COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

from the U. C. APIARIES University of California

Nov/Dec 2010

Newsletter E-mailed to You

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Legal CA Honey Labels

During my travels around the state, I often look at the honey being sold at various smaller outlets, such as fruit stands, fairs, farmers' markets, etc. Nearly all the labels on the jars displayed too little information to be legal.

In order to prevent future embarrassment, I will briefly report the California label requirements for honey being sold anywhere other than on the beekeeper's property. When your customers come to you and purchase honey in their or your containers, the labels can display less information.

The first thing to consider is container size. The last time the regulations were revised, I tried to include all the container sizes on the market. Beginning with the largest size, the legal sizes are 60 pound, 12 lb, 10 lb, 6 lb, 5 lb, 3 lb, 2.5 lb, 2 lb, 1.5 lb, 1 lb, 12 oz, 8 oz, and 5 oz. The 4 oz containers on the shelves are not in compliance.

Standardized honey colors usually are used more for bulk marketing than for retail sales, but if the honey is in an opaque container, then the color is required on the label.

The standard colors are:

Water White	-	Pfund = ≤8
Extra White	-	Pfund = >8 - 17
White	-	Pfund = >17 – 34
Ex. Lt. Amber	-	Pfund = >34 - 50
Light Amber	-	Pfund = >50 – 85
Amber	-	Pfund = >85 - 114
Dark Amber	-	Pfund = >114.

Various styles of expensive Pfund graders can be ordered from beekeeping supply companies or over the Internet. If an approximation is close enough for your purposes, then the much less expensive Jack's Scale color comparator cards will be adequate.

The next consideration is the honey grade. Before the 1985 revisions to the USDA grade standards, the size of suspended particles in the honey drew heavy emphasis. The grade relied heavily on moisture content and the sieve size through which the honey was strained. Now for Grades A and B, the moisture content must be at or below 18.6%. Grade C honey can contain up to 20% moisture (very apt to ferment, especially if the honey granulates). Most California honeys are likely to be around 13-13.5%.

Instead of mesh sizes, "defects" in honey are now described in more nebulous terms:

Grade A – Practically free – practically no defects that affect the appearance or edibility
Grade B – Reasonably free – do not materially affect the appearance and edibility
Grade C – Fairly free – do not seriously affect the appearance or edibility
Substandard – Fails Grade C.

These criteria would require a label grade of "Substandard" for extracted honey containing wax particles or bee parts in states, like California, where a US Grade is required to be on the label. Honey will be Grade A, unless it is handled inappropriately or something is added to it after it has passed through a mesh similar to a nylon stocking or nylon paint screen that precedes spray painting.

The rest of the criteria for US grades relate to flavor and aroma:

Grade A – Good – free from caramelization, smoke, fermentation, chemicals, and other causes
Grade B – Reasonably good – practically free from caramelization; free from smoke, fermentation, chemicals, and other causes
Grade C – Fairly good – reasonably free of caramelization; free from smoke and fermentation, chemicals and other causes
Substandard – Poor – Fails Grade C.

Next is source identification. California Food and Ag Code Section 29611: "Every container or subcontainer of extracted honey shall be conspicuously marked with all the following: (a) The name and address of the producer or distributor of the extracted honey. (b) The net weight of the honey in the container. (c) One of the United States grades which are established for honey by the United States Department of Agriculture. This subdivision does not, however, apply to honey to which pollen added is visible and each such container is plainly and conspicuously labeled with the words 'pollen added.' (d) In the case of any opaque container, the color of the honey."

Another mild concern is to avoid "slack-filled" containers. The honey level should be very close to the cover. If that cannot be done, put "slack-filled" on the label.

If you wish to put the word "California" on the label, then only honey actually produced in California should be in the container. Regardless of where it was extracted, it should not be a blend of California honey and honey produced out of state.

Pesticides and Honey Bees

In response to requests from both the California Specialty Crops Council and the Almond Board of California, Los Banos beekeeper Gene Brandi and I developed the following statement concerning the relationships between honey bees and pesticides.

The document will receive fairly wide distribution, in addition to this newsletter. I will add it to my Bee Briefs which can be found on my UC Davis web page.

Relationships of Honey Bees and Pesticides

Eric Mussen[1] and Gene Brandi[2]

Honey bees are an essential component of modern agriculture as their pollination efforts are necessary for production of about one-third of the crops we produce in this country. Exposure to pesticides has produced negative effects on individual bees and their colonies for nearly a century. Historically, dead or dying bees on the hive bottom boards and on the ground in front of the hives, demonstrated to beekeepers the negative effects of such interactions. The losses can be pretty spectacular and piles of dead bees very voluminous. In addition, there also can be negative effects on queens, drones, developing brood, and bee behavior that eventually result in weakened or dead colonies.

