racks, jewelry display rack or case, cash register & chairperson for Sales Committee.

News from the Auxiliary

No report received by press time.



Ray's Remarks

Dr. Raymond Nabors, Missouri Extension Entomologist

No report at press time.

Mike Brown's Comments

State Entomologist

A beekeeper contacted Mike Brown about the possibility of having hive beetles. Upon examination, no hive beetles were found. As far as we know, no hive beetles are in the State of Missouri.

Queen's Piping

No report at press time.

Honey Board Report

Representatives — Sharon Gibbons, Region 5 & Glenn Davis, Missouri

We will be electing a new Honey Board Representative at the October Meeting. We wish to thank Glenn for his six years of service. According to the National Honey Board, no state representative can serve more than 6 years. The Secretary of Agriculture requires that two names be submitted for each expiring position. The Secretary then will make the final selection from the two names submitted.

The Secretary of Agriculture has asked us to identify qualified minority and women candidates for these positions, if possible. A minority is identified as Asian, American Indian, African American, Hispanic or a disabled person.

The obligation our representative would have to the National Board is attending one (expenses paid) meeting each year, usually the meeting is held in October and write a report for the newsletter four times a year.



If you would like to nominate yourself or another individual, please send to Art Gelder, who is in charge of all nominations. Make certain that you indicate if you or your nomination can be classified as female, minority or disabled.

It has also been suggested that the outgoing President be automatically nominated, for this year it would be Neal Bergmann, in six years Ian Brown, the following six years would be Art Gelder, and so on. If an outgoing (past president) declines the responsibility, then another individual would be elected.

All nominations and your thoughts on the past president automatically be the representative, should be received by Ari Gelder by September 1st, so that a ballot can be prepared for our vote to be held in October, at the Lake of the Ozarks meeting.

September is National Honey Month, contact the National Board for your press release packet. Also, request that one be sent to your local newspaper and radio station.

To Our Health

Petroleum Jelly

Petroleum jelly is easy to make and it is an ingredient of many other products. Naturalists may substitute natural oil, such as grapeseed oil or sweet almond oil for the baby or mineral oil to create an "un-petroleum jelly."

1 ounce (weight) beeswax & ½ cup baby or mineral oil

Melt the beeswax in a microwave or a double boiler. Stir in the mineral oil. Remove the mixture from the heat and stir until cool.

Honey Face Mask for Oily Skin

4 Tbls. honey & ¼ cup finely chopped parsley

Combine the ingredients and stir until smooth. Makes enough for 1 application.

Honey Treatment for Very Dry Damaged Hair

3 Tbls. honey & 1 Tbls. olive oil

Stir for a minute or so until the mixture is smooth. Apply to freshly shampooed hair and let soak in for 10-12 minutes. Rinse off with warm water. Makes enough for 1 application.

Fun Fact



For juicy, succulent tomatoes, don't overdo chemical pesticides, heirloom-tomato grower Maryann Underwood recommends growing marigolds between tomato plants. The flower's strong scent drives off pests while attracting bees.

The Tomato How Sweet It Is!
By Malcome McConnel
Reader's Digest, May 1999

Local Association Updates

Midwestern Beekeepers had 110 attend their recent beekeeping class. GREAT WORK!!

May 3rd, Missouri Valley Beekeepers held an advanced beekeeping course in Union, Ray Nabors was the instructor. We heard that it was a super presentation.

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"Bees are our Business"

indicating strong retail orders to replace stock moved in January.

"Honey, You're a Classic" – The National Honey Board has a new recipe brochure available to the honey industry. "Honey, You're a Classic" features color photographs and five classic honey recipes such as Southern-Style Honey Barbecued Chicken and Cinnamon Honey Buns. The brochure folds out into individual tear-off recipe cards.

Assessment paying supporters of the National Honey Board can order up to 500 recipe brochures per year free of charge. Additional brochures are available at 10 cents each. To order brochures, call the Honey Board's automated order line at 888-421-2977. Press "7" and leave your request. Brochures are also available for download from their Web site: www.honey.com.

November 19-20 - Iowa Honey Producers Annual Meeting, Best Western Regency Motel, Marshalltown – Patty Stewart – 619-662-4145

News Releases

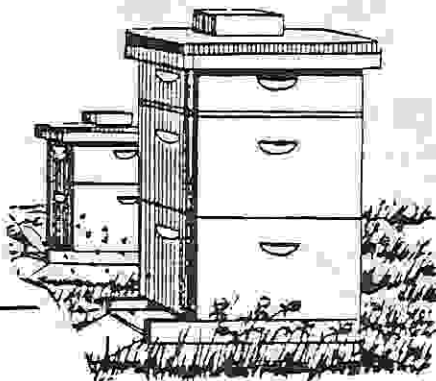
"Give Your Honey a Squeeze" Ad Campaign a Success – The National Honey Board is pleased to announce the results from the "Give Your Honey a Squeeze" advertising campaign that appeared in supermarkets across the country during late December 1998 and early January 1999.

According to Nielsen market research, honey enjoyed a 6.74% overall retail sales increase during the four weeks honey health messages appeared in stores. This represents a 420,000 pound retail movement increase, compared to the same period a year ago. Making the numbers even more impressive: the 6.74% increase was measured across all 20,000 U.S. supermarkets included in the Nielsen research. The honey promotion actually appeared in only 12,000 of those stores. All indications point to substantially higher sales increases in stores where the promotion appeared. Packer retail sales for February 1999 were up nearly 20% possibly

Classifieds

Selling New PIERCO one piece plastic frame and waxed foundation - No assembly required - ready to put in the hive. Close to one million sold to commercial beekeepers last year. In the bee business there is nothing more time consuming than assembling frames. Imagine the time you will save! That's why we at Hawthorne's Honey Farm have switched. We have the (9-1/8) one piece frame and waxed foundation in white and in the new black color, which makes it easy to see eggs and larvae; and the 6-1/4 one piece frame and waxed foundation in white. Call Jim or Kathy for prices. Special discount for volume. 1(800) 556-3626.

