



Bee Culture

JUNE 1993





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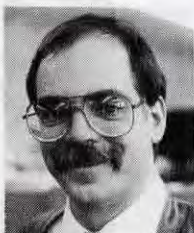
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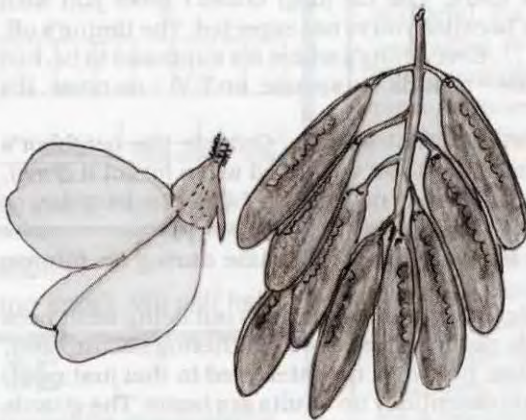
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INNER·COVER

Honey Flow.

Whether you've just completed one, are in the middle of the season's big blow, or are ready and waiting for that incredible rush, Honey Flow is a magic phrase for everyone and anyone connected with bees.

All the get-ready stuff – swarm control, extra supers, healthy bees – is over, or nearly so, and it's just wait and see if the nectar Gods smile this year.

Opening a colony during a Honey Flow rush can be like coming home in the middle of the day. You open the door but nobody's there. The cat (dog) doesn't greet you with effervescence because you're not expected. The timing's off.

It's quiet. Everything's where it's supposed to be, but there's no noise – no kids, no spouse, no T.V. – no noise. It's just – quiet.

But there's different activity. Outside the neighbor's mowing her lawn (and you wondered when *he* got it done), there's less traffic, and no kids on bikes, or tricycles or skateboards. It's just quiet.

A colony is pretty much the same during an intense Honey Flow.

Everybody (Everybee?) who can is out doing what bees are so perfectly programmed to do – gathering nectar, (and, I suppose pollen, but we're not interested in that just now). Because of this essentially no adults are home. The guards are working overtime downstairs checking the rush hour traffic at the front door, foragers are doing just that, and everyone (everybee?) else is busy at the loading dock taking in what all the rest are delivering. Those not otherwise busy are feeding the full house of brood, or running themselves ragged just trying to stay ahead of a queen running crazy laying eggs, or they're making comb to store all that nectar.

So when the cover comes off – nobody really notices. There is just too much to do. Which, I've found, makes cruising through a colony a bit different, and certainly gives an opportunity to see some of the more subtle activity a group of honey bees can offer.

There's lots to see certainly, even though it's not really business as usual. Pull a brood frame and look for bees emerging, there's at least one or two pushing out. Watch the antennae check out this brand new world. Look at a honey frame with lots and lots of house bees moving nectar from forager to cell. Look close because they move fast, and don't even notice you, or the light.

If you find the queen she's moving from cell to cell with her court not far behind, and none of them seem to notice either.

The drones are as lazy as usual, probably looking for a quick lunch but not moving fast. And all those brand new fuzzy house bees, just moving, moving, moving.

I know the experts say that opening a colony disturbs and disrupts this society for a day or more. There's all sorts of damage to repair and replace. And I suppose there's some truth to that. After all, you did take the roof off and got just a bit intimate with the private goings-on of a group that likes the dark. Further, if honey production means bread on the table you may be hesitant to jeopardize the cash flow.

But for me, to witness that energy, that organization,

that complete and total dedication is a bit more. Some say it's like looking at the face of God. I'm not sure, but well, I'm not sure.

But whatever the emotion, the experience, or just for the fun of it, you can do it whenever you get the chance, and at will, if the Nectar Gods smile.

Honey Flow. It's magic. And so much more.

With nearly everyone's paranoiac attention to mites, other, perhaps less glamorous but certainly no less deadly dilemmas await in the wings. And just because we don't give them front page press, or command public funds to combat these demons doesn't mean they don't kill, maim, make life miserable, or expensive.

The worst of these devils is, of course, American foulbrood. And this demon, this nightmare of neglect came to my door this year. Or actually it came last year, when my attention was elsewhere, my time ill spent, my personal paranoia focused on six legged pests. Not on the basics, not on the common things we are all aware, this plague of the past.

In spring I discovered the results of my folly. The stench of death reaches out yards away. And dead bees, empty combs and the repetitive pattern of cling-tight scales silently reflects the afternoon sun, each in its own casket-like chamber. Now those silent never-born bees await the chance to share the cause of their own demise. And mine.

An afternoon of digging and sorting and moving the remains is my first penalty. A funeral pyre awaits the worst of the lot. Replacing the boxes and bees, the frames and foundation is my next task. Time and money is my greatest cost. But life and lives the price my bees have paid.

Attend to the same ole' things, as well as the new and unknown. They all have a cost, and they all kill bees.

Kim Flottum

Honey Flow, and Other Thoughts

Reader Assistance

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NEXT MONTH

July – the King of summer time. Holidays and vacations. Hot weather and days at the beach. Honey making time, or nectar dearth days. They all say July.

Bee Culture kicks off the summer months with a great pictorial on harvesting and packaging round comb honey. The popularity of this pristine product increases every year – and here's how to make the best of it.

And part of that is selling, certainly. Marketing, and the bigger picture of running your business using a sound business plan is the key. Especially now, with the current pricing situation, developing that plan for a beekeeping business is a bit tricky. But we'll have the perfect starting point – right here, next month.

Purple loosestrife. Is this beauty a beast? Although a wonderful honey producer, some feel it causes more problems than it's worth. Decide for yourself – Loosestrife and the Law!

Laying workers a problem? How did they get there? What can you do about them? Can it be prevented from happening again? All here, next month.

And finally. Every beekeeper, at one time or another, gets blamed for problems caused by yellow jackets, bumble bees and even mosquitoes. Next month, in color, see for yourself, and show to the world, the differences in how they look, where they live and what they do. What Kind Of Bee? Answers all of this – and more.

July – Summer Sun and *Bee Culture*.

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■ Crazy Parade

The Downtown Doo Dah Parade madness continued this year as the local loonies gathered April 1st at high noon in Norfolk Virginia. The annual event has become an "outing" of sorts for the out of sorts.

Some of the units in the parade consisted of the Lawyers Briefs, all wearing short pants and sleeveless shirts; the sanitation workers trash bin brigade, the House Wives Credit Chargers, and the Dentist Precision Drill team, no explanation necessary!

Not to be out done, the local bee club entered their cracked drill team, the P-P-P-P (Proficient Pollinators for Produce a-Plenty)! Their members portrayed an elegant queen with her larva by her side, several worker bees, (who looked suspiciously more like drones) and the whole entourage being chased by four hapless beekeepers with smokers blowing. The worker bees carried honey buckets filled with honey stixs which were passed to the children along the parade route.

The Tidewater Beekeepers did not win the Fool's Cup Award, that dubious honor going to a group of Elvis impersonators, but everyone did have a fun time and are desperately trying to find more loonies for next year.

W.A. Halstead
Chesapeake, VA

■ No Photos?

Just an observation There are nine questions on the wax moth in the

?Do You Know? article on page 136 of the March '93 issue of *Bee Culture*. Do you know there are no pictures of this insect in the illustration question? Why not?

Bill MacMunn
Lunenburg, MA

Editor's Note: We'll be publishing an article on control, with photos, later this year.

■ Thanks

Just got the April issue of *Bee Culture* and wanted to say "Thank you!" for the Who's Who Directory.

I especially appreciate having this listing; it is concise, easy to use; I will use it often.

Judith C. Shaw
Mgr, Monitoring Products, Scentry
Langhorne, PA

■ Success!

I want to comment on the article "A Wall Street Beekeeper" in the Nov. '91 *Bee Culture* by O.B. Wisner. I made two splits in '92 and nine in '93 using the method described. I used the method for increase and not honey production. Once the splits were strong, they were moved to another location. I am delighted with how fast the little divides built up sitting on a strong colony. I used one layer of screen on plywood dividers. I had 100% queen acceptance and no trouble with queens trying to fight through the divider. I believe the little divides have a reduced mite level because older bees go back to the parent colony.

Thanks for the information.

Al Norton
Toney, AL

■ Ultimate Pollen Trap

I have had many letters from would-be pollen collectors on how to build my pollen trap. As mentioned in the December issue it is not economical to build one's own pollen traps. C.C. Pollen builds all my pollen traps from my plans at a very reasonable price. Cheaper than I could build them myself. In fact I have ordered my own replacement traps from CC Pollen this year. Their ad is in *Bee Culture* every month.

I love to hear from the readers of O.B. However please send them to the editor and enclose a self addressed and stamped envelope. I often reply to multiple questions in *Bee Culture*. Summer is coming fast and I learned the Hard way.

O.B. Wisner

■ Fertile Fireant Control

Here in Alabama I have found a way to kill fireants - commercial fertilizer.

Fertilizer - at least five pounds slightly buried and water - then cover with sheet metal or plywood.

The cover "drives" the fumes down or at least contains it.

The soil will be over fertilized but a few shovels full can be dug up and scattered in garden area or around trees, etc.

W.J. Hagelshaw
Greenville, AL

■ Wants To Know

A fellow beekeeper gave me the Nov., 1992 issue of *Bee Culture*.

I was impressed with the article on "Photonia" I would appreciate knowing where I might get a start of the Photonia.

Lorraine Wirges
931 Briarcliff, Rantoul, IL 61866

NEW PRODUCTS

Pollen Cleaner

The Hance Corporation, of Westerville, Ohio has expanded the promotional activities for their Bee Pollen Cleaner.

The Pollen Cleaner can handle between 200 and 250 pounds/hr. of fresh, frozen or dry pollen. Features include adjustable air separation; an agitator hopper and the ability to change or add screens for different cleaning levels. There is a variable speed for different weights of pellets, and the unit is designed for easy cleaning and low maintenance.

Shipping weight is 230 pounds, and dimensions are 31" x 44" x 45"

The unit has one top scalping screen for large particles and a bottom sifting screen for removing fine matter. The air aspiration feature removes dust, dead bees and other foreign matter commonly found in collected bee pollen. The Pollen Cleaner is powered by 1/2HP DC variable speed motor, which drives the fan and controls the cleaning speed. Parts and additional screens are readily available.