Over the decades there has been a succession of insecticides, acaricides, fungicides, and herbicides as new chemistries were developed and older chemicals were retired, often due to resistance in the target pests. More recently-developed insecticides and acaricides are fast-acting, killing most contaminated honey bees before they can accomplish many foraging flights. Some of those foraging bees die in the field. However, before other bees succumb to a toxic dose, or after the pesticide residues have broken down to sublethal levels, contaminated pollen can get carried into the hives. That pollen is transferred to housekeeping bees that pack portions of it into cells. The stored pollen undergoes microbial, partial digestion and becomes preserved with lactic acid for consumption some time during the next half year or so.

Fresh and stored pollens are mainly consumed by so-called "nurse bees" whose head glands extract nutrients from their blood and convert it into brood food. Brood food is a protein-rich, gelatinous secretion fed to the queen, so that she can lay 1,000 to 2,000 eggs a day if required. Brood food is fed to developing worker and drone larvae, and to adult drones and worker bees. When fed to queen larvae, additional proteins and sugar are added to the brood food and we call it "royal jelly." Nurse bees that consume contaminated pollens will produce contaminated brood food and royal jelly.

In addition to pollen contamination, honey bees can become contaminated by drinking field water which contains chem.-ical residues. While irrigation that leads to tail water puddles or ponds may be declining, the use of chemigation is increasing. Honey bees can drink chemigated water from emitters, leaks in the system, or even from moist soil that contains water from chemigation. Often honey bee colonies show serious decline following imbibition of that water.

Additionally, in recent years, insecticides are being formulated as systemic compounds that move throughout the plant tissues. If and when the treated plants bloom, the pesticide is delivered to the bees in the pollen and nectar. In tree crops, those pesticide levels in blossoms can be surprisingly high, even as much as a year following the initial application.

The biochemistry of adult bees is not terribly complex, since they are fully developed and require only maintenance nutrition. Larvae are another story. They are growing at a fantastic rate (1,000 X gain in mass in six days). They undergo six molts during their development that require an intricate balance of hormones in order to reach maturity. That makes the larvae very vulnerable to any chemicals that might interfere with the delicate balance of interacting bio-chemical pathways being utilized. Pesticides frequently are designed to interfere with one or more biochemical pathways of the target organism. It should come as no surprise that exposure to small amounts of any of a large number of pesticides can disrupt normal larval development. All types of pesticides contain some products that are toxic to developing honey bee brood.

It would be nice to think that we know all about the effects of pesticides on adult and immature honey bees, but that just is not the case. New pesticides, being reviewed for registration by EPA and CDPR, are required to be tested against the relatively chemically inert adult worker honey bee to determine the short-term acute toxicity levels by contact and ingestion. If the pro-duct is determined to be toxic to adult honey bees, a warning or prohibition is placed on the label. Any product toxic to adult honey bees also is supposed to be tested against honey bee brood, but definitive protocol for such testing never has been developed at the federal or state level. Some companies conduct such studies on their own volition, but most do not. Also, many products are registered on the basis of toxicity testing of the active ingredient in a pesticide. So-called “inert ingredients” are neither listed on the label nor tested for honey bee toxicity. Thus, some formulations, with active ingredients that are supposedly innocuous to honey bees, kill bees on contact or when taken back to the hive and introduced into the colony food chain. Products that are tank mixed may produce synergistic effects many times more toxic then the individual products, alone, but the tank mixes are not tested for bee toxicity. Label statements can fail to relate the true toxicity of their pro-ducts to honey bees.

The best way to protect honey bees from damage by pesticides is to keep them from being exposed. Very infrequently do pesticides enter the hive directly. However, on warm to hot evenings very large groups of honey bees can be clustered on the fronts of beehives and are very susceptible to being hit by applications from directly overhead or from pesticide drift. Better attention to local hive conditions by applicators can reduce those problems.

Most honey bees and their food are contaminated by applications through which the pollen foragers fly or by residual products on floral parts (especially pollen) or foliage. Surface contaminated bees will add pesticide to their pollen loads. Contaminated pollen can be returned to the hive. Most pesticides are lipophilic, so they blend chemically with the hydrocarbons in bees-wax and the exoskeletons of honey bees. They also become blended with the lipids in the outer layer of pollen grains. Thus, bees-wax and pollens exchange contaminants.