24 hives/w 3 supers, one 12 frame Kelly extractor, two 100 gallon tanks, one ext tub, all bee tools, one hot knife. All for \$350.00 – 573-734-6087.



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Gateway Food Products introduces a liquid sweetener for all beekeepers.
No more mess mixing hot water with sugar to feed bees.

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| * 5 gallon reusable food grade plastic pails. Excellent for re-packing honey | |
| * Centrally located, 5 minutes from downtown St. Louis | |
| * For mite problems, try 50# Cake & Icing Shortening | |

For more information, call Teresa Elder (Account Executive) at Gateway Food Products, Co. 877-220-1063

Pollination

Effective Fruit Pollination

Based on a short course by Richard L. Norton, Regional Fruit Specialist with Cornell Cooperative Extension (NY), edited and minor additions by Dave Green from Kentucky.

Nothing in fruit production is more important than fruit set, yet it receives so little attention. This is a course to provide the grower with a few of the basic reasons why a flower may fail to set fruit. It would appear that all of the brief discussion statements below can be grouped into three categories:

- 1.) Lack of pollination due to lack of pollen or to a lack of honeybees and pollinating insects.
- 2.) Pollen does not provide fertilization. This may be due to sterility of the pollen grain or egg cell. Also, pollen may not be able to penetrate the style due to incompatibility between two varieties.
- 3.) Seed abortion. This may be due to nutrition and low temperature.



APPLES:

IMPORTANT PRINCIPLE

The more seeds present in the fruit, the bigger the fruit, and the more symmetrical the shape. Seed numbers have a profound influence on both the size and shape of the fruit. There is a direct correlation between the number of bees and/or pollinating insects and seed numbers in the fruit.

-All apple varieties should be considered self-unfruit-ful; therefore, cannot effectively pollinize them-selves. Even such so-called "self-fruit-ful" varieties as Golden Delicious, Rome, Wealthy, Baldwin and Jonathan, etc., need another variety nearby to serve as a pollen source (pollinizer) to set consistent crops. No apple variety is sufficiently self-fruitful to be dependably productive when planted alone.

-Because of poor pollen (triploid), R. I. Greenings, Mutsu, Jonagold, Baldwin and Stayman, etc. are worthless for pollenizing other varieties. If a triploid variety is to be planted, a pollen variety must be planted with it, then a second pollinizing variety must be planted to pollinize the pollinizing variety.

-Red strains or sports or a variety will not pollinize the parent variety or other red sports of that variety.

Example: no Red Delicious strain or sport will pollinize another Red Delicious strain or sport. The same is true for McIntosh, Rome, Golden Delicious, etc.

-Biennial varieties are not reliable pollinizers. In their off years, when they fail to bloom, there will be no pollen supply to pollinize the annual varieties. It is suggested to set a third variety in such blocks.

-In our northeast climate, Red Delicious often fail to set adequately. Red Delicious requires an abundance of cross-pollination. For this reason, we urge growers to set a pollinizer row next to every Red Delicious row. If you want consistent Red Delicious crops, this practice is very important.

-Red Delicious and Empire have a very sensitive blossom to frost injury. Such varieties should not be set in low spots, only on sites with good air drainage. Note: Starkrimson (Bisbee) Red Delicious appears to have considerable frost hardiness compared to most Red Delicious strains.

-We suggest never to plant more than four rows of a main variety followed by two rows of a pollinizing variety for top yields.

-In high density apple orchards, bees tend to fly down the row in contrast to flying from one row to another. In such hedgerow plantings, we suggest grafting in, for example, Winterbanana, Golden Delicious, etc. in the row of a red colored variety.

-Cross pollinizing varieties should bloom at approximately the same time the main variety blooms. Do not expect Golden Delicious (late bloomer) to pollinize Idared (early bloomer). In most years, there is sufficient overlap between early and late bloomers to give adequate pollination. However, in some years, the early bloomer may be in petal fall before the late bloomer comes into bloom. Note: For some unknown reason we take our best Red Delicious (mid-season) crops from orchards that have Romes (late season bloomer) as pollinizers.

-Pruning plays an important role in pollination. Blossoms on older spurs are first to open, and followed in sequence by blossoms on three, two, and one-year laterals. Prune to ensure a balance of fruiting wood of different ages in the tree. If the flowering time is spread, this will increase the chances of some flowers meeting favorable weather. Pruning provides light within the

tree, and bees will fly in areas where flowers are more shaded, if the tree is pruned.

-Tree nutrition helps set apples. Pollen from trees short of nitrogen is markedly inferior in its ability to bring about fertilization, to pollen from a tree with adequate levels of nitrogen. Trees that are deficient in nitrogen often flower profusely, but the blossom is weak and fruit set is usually light.

-Weather at blossom time plays a dominant role in pollination. As temperature falls to 28 degrees F., ice formation within the flower tissue can cause injury to fruit finish. At 27 degrees and below, the styles and ovules can be killed, preventing fertilization. Low temperatures (below 41 degrees F.) can cause the pollen not to germinate and pollen tube growth is very slow below 51 degrees. Wind plays no significant role in cross-pollinating tree fruit. However, it does have an adverse effect in insect activity that provides for cross-pollination. If cold weather prevails from green-tip to half-inch green while the pollen is in the process of production, the quality of the pollen may be seriously reduced. Hot, dry weather, will reduce the stigma receptivity. When the stigma is receptive to pollen germination, it glistens with a sugary exudate. Once it starts to dry and turn brown, it is no longer receptive to pollination. Bee flight is reduced by rain, wind, and cool temperatures, therefore, pollination may fail even though all other factors are okay.

