

IEBA BEEMAIL

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Presidents Corner

Well I made it through package bee weekend madness and I hope all of you had a good time getting your bees. It is the end of winter months and all our preparation for the new seasons starts now. It sure makes for a real busy day. All of you were great that weekend. I'm glad it's over but there was no rest as the orchards started showing bloom early. I have added below some references to articles that might be of interest to many of you. There is a lot of info out there just takes time to find and then share it.

We Liability Insurance Available through ABF Beekeepers who are in need of beekeeper's liability insurance can secure coverage through the American Beekeeping Federation. An agency affiliated with ABF offers coverage to ABF members in 33 states and is committed to going into other states where the demand makes state licensing practical.

The ABF has had a relationship with this agency and its predecessor companies for several decades, said ABF Executive Director Troy Fore. They are a stable company with a good reputation and solid financial backing. They have a secured a coverage line with a nationally-known insurance company. We have confidence in their ability to serve our members in the area of insurance. For insurance applications, contact the ABF Office. Persons who are not ABF members should first enroll as a member: ABF, P.O. Box 1337, Jesup, GA 31598, ph. 912-427-4233, fax 912-427-8447, e-mail: info@ABFnet.org.

Wicwas Press Website: Dr. Larry Connor has established a new website for his respected Wicwas Press <<http://wicwas.com/>>. The site includes information on how to subscribe to a free e-newsletter and other information (slide sets, books) for sale. Perhaps most innovative is the section on how to enlist Wicwas press in helping publish one's own bee book. For further information, visit the website or contact Dr. Larry Connor Wicwas Press, LLC 175 Alden Avenue New Haven, CT 06515, phone (203) 397-5091.

Steve Sheppard reports recent results showing how fluvalinate and coumaphos impact queen honey bees as described in Haarmaan, T., M. Spivak, D. Weaver, B. Weaver and T. Glenn. 2002. "Effect of fluvalinate and coumaphos on queen honey bees (Hymenoptera: Apidae) in two commercial queen rearing operations", *Journal of Economic Entomology* 95:28-35. Steve's is an important article to distinguish how subtle the effects of pesticides can be on honey bees; this adds fuel to the fire that has been brewing for some time on this subject. He concludes, "To me, these findings strongly support the common sense wisdom that beekeepers should strive for prudent and minimal use of pesticides inside honey bee colonies." For more on queen problems, see <http://66.181.86.172/beeculture/months/98mar/98mar4.html>>.

Jim Tew and his incredibly detailed description of queen rearing for the backyard beekeeper. He covers the Alley, Miller as well as the grafting or transferring of larvae (Doolittle) methods and the pros and cons of using natural cells. Finally he weighs in on newfangled plastic technology and its possibilities. For all he provides a detailed description, but more important a list of problems of what might go wrong. With this kind of solid advice any beekeeper should be able to produce quality queens. For other resources, see <http://members.aol.com/queenb95/queenrear.html>>.

Canadian beekeeper Terry Fehr writes about the value of making nucs (nuclei: small colonies) in Manitoba. He emphasizes that these smaller colonies (nucs) make for a stronger operation and also can take advantage of younger queens. Colonies are wintered both indoors and out depending on size and age. The effects of tracheal mites are discussed, a problem that affects northern beekeepers more than those in the south. Mr. Fehr says it takes about a year and a half before colonies show detectable mite levels; thus, in his system using nucs and young queens no treatment is necessary. His technique has stood him in good

stead for over 12 years with surprisingly few changes implemented during that period. See also <<http://outdoorplace.org/beekeeping/nucs.htm>>.

Inland Empire Beekeepers Association

This is our local association. It meets the 2nd Friday of every month at the Spokane County Ag Extension office by the County Fairgrounds, at 222 N. Havana. The executive board meets at 6:30-7:00, followed by a social hour till 7:30 when the general business meeting starts. The meetings end at 8:30. The association is affiliated with the Washington State Beekeepers Association. Membership dues are \$5.00 for an individual or \$10.00 for the entire family. This includes your receiving the Inland Beemail, which is published by the association.