For information on the Bee Pollen Cleaner, contact Jeff Cox, The Hance Corporation, 235 E. Broadway, Westerville, OH or call 614-882-7400.



Hive Carrier

The Super Carrier is made of strong, but light-weight, welded steel tubing. It easily handles even a hive body full of honey. Weighing less than three pounds, it works with any depth 10 frame super that has some sort of routed hand holds the carrier tabs can slip into. It goes on and off supers instantly, and is held taut by springs. It stays in place so your hands are free to break a super loose with a hive tool. Using the carrier eliminates the need to lift supers with your finger tips, transferring it instead to the palms, where whole-arm strength can be used.

The Super Carrier is available for \$49.00, postage paid anywhere in the United States. For more information write to Danenhower Apiaries, 249 Dietrich Valley Road, Kutztown, PA 19530.

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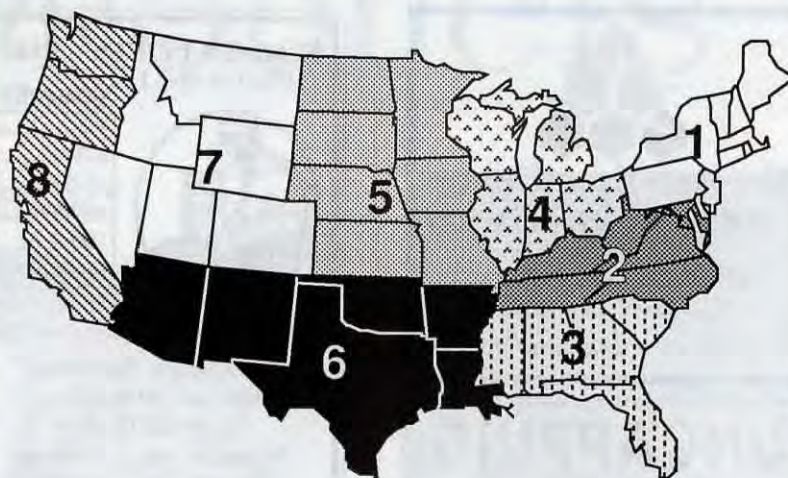
"SO, YOU'RE A KILLER BEE..."

JUNE Honey Report

June 1, 1993

REPORT FEATURES

Prices shown are averages from many reporters living in a region, and reflect that region's general price structure. The Range Column lists highest and lowest prices received across all regions, from all reporters.



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8	Range	Avg.	Last Month	Last Yr.
Extracted honey sold bulk to Packers or Processors												
Wholesale Bulk												
60 #Light	49.93	40.63	55.54	46.54	45.04	41.67	44.53	41.07	31.20-65.00	46.07	41.44	44.49
60 # Amber	46.30	41.10	50.95	42.57	42.96	39.88	41.79	38.67	27.00-58.75	43.14	39.51	41.51
55 gal. Light	.678	.575	.606	.555	.550	.567	.583	.603	.47-.75	.599	.595	.594
55 gal. Amber	.596	.525	.576	.504	.544	.523	.540	.537	.45-.73	.547	.553	.541
Wholesale - Case Lots												
1/2 # 24's	21.09	20.73	23.81	21.31	16.86	21.25	21.06	22.00	16.32-26.88	20.73	20.26	20.95
1 # 24's	31.13	29.90	33.00	30.17	28.21	31.92	30.35	28.10	24.00-42.00	30.34	29.37	29.70
2 # 12's	29.33	27.02	34.63	28.05	25.70	26.73	28.39	31.91	22.80-40.80	28.50	28.28	27.26
12 oz. Bears 24's	29.00	26.58	29.89	25.93	23.78	25.88	26.88	22.62	21.00-37.68	26.66	25.69	26.05
5 # 6's	31.65	27.50	33.61	30.91	29.04	30.92	29.23	28.35	26.00-48.00	31.21	29.35	30.58
Retail Honey Prices												
1/2 #	1.22	1.33	1.37	1.26	.93	1.12	1.14	1.24	.85-1.75	1.18	1.12	1.19
12 oz. Plastic	1.69	1.66	1.60	1.51	1.39	1.47	1.55	1.37	1.00-2.00	1.53	1.54	1.53
1 #	1.73	1.84	2.04	1.69	1.63	1.78	1.80	1.74	1.39-2.25	1.78	1.77	1.76
2 #	3.36	3.12	3.77	3.02	2.71	2.99	3.41	3.35	2.69-4.29	3.14	3.13	3.14
3 #	4.74	4.32	5.06	4.67	3.81	4.01	4.31	4.49	3.50-6.19	4.33	4.28	4.40
4 #	5.94	5.28	5.47	5.94	5.71	4.96	5.32	5.22	4.99-7.40	5.43	5.39	5.15
5 #	7.48	6.37	6.47	6.37	5.99	5.74	6.34	5.74	4.59-8.75	6.45	6.45	6.61
1 # Cream	2.30	2.55	2.32	2.08	1.99	2.46	2.23	1.69	1.69-3.00	2.26	2.22	2.07
1 # Comb	2.93	2.65	2.87	3.16	2.98	3.35	3.14	3.00	2.00-4.50	2.99	3.11	2.66
Round Plastic	2.43	2.54	2.59	2.59	2.28	2.90	2.66	2.76	1.95-3.25	2.57	2.44	2.37
Wax (Light)	2.51	1.70	1.58	1.15	1.89	1.99	1.59	1.23	1.05-3.80	1.79	2.05	1.53
Wax (Dark)	1.66	1.22	1.30	1.05	1.33	1.65	1.28	1.13	1.00-2.25	1.39	1.49	1.27
Poll. Fee/Col.	34.63	20.00	30.00	32.50	28.99	24.00	31.47	30.00	20.00-37.50	29.43	30.93	29.85

MARKET SHARE

As of May 14, the House Ag Committee nearly rewrote the farm bill in finding ways to claim a \$3 billion savings in budget outlays through fiscal 1998. Changes include limiting CRP acreage. Require no fewer than 330 M acres in the Wetlands Reserve Program. Extend the oilseeds program. Increase recreation fees at USDA facilities, and gradually reduce honey deficiency payments from \$125,000 per producer to \$50,000 by 1997.

Region 1

Sales heading toward seasonal slow time as the weather warms. Prices reflecting sales, but for very different reasons. Imports being felt stronger here than most places. Late spring slowed field work, but catch-up activity fast paced. Winter losses still felt fewer bees, less honey.

Region 2

Both prices and sales steady to improving a bit. Early flows hampered by the weather, but came on strong later. Solid flows helped build divides and splits from winter losses. Pollination contracts hard to fill because of short supply of bees. Package business booming!

Region 3

Sales appear strong and prices increasing as farm markets begin opening. Strong citrus flow has really helped buildup, but wholesale prices are depressed so it's anybody's guess what will happen.

Region 4

Although sales and prices are steady, the outlook for the rest of the season is not. Heavy losses reported across the center region due to mites and starvation late spring the major culprit. Losses of 40%-100% reported, making splits difficult and package repopulation cost prohibitive.

Region 5

Sales mostly strong and prices steady, but dropping some in the wholesale area. Imports are definitely affecting large producers, but retail prices not affected. Cool wet spring slowed early work, mite losses spotty and outlook steady.

Region 6

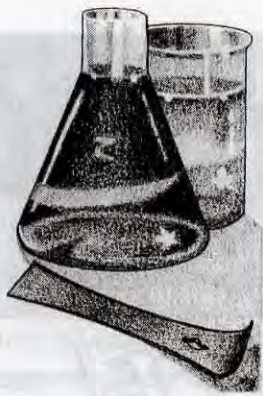
Sales, prices and demand unseasonably steady. Cool and wet (by local standards) weather has helped. AHB's and mites kicking up noise, and concern. Colonies in basically good shape. Incredible run on packages and queens this year.

Region 7

Prices only steady, demand and sales seasonably strong but biggest part of summer tourist season not here yet. Colonies in good shape but mites and cool, wet weather slowing buildup.

Region 8

Sales strong, especially in the north and prices at retail level steady to increasing. Cool, wet spring slowed pollination and buildup bloom, but catch-up weather followed. Colony losses decreasing somewhat, mostly due to adequate treatments.



RESEARCH REVIEW

roger morse cornell university ithaca ny

"Varroa Resistant Bees Are Coming."

Good News! Four colonies of varroa infested bees left untreated in Florida last year were alive and in good condition when inspected this past January. In March, these colonies had between one and ten varroa mites per 100 live bees. That number was determined using the soapy water detection technique (see below). This is a relatively low infestation rate and suggests these bees have a high degree of resistance.

The queens heading these colonies were produced by David Miksa and in part were granddaughters of the original resistant colony found by John Masenheimer in March, 1990. All of these queens were open mated. The bees had the ability to remove and mutilate the mites, biting off their legs and crushing their bodies (Morse, Miksa and Masenheimer, 1991).

The United States is not the only place where varroa resistant bees have been found. Dr. Jovan Kulencevic found bees in Yugoslavia in which varroa infestations "were generally low". All of the colonies used in U.S. testing of this stock died during the trials but the fact that differences between susceptible and resistant bees were found is what is important (Rinderer et al. 1993). What makes the Yugoslavian bees resistant to varroa has not been determined yet.

In Austria a beekeeper reported that 12 of his 700 colonies showed some degree of varroa resistance. It was discovered that these bees removed the legs from the mites and as a result they dried and died (Ruttner and Hanel, 1992). I reported this in greater detail here last August.

The Brazilian Situation

This past February I spent a week in Brazil. Observations indicate that here the Africanized honey bees are resistant to varroa mites because of their grooming behavior. They groom off the mites, bite and mutilate them and carry them out of the hive. It had been thought earlier that the bees defended themselves against the mites because of a shorter development time (20 days instead of 21) and that the mites did not have time to mature. This is not the case, it appears.

The Future

In three of the four cases cited above the bees defend themselves through grooming. This may be true in the fourth case too which leads me to think that if we exploit this behavior we can have varroa mite-resistant bees within a few years. Then we can get back to normal beekeeping. Stock from the American varroa-resistant bees is already in the hands of many beekeepers who are doing their own sorting and evaluating.

It is my thought we now need a number of beekeepers looking for and selecting resistant stock. **The final solution to the varroa problem will come about as a result of the more susceptible stock dying.** This process is being speeded up by a number of people who are selecting stock and growing queens. All this is an excellent example of evolution at work.