-Effective pollination period has a direct relationship to crop potential. This is the time needed for the pollen, once it is deposited on the stigma, to grow its pollen tube to the ovule before it degenerates. This concept was introduced by an English researcher (Williams). The effective pollination period varies from year to year, and from orchard to orchard. For apples, it is several days, and for pears (some varieties), it can be as little as 24 hours.

-There must be a large enough population of bees to transfer the pollen while the flowers are receptive. There should be two colonies per acre on pears and one colony on other tree fruits.

-Move bees into apple orchards when the king blossoms have opened. If they are moved too soon, they will find other sources of nectar and will not work the orchard properly. If they are moved too late, they will set up too much of the late and less vigorous bloom.

Move colonies into pear orchards when trees are 30 to 50% in bloom. Due to low sugar content in the pear nectar, the blossoms are not very attractive to honeybees.

However, if the trees are well into bloom, they will work the blossoms for a period until they find a more attractive source of nectar. If there is only a small amount of bloom, they will start working more attractive sources almost immediately. For the same reason, it's a good idea to mow dandelion bloom as the bees are brought in.

-With sweet cherries, move colonies in a day or two before the first blossoms open. The flowers have a short period of viability. Sweet cherries must be pollinated quickly. If bees are one day late, the crop can be reduced considerably.

-If the bloom is light, bee colonies should be distributed throughout the orchard in small groups. If bloom is heavy, colonies can be placed in larger groups.

-Protect the bee colonies from wind. Always place the colonies in sunny locations. If no natural windbreak is available, erect a temporary wind shelter. Bales of straw, old doors, pallets, tarps, etc. are suitable. It's best to place the colonies where the morning sun hits the entrances. Make certain there is an uncontaminated water supply nearby. Keep hives off the ground with pallets, old tires, or concrete blocks. Beehives setting on the ground leads to stress from dampness and lack of ventilation.

-If dandelion bloom is heavy, mow as bees are placed. Heavy bloom is competition for the apple bloom. Light dandelion bloom will just help feed the bees.

-Bouquets: If pollinizers are lacking, flowering branches from cross compatible varieties (crab apples are also excellent) can be placed in barrels or pails of water and will provide an emergency source of pollen. This is a short term solution, and pollinizers need to be included in long term pollination planning.

-Beehive inserts placed at the hive entrance and loaded with pollen from a pollinizer variety can be useful. However, improper handling of the pollen can quickly destroy the viability. It must be kept cool (thermos chest) and out of sun until it is placed in the insert. The insert needs to be fed on intervals of a half-hour to an hour. Lycopodium powder (spores of club moss) is sometimes used to dilute the pollen, although this is not recommended by some, who feel that this irritates the bees, and causes them to rub it off their bodies before flying to the blossoms.

Apricots:

We have some varieties that are self-compatible, and can set crops without cross-pollination. There are also self-

incompatible varieties that need to be pollinized by another variety. There is no intersterility in apricots; any variety can be used as a pollinizer.

Sweet Cherries:

Nearly all sweet cherries are highly self-unfruitful, and require cross pollination. The exception to this statement is Stella. It is self-fruitful, and can pollinize any other sweet cherry variety.

-Bing, Lambert, Emperor Francis and Napoleon are inter-sterile and cannot pollinize each other. Van or Windsor are good pollinizers for these varieties and can in turn, be pollinized by any of them. Sam is a satisfactory pollinizer for all the above varieties, including Van. Cjomppl and Ramoer are effective pollinizers for Bing and can be pollinized satisfactorily with pollen from Bing, Sam and Van. There are two other groups that are inter-unfruitful - Black Tartarian and Early Rivers and the other grouping - Abundance and Windsor.

Sour Cherries:

All commercial varieties are self-fruitful and can be planted in solid blocks. However, self-compatible cherries still require the presence of honeybees and other insects to effect pollination. Without honeybees, fruit yields can be reduced.

Peaches:

All peach varieties, with the exception of J. H. Hale, and June Elberta, which are male-sterile, are fully self-compatible and require no pollinizer variety. As with sour cherries, bees are needed, even though the pollen is only moved within the flower. However, fewer hives are needed than for fruit that requires crossing.

Pears:

-Bartlett is one of the main varieties, and seems to be affected to some extent by climate. On the west coast, it can develop without fertilization of the ovule (parthenocarpic fruit) and is seedless. This is NOT true in the northeast, and the number of pollinizers in pear plantings should be as large as possible, preferably on a one-to-one basis!

-Bartlett and Seckel are inter-sterile; they will not pollinize each other. Kieffer is not usually a good pollinizer for Bartlett, since pollen from the late bloom of Kieffer is sometimes aborted. Flemish Beauty and Dutchess d'Angovienne appear to be self-fruitful.

Plums (European):

Although the Italian prune and the Stanley prune are considered self-fruitful, these varieties benefit greatly

from cross-pollination. All other European varieties should be considered self-unfruitful, requiring other varieties for pollinizing.

Plums (Japanese):

Japanese type varieties must be pollinized by other Japanese type varieties, since they bloom earlier than most European varieties. Although Shiro will pollinize

Burbank, Burbank will not pollinize Shiro - and thus, these two varieties should not be planted together, without a third pollinizer.