To prevent negative effects of pesticides of all types, do not apply them to blooming plants upon which bees are foraging. Evening or night applications of short residual materials, in areas where bees are foraging, will greatly reduce negative effects on bees. What about fungicides that are routinely applied during bloom? Again, proper timing of such applications can be significant. For example, given good flight conditions, pollen foragers will remove nearly all of the day's melon pollen by mid-morning and almond pollen by mid-after-noon. Fungicides applied to almonds from late afternoon until very early the next morning will contaminate pollen or pollen foragers much less than fungicides applied early-morning to mid-after-noon. Concerns about fungicide-induced failure of pupae to emerge as adult bees could be greatly reduced. The least exposure to pesticides is best for the bees.

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FSA and ELAP

For decades the federal government, through the USDA, has been authorized to provide different sorts of subsidies to agricultural producers. The program we hear most about is the crop-loss insurance program. In that program, growers pay a premium and receive a payment covering a portion of their losses, when yields are less than a specified percentage of previous yield averages. If beekeepers signed on for the program, they could file claims for losses due to such calamities as drought, fires, or extended rainy periods (or floods).

This changed when the current farm bill included compensation to beekeepers who lost substantial numbers of colonies to colony collapse disorder (CCD). The paper work was handled in regional FSA (Farm Service Agency) offices. The applicable program is ELAP (Emergency Livestock Assistance Program). The first few years, beekeepers simply submitted completed application forms and a letter from an appropriate expert covering the losses. The numbers of colonies lost to CCD were calculated by the expert as the number of colonies lost that were greater than historical averages.

As the program matured, some changes came about. Participants now are expected to sign up for NAP (Non-insured Crop Disaster Assistance Program) similar to an insurance program. The sign-up deadline is around the first of December, but some offices allow a bit of leniency. A second change is that instead of calculating historical losses and using that number to determine anticipated losses, a national average of 17.5 percent has been assigned as the basic loss level. If, previous to CCD, a beekeeper was losing only 10 percent of the colonies annually, this average is a disadvantage. If normal colony losses were in the 25 percent range, the average is beneficial to the beekeeper.

Finally, some local offices have formalized the report form which is to be submitted by the experts. The desire is to have a local expert examine the equipment that exists in a CCD claim to verify it really is CCD.

First, I have written more than 80 supporting letters for CCD claims over the last three years. Beekeepers requesting those letters were all over the country. I cannot visit all those locations. Second, no one is going to be able to say for sure that the hive boxes are empty of bees due to CCD, because we do not know what causes the malady. So, as usual, I have to state that "the losses appear to be due to CCD."

I thought that this year was going to see a significant decrease in CCD losses, compared to earlier years. Usually, reports of colony dwindling and losses became common by late summer and increased significantly into winter. This year, colony health appeared to be holding in October and November, so I was encouraged. Over the first ten days of December, I am beginning to hear the horror stories, again: from two to three deeps of bees to empty boxes in a week or so. I was hoping the problem had finally run its course.

Nosema vs. *Varroa*

At a recent meeting, I had an opportunity to listen to Dr. Frank Eischen as he summarized the myriad of studies that he has conducted on feeding bees and controlling *Nosema* and *Varroa*.

There is no doubt that honey bee colonies require a substantial amount of food in late summer and fall to keep populations at levels acceptable to almond growers in February. In some places in the US, colonies overwinter as very large clusters. But, at least here in most of California, clusters will shrink to sub-almond levels without food inputs from the beekeepers.

Way back when, Dr. Christine Peng determined that feeding pollen substitute to bees in August boosted their nutrition enough that the results of the feeding could still be detected the next May. Dr. Eischen has had similar results. It is obvious that feeding colonies will at least prevent the population dwindling that tends to occur in CA, unless CCD becomes involved. Feeding does not prevent CCD.

Some recent studies by Frank were designed to try to show which was worse, infection by *Nosema*, infestation by *Varroa*, or having both at elevated levels. It probably will surprise no one to find that *Nosema* alone is detrimental to a colony going into winter. Treatments with fumagillin or supplemental feeding have fairly similar, beneficial effects regarding eventual colony size. *Varroa* infestations alone are worse than *Nosema* infections alone. We are rapidly running out of registered *Varroa* treatments that have much impact on mite populations. Although Apiguard® is a "soft" (thymol-based) treatment, it does have a depressing effect on mite populations.