Looking for Resistance

In many parts of the United States feral colonies are dead from varroa or a combination of varroa and tracheal mites. This is especially true of those areas where migratory beekeepers move in large numbers.

Beekeepers in areas devastated

by mites during the past few years should be on the lookout for feral colonies that survived this past winter. There is a strong possibility these queens produce stock that is varroa and probably tracheal mite resistant. These are the bees that should be used to grow new colonies.

The American Stock

Last year the Miksas gave 200 queens to a number of beekeepers in the Northeast for evaluation. I have not heard from everyone who received these queens yet but, overall, the reports are good. The colonies headed by these queens were productive. Two reports indicated the stock was a bit hot—that is the bees were a little more inclined to sting. However, this was not a serious problem.

Soapy Water

Cornell conducted a formal research project on varroa in Brazil for six years starting in 1980 when Dr. David De Jong went there to study varroa biology. This was before we knew there was resistance to varroa mites. De Jong and his colleagues experimented with many methods of detecting varroa used in Europe. They concluded that shaking a few hundred worker bees in a 0.4% detergent solution for several minutes would dislodge more than 95% of the mites. The solution could then be poured over a piece of white cloth and the brownish mites would be easily seen on the surface. This is the best detection method I have used and I recommend it above all others for determining varroa mite infestation. ☐

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? DO YOU KNOW ?

All About Queens

clarence collison

Young productive queens are essential to successful beekeeping. The queen has two primary functions in the life of the colony. She is responsible for reproduction and produces several chemicals (pheromones) that are important in maintaining the organization of the colony. Since success in beekeeping is so dependent upon the queen, beekeepers are always looking for a source of better queens to head up their colonies. It is important for the beekeeper to understand the basic biology of the queen,

The first ten questions are true and false. Place a T in front of the statement if entirely true and F if any part of the statement is incorrect. (Each question is worth 1 point).

1. ___ Young bees raise better queens than old bees.
2. ___ If you dequeen a colony and let the bees raise their own queen from the brood present, they will normally select the youngest larvae present.
3. ___ When the larvae have been grafted into queen cells or when the doner combs are removed from the hive, they should be wrapped in a damp towel.
4. ___ Varroa mites can be a serious problem in cell builder colonies since female mites prefer to lay eggs in developing queen cells because of the abundant supply of royal jelly.
5. ___ Fall is the best and easiest time to requeen colonies.
6. ___ Cell builder colonies can be either queenless or queenright.
7. ___ Any fertilized egg can develop into a queen with proper care and conditions.
8. ___ Colonies will produce queen cells when the bees and young brood are separated from their queen.
9. ___ Queen larvae are fed much more often than worker larvae.
10. ___ Queen cells have a larger diameter and different orientation than worker cells.

Multiple Choice Questions (1 point each)

11. ___ Young queens emerge from their cells in approximately ___ days after they hatch from the egg.
A. 16 days
B. 21 days
C. 10 days
D. 13 days
E. 14 days
12. ___ The declining supply of _____ in the colony serves as a chemical cue for the workers to initiate queen cell construction.

and know what characteristics should be used in judging the quality of the queen. In addition, it is important to understand the conditions during her development and within the hive that ultimately effect her productivity. How well do you understand the conditions required to raise high quality queens and increase productivity after they have been installed in your colonies? Please take a few minutes and answer the following questions to find out how well you understand these important topics.

- A. 2- Heptanone
- B. 9-oxodecenoic acid
- C. Nassenoff pheromone
- D. Footprint pheromone
- E. Isopentyl acetate

13. What is the advantage of raising queens from eggs deposited in queen cells rather than from larvae hatched from eggs laid in worker cells that are destined to become workers. (1 point).
14. Name two advantages of having marked queens in your colonies. (2 points).
15. What are the two primary constituents used in making queen cage candy? (2 points).
16. Why is it more difficult to find a virgin queen than a laying queen in a colony? (2 points).

Listed below are several structures associated with either queens, workers, laying workers or drones. Please indicate which caste(s) has the following structures.

- A. Workers only
- B. Queens only
- C. Drones only
- D. Workers and Queens
- E. Workers and Drones
- F. Drones and Queens
- G. Laying Workers, Workers and Queens

17. ___ Wax Glands
18. ___ Mandibular Glands
19. ___ Spermatheca
20. ___ Ovarioles
21. ___ Hypopharyngeal Glands

22. Why would it be wise for you to plan to requeen a new colony just recently established from a swarm that you had captured? (1 point).

ANSWERS ON PAGE 335

Understanding DRONES

richard bonney

What comes to mind when the subject of drones is raised? Undesirable, laggard, ne'er-do-well, a necessary evil, or any of several other epithets that are often applied? Or how about – desirable, beneficial, morale builders, contributors to the well-being of the colony? I hope your thinking runs more to the latter.

Over the years drones have been much maligned. In one sense this is understandable. When we see drones, it is usually in or about the hive, not out in the field. They hang around for a good part of the day, making no obvious contribution, getting in the way, eating the output of the workers' hard labor – in a word, bums.

As we look at these drones, these supposed malingerers, we must keep in mind that a drone is equipped for only one thing – reproduction. His responsibility in life is to mate with a queen and as far as we know he does this well. He should not be faulted because he does not forage or guard or build comb. He does not have the equipment. Work was never the intent.

Actually, most of us know this. We rationalize, though. We accept that a drone's function is

to mate with a queen, preferably one from a colony other than his own. We also know that a queen mates with perhaps a dozen drones, often fewer and that suffices for her lifetime. Further, some beekeepers requeen their colonies every year or so with mated stock. These beekeepers stay in control – or at least try to. Their hives don't need the services of any drones and should be excused from contributing to the neighborhood gene pool, goes their thinking. Why, then, do we need hundreds, sometimes thou-

Behold the lowly drone. Stout of body, wide of eye and bigger than those that do the work.



sands, of drones in a colony?

What are we ignoring here? Basically, thousands upon thousands of years of evolution. Nature brought drones into being, and gave them a role. The large numbers are not arbitrary. Nature recognizes the varying difficulties of reproduction for each of its millions of species and adjusts numbers accordingly. We can reasonably assume that such large numbers of drones would not have been allowed if it weren't in the best interests of the species. We can rationalize and say that now, with mankind in the picture, nature is relieved of some of her responsibilities. Colonies can do with fewer drones. However, too often when we try to second guess nature, things don't work out too well.

Another concern of nature is inbreeding. Generally speaking, inbreeding is not in the best interests of a species, and nature works to prevent it. Large numbers of drones competing so that only a few of them can mate with any one queen is part of this prevention scheme. And consider another facet of this, another control that nature has brought into the picture – diversity.

This diversity has two aspects. First, mating does not take place in the hive, where normally only sisters and brothers would be present to participate. Mating takes place in flight. Second, mating takes place away from the hive, usually at least a mile or two distant. It happens in drone congregation areas, where drones from many colonies in the countryside assemble. Considering the large numbers of drones produced by each colony, the chances of a given queen meeting and mating with drones from her own colony –

her brothers — are much reduced. Further, there may be several of these drone congregating areas within range. Drones from a given colony may divide, some going to each of these areas and further diluting the numbers.

Of course, eliminating drones from our own colonies does help control inbreeding. By doing so we further reduce the chances of our new queen meeting her own brothers out there. We are upsetting nature's scheme a little, though, by reducing the size of the gene pool, and generally speaking, this is not good. Further, by eliminating drones we are preventing our colonies from contributing to and perhaps improving the general quality of bees in the area. We should always be thinking beyond the confines of our own beeyard. Perhaps the quality of the neighborhood bee population needs upgrading.

All of this, though, ignores the bees and their reactions and well being. Keep in mind that the colony wants drones. Nature has built into them this urge to raise and maintain given numbers of drones under given conditions. They will try to do this no matter what. If we remove drones, they will raise more. If we destroy drone comb, they will make more. Both these activities will use time and resources that could better be spent raising workers and making honey.

We can keep things within reason, though. Over time, excessive amounts of drone comb may build up in a hive. We can control that through a regular program of replacing comb every year. A good program to follow is to take one or two old black combs from each hive body each year, replacing them with new foundation. It is those tired old combs that so often contain excessive amounts of drone cells. This is a good program to follow anyhow because of the disease organisms that build up in old comb over time. In a strong colony, these organisms may not be causing problems at the moment, but disease could take over if the colony comes under stress. And coming around full circle, stripping a colony of its drones or drone comb could bring on an undesirable level of stress.

There is another area to be considered — the bee's morale and their energy level. Over the years beekeepers have reported that colonies are better in several ways when drone

rearing is not restricted. Controlled, yes, but restricted, no. Colonies with plenty of drones have been reported as more active, better tempered, better honey producers, and healthier. Further, they stay more in control of their drone population, raising them in good times but evicting them promptly in times of dearth or at the approaching end of the season.

So, rather than be constantly at odds with the drones, and with a colony's attempts to maintain their numbers, we should recognize their importance, and encourage them, within reason. Accepting all of that, let's look more closely at drones and at their place in the colony. Why do we find them where we do and when we do? A look at their development cycle will help.

A drone's development cycle is much like that of the worker. For a start, there is a brood stage and an adult stage.

Fig. 1. BROOD DEVELOPMENT

Development Stage	Time in Days
Egg	3
Larva	6-1/2
Pupa	9-1/2
Total	24

Brood development consists of three parts — egg, larva, and pupa. It is very similar to the workers except for the slightly longer duration of the larval and pupal stages. Upon emergence, a worker bee starts work almost immediately. In contrast, a drone does nothing productive for more than a week. He is not yet mature and cannot immediately do the two important things in his life. He cannot fly, and he cannot mate. So neither the worker or drone are not mature upon emergence. A difference here is



A worker (top) and drone together. Note the differences in body shape, size and coloration. Drones are easy to spot, and their presence indicates many things in a colony.

that there are a number of tasks a worker can carry out in the hive before she is completely mature, tasks that require little special equipment

cell cleaning, for instance. The worker starts this simple task almost immediately, and continues to work for the rest of her life, as long as there is something to be done. But even she cannot fly in her first days, and several of her glandular systems have yet to develop. The drone's maturation period lasts almost two weeks, and during that time he is largely idle, eating, resting, and occasionally making an orientation flight. But again, this is nature's design.