POLLINATION AND HARVEST DATES

For standard apples varieties in the Rochester, NY area:

Variety	Appr Harv.	Bloom Date	Annual or Biennial	Pollen Viability
Lodi	7-30	Early	B	Good
Vista Bella	8-1	Early	A	Good
Quinte	8-1	Early	A*	Good
July Red	8-14	Medium	A*	Good
Jerseymac	8-20	Early	A	Good
Puritan	8-22	Early	B	Good
Early McIntosh	8-28	Late	B	Good
Tydemar Red	8-30	Medium	A	Good
Paulared	9-5	Early	A*	Good
Burgandy	9-10	Medium	A*	Good
Niagara	9-12	Medium	A*	Good
Wealthy	9-15	Early	B	Good
Ozark Gold	9-18	Medium	A	Good
Jonamac	9-20	Early	A	Good
McIntosh	9-25	Early	A	Good
Spartan	10-1	Medium	B	Good
Cortland	10-1	Medium	A	Good
Macoun	10-5	Late	B	Good
Jonathan	10-5	Medium	A	Good
R. I. Greening	10-5	Late	B	Not Viable
Twenty Ounce	10-10	Early	A*	Good
Empire	10-10	Early	A	Good
Red Delicious	10-12	Medium	A*	Very Good
Jonagold	10-15	Late	A*	Not Viable
Spijon	10-18	Late	A	Good
Spigold	10-20	Late	B	Not Viable
Northern Spy	10-20	Late	B	Good
Golden Delicious	10-25	Late	A*	Very Good
Melrose	10-25	Late	A*	Good
Idared	10-25	Early	A	Good
Rome	10-28	Late	A	Good
Mutsu (Crispin)	10-28	Medium	A	Not Viable

**These varieties tend to be somewhat biennial, but can be kept annual most years through good management. This means fruit thinning must be used most years.*



Average Pollination Rental Fees

As was reported in the May, 1999, **The Bee Line**, the 1998 average pollination rental fee, computed from commercial beekeeper rentals on all crops reported, was \$29.65, for the states of Oregon and Washington. This is a \$1.40 decrease from the average pollination fee charged in 1997. This is the second year where the average pollination fee has declined. Commercial beekeepers were responsible for 99% of all reported pollination rentals and a corresponding 99% of all pollination income. The average pollination rental fee for semi-commercial beekeepers was \$32.85.

Fruit trees are the dominate crops for pollination income, the combination of pears, sweet cherries and apples account for 40% of all reported rentals and 37% of all reported pollination income. More than 95% of all commercial colonies in Oregon and Washington are taken to California for almond pollination.

Apimondia '99 World Beekeeping Congress

You will not want to miss this meeting September 12-18. In terms of magnitude – a program with several hundred presenters, the ApiExpo tradeshow with exhibitors from all over the world, the world-class meeting facility – this congress will be unlike any beekeeping meeting you have ever attended! Yes, it is expensive, but not as expensive as usual, because it will be held just a stone's throw from our country in Vancouver, BC.

Act now to register for the congress at a 25% discount! A brochure and registration form can be obtained by sending your name and address to: #645-375 Water Street, Vancouver, BC, Canada V6B5C6 or by e-mail to: congress@venuewest.com. Or check out their Website at: www.apimondia99.ca.

There are several other ways to economize. If you drive with several people that may save you some money and provide a beautiful tour of the country. There are less expensive housing arrangements available also. Bed & Breakfast Inns range from \$35 to \$135 US\$/night. To get a list call 604-986-5069 or 604-255-9199 or 604-738-770.

There are several hostels that offer good accommodations at excellent value. Two, the Vancouver Downtown Hostel 604-684-4565 and the New Backpackers

Hostel 604-699-0112, are within walking distance of the Convention Center. For information on these and other BC hostels, you can call 604-684-7111.

Bob Cox, Iowa State Apiarist
copied from **The Buzz**, May 1999
Newsletter of the Iowa Honey Producers Association

Ways to Dehumidify Your Honey

During humid conditions, honey that is capped and "ripe" may, in fact, exceed 18% water and be prone to fermentation. This can ruin your honey. There are some things you can do.

It is far easier to try to dry your honey **before** you extract it. After removing the honey supers from the hives, stack them in an enclosed room on pallets in a staggered fashion or upright on their ends if you have the room. The objective is to maximum airflow over the combs. Set up a fan and an electric space heater to provide warm air (not exceeding 95 degrees flowing over the combs. Better than that, if possible, set your supers in the above fashion and put a dehumidifier and a fan. Be sure windows and doors are shut. Provide a hose or drain bucket for the dehumidifier.

The length of drying time depends on the amount of honey, its moisture level, height and placement of stacks and how efficient your dehumidifying system is.

Once you start the drying process be prepared to extract as soon as the honey is ready. The honey will be warm and will be easy to extract, by delaying too long, wax moths can get a foothold on those warm combs!

It's always something. One note of caution: Do not let your supers and frames get over that 95°F range because then the combs can melt from your frames and that can be a mess, trust me! I been there, done that!

This article was mostly taken from
Honey Bees and Beekeeping by
Keith Delaplane, University of Georgia
Copied from **The Bee Buzzer**, NE KS Newsletter, Aug. 98



Bee Nutrition

Honeybees may need the farmer's help to get the varied diet necessary for good bee health.

Nectar supplies carbohydrates or sugars. Pollen supplies everything else. But sunflower pollen, one of the honeybee's favorite foods, does not provide enough protein, according to tests by Agricultural Research Service scientists. They found that bees fed canola pollen lived 48-65% longer than those fed sesame or sunflower pollens.

Bees that work only in sunflower fields are likely to become undernourished. As they lose strength, they may not do a good job in that crop or in other crops they are hired to pollinate later on.

Sunflower growers can help bees get the mix of nutrients they need by planting small areas of other crops such as canola (also known as rape) near sunflower fields, or they can let weeds and wildflowers grow along field edges, beside ditches or among rock outcroppings.

Honeybees that pollinate only one greenhouse crop run a similar risk of nutrient deficiency. As a preventive measure, beekeepers can place protein supplements or high-protein pollen patties in the hive.