Association Officers

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Varroa & Virusses

Gard Otis
University of Guelph
Canada

PMS: Parasitic Mite Syndrome

Parasitic Mite Syndrome was a name coined by USDA researchers for the multiple symptoms that accompany severe infestations of varroa. It is not a virus, and in fact is not caused by a simple pathogen. And it is Kashmir Bee Virus, I believe. Beekeepers in N. America are much less cognizant of viruses than in England, in part because we have never had a virus specialist. The closest we have now is Akey Hung, at the USDA lab in Beltsville, Maryland. Maybe you could get a direct report from him. Most beekeepers see mites, and see dying colonies, and it ends there. Of course we have Parasitic Mite Syndrome, in which the larvae express all sorts of strange symptoms and maybe secondary infections, but we would not have that without Varroa. My colleague here at the University of Guelph, Cynthia Scott- Dupree, in conjunction with Brenda Ball of Rothamstead, did a study to try to determine whether tracheal mites were transmitting viruses from one bee to the next. They have no evidence that this in fact occurs. Brenda Ball could provide a more definitive statement on their results.

APV: Acute Paralysis Virus KBV: Kashmiri Bee Virus

Denis Anderson, of Australia, believes that KBV is an ecological equivalent of Acute Paralysis Virus (APV). He has never seen bees with both, and usually a geographic region has one or the other. We have KBV widely distributed in the US; Europe has APV. Varroa does transmit APV from bee to bee, increasing the severity of the problems associated with mites. KBV, if injected into hemolymph, causes rapid death of the bee, as does APV. So it would appear that we should be having problems due to KBV, but as far as I know this has not been confirmed.

IEBA Meeting and Event Schedule

January 10, 2003	IEBA Meeting Program-Organizational Meeting
February 14, 2003	IEBA Meeting Program-What to do with those weak hives in the fall-Nuc wintering
March 1, 2003	WSBA Meeting in Ellensburg, 10:00 AM at the Cattlemen's Club
March 14, 2003	IEBA Meeting Program-Jan Dormaier-Honey Bee Diseases-Meeting starts at 6:30
April 11, 2003	IEBA Meeting Program-Package Bees, feeders, Nuc's
May 9, 2003	IEBA Meeting Program-Making Mead
June 6,7, 2003	WSBA Meeting Program-Visit of WSU program and facilities
June 13, 2003	IEBA Meeting Program-Comb Honey and old combs and foundation
July 11, 2003	IEBA Meeting Program-Fall requeening- watching for bad queens

August 2003	IEBA Summer Picnic
August 20-24, 2003	North Idaho State in Coeur D'Alene
September 4, 2003	Meeting will be at the Fair Ground on Thursday night
September 5-14, 2003	Spokane Interstate Fair
October 10, 2003	IEBA Meeting Program-Packing hives for winter
November 6-8, 2003	WSBA State Convention Joint Meeting with Oregon
November 14, 2003	IEBA Meeting Program-Thanksgiving Potluck
December 12, 2003	IEBA Meeting Program-Catered Christmas dinner Election of Officers
January 9, 2003	IEBA Meeting Program-

QUEENS by Kim Flottum of Bee Culture

During the past two or three seasons the number of comments reaching my office on queen performance have increased dramatically.

This doesn't mean all queens, queen producers or beekeepers have messed up, since there has always been some small contingent of each of these groups that have had trouble. It's just that lately there seems to be more than usual. Enough to draw my usually too-scattered attention for more than a moment.

So, after talking to a great number of people with more questions than answers, I posed the question on these pages last year. The result was phenomenal. It's gratifying to get a response to a question posed, but unsettling when you don't have the answers. So I posed the question to the American Beekeeping Federation and suggested they address this at their January meeting. They agreed.

Actually, they agreed to let me go ahead and put something together. So we contacted a variety of people who had a range of experience in this. Here's a list:

Marla Spivak, Professor & Extension Specialist, University of MN

Jeff Pettis, USDA Beltsville

Eric Mussen, Extension Specialist, UCDAVIS

Jennifer Finley, Research Specialist, Penn State

Danny Weaver, Queen & Package Producer, TX

Reg Wilbanks, Queen & Package Producer, GA

Pat Heitkam, Queen Producer, CA

Tom Glenn, Queen Producer, CA

Gus Rouse, Queen Producer, Hawaii

Dave Miksa, Queen Producer, FL

Tom Hamilton, Commercial Beekeeper & Pollinator, ID

Jim Doan, Commercial Beekeeper & Pollinator, NY

David Hackenberg, Commercial Beekeeper & Pollinator, PA

Medhat Nassar, Researcher, Guelph, Ontario

Sue Cobey, Researcher, OH

Geographically we covered the country, and we included queen producers and queen users, along with scientists. You probably recognize many of these names.