Fig. 2. DRONE MATURATION TIME

Activity	Days from Emergence
First orientation flight	8
First mating flight	12

During these early days the drone stays in the brood nest. He solicits food and is readily fed by the nurse bees. Whereas the workers are self-sufficient immediately, feeding on honey and pollen the drone is so helpless (or perhaps he's just putting on a good act) that he cannot feed himself and receives a modified brood

Continued on Next Page

food. Drones need the extra nutrients to ensure those all-important reproductive organs develop. Later, he does feed directly from the honey stores.

Even after the drone is mature and starts on his regular rounds, visiting the drone congregating areas of his neighborhood, he only flies out during a part of the day, making several flights during the afternoon hours, pausing to rest and refuel between trips. So all through his adult life a drone spends large amounts of time in the hive. When we open the hive, there they sit, doing just what nature intended.

So far, we have been acknowledging the one very specific role of the drone — reproduction. We should not ignore some other benefits of the presence of drones. For instance, some researchers have suggested that because of their large body mass and their preference for the brood nest as a place to hang out, drones contribute heat to the incubating brood. (Other authorities question this.) Another more demonstrable benefit, one that accrues directly to the beekeeper, is their value as indicators. In spring early drone rearing is a signal that the colony may be building up to

Recognize the importance of drones in your colonies, and encourage them. Within reason, of course.

swarm. The conditions that allow for early drone rearing are the same conditions that allow for a general expansion of the brood nest, which in turn brings about a faster buildup in population. Although a large population is not in itself a cause to swarm, it is a contributing factor. We can have large populations, both of drones and of workers, without swarming.

The presence or absence of drones or drone brood later in the season can give a clue to the general well being of the colony. Steve Taber, in his book *Breeding Super Bees*, observes that no drones in a colony (when they might normally be expected) indicates a severe shortage of pollen. At the other extreme, the presence of adult drones and all stages of brood indicates that pollen is abundant. This is information a beekeeper may not need to know, but having the knowledge leads to a better understanding of ongoing life in the colony, always a desirable goal.


On another level, the presence of drones can help you make some management decisions. Perhaps it is mid-summer and you are contemplating the future of a small colony, one that might not make it through the winter on its own. The presence of drones in a small colony suggests that, although the colony is small, it is basically healthy and well balanced. Perhaps it is a candidate to spend the winter on a double screen over a stronger colony. However, a similar colony without drones may have a basic weakness. It might be better to combine it with a stronger colony. The absence or presence of drones then is a signal. It is left to you to interpret it.

In summary, drones have a role, both in the life of the colony and in the management of the colony. It is to our benefit to understand the drones and to work with them. In beekeeping as in so much of life, working against them will seldom bring benefit and will often bring loss. ☐

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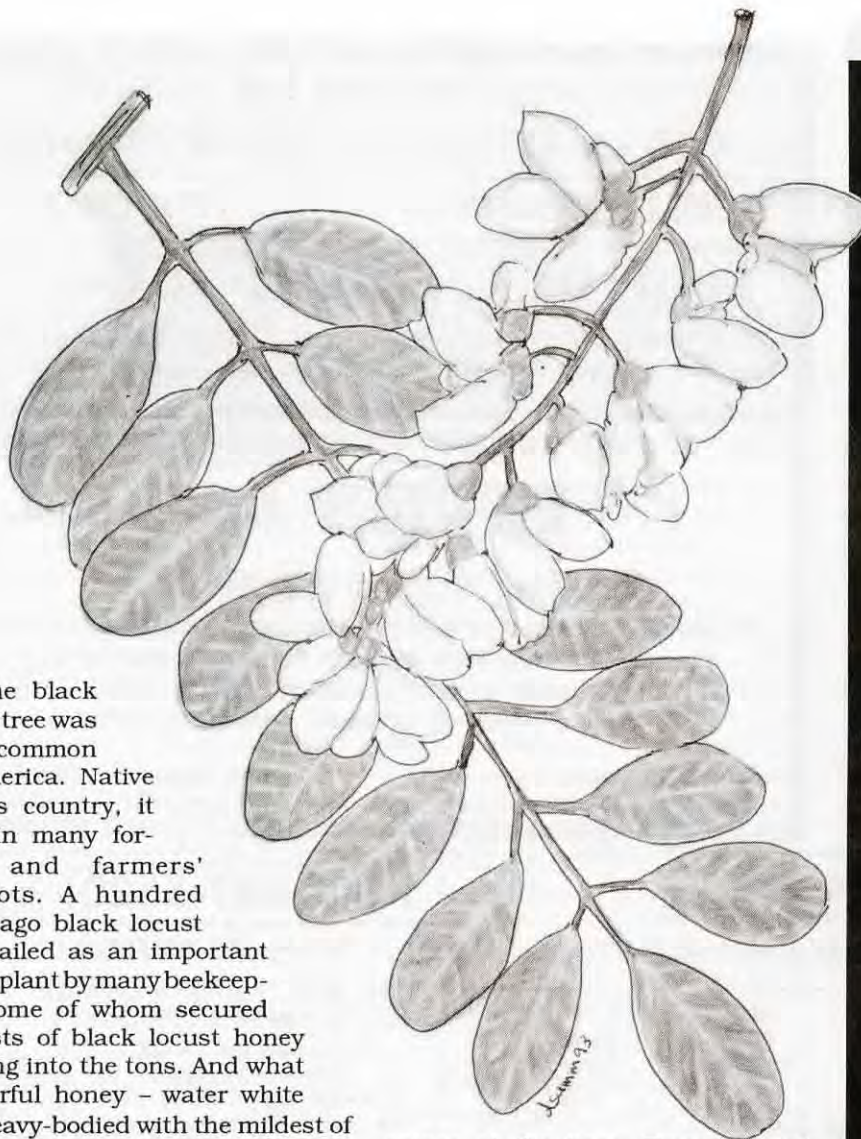
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The black locust tree was once common in America. Native to this country, it grew in many forests and farmers' woodlots. A hundred years ago black locust was hailed as an important honey plant by many beekeepers, some of whom secured harvests of black locust honey running into the tons. And what wonderful honey - water white and heavy-bodied with the mildest of flavors.

Today, in most areas of the country, black locust trees have all but disappeared. In any quantity, black locust honey has become a rarity. Few people have ever tasted it. Few beekeepers ever harvest any. What happened?

Well, partly it's the same story as with other honey plants that were once common. The great forests were cut down. Pastures and woodlots were transformed into housing tracts and shopping malls. And few people, including beekeepers, bothered to plant any new trees. So black locust populations dwindled.

What does the average black locust tree look like? One writer describes it as a "tall, slender tree, 40 to 80 feet tall, with erect branches forming an oblong head." The bark of the mature tree is an inch or more thick, reddish brown to gray in color, and deeply furrowed with forking ridges. The twigs are roundish, somewhat brittle, with a pair of short, sharp



spines at the base. Trees without these spines are sometimes found.

Black locust leaves are eight to 14 inches long, composed of seven to 19 leaflets, each one to two inches long. They are oval in shape, silvery when they first appear, becoming dark green above, lighter below. An interesting peculiarity of the leaflets is their habit of drooping downward and folding together as evening approaches. In autumn the leaves of the black locust turn a clear light yellow before falling. On the ground the small leaflets soon dry and disintegrate, which makes raking unnecessary.

The black locust's white flowers appear in late May or early June, hanging in loose racemes four or five inches long. There are 10 to 25 blossoms on each raceme. In form, the blossoms are similar to the blossoms of the common garden pea, since both are members of the legume family. The blossoms are composed of five white petals with a characteristic papilionaceous or "butterfly" form:

BLACK LOCUST

richard dalby

two lower keel petals, two wing petals, and the uppermost petal (called the "banner" or "standard"), which is marked with a large yellow spot. The blossoms are very fragrant and attract a number of insects, honey bees among them. The blossoming period lasts for approximately 10 days. As with many flowering trees, black locust seems to blossom heavily every other year.

From each flower develops a reddish brown pod three to four inches long, about half an inch wide, containing four to 16 flat, oval seeds an eighth of an inch long. The seeds are dark orange-brown with irregular dark spots. The pods typically hang on the trees until late winter or early spring when they open and release the seeds.

Few trees have a more interesting history than the black locust, which has much to do with the characteristics of the tree's wood. Black locust wood was prized by early Americans for its durability and resistance to rot.



One early visitor to the colony at Jamestown noted that the colonists used black locust posts to support the four corners of their first dwellings. It was here that the tree acquired its English name "locust", the colonists apparently assuming this tree was the same as the old-world

Locust tree (*Ceratonia siliqua*), known as the Carob, or St. John's bread.

Black locust wood is extremely hard, strong, and close-grained. A cubic foot of the seasoned wood weighs approximately 48 pounds. It is exceptionally durable and rot resistant, the most durable of all North American hardwoods. It shrinks less in drying, is stronger and stiffer than white oak and takes a very high polish. Its fuel value exceeds that of any native tree.

In earlier times, black locust was used extensively in shipbuilding, the wood being prized for this use. The so-called tree-nails (pronounced "trunnels") used to pin together the hulls of many old-time vessels were preferably made of black locust. In the War of 1812, after being defeated on Lake Champlain, the British pointed to the superiority of the black locust used in the building of the American fleet.

Other early uses of black locust include the making of mill cogs, wagon

Continued on Next Page



Recognized as a black locust tree enemy since 1702, the locust borer beetle (*Megacyllene robiniae*) is found in eastern Canada and across much of the U.S. But beetle-free areas do exist. Your local Cooperative Extension Agent should know if locust borers are a problem in your locality.

Adult borers emerge in late summer or early fall. They are fond of goldenrod pollen (and the pollen of other flowers), feeding mostly in the forenoon. The adult borers (about three-quarters of an inch long) are black with bright yellow lines, both curved and straight, running across their entire body and with their long antennae, they are easy to identify.

Adult female borers lay 100-200 small white eggs here and there in bark crevices and near wounds on trunk and large branches. Hatching in five to eight days, the larvae burrow their way into the inner bark, where they spend the winter. With spring sap rise the larvae resume feeding and boring, eventually creating a tunnel three to four inches in length.

As the borer larvae tunnel toward the heartwood, they return often to the surface of the bark to enlarge their tunnels. Reaching full size by mid-August, the borer larvae enter a pupae stage while still in their tunnels, then emerge as adult borers.

Thus one generation of borers emerges each year.