Juatin Schmidt, 520-670-6482 ext. 109, e-mail
joschmid@u.arizona.edu

Recipes

TORDILLA

1 cup vegetable oil	5 eggs
1 cup cheap red wine	1 ½ Tbls. sugar
1 teaspoon salt	5 cups flour

Bring oil and wine to boiling point, then cool. Beat eggs, add flour, salt and sugar. Add wine and oil mixture. Knead til well blended.

There is a special shape for these cookies. But a 3/4" diameter glob that you pinch off with your fingers will do. If you want the special shape: Cut pieces 3/4" size. Roll like breadstick and cut into 1" size pieces. With piece on index finger, roll on vegetable grater so there are indentations on part rolled on grater, and a valley

next to your finger.

Drop into hot vegetable oil. Fry til brown. (Make sure your pan is at least 3 inches higher than the oil as the oil will foam.)

Drain tordilla on paper towels. Place in flat baking pan and cover with honey. The longer setting in the honey, the better. Will keep for up to six weeks in covered container. Makes about 6 - 8 dozen cookies.

Judy in Kentucky
Sent in by Knox Adler, MO Valley Beekeepers

SESAME CANDY

3 cups honey
2 cups sesame seeds
peanut oil

In a deep, medium-size saucepan slowly heat honey over medium-low heat, using a heat diffuser, to the hard-crack stage (about 305 to 310 degrees on a candy thermometer). Stir down often to prevent boiling over, about 45 minutes. Stir in sesame seeds.

Set aside for a few minutes to cool slightly. Lightly grease a 9x13-inch baking sheet with peanut oil. Do not use waxed paper. Pour honey mixture onto it. Set baking sheet on a cooling rack. When cooled, but not hard, score into diamond shapes. When cooled completely, remove candy and separate into pieces.

WARNING: Be sure to alert friends and family to the danger of burning themselves on the extremely hot caramelized sugar.

The Frugal Gourmet

Small Hive Beetle Update Survey Tips

The small hive beetle (SHB), *Aethina tumida* Murray, becomes inactive at around 70 degrees. Long before the temperature drops that low they will move into the cluster of bees where they are kept warm. It is useless to treat or survey (try to detect) for them at this time (when temperatures are around 70 degrees). Temperature will probably have to be in the 80 degree range before the beetles become active in the hive and move to the bottom board.

To survey for the SHB you do not need to use the Bayer Bee Strip (CheckMite+). If the beetle is moving in the hive they will congregate under a piece of one sided corrugated cardboard placed on the bottom board and the brood nest will have to be removed to see them.

To survey, prepare a piece of corrugated cardboard at least 16 square inches in size (length and width is not critical) by removing one side or purchase one-sided cardboard. Staple a tongue depressor or similar stick to it for a handle. Clear a space on the bottom board 8 or 10" back from the entrance using a long bladed knife. Place the detection device in the entrance with the cardboard at least 2 inches inside the entrance. Fasten tongue depressor to the bottom board with a thumbtack, nail or staple. The bees will often push the device out of the hive if not fastened. Place the device in one day when temperatures are above 80 degrees and check the next day.

Bees will chew the cardboard. If the device is to be used more than once, cover the top with tape to slow down chewing.

Laurence Cutts, Florida State Apiarist
Copied from *The Buzz*, May 1999
Newsletter of the Iowa Honey Producers Association

Other Hive Beetle News

Small hive beetles were detected in Minnesota in over wintered colonies last month (April). The same beekeeper has bees in Iowa, but no beetles have been detected in the beekeeper's colonies in Iowa yet. The location of the beetle in Minnesota is less than 10 miles from Iowa.

Small hive beetles were also detected in package cages shipped from Georgia to Pennsylvania.

Bob Cox, Iowa State Apiarist
Copied from *The Buzz*, May 1999
Newsletter of the Iowa Honey Producers Association



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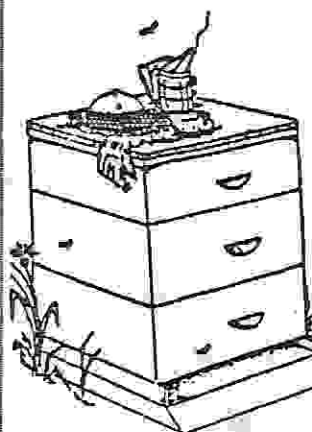


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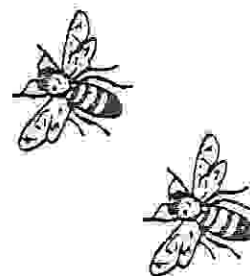
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P.O. Box 448
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The Biology of the Honeybee



Who's Who in the Hive

A typical small hive contains perhaps 20,000 bees and these are divided into three types: Queen, Drone, and Worker. The chart below compares these types:

	Queen	Drone	Worker
relative size	large	medium	small
#/hive	1	~200 or 0	20K-200K
lifespan	2 years depending on #sperm	21-32 days spring 90 days summer or until mating 0 winter	20-40 days summer (worked to death) 140 days winter
sex	female/bisexual	male	sterile female
functions	<ul style="list-style-type: none"> -kill sisters and mother -mate with males -lay 1500 eggs/day = 200K eggs/year -secrete pheromone = 9-hydroxydecenoic acid $\text{HOOC}-\text{C}=\text{C}-\text{C}-\text{C}-\text{C}-\text{C}-\text{COH}-\text{C}$ 	<ul style="list-style-type: none"> -mate with young queen 	<ul style="list-style-type: none"> -make comb -tend larvae -tend young drones -tend queen -clean hive -gather nectar -gather pollen -gather propolis -evaporate nectar -cap cells -defend hive -starve drones -lay drone eggs -move larvae for making new queen

The Not-So-Queenly Queen Bee



Careful observation of the table above, shows how the queen basically keeps the workers uninterested in reproduction on their own by secreting a pheromone. This chemical is spread from body to body among the workers starting with those tending the queen.