Then, we let them do what they do. The Extension people detailed what they had been seeing in their various locations, which covered even more than the phone calls I've been receiving. We let the audience have a say, too, and they added even more to the story, with more real world experiences.

Putting all this together we came up with a collection of problems encountered. Some, admittedly, have always been here, and probably always will be. But others were new, undiscovered, unexplained, and for some, absolutely unreal.

We made a list of what was mentioned by everyone and I'm sure that you have seen, or at least heard of some of these problems. The first step in solving a problem is identifying it.

Problems identified covered a variety of behaviors relative to egg laying. These included queens starting strong then quitting after only one or two brood flushes. Sometimes she would start up again in a month or so (this assumes, of course she wasn't superceded), sometimes she never did. Interestingly, some colonies, when confronted with this behavior did not supercede. At all. Ever. Others never quit replacing the queens they produced or that were introduced. The outcome of all of these was that colonies either never took off, or (in the exact words of the symposium) pooped out shortly afterwards.

Commercial beekeepers noted that queens just didn't last as long as they used to. A queen, according to some, should (or had in the past) last a year plus. Lately, they weren't around more than five or six months. Not good.

Another major problem encountered was the affect of the mites – both mites – on the colony as a whole

and queens in particular. Drones, however, are equally or even more affected by *Varroa* mites it seems, since they are so much more attractive. (A fatal attraction?) Drones that have been attacked by *Varroa* are less virile, less vigorous, less long-lived and less almost everything than their unattacked counterparts. And, unless a *Varroa* infestation is incredibly heavy, it's difficult or impossible to tell, just by looking. So, it seems, a queen breeder may have drones, but they may be duds.

Tracheal mites attack queens just like workers, and in the same one-four day old time frame. Producers who aren't treating for mites could be opening the door for sending queens out already infested with these pests.

A whole list of similar problems came up involving queen cages, the candy in them, and the shipping environment between producer and consumer.

Queen cages have changed since the days the two-hole Kelley cage dominated the market. Invented, essentially, as a two-hole before the turn of the century and made popular by the A.I. Root Company, the cage went from two to three holes within a couple of decades or so because of the improved shipping it allowed.

Within the last decade, several new changes have occurred. Plastic cages, small wooden cages and smaller two-hole cages have come on the scene. Coupled with these has been the learning curve of queen catchers, and queen consumers in dealing with these. Smaller space inside, and packing then in battery boxes (which in turn are packed tightly in shipping vehicles) has also changed the queen's environment. For the worse, perhaps.

Receiving much attention, too, was what could be happening to queens after they arrive, which falls right in the hands of consumers. But first, let's go back to producer basics. It all starts there, and as long as we're looking at fundamentals let's start with those things queen producers can perhaps attend to, to produce better queens.

Every producer probably believes they have the best breeder stock in the world. Too often, however, the theory of "pick the best and hope for the best" is used rather than a continuous upgrading each year. An analogy would be that if when vegetable breeders want to register a new variety of, say, a green pepper, they must show it is 'at least' as good in several major areas (vitamin content, disease resistance, hardiness) as any other

already on the market. If not, they don't get registered. So too should queen producers strive for 'at least' as good. Measurably better every year is even better. And, if queens are sold in Ohio, Georgia and California, they better be 'at least' as good in every location. Breeding a 'northern' queen, and selling it in the south, or vice versa, should not only be discouraged, it should be outlawed. But it won't be.

After breeder selection comes production – no easy task. Right-aged larvae, weather, comb environment (humidity control), the right (and healthy) queen cell cups, and especially nutrition – probably the most important, and most underrated part of the game. Colonies that support breeders, cell starters and finishers, mating nucs and absolutely in every drone producing colony need better than 'average' nutritional status.

Pollen, pollen supplement and pollen substitute, plus lots and lots of nectar every step of the way. You can't stress, even a tiny bit, any colony involved in this process. Do it, and you and your queens will suffer, and you end up with unsatisfied customers. Or no customers.