Borer activity in spring can be recognized by sap oozing from tunnels which creates dark wet spots on the bark. In late summer the borer larvae eject a yellow sawdust from their tunnel entrances. This sawdust is easy to spot on the bark near tunnel entrances or at the base of the tree. Borer infestation can cause broken and dead limbs, knotty swellings of the bark (where the tree grows faster in response to tunneling), and shortened life of the tree. Borers seem to be more of a problem where black locust trees are numerous and planted close together.

Fortunately, these pests have some natural enemies, chiefly woodpeckers. Wheelbugs (of the order Hemiptera) also kill adult borers. Moreover, hale and vigorous trees show a natural ability to resist borer infestation. Larval mortality during rapid spring tree growth is high, the cause presumed to be high sap flows.

If necessary, insecticides can be applied to trees. For detailed information on what to use, how to use it, and when, contact your local extension service.

(I am indebted to the Cooperative Extension Service, Utah State University, Logan, UT 84322 for this information.)

wheel hubs and spokes, in turnery, and for all sorts of posts. The rails of many early American railroads were laid on black locust ties, thousands of trees being felled for this purpose. Some 19th-century railroads even planted their own black locust stands for use as ties. In the earlier years of the 20th century, black locust was the wood of choice for making the insulator pins found on the cross arms of telephone and power lines. Some 18,000 cords of wood were used in one year to manufacture 25,000,000 pins.

Today, large-scale plantings of black locusts in America are unusual, despite the superior quality of the wood. The main reason is the spread of the locust beetle, which damages the trees with its burrowing. But even in Europe, where the black locust has long been very popular and where the locust borer seems to be no problem, large-scale plantings have not been successful. One reason cited is that the tree trunks proved to be too crooked for the sawmills. Perhaps the extreme hardness of the wood was also a factor. Hard crystals called *raphides*, which form in the cells of the wood, soon dull the tools used to cut the lumber.

On the plus side, black locust is the fastest growing hardwood in the United States. In only three years, black locust begins converting its sapwood into heartwood, something other native hardwoods do not do for ten or more years. So the trunk of a mature tree is mostly desirable heartwood, with only a thin rind of sapwood. Also, the tree begins to blossom in only two or three years, a fact of importance to beekeepers.

Black locust was one of the first of our native American trees to reach Europe and has remained a very popular tree there. Apparently Jean Robin, herbalist to Henry III of France and founder of a botanical garden in Paris in 1590, received some black locust seeds in 1601. From these he grew a number of black locust trees.

Linnaeus honored Jean Robin with the black locust's scientific designation, *Robinia pseudoacacia*. The generic name *Robinia* commemorates Jean Robin (1550-1629), while the designation *pseudoacacia* reflects the fact that the black locust, though similar, is not a true acacia.



I'm awfully fond of black locust trees. They are appealing even if you're not a beekeeper. If you are, then the black locust is downright lovable.

Black locust blossoms are beautiful showy things. Harriet L. Keeler (*Our Native Trees*, 1907) describes them as "Papilionaceous, perfect, borne in loose drooping racemes four to five inches long, cream-white, about an inch long, nectar bearing, *fragrant*." Fragrant indeed! On calm evenings that fragrance haunts the air like the most subtle of perfumes.

Not that it's easy to get a super of black locust honey. Part of the problem is the trees blossom rather early for those of us in northerly climes, before the bees have built up to top honey gathering strength. And the flowers are fragile things, easily desiccated by spring winds. Even under ideal conditions blossoms only last a week or ten days, tops. So getting surplus black locust honey is something of a rarity.

That doesn't mean black locust bloom doesn't help the bees. Most of that light and delicate-flavored honey winds up in the brood chamber and that's fine with me. Many of the bees gathering clover and alfalfa honey in June and July were reared on locust honey.

One thing I've noted is bees have a hard time working black locust flowers, particularly those that have just opened. The problem has to do with the length of a bee's tongue and the particular construction of a black locust blossom. In order to get to the

nectar, a bee must push the upper and lower petals apart, using her head as a wedge. A bee has to push hard to do this. With her head right inside the parted petals the bee extends her tongue and gathers her reward. A sweet reward it is, too. According to work done on various plants by G.H. Vansell some years ago, black locust nectar has a very high sugar concentration. So there's an interesting tradeoff involved here. A bee has to work hard to gather black locust nectar, but it is worth the work. And the blossoms get pollinated in the process. The pollen-bearing structures are contained in two keel petals which are united below to form a sort of cup. As a bee extracts nectar the underside of her body is dabbed with pollen.

Other insects are attracted to black locust blossoms—moths, wasps, and bumblebees, too. I observed several bumblebees. Because of their much greater size bumblebees have little trouble opening the flower while honey bees struggle. Sometimes other insects will chew holes at the base, and honey bees are quick to use that opening to their advantage.

I had fun observing black locust blossoms and bees and their interrelationship. Perhaps the most interesting thing I learned is that answers lead to more questions. Now I find myself with a new curiosity about wasps and their habits. Not to mention moths and bumblebees. And it didn't cost me a dime. Deals like that are pretty hard to come by these days.

The Englishman William Cobbett grew black locust trees on his Long Island farm between 1817 and 1819. At this time the tree was very popular on Long Island, the growers hoping to sell the trees to the British navy for tree-nails. Because of some unpopular statements he made, Cobbett had to beat a hasty retreat back to England. He took along a supply of black locust seed.

Cobbett loved the black locust. He praised the tree highly in his popular book *Woodlands*, published in 1825. His readers clamored for the tree and to satisfy the demand, Cobbett obtained a great quantity of seed from America, selling more than a million plants. Black locust remains a popular tree throughout Great Britain.

It should be noted that several varieties of black locust have developed. Most of these have originated in Europe. One American variety known as Shipmast Locust was first described in 1936. Apparently this variety produces few blossoms, which would not endear it to beekeepers, and it is not widely grown, though it seems to be resistant to the locust borer.

Whatever the variety, the black locust is fairly easy to grow, and once established is very drought resistant. Sources list different types of soils that the tree prefers, but in fact it will grow almost anywhere. Very wet, very



sandy, or very acid soils might be the exception. The original range of the tree was the Appalachian Mountains but it can now be found in every state.

As previously noted, black locust is a member of the pod-bearing family of plants, *leguminosae*, the legumes. In common with such other legumes as alfalfa and the various clovers, black locust trees improve the soil by adding nitrogen to it. Because of this, and because of their fibrous root system, the trees are well-suited for the reclamation of disturbed and eroded soils. They have been planted with success on eroded slopes and strip mining spoil heaps.

In some states black locust seedlings may be available at a nominal charge from the state conservation department, the state forester, or equivalent agency. Local nurseries sometimes carry the tree, and at least

two mail-order nurseries handle black locust.

Another option is to grow your own trees from seed. Heat a pan of water to boiling, remove from heat, drop the seeds into the hot water and let them soak overnight. This will soften the hard seed coat. You can tell when the seeds are ready to plant because they will swell and soften. They can be planted in a seed tray, Jiffy Pots or even used milk cartons cut in half. In any case it is best to use sterile potting soil. Keep the soil damp (but not waterlogged) and provide some sort of bottom heat to maintain a soil temperature of 70-75° F. to assist germination. When seedlings are of a good size and danger of frost is past, they can be planted in permanent locations.

What of the black locust as a honey plant? Experience has shown that, as with other flowering trees, the amount of nectar gathered varies considerably from year to year. But when conditions are favorable the trees yield heavily. Bees will work the blossoms as long as any remain.

The people who settled the West in the 19th century planted many black locusts; some for shade or wood, others to fulfill provisions of the Timber Act. Some of those old trees still blossom in Utah every spring and my bees never fail to find them. It remains a tree of many virtues, black locust; a tree well worth planting. □

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Bees in the Road

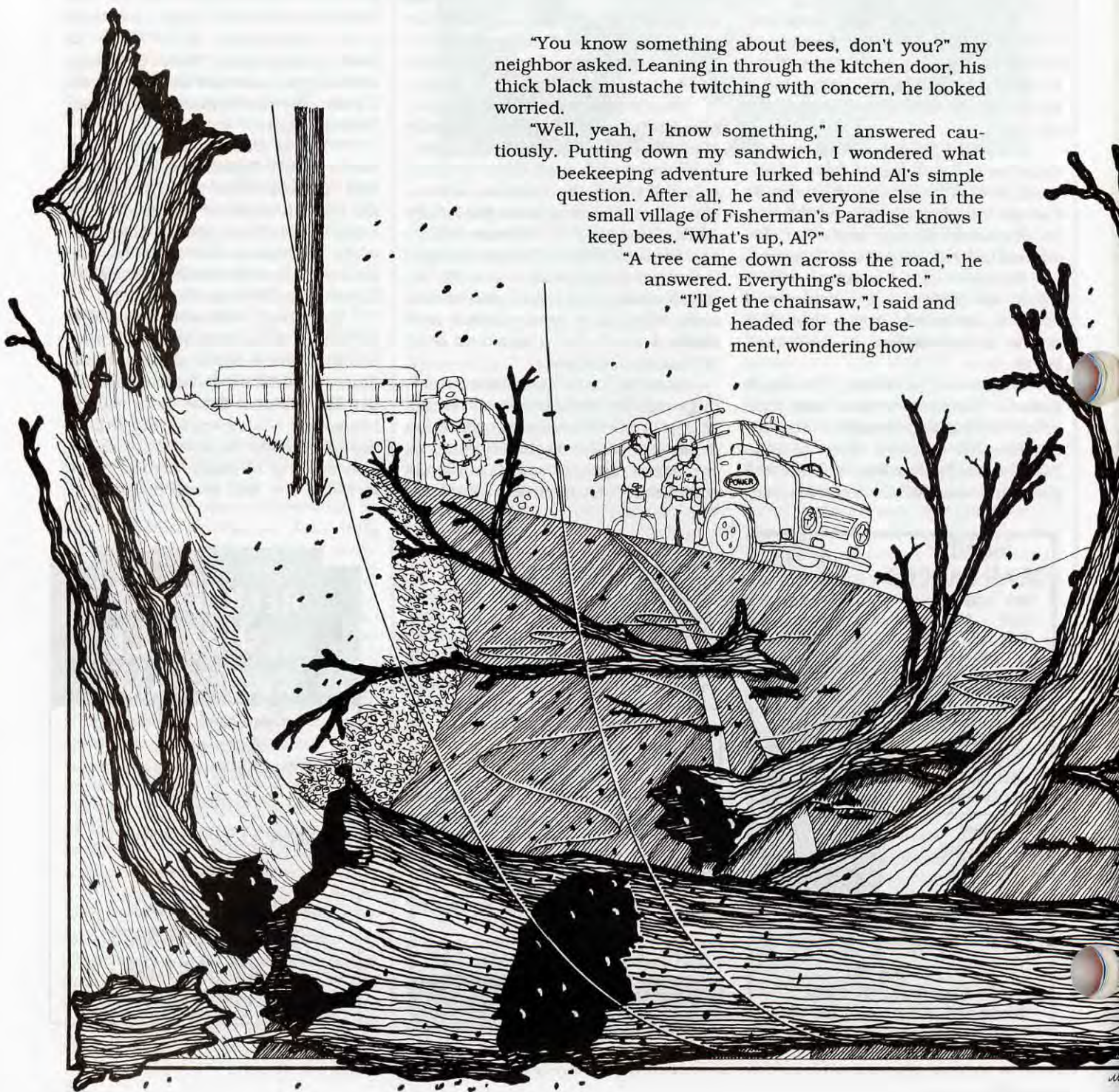
paul hutchison

"You know something about bees, don't you?" my neighbor asked. Leaning in through the kitchen door, his thick black mustache twitching with concern, he looked worried.