The other job of the queen is to lay eggs and this task consumes all her conscious effort. You might wish to calculate this rate down to the minute and you will see that she has no time to eat or fly around. A group of five to ten workers feed her a small bit after she lays about 20 eggs. In fact, if she stops making pheromone or laying eggs, one of her most recent eggs will be

moved to a specially prepared queen cell to produce a replacement queen.

The newly hatched queen destroys any other unhatched queens, fights to the death any hatched queens, may destroy her mother, and then takes her mating flights. The mating flight follows a pattern. The virgin queen flies to a congregation area where hundreds or thousands of unrelated drones await. The drones pursue the queen and several mate with her in flight.

The drone mounts the queen, inserts his endophallus, and ejaculates his semen. During ejaculation, the male falls back and his endophallus is ripped out of his body and remains attached to the queen. Drones mounting later remove the previous drone's endophallus and lose their own through similar matings. The emasculated drones die very quickly with their abdomens burst in this fashion.

Of the 90 million sperm deposited by several males in the queen's oviducts, a mixture of about 7 million are stored in a special pouch in her body called the spermatheca.

These sperm will be used, a few at a time, during the queen's life to fertilize her eggs. The one (or few) mating flight(s) in her first few days of life are her last. Should the old queen run out of sperm, a new queen will be produced through the intervention of the workers.

The Specialized Drone Bee

Drones are tolerated in the hive only when there is a possibility that they may mate with a queen. Thus a few are tolerated in spring and fall, more in the summer, but none in the winter. The workers keep the drones out of the hive to starve to death in the autumn. Drones, like queens, lack the body parts to effectively harvest nectar or pollen to feed themselves. Drones also lack a stinger of any kind. They are designed for mating only.

Drone's eyes and antennae are specialized for seeing, following, and mating with a queen and most of the drones' internal organs are designed for flying fast enough to catch the queen or for delivering sperm cells into her oviduct. If the drone succeeds in this, it dies. Thus all surviving drones are virgin.

The Important Worker Bee

Workers, as their name implies, do most of the "work" around the hive. They secrete wax from glands on the abdomen and fashion the honeycomb and broodcomb from it. This comb contains hexagonal cells large enough to hold a developing worker or drone, a small quantity of honey, or pollen. When the cells are filled with honey, pollen, or a pupa, a worker caps the cell thereby sealing the contents inside.

The workers tend the queen and young drones as well as the young brood. All bees develop through a complete metamorphosis: after three days, the egg hatches into a worm-like larva which feeds voraciously and grows and molts each day for about four days. It then goes into a resting stage, the pupa, which lasts for another few days in a capped cell until the bee emerges as an adult. This process takes 16-24 days depending on season and class of bee. As mentioned previously, workers feed the young larvae and seal the pupa into the cell. They also feed the emerged young adults until they are old enough to fend for themselves.

The young worker tends larvae and uses its wings to help ventilate the hive. As it gathers strength, it will start cleaning out old used cells for reuse, may tend the queen or young drones, or work on capping cells. Depending on the season, and after a few days have passed, the worker works at gathering operations. The bee will fly out of the hive and visit flowers in search of nectar and pollen, or will visit trees for harvesting resin to make propolis. The propolis is used as glue and caulk to seal cracks in the hive. The nectar and pollen are collected and returned to the hive for use and/or storage.

Pollen is stored in broodcomb cells and is the main supply of protein and vitamins for the hive. Pollen is 6 to 28% protein by weight and usually contains the 10 amino acids essential for bees.

Nectar is from 5 to 80% sugar but is less than 0.2% in protein, so nectar is the carbohydrate supply for the hive. Nectar is placed in honeycomb cells and the bees tending the honeycomb evaporate the water from the nectar by rapid wing movement to create ventilation. When the amount of water remaining in the nectar is less than 18%, the mixture is called honey and the bees cap off the cells.

A mixture of honey and pollen is called "bee bread" and is the food for most larvae and bees. When a worker egg has been selected to become a queen, it is moved to a much larger queen cell and is fed large quantities of "royal jelly" which is similar to bee bread but contains more mandibular gland secretions and more honey (34% vs 12%). The larger cell for growth, larger food supply, additional carbohydrate, and more worker secretions results in the development of a queen.

The workers defend the hive with their sting. Rather than developing extensive ovaries, the worker bee develops a barbed stinger and a muscular venom pouch. When it is necessary to kill an intruder, a worker pushes the tip of the stinger into the surface of the intruder. The muscular barbed stings quickly saw their way into the skin of the invader and the venom pouch begins to contract rhythmically to pump venom into the intruder.

Generally the bee pulls herself away, leaving the venom pouch and sting in the invader; the worker soon dies because of the abdominal rupture. Thus stinging for honeybees is an act of self-sacrifice. Unlike many other hymenopterans, honeybees are not likely to sting unless provoked.

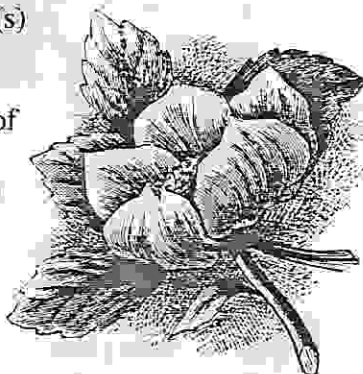
Compound	% of Venom	Effects
Melittin	50 %	Lysis of blood cells Release histamine Depress blood pressure
Phospholipase A	12 %	Cell lysis Pain Toxicity
Hyaluronidase	<3 %	Spreading factor Hydrolyzes connective tissue
Acid phosphatase	<1 %	Induces allergic reactions
Histamine	<1 %	Itching Pain

The Relationship Between Flowers and Bees

Flowers which have evolved to attract honeybees have optimized their flowers to increase the chance of a bee visit. The bees unwittingly carry pollen from flower to flower, thus pollinating the plants and permitting them to reproduce. Plants most successful in attracting bees and getting them to make repeat visits will out reproduce those which are less successful. Thus flowers must both attract and reward an insect visitor.