Next, in every one of these colonies mites and diseases must be controlled. Remember the comments about tracheal mites and new queens, and *Varroa* and drones? Also, queen producers in the south who don't treat for tracheal mites because they're not a problem *there*, are doing their customers up north a *great* disservice. And so much for anything approaching a quality control program. Yes, it costs. But lost customers cost more.

So far, nutrition, diseases and predators are under control . . . right? Healthy nurse bees, healthy drones, healthy queens – both virgins and newly mated – so what's next?

The mating game is next. This, at our symposium gained a lot of attention, and here's why.

All the past research has shown that you need at least 15 drone colonies for every queen mating nuc. That's a 15:1 ratio. Now, let's look at what's happened over the past few years that's affected this drone to virgin queen ratio.

First, in the past, producers who supplied this many drone producers (assuming they made that large of an investment) made the assumption this was correct. And, all things considered perhaps it was. But let's consider all things for a moment. Years

ago, there were more bees. There were feral colonies out there. There were other beekeepers out there. More bees, everywhere. This a case for drone comb if there ever was one.

Also, the health of the drones that were there was probably better. *Varroa* has certainly taken some toll, viruses associated with *Varroa*, too. And of course any feral drones will be similarly affected.

Given these changes, the placement of drone colonies in mating yards has become more crucial. This has probably not been a priority for some, perhaps high for others. It is a necessary ingredient.

So, drone numbers, drone health and drone locations have all changed – for the worse from a consumer’s point of view – and all of these can, and probably have led to some of the problems mentioned.

Another, probably less important consideration is that with fewer drones from fewer sources, the genetic base begins to shrink. Considering that at least a 1:15 ratio is required for good mating, how many outside queen or drone sources must be brought in to avoid inbreeding and other too-close problems?

Let’s revisit one of these disease problems again – nosema. This is an insidious and nearly undetectable problem, but it is deadly in a queen producing outfit. Queens exposed to nosema in mating nucs will mate, but are so often superceded once introduced that you can not only count on it, but very nearly predict when after introduction in your colony it will occur.

Nosema then reduces queen acceptance, but, once introduced into a colony, begins to reduce production there, too. A double edged sword so easily avoided. This doesn’t even consider what it’s doing to these bees in mating nucs, does it?

Then, comes collection. Are these queens collected on days that catchers need to wear coats because it’s cold? Or shorts because it’s hot? What temperatures are these brand new queens exposed too so early in life? Hold that thought for a moment.

Speaking of exposure, let’s consider the internal environment of these mating nucs. These tiny (usually) colonies are exposed to a variety of drugs and medications – fumidil (we hope), terra, menthol (maybe), Apistan, grease patties . . . all the

‘legal’ stuff. After awhile the comb in these colonies will reflect the history of this exposure. How much ends up in the wax? Any? Some? Lots? And what affect does this have on those brand new virgins, or when they’re first mated? Nobody knows. Somebody should. At the least old combs should be rotated out, routinely.

Back to the temperature thing. Queens are collected and brought back to some central area. Hot in the truck, or too cold? Piled up and overheated on a bench, when the sun moves around through the door? Or chilled just a bit in the cab’s air conditioned comfort, or the boss’s office?

Queen banks? Done well they serve the perfect purpose. Done wrong and you might as well kill them outright. Lots and lots and lots of young bees, everyday or two, at least. And lots and lots of food, lots and lots of food. Continuously. Constantly. Every day, all day. Pollen, nectar and all the right medications. Remember nosema? And what about queen cages? Are they perfectly secure? No chance of damaging the queen’s feet, or antennae? A damaged queen, however so slight, pretty much has a death warrant when introduced to a new colony.

And then there’s the mail. Queens sent out in packages probably have a better change than those sent alone. They have food – at least for awhile – and a fairly consistent thermal regulation organization – pounds of bees. It’s those who travel alone that run the greatest risk. Consider that risk. Those little post office trucks, that can get really hot, start the journey, unless the producer takes the extra step and delivers them personally.

Then they enter the real world of mail delivery. Most are sent air mail, or priority mail. Many spend time in an airplane, in the cargo area. Air pressure is a factor here, as is temperature. What, exactly, does cold temperature and reduced cabin pressure do to a brand new queen? Or, to a battery box of 100 queens – those on the edges, and those in the middle? Who knows? According to those at the symposium, nobody. And, once arrived, does she sit in your mailbox until you get home from work? These all add up.