"Well, yeah, I know something," I answered cautiously. Putting down my sandwich, I wondered what beekeeping adventure lurked behind Al's simple question. After all, he and everyone else in the small village of Fisherman's Paradise knows I keep bees. "What's up, Al?"

"A tree came down across the road," he answered. "Everything's blocked."

"I'll get the chainsaw," I said and headed for the basement, wondering how



bees were going to fit into all this. I did not have to wait long.

"And there are bees everywhere," he blurted out, looking around as if a squadron of the little hummers would attack him at any time. I kept my smile to myself as we headed outside. One thing was certain: Al was fired up, and I was beginning to think the afternoon would prove interesting.

A quarter-mile down the township road I saw what all the fuss was about. A tall red oak tree had fallen down the steep hillside to the right of the road and ripped through power, phone and television cable wires. Now, its thick trunk lay splintered on the hardtop, effectively sealing the only road into or out of Fisherman's Paradise. A crowd of about 20 men stood around while eight utility trucks growled at idle, their orange lights swirling through a din of radio traffic. Getting closer, I realized why no one was busy clearing away the mess. In fact, I realized why no one was standing any closer than 30 yards. A dense cloud of darting insects hung over the entire scene and I recognized the loud, angry buzz of a smashed feral hive. Now I smiled. This afternoon would certainly be interesting.

Wading through the crowd of worried men came a dark suit with a white hard hat who introduced himself as the supervisor of operations from the power company. From the look of things, he was in charge. "You the bee man?" he asked.

I nodded. "Looks like you've got a small problem," I said, pointing to the cloud of bees and trying to minimize the fear on the workers' faces.

"Small problem?" one guy echoed. He and three other linemen retreated to their truck and climbed inside, rolling up the windows.

"Look," the supervisor said, grabbing my arm, "can you do anything? Power is out all the way into town, and that means nobody can pump water from their wells or anything." All those who had not sought refuge in their trucks were watching me, and I gave them my biggest, most confident smile.

"I can try," I said, "but there's no guarantee it will be fast or easy."

The supervisor's tense face loosened for the first time, and he resumed chewing a piece of gum that had sat forgotten in his mouth until now. "Do what you can," he said. His expression told me that now I was in

A crowd of about 20 men stood milling around while eight utility trucks growled at idle, orange lights swirling through a harsh din of radio traffic.

charge. As I turned to leave, I heard his voice crackle over the two-way radio: "We got a bee man here who's going to take care of everything."

Walking back to collect my gear, I tried to control my excitement by recalling the many stories, tips and helpful columns I had read in *Bee Culture*. At 39, I have only been keeping bees for four years, and in that time I had never been called on to handle anything like this. In fact, I had never even hived a swarm! Now, here I was, trying to work out a pretty sticky situation, and without a wealth of practical experience, I was left with only two things to rely on: my hours of reading and my enduring love of bees.

Assembling a hive and loading it into my truck along with my smoker, suit, gloves and veil, I felt confident. I knew the bees and I would get along. It was the men that worried me. I would have to be slow, deliberate, and confident as I helped them through this, exactly the way one acts when managing bees. Driving back to the scene, I grinned at the irony.

When I walked toward that cloud of bees in my suit, veil and gloves, the men stared as if I were strolling nonchalantly into the very core of the Chernobyl nuclear reactor, hoping to cool it with a watering can. In fact, one man thought my smoker was a watering can, at least until I lit it. What they did not know, however, is that I trust my equipment, and more than that, I trust bees. As they flew up to challenge my approach, their striped bodies flashed in the sun, hanging a golden tapestry through which I stepped into their world.

The colony was a mess. The huge tree, hollowed by rot, had split open right at the hive, and comb and bees were smeared all over the road. Looking for the queen, I laid down some smoke and began going over the combs where the largest masses of bees clung, but she was nowhere to be

found. If I could find her and put her in my hive box, there was a good chance the other bees would follow. Then I noticed something strange. There were no eggs or brood. Without a queen, how was I ever to control this swarm? I reached up into the dark trunk, hoping other combs might yield the royal lady.

"Scree, scree, scree, scree," something protested loudly from up inside the tree. Then I felt it struggling faintly in my hand. Pulling gently, I withdrew my hand and there, curled in my gloved palm, was a baby squirrel. Tiny and still blind, it huddled against my fingers, squeaking forlornly. It had been living right above the hive, but appeared untouched by the bees. They too were curious about this baby creature and flew around my hands to look at it. Yet, while they were landing on my gloves and arms, not a single bee touched the baby squirrel. Could it be the squirrel smelled like the hive and therefore was accepted as part of the bees' society? I wondered about that as I carried the squirrel back to the men and put him in a small carton. One man produced a spare work shirt and wrapped it around the little guy. As I returned to the bees, I heard the men already arguing over whose children would give it the best home. Squirrels, it seemed, they understood.

Without a queen for guidance, I could think of only one way to get the bees moving. As smoke swirled around me, I removed four frames from my hive box and began filling the space with all the chunks of comb I could collect. Each was dripping with bees, and I hoped that sheer mass would eventually attract the other bees to the hive. But the bee scene was rapidly becoming complicated by intruders. Yellow jackets and large, black hornets were showing up everywhere, and then the first wave of robbers from my own hives, which were lo-

Continued on Next Page

Bees flew everywhere, and although the men calmed down after watching me work they still could not be convinced the scene was reasonably safe.

cated just a quarter mile up-stream. Bees, locked in mortal combat fell from the sky and struggled on the road. The tone of the swarm changed abruptly, and I knew the time for slow and deliberate work was over.

Placing the last of the larger clumps of bees into my hive, I picked it up and backed out of there, taking the hive about 30 yards from the tree and setting it down in the grass. To my surprise, most of the bees seemed to stay with me, although the hive entrance was littered with dead and struggling bees. Gruesome as this was, it was also heartening because it seemed to indicate that the bees inside the hive were defending it. Perhaps I had succeeded after all.

The road was still a problem. Bees flew everywhere, and although the men had calmed down after watching me work with the bees, they still could not be convinced that the scene was now reasonably safe. But what about all my neighbors who had been without power and water for nearly two hours? For the power company, the solution was simple. "Hey, Beeman," the supervisor called through a bull horn, "we're going to pass you the wires and you can walk them through." Putting down my smoker and grabbing the first cable they passed, I wondered if that supervisor would understand if I told him I was just about as happy to be dragging a 15,000-volt power line as he would be carrying a hive full of bees. But there were my neighbors to consider, so I let the bees calm me down and concentrated on pulling those heavy cables. I just hoped no one threw the wrong switch.

With the power lines finally reconnected, it was the phone company's turn to go into action and cut the tree off of their wires. But the men refused to work. "Can you guarantee I won't get stung?" one demanded. "I mean *guarantee*?" "Let's

get some spray and kill all these suckers," he said, raising his voice so the rest of his crew could hear. They sounded their agreement from inside the truck.

Looking around, I realized this could get ugly, not so much for me, but for the bees. Indiscriminately spraying chemicals would kill a lot of bees right at the site, and my own bees might carry the insecticides back to my apiary. By the next day all my hives could be wiped out. This was serious! "So?" the phone man demanded, spitting tobacco juice on the road.

I thought fast. "Give me a second," I said, then walked over to the yellow state highway truck where the guys were gathered around the baby squirrel like a group of new mothers. Taking the foreman aside, I spoke to him quickly. He nodded, then got on his radio. Five minutes later, with lights flashing and siren wailing, the fire truck arrived.

I had remembered the July '92 cover of *Bee Culture*, the one featuring the fire truck. I figured if we could wash the honey off the road, we could keep the bees away from the phone lines.

With the hose laid out, I went in with two firefighters and started. Then we heard "Scree, scree, scree, scree." I reached inside the tree and found another baby squirrel, as blind as the first, soaking wet and shivering. Quickly we got him into the box with his brother and they snuggled together.

The water did the trick, and before long the phone lines were back up, the television cable was rehung, and the highway workers' chainsaws were filling the afternoon with their high whine and wood chips. Off to the side, I noticed a three-foot piece of limb still covered with bees. Picking it up, I carried it over to the hive box and leaned the end against the bottom

board. To my delight, the bees all ran inside! Every last one! I had successfully hived that mass of bees.

As I loaded my equipment into my truck, the supervisor from the power company walked over and shook my hand. "Nice work, Dave," he said.

I laughed. Pointing to the "Dave" stenciled on the secondhand butcher's coveralls I use as a bee suit, I said, "My name's Paul. I'm only 'Dave' to my bees. This way they can't look me up in the phone book and find out where I live."

He laughed, thanked me again for helping them out of a tight spot, and jotted down my name and phone number for future reference.

I pondered what I would say in the future when someone asked for help. I know that many beekeepers now refuse to collect swarms or to help in situations like this, and I agree they have very sound legal reasons for taking that position. But I also know that when my neighbors needed my help, I had to respond. And despite the risks, I feel amply rewarded. Power, phone and cable service were restored to our little valley and the road was reopened. There is a new hive of bees out in my apiary, and I prevented the use of chemicals that would have put my bees at risk. And I had the opportunity to educate many people about the amazing culture of bees. That's enough for me. ☺

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Supering & Bee Behavior

o.b wiser

It was a long hot summer in the Rockies last year. All supers were about full as August drew to a close. I didn't run any two-queen hives because I had been decimated by mites. The previous December my hives were filled with bees and by mid-February, most of them were on the ground outside the hives - dead from mites.