Attraction

The design of bee-pollinated flowers includes mechanism(s) to attract a bee to visit the flower. The flower is shaped differently from the display of the leaves. The flower is usually a different color than leaves so that the flower is visible on the background of leaves. In general the coloration is designed so that the bee learns to distinguish it and associate a visit



to that pattern with the reward. Flowers have evolved bull's-eye and nectar guide patterns in their floral displays to attract a passing bee into landing. Some flowers also attract insect visitors with fragrances. Bees have an excellent sense of smell with chemoreceptors in their antennae and are attracted to particular fragrances. The combination of visual and olfactory attractants gets the bee to land most frequently. In the absence of attractants, a bee is unlikely to observe the flower and make a landing even if there is a reward waiting for her!

Reward

The reward plants provide bees include nectar and pollen. The nectar is a sweet liquid composed of mostly sucrose. The bees collect this liquid in their crop.

Digestive enzymes, most importantly invertase, are added. By the time the bee returns to the hive, much of the sucrose is converted to glucose and fructose. In the hive the bee empties its crop into a cell or the nectar is transferred to another worker who takes it to the honeycomb for evaporation to make honey. The bee below has a full crop!

Pollen is dusted all over the bee as she visits a flower. The bee's legs are designed to comb this pollen from her body... and catch it in a tuft of bristles on her third pair of legs:

Fortunately for plants, the bee does not clean herself completely or often enough to prevent pollen from being transferred from flower to flower; so the flowers are usually sufficiently pollinated.

If a plant provides little in the way of reward, a bee is unlikely to make many repeat visits.

Bee Learning and Communication

Bees are quite adept at association learning. A single bee will visit different flowers in the morning and, if there is sufficient attraction and reward in a particular kind of flower, she will make visits to that type of flower for most of the day, unless the plants stop producing reward or weather conditions change.

The mutualistic relationship between flowers and bees has been going on for millions of years and, not too

surprisingly, has developed many interesting specialized relationships.

Bees have also apparently learned to communicate their floral findings. A bee which returns from an area with many flowers producing much nectar performs a dance on the comb. The orientation of her movements and the frequency of her vibrations indicate the direction and distance of the flowers from the hive. Thus other bees, observing her dance, will know where to find this wonderful source of food. This amazing level of learning and communication benefit both bee and plant.

Ross E. Koning, "Honeybee Biology"

Free Listing in the Honey Producers Directory

We have only received 32 listings for the new directory to be printed. As of today, you can still have your name or business included. I don't know the exact day that it will be to late. If you want to be included, complete the form that was in the March newsletter or get a copy from your local officers and mail or email the information to the newsletter editor. No listings will be taken over the telephone.

How to Keep Your Honey Naturally Safe

Even though honey may be one of the most microbiologically stable foods in existence... Beekeepers still need to take steps to keep honey free of contaminants.

It's a sweet truth that honey is being used as an ingredient in more foods, pharmaceuticals and cosmetics than ever before. Manufacturers of such products often set purchasing specifications that include microbiological criteria. For that reason, beekeepers must pay attention to microorganisms that cause diseases in bees and to yeasts that can spoil honey.

Lets start with the positives.

It's important to remember the safety features naturally associated with honey. Honey's high sugar content,

low pH (high acidity), hydrogen peroxide and other antimicrobial factors go a long way in making it one of the safest foods around. However, the antibacterial properties of honey are reduced or removed when honey is combined with other ingredients, especially water. Any microorganisms present may then have the opportunity to multiply and spoil the product in which the honey has been mixed.

Be sure to always follow Good Manufacturing practices (GMP's) such as:

- 1.) Use stainless steel whenever possible.
- 2.) Wash your equipment on a regular basis and keep equipment dry and covered if possible.
- 3.) Keep honey processing area clear of contaminants such as animal waste.
- 4.) Wear hair covering (both head & facial) and sweatbands when extracting.
- 5.) Wear clean clothes/apron when extracting or filling.
- 6.) Wash glass containers before filling.
- 7.) Have hand/jar washing supplies readily available when filling jars.
- 8.) Store honey in only food approved containers.
- 9.) Do not smoke or chew gum or tobacco in the processing areas.
- 10.) Have handwashing supplies readily available. Wash hands after blowing nose or sneezing. Our face contains many microorganisms. Do not touch your face and then the honey or supers ready for extraction.
- 11.) It is important to process and store honey in a way that minimizes microbial contamination. Avoid handling or storing honey in ways that encourage microbiological growth.
- 12.) No glass is to be in the processing area, only the jars you are using for packing in the filling area. This includes glass light fixtures, they should be covered by plastic.
- 13.) Use only food processing lubricants on equipment.
- 14.) This may sound extreme, but in food handling plants, everyone steps into a sanitizing shoe bath before entering the building and processing/packaging area. This keeps from carrying in microorganisms into the area that can then become airborne.

What are microorganisms?

Microorganisms are a group of organisms that typically cannot be seen with the naked eye. Microorganisms may be classed into four groups: fungi (yeast's and molds), bacteria, viruses and parasites. All micro-

organisms exist in an active, growing phase (the vegetative phase) for all or part of their life cycle. Some microorganisms remain in a dormant, hardy spore form, similar to a seed, until conditions are conducive to growth. Microorganisms have an important role in determining the shelf-stability and safety of food.