The worst impacts on honey bee colonies were caused by the combination of *Nosema* and *Varroa*. When both parasites exist in high proportions of the bees, the colonies are going to be lucky to survive, much less be large enough for almond pollination.

Despite whatever else is going on, it still sounds as if August is the month in which *Nosema* and *Varroa* have to be suppressed, and food provided, to keep most of the colonies in California prosperous enough to be used for almond pollination the next February.

New Beekeeping Book

It seems as if publishers are determined to take advantage of the revived interest in honey bees by contacting potential authors and asking them to write bee books. Most of the recently published books are reviewed in the bee journals shortly after their release. In this case, the author sent me an early copy and hoped that I would review it for him.

Author Dr. Malcolm T. Sanford undertook the task of combining and updating two well-known previous publications of the late extension apiculturist Richard Bonney. Dick released "Hive Management" in 1990 and "Beekeeping: A Practical Guide" in 1994. Dick was a beekeeper, a Massachusetts apiary inspector, and taught beekeeping at the University of Massachusetts.

Written for the beginning beekeeper, but appropriate for experienced beekeepers as well, this comprehensive text covers ten aspects of beekeeping in an interesting manner. The generalities of beekeeping are covered very well, but the minute details of colony management are left for the beekeeper to determine. Malcolm defends this approach by noting that honey bee colonies respond to regional conditions quite differently from region to region. He suggests that novice beekeepers become actively involved with seasoned beekeepers in the local area and read beekeeping publications, to learn when things are apt to happen and what to do about them.

The book is embellished with numerous, very well-drawn illustrations of important points made in the text.

Under "Beginning Beekeeping," there are Tips for Starting, Commitment to the Bees, Financial and Legal Considerations, and Information Resources.

The "Origin and History of Beekeeping" is pretty self-explanatory. It includes a very nice Beekeeping Timeline, noting important developments from 1851 (Langstroth, bee space) to 1987 (*Varroa* mite).

"A Bee's Life" is interesting, because it is here that Malcolm proclaims that *Varroa* mites are now to be considered part of the normal colony community that includes queen, worker, and drone bees. The mites will be discussed in subsequent sections in that context.

"Choosing a Hive Location" is straight forward.

"Getting Equipped" describes various components of different types of hives, a hive scale, feeders, pollen traps, personal equipment, and more. Again, the choices are left for the beekeeper to decide, with only some very practical advice for assembling frames so that they will remain intact.

Under "Enter the Bees," the author explains in detail the possible sources of bees for the new colonies. Malcolm suggests beginning with two colonies at the onset, to compare development and perhaps have one colony boost the other if needed. However, he actually cautions against purchasing functioning colonies because of their size, and reproductive and honey production potential.

"Managing Honey Bee Colonies" describes the annual cycle of a colony and the observations that should be made by the beekeeper in order to help manage the situation. Requeening is described. Honey bee nutrition is covered, and late season management is given special attention.

"Taking the Crop" deals with obtaining, harvesting, extracting and storing the honey crop. The author explains that all this fuss may not be essential the first year, but after that it pays to be well prepared.

Under "Pollination," Malcolm describes the use of honey bee colonies for crop pollination. He suggests that crop pollination may be more difficult than it appears. He cautions not to promise more than can be delivered. Moving colonies is mentioned. Pollination contracts are suggested.

Leaving the worst for last, the final, substantial (42 pages), tenth section of the 244-page soft-bound book is devoted to "Diseases and Pests of the Honey Bee." Following a description of some of the innate defenses of the bees, Malcolm covers brood and adult bee diseases, parasitic mites, IPM, tolerant or resistant stocks, CCD, wax moth, small hive beetle, bears, and more. For the most part, exactly how to deal with the problems is left up to the beekeepers, with only generalities given.

The book wraps up with a Glossary, Model Beekeeping Ordinance, Sample Pollination Contract, Resources, and an Index.

The text of the book is very easy reading. There are a number of quotes from various beekeepers that support the ideas and opinions expressed in the text. If you are looking for a very comprehensive over-view of bees and beekeeping, then this $20 textbook from the "Storey Guide to …" series, certainly would be a worthwhile investment. Storey Publishing is located at 210 MASS MoCA Way, North Adams, MA 01247. The ISBN numbers for this book are: 978-1-60342-550-6 (paperback) and 978-1-60342-551-3 (hardcover).

Another very complimentary review of this publication can be accessed at: http://stliving.com/?p=3531. That is from Small Town Living.

Check for this book on Amazon.com. The price is significantly reduced, as I write this.

Happy New Year,

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