What was left were mostly weak hives and a few strong ones. I have not given up bees, like many, because of the mites. I love my bees. The money thing is not the reason I keep them, but I intend to be profitable.

So I found the means to protect my bees totally from mites (both kinds) and in a way that is very economical and feasible - a means that was already developed and used elsewhere. My bees totally recovered. I divided in April as usual, replaced my lost numbers, and even made 80 new hives. They now sit in the yards, strong, with an average of 90-120 pounds of honey because last year was good, and I am preparing to treat them again after the honey comes off, but that is another story.

Last week I received several questions from readers. (By the way, I love to answer questions. All I ask is that you send your question with a stamped, self-addressed envelope to the Editor. He will forward them..) Two questions had to do with supering hives, and why is the two-queen system better than two hives side by side. The question about supering came from a veteran commercial beekeeper who has kept bees nearly 40 years; the other from a novice.

I read the first question and groaned. Again the typical beekeeper reasoning that is totally Anthro-

morphic. That means we, as beekeepers, make little humans out of bees for romantic reasons; and instead of trying to think like bees, we make them think like us. Thus the problem in beekeeping - true bee behavior vs. romantic Anthropomorphism.

Why Two-Queen Systems Work A parent hive, after division, will produce two boxes of honey in my area. Its divide, at best, will produce one box of honey. Often, no honey is produced by the divide the first year. Bee age is the reason. When the divide was made, the field bees of the parent hive, the bees that would have collected the crop of honey that year, were taken away. In short, the honey gathering strength of the parent hive was divided to keep them from swarming.

When a two-queen system is united, that total field force is put back together again, plus another field force of smaller size produced by the division's new queen. The result is a huge field force, capable of taking advantage of short honey flows, three times greater than the single hive. Thus, in a poor year when divides make no honey, and parent hives only make 30-40 pounds the united two-queen hive still makes 80-100 pounds.

The next question came from my commercial friend. He stated as a fact that if you take your honey off the hive more than once, the bees will make more honey. I choked back a sigh and simply said that was interesting and changed the subject. (I hate to argue over the phone, especially with friends.)

So my friend and his brother take honey from their bees two and three times each year, increasing their expense and back labor, and they never take more than 120 pounds of honey from a hive. In fact, the hive average is 45 pounds or less.

This statement is relevant to the question asked by the novice reader about why two queen hives are better than having the same two hives on the ground next to each other. *Understanding actual bee behavior is the real answer to both these questions.*

Behavior Statements

Field bee populations make honey crops - not strong hives. Field bees that are old enough to make the trip to the bee pasture are what makes honey. Hopefully, both strong bees and strong populations will coincide, but not necessarily. As a beekeeper, you can screw up the works by making late divides and thus making it impossible for the parent hive to have enough field bees to gather a crop.

Honey bees have built in hoarding behavior that will bring honey in, at full capacity, until all comb space is filled. Bees are not content when they have enough honey for the winter. They are programmed to gather all available nectar until no room exists in the hive to store it. Adding empty supers above

Continued on Next Page

Field bee populations make honey crops, not strong hives. Look for foragers, not fuzzy house bees.





A divide, at best, will produce one box of honey. Often, no honey is produced by the divide the first year. Bee age is the reason.

BEE BEHAVIOR ... Cont. From Pg. 329

the brood nest will not stimulate them to gather one more load of honey than they would have otherwise.

Keeping hives short saves time so the field bees will not have to travel through all those supers to the top empty one to unload, thus giving more time for collecting honey. **THIS STATEMENT IS FALSE!** This same reasoning would have you open hives at the top and middle and provide huge lower entrances so bee traffic could move faster. In reality, one small hole at the bottom is all that is needed. Crops will not be adversely affected by having only one small entrance. Why?

Bee behavior is the reason. First of all, **field bees are not born – they are made.** A bee is not born. A field bee has to progress through a regiment of physical and behavioral maturation that take time to accomplish.

Twenty-two days (more or less) is the fastest time from emergence to field bee. Thus, the your calendar and the honey flow must coincide. The queen instinctively knows this when she starts laying eggs in January to be prepared for the honey flow in spring.

The waste of time, energy and money spent on bottom supering becomes apparent when you understand the behavior of the field bee and its support system, the house bees.

Bee Behavior, Step by Step

Step One The hive must have an adequate field force at the time of the honey flow. A million fuzzy house bees will never store a pound of honey. If the nectar is ready for harvest on July 4th, the bees must be ready.

Step Two Field bees do not, I repeat, do not travel to the top of the hive to unload a load of nectar. When entering the hive and brood nest which is situated at the bottom of the hive, the workers find a house bee and transfer their nectar load to her, who takes it and adds enzymes to invert the sugars. At the same time, the house bee will stretch the drop of curing nectar with her tongue, thus exposing the maximum surface of nectar to the warmth of the brood nest. The field bee is unloaded rapidly so she can fuel up with honey and head out. Her turnaround time can be as little as 60 seconds. Then she is back in the field if the nectar source is still producing at that time of day. Bees that enter at the top of a stack of honey would have to travel to the bottom to be unloaded in the brood nest. At this time of year my hives with seven full-depth supers) have almost no flight in the upper entrance created by the inner cover. Why? Because they are entering the hive nearest the brood nest and the unloading zone. This turnaround time is a critical factor in the survival of the species.

Step Three Time is not lost in the transfer of nectar to the top box, and thus does not reduce the potential honey crop. This is where beekeepers try to do the bee's thinking instead of understanding the behavior of the bee and how she really works. As noted in step two, the field bee is served by the house bee to keep the turnaround time as short as possible. Why? Evolution has selected those bees that could take best advantage of honey flows that often are available a few hours a day, some even less. Example: Dandelions are productive for about two hours in the morning in the early spring, weather permitting. The hives with the fastest turnaround time and the strongest field force takes advantage of the tons of nectar, while those who do not have bees of the right age can starve to death in the spring. Not because of numbers, but because of age.

Step Four The nectar is handled by house bees that cannot, I repeat *cannot*, fly in the field to collect nectar. Uncured nectar is put in the brood cells and any cell that has room in its top. The drop is hung to dry and to speed up the biochemical process of inverting the sugars that require a

warm environment to proceed quickly.

It is by the timing of this very real chemical reaction that the next behavior is controlled. The drop of curing honey is moved into storage above the brood nest where the excess moisture is driven off. This normally takes place at night by house bees. Thus, no time is lost to honey gathering. At worst, the house bees take a few more seconds to traverse the extra distance to the honey super.

You may say "Well that is time lost. What if there are too many house bees moving nectar and the field bees have to wait?" The way colony dynamics work, there are always more house bees than are needed except in a new swarm where there are no house bees. Then, some field bees revert back to their old behavior of house bees and, the majority of movement still takes place at night when no nectar is being gathered.

Speaking of the swarm, we have all marveled at the capacity of a two-pound swarm to out-produce our best hives. Why? The percentage of field bees is the answer, and a beautiful example of the dynamics of subpopulations in a hive. That is why the date

"Although some disagree, my experience has been that removing honey more than once a season wastes time, energy . . . and honey."

to divide bees is so critical.

Conclusion The removal of honey more than once a year has no basis in increasing production. It may be necessary because of a lack of supers or because hives are not on level ground, or because of schedules the beekeeper must keep. In my experience, taking honey off several times a year and bottom supering have a detrimental effect. The second brood chamber never gets filled until the supers are finally removed. If there is no honey flow after the supers are removed, the bees must either starve or be fed and I hate to feed bees. I like to see my hives' second brood box full of honey

at the first of the honey flow, the bottom box being used for brood production. In my neck of the woods, the bees that are hatched in July will never collect honey that year anyway.

The effort to bottom super, which is backbreaking, accomplishes no increase in honey production. It only insures an empty second brood box. If it's convenient, do it. Maybe you like to tinker with your bees; and gas and time are of no consequence; or you are short on supers. Those are all valid reasons to harvest honey more than once in the West. Bees think like bees no matter how much we beekeepers wish they did not. **And I learned that the hard way.** ☐

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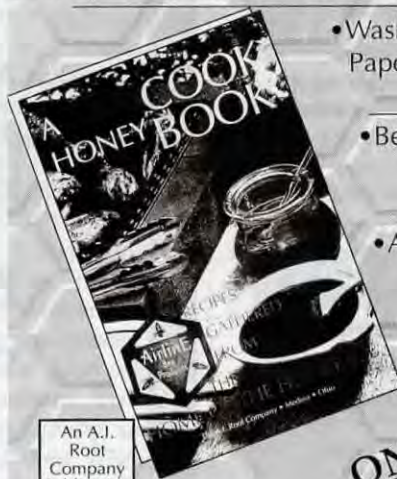
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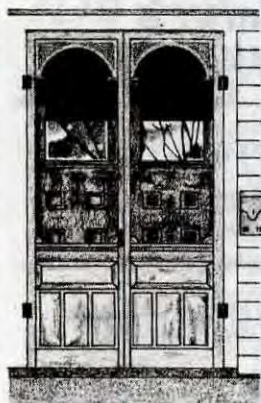
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Good nutrition: Blueberries are very rich in vitamins A and C, minerals and other vitamins. Excellent keeping qualities: It's a firm berry that ships well, cans well, dries well, and keeps frozen for up to two years. **Versatile:** Blueberries are sweet enough to eat right off the bush; their flavor blends well with other fruits and they can be used in many different recipes from soups to ice creams. **Easy cultivation:** They grow wild throughout the eastern part of the U.S. and Alaska; cultivated varieties can be grown throughout many areas of the country. **Low calorie:** One cup contains only 86 calories. (Go ahead and eat while you pick!) And blueberries are easy to pick – no thorns.

By the way, huckleberries are not blueberries although they may seem similar. Huckleberries belong to an entirely different genus of plants, making them only remotely related to true blueberries. Huckleberries are characterized by "large, bony seeds", as described in one book. A cookbook pointed out that a pie made with true huckleberries was quite inedible because of the large number of gritty seeds. Some berries related to blueberries are bilberries, whortleberries, and the native cranberry. These berries are characterized by having very small seeds.