Why microorganisms are important to beekeepers.

Beekeepers have to be attentive to the microorganisms that cause diseases in bees and the yeasts that can spoil honey. As consumers become more aware of food safety issues, food manufacturers have become more demanding.

Honey is increasingly being used as an ingredient in different types of foods, pharmaceuticals and cosmetics. Manufacturers of such products often set stringent microbiological standards. And since food processors frequently set purchasing specifications that include microbiological criteria, honey may be subject to tests by honey packers or end users.

Honey suppliers will need to consider the microbiological purchasing specifications that they may face. Since some microorganisms cannot be removed from honey without destroying the honey, there is a great need for an effective partnership between producer and packer so that the honey meets a food processor's needs and maintains honey image as a pure product.

How microorganisms get into honey.

Microorganisms can enter honey either while the bees are making the honey (a primary source) or after the honey has been harvested (a secondary source). The primary sources of microorganisms are likely to include pollen, dust, air, dirt, flowers and the bees. Secondary sources of contamination in honey are humans, equipment, containers, insects, animals and water.

Possible routes of transmission into extracted honey would include air (in the honey house or while the honey is being packed), food handlers (from skin infections, sneezing or fecal contamination), cross-contamination (largely from animals or animal products) and equipment (including residues of food and water). Floors, walls and ceilings can also be reservoirs of microorganisms that enter food. Secondary sources of contamination are controlled by standard sanitation and GMP's. Do you have an air cleaner in your honey house?

What microorganisms are found in honey?

Bacteria from the genera *Clostridium* and *Bacillus*, yeasts and molds are the most common microorganisms in honey. Microbiological counts are highly variable. Bacterial counts are often close to zero, but may occasionally reach 10,000 CFU (Colony Forming Units) per gram. An 'average' count might be 400 CFU per gram. Typically, yeast and mold counts in honey are less than several hundred CFU per gram if there are any at all.

How to control microorganisms in honey.

Practices that protect the health of the bees are likely to protect the quality of the honey produced by those bees. Since it is very difficult to remove microorganisms from honey, it is more practical to learn how to block their entry. This is done by following honey house sanitation guidelines and GMP's. More experimentation is needed to identify production techniques that influence microbiological quality.

What happens when honey is combined with other ingredients?

The antimicrobial properties of honey are reduced or removed when honey is combined with other ingredients. Any microorganisms that are present may then have the opportunity to multiply and spoil the food, cosmetic or pharmaceutical product.

For more information on microorganisms and honey, call the National Honey Board, 800-553-7162, Marcia Cardetti.

Copied from **How to Keep Your Honey Naturally Safe**
National Honey Board with additions by Pamela Brown,
GMP Instructor at Nabisco Foods, Inc.





In 1987, beekeepers in Europe and the Middle East took a chance by using fluvalinate in an unauthorized manner to control varroa mites.

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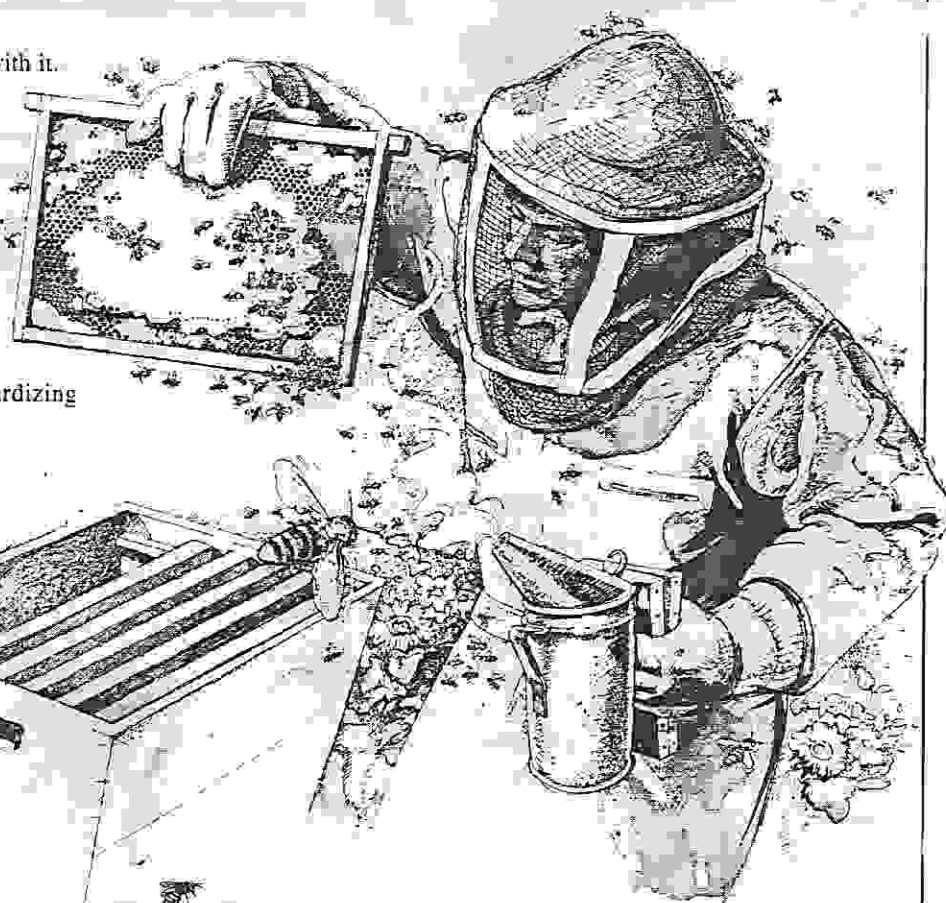
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