We looked at some of the things queen producers should be thinking of, and doing, to reduce problems with queens. This is the time of year they should be

thinking of them. Some things, of course, should have been dealt with before now. Let's hope they have. And, as a consumer, you should be asking which of these is under the producer's control, and, of those which are controlled.

There's another great black hole of problems that need to be considered – those dealing with what happens to that queen *after* she leaves the mail stream and comes home. What is it that the consumer can do, should do, must do to ensure success?

That, we'll explore, next time.

The information in this article was taken from a white paper written by Marla Spivak and Jeff Pettis presented at the Honey Bee Queen Symposium held at the 1998 American Beekeeping Federation meeting, and comments made by the participants and members of the audience.

Honey

Honey is a versatile sweetener. It can be substituted in almost every instance where sugar is normally used. Additionally, it has its own place in the culinary scheme, giving a whole new range of taste treats and experiences. There are some standard ways in which many people use honey -- as a sweetener for tea and coffee, as a spread for toast or muffins, or perhaps drizzled on cereal or on pancakes. There are many other ways to use it though. As examples, in a marinade or glaze on meat, poultry or fish, as a salad or salad dressing ingredient, or as a sweetener in baked goods. In each of these instances honey adds a little something extra. When used in fruit salad for instance, the fruit will stay bright and fresh for hours while refrigerated. In baked goods, honey

enhances the keeping qualities because of its moisture retaining properties. The baked goods stay fresher much longer.

Handling and storing honey.

- * **Honey does not require refrigeration. Room temperature is best. Cold temperatures encourage granulation.**
- * **Granulation (sugaring) is a natural state of honey. It does not indicate spoilage. To return honey to its liquid state, place the container in hot water (not over 140°). Keep it in hot water, reheating as necessary until the honey liquifies.**
- * **Containers of honey should be kept capped, and should be stored in a dry place, since it absorbs and retains moisture.**
- * **When measuring honey, lightly grease the measuring spoon or cup and the honey will roll right off.**

Substituting.

- * **In a given recipe, use only 1/2 cup of honey for each cup of sugar specified. After some experience you may want to adjust this, but remember that cup for cup, honey is sweeter. You may want to reduce other liquids in a given recipe to compensate for the moisture in the honey. A starting place is to reduce other liquids 1/4 cup for each cup of honey used.**
- * **Reduce oven temperatures about 25° to prevent overbrowning. In general, when using honey, oven temperatures should not exceed 375°.**

If your first attempt at substituting honey does not come out just right, make adjustments and try again. When

you get it just right, it will be worth the extra effort

us some server space and has started on a new web site.

<http://inlandbeemail.com>

John has been able to convert the Inland beemail unto the web site so hopefully by mid summer we won't have all these mailings just an email reminding you to read the beemail at least for all of you email and web users.

Washington State Beekeepers Association

The WSBA will be having a joint meeting with Oregon at Hood River, Oregon Nov. 6-8, 2003. This is a great time and you can learn a lot from all the experts that attend the meeting and give talks. A combined meeting only every 2 years.

Return all package bee containers to be returned to the supplier.

Walt Peterson Joy in Beekeeping Trust Fund

1999 Recipient	Jason Berry
2000 Recipient	Sean Davis
2001 Recipient	None applied this year
2002 Recipient	Erika Swenson
2003 Recipient	



Peggy's First Swarm

There was some excitement at home while I was out of town, and it wasn't just Lucy excited that she got to have Ron all to herself. One of my hives chose that evening to swarm. Luckily, they didn't go far and our neighbor spotted them and told Ron. Unfortunately, I wasn't there to see it or to take care of it. I was **SO** disappointed! Thank goodness Dad was willing to drive out and save the swarm into an extra hive that Ron had ready. Attached is during and after photos of the tree that the "girls" decided to attach themselves to. The video that Ron took of Dad handling the swarm is

IEBA news:

We have an additional Web site being built to replace our current site. John Pierce a new beekeeper and Web Master volunteered to give

fascinating...and I hear he only got stung twice.
Sorry, Daddy!

Peggy McCartney

Hive Care Calendar

May

- Check for new brood in various stages of development.
- Put entrance reducer to largest opening if you haven't already.
- Medicate hives. Be sure to use proper doses and remove medication when it's time.
- If you have new hives this spring, add second brood box when the bees are using 5 or six frames of the first one.
- Check for food stores. Existing hives may need supplemental feeding to get them through the month. New hives may need additional syrup

June

- Put your queen excluders and your extracting supers on once all medications have been removed.
- Do not feed the bees additional medication during the honey flow.
- Remove entrance reducers.
- Inspect colonies once during June for congestion, diseases, mites and stores.
- Watch for swarming (are queen cells being created?) and have a swarm box ready to pick up any swarms.
- Check the filling honey supers regularly and keep ahead of them. If the bees have just begun putting honey

in a super it is okay to put one or two empties above it. On a good locust flow they can fill three supers in a week.

- If the weather is very hot and bees are hanging out on the front porch, increase the amount of ventilation at the top of the hive.
- Cut the grass all the way around the colony so they do not become shaded and flight to and from is not impeded.

FOR SALE

Telesoping cover \$6, Inner cover \$3, Wood Bound QE \$3, Frame Feeder \$1, Hive body w/unused fr \$5, 7 5/8 Super w/unused fr \$4, Hive scale \$120, Honey Pump w 1 HP motor \$300, SS Extractor 20 fr Maxant Series 500 \$1000, 15 Gal SS Water Jacket Uncapping Tank \$275, 2ea 60 Gal ss Tank w valve \$130 and 2 baffle 30 Gal Sump \$105

Call Jim McAcam, 509-276-2386

Looking for board ends in pine or cedar. Or maybe some bee supers, bottom boards and other items. Contact Leo Berchtold at 208-687-1300.

NOTICE:

From Tim Bueler, Area 1 WSBA Rep. I just got an email from Jaquie Bunse, B.C. apiary inspector among multiple other titles, wondering if anyone would like to contribute an article to the Western Apicultural Society Journal. Those working toward their WSBA Master Beekeepers certificate receive points for published articles...this could be a great opportunity! Articles can be sent to Fran Bach, wife of former state apiarist Jim Bach, at meaghen@charter.net.

I found this on the Web and though it went along with Ted's Candle Class

uses for beeswax in the home and shop

University of Massachusetts Cooperative Extension System Beekeeping update

1.As a lubricant.

Use on nails and screws to make them drive more easily;
on sticking drawers, doors, windows, and the like;
on needles and on thread to allow them to penetrate heavy material more easily and to add a degree of waterproofing to the thread. To use, simply rub the object to be lubricated with the wax; with nails and similar objects, push them into the wax.

2.As a metal preservative.

Screws, nails, or metal parts will not rust readily if immersed in molten beeswax and left until the temperature of the metal reaches that of the molten wax. The metal will absorb some of the wax and become rust resistant. For this to work, it is important for the metal to remain in the molten wax long enough to attain the proper temperature. Otherwise there will

be only a surface coating of wax which will wear off quickly.

3.As a metal polish.

To make a protective coating and polish for metal, mix turpentine (8 parts), beeswax (1 part), and boiled linseed oil (1/2 part)*. This mixture also makes a good lubricant for saw blades and table saw tops.

4.As a wood polish.

There are various proportions of beeswax with boiled linseed oil and/or turpentine that make a good polish. It may take some experimentation to find a consistency that you like. To make a paste, mix 1 part beeswax, 2 parts turpentine, and 2 parts linseed oil. A larger proportion of beeswax will make a mixture that is stiffer, perhaps too stiff.

5.Leather treatment.

To make a conditioner and waterproofing for leather, combine equal parts of beeswax, tallow, and neats foot oil. Before applying, warm the mixture slightly and have the leather at room temperature or higher.

6.Candles.

Candles made from pure beeswax are special. They are superior to candles made from paraffin in that they burn longer, are pleasant smelling, and are virtually drip free when made from well cleaned, yellow beeswax. To make good candles it is also important to use proper candle wicking, not just string. As a guide in making candles, three pair of 10" molded or dipped tapers can be made per pound of wax. Size 2/0 wicking is appropriate for these.

NOTE: Beeswax should always be melted in a double boiler arrangement for safety. It is highly flammable in contact with direct heat. When other ingredients are to be added to beeswax, they may be added to the cold wax and everything heated together, or pre-

**warmed materials may be added to
molten wax. Beeswax melts at
approximately 145°F (60°C)**