It is interesting to note that the cultivated blueberry is quite new. The wild plants were the sole source of

blueberries until 1909 when USDA experiments showed that blueberry plants needed an acid soil. Today, wild blueberries are the same plants the settlers found: the lowbush blueberry, growing about a foot high, found in the northeastern U.S. and eastern Canada; the highbush, which can grow as high as 30 feet, found in the eastern U.S.; and the rabbiteye blueberry of the southern U.S. The cultivated blueberries were developed from these native plants.

Cultivated varieties of blueberries make attractive shrubs for urban and suburban gardens. Given properly acidic soil, blueberries will welcome spring with white or pinkish flowers, followed by the blueberries themselves, and then will give you a display of colorful leaves in autumn. Cultivated blueberries come in early, middle and late varieties so that your harvest can extend over several months with just three plants. An evergreen species native to the Pacific coast produces berries and greenery for floral decorations.

Today Maine is the leading state in production of the wild blueberry, with a record crop of 85 million pounds in 1992! Wild blueberries are considered so important that they have an association: The Wild Blueberry Association of North America, P.O. Box 35, Orono, ME 04473. They will be happy to send you information on wild blueberries, including recipes.

The best part of blueberry cultivation is the need for honey bees. Not only do our bees provide good pollination of blueberry blossoms, but they make a honey crop, giving us an excellent and tasty honey. What did the wild blueberry plants do before honey bees were introduced into the United States? Well, enough native bees of other species were available

for pollination to produce a modest crop. Research has shown definitely that honey bees are an important pollinator of the blueberry blossom. The higher the honey bee concentration, the more efficient the bees become, and therefore the greater the fruitset. In 1983 11,000 colonies were moved to Maine for blueberry pollination with production at 44.6 million pounds. In the record year of 1992, 32,600 honey bee colonies arrived to pollinate 50,000 acres of native lowbush blueberry.

You are probably familiar with blueberry yogurt, blueberry ice cream or sherbet, and blueberries in breakfast cereals. Try blueberries with citrus fruits and melons. Garnishes and relishes with blueberries complement meats. Use spices such as cardamon, cinnamon and nutmeg with blueberries. To keep blueberries from sinking in baked goods and to keep them from bleeding into the batter, coat the berries gently but thoroughly with flour. Wild blueberries are small (but flavor-packed) and are ideal for muffins and pancakes. Cultivated blueberries are large and perfect for pies, salads and quick breads. Use blueberries to decorate cakes, pies and salads. Freeze blueberries inside ice cubes or in an ice ring to float on fruit punch.

CUMBERLAND SOUP

Serve this soup with a garnish of fresh mint.

1 envelope unflavored gelatin
1/4 cup cold water
4 cups orange juice
3 tablespoons lemon juice
1/4 cup honey
1 pint fresh blueberries

Soften gelatin in the cold water, Melt over
Continued on Next Page

HOME ... Cont. From Pg. 333

heat but do not boil. Combine gelatin with juices and honey and mix until well blended. Chill until thickened. Fold in blueberries and chill. Makes 8 cups.

The Blueberry Connection
Beatrice Ross Buszek

HONEY BLUEBERRY MUFFINS

No collection of blueberry recipes would be complete without one for blueberry muffins. If you have a favorite muffin recipe — using honey, of course, then just fold in 1/2 cup fresh blueberries, dusted with flour.

- 2 cups whole wheat flour
- 1 teaspoon salt
- 3 teaspoons baking powder
- 1/2 cup fresh blueberries
- 1 cup milk
- 4 tablespoons honey
- 1 egg, beaten
- 1/4 cup melted butter or margarine

Combine dry ingredients. Add blueberries and mix gently. Mix milk, honey, egg and melted shortening. Add to dry mixture. Stir quickly, just enough to moisten dry ingredients. Ignore lumps. Fill greased muffin cups 2/3 full.

Bake at 400°F, for 25 - 30 minutes or until delicately browned.

The Healthy Taste of Honey
Larry J.M. Lonik

BLUEBERRY NUT QUICK BREAD

This quick bread makes a great snack. Try it with a mid-morning cup of tea or coffee.

- 2 eggs
- 1 cup honey
- 1/2 cup milk
- 1/4 cup butter
- 3 cups flour
- 1 teaspoon salt
- 4 teaspoons baking powder
- 2 cups fresh blueberries
- 1/2 cup broken walnuts

Beat together honey and eggs. Heat milk and butter. Add to honey and eggs. Mix until lemony colored. Combine dry ingredients and add to first mixture until just blended. Toss nuts and blueberries together with a small amount of flour to keep them from sinking. Grease two small loaf pans. Bake at 350°F, for 30 to 40 minutes.

The Vermont Beekeepers Cookbook

BLUEBERRY CUSTARD PIE

This pie recipe is incredibly good. If you really want to gild the lily you can decorate the top with fresh blueberries just before serving.

- 1 unbaked pie crust for 9-inch pie
- 3 cups blueberries
- 2 tablespoons honey
- 1 tablespoon lemon juice
- 1 teaspoon mace
- 3 eggs
- 1/2 cup low-fat yogurt
- 1 cup sour cream
- 1/4 cup honey
- 1 teaspoon vanilla
- 1/2 teaspoon grated lemon rind
- cinnamon

In a bowl mix together the berries, honey, lemon juice and mace. Pour fruit mixture into the unbaked pie shell and bake at 375°F, for 25 minutes. Meanwhile, mix together the remaining ingredients except the cinnamon. When the pie is finished cooking, pour the cream mixture over the blueberries and sprinkle the top with cinnamon. Lower the oven temperature to 325°F and bake for 45 minutes. Chill before serving.

Honey 7 Spice
Lorena Laforest Bass

BLUEBERRY-APPLE CONSERVE

Since blueberries freeze so well, in season freeze one quart to use when good tart cooking apples ripen in the late fall.

- 1 quart blueberries
- 4 medium-size tart apples (about 1 quart chopped)
- 1/2 cup raisins
- 3 cups honey
- 1/4 cup lemon juice
- 1/4 cup chopped nuts

Core and chop the apples. Combine all ingredients except the nuts. Cook rapidly for about 20 minutes or until thick. Stir frequently as mixture thickens. Add the nuts during the last 5 minutes of cooking. Spoon into hot sterilized jars to within 1/2-inch from top. Complete seals and process in a boiling-water bath for 10 minutes.

Putting It Up With Honey
Susan Geiskopf

You may find some delicious blueberry recipes that use sugar. Do experiment because blueberries are such a natural with honey.



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?Do You Know? Answers

1. **True** An abundance of young nurse bees is a primary requirement for production of high quality queens. Nurse bees provide a surplus of royal jelly and proper care for all queen cells being developed. Older bees are unable to supply adequate amounts of royal jelly.
2. **False** One disadvantage of permitting bees to select their own larvae from which to produce queen cells is that they will select some larvae which are too old to produce the best queens. Queens produced from the oldest larvae will be the first to emerge and will destroy all other queen cells present.
3. **True** Great care should be taken to prevent young larvae from becoming chilled, overheated, or from drying out during grafting. Bars of grafted cells and the combs from which the larvae are grafted are often wrapped in moist towels to keep them from becoming desiccated.
4. **False** Varroa mites show a strong preference for drone brood rather than queen cells. Female varroa mites seldom enter queen cells, except under extremely high infestation levels. Successful mite reproduction in queen cells is hindered since the queen's developmental period is shorter than the mite's complete life cycle.
5. **False** Fall is considered by many to be the best time to requeen colonies since a new queen will lay later into the fall, providing a higher proportion of young bees to survive the winter. But fall is not the easiest time to requeen since colony populations are large and honey supers are often still on the colonies. Thus, the beekeeper has to handle a lot of equipment and search through a large population of bees to find the old queen.
6. **True** Colonies used for the purpose of building queen cells can be either queenless or queenright. In queenless units, nurse bees must be concentrated in the cell-building area, and separated from the queen and young brood. Both types of cell builders must be strong with bees of all ages and especially strong in nurse bees. Each must have abundant honey and pollen.
7. **True** In common with the worker bee, the queen develops from a fertilized egg. Fertilized eggs which produce female offspring are laid in either worker or queen cells. All female larvae develop into queens or workers, depending on the food and care given them during the early stages of their larval life.
8. **True** Colonies of honey bees rear queens in connection with three distinct processes: 1) replacement of a queen that has been lost suddenly, 2) superseding of a failing queen that is still heading the colony, and 3) during preparations for swarming. In each case queen rearing begins when the workers become short of inhibitory pheromone. Colonies will produce queen cells when the bees and young brood are separated from their queen. This reaction will occur under a number of circumstances, such as removing a queen from a colony, when the brood nest is divided by a queen excluder and the queenless division has young brood or when a colony is divided and the queenless portion is placed in a separate location.
9. **True** Not only are larvae developing in queen cells provided larger quantities of food and royal jelly throughout the entire larval period, they are fed much more often than worker larvae.
10. **True** Queen cells have a larger diameter than worker cells, and the open end faces downward instead of horizontally.
11. D) 13 days
12. B) 9-oxodecenoic acid
13. Larvae which are hatched in queen cells normally receive a greater abundance of food during the first two days than larvae that are selected after they hatch in worker-size cells.
14. Marked queens are easier to find when you are searching for them, serves as a record of their age and allows you to know when they have been naturally replaced (superseded).
15. Liquid invert sugar syrup and powdered confectioners sugar without cornstarch. Honey could replace the invert sugar syrup but is not used commercially because of the possible danger of spreading American foulbrood.
16. Young virgin queens are not as attractive to workers as are laying queens due to differences in pheromone production and do not have a retinue of workers surrounding them. Virgin queens are smaller in size and more prone to run and hide than are laying queens. Virgin queens may even attempt to fly as you are searching for them.
17. A) Workers only
18. D) Workers and Queens
19. B) Queens only
20. G) Laying Workers, Workers and Queens
21. A) Workers only
22. Primary swarms are normally accompanied by the old queen of the parent colony from which the swarm issued. Therefore, it would be wise to replace her soon after the colony is established.

There were a possible 25 points in the test this month. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct

25-18 Excellent

17-15 Good

14-12 Fair

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BY bill sames



TEXAS

Most everyone has heard that everything is bigger, if not better, in Texas. Well, it just so happens that that is the truth, and to prove my point, I've got a true Texas bee tale to tell you with pictures to back it up.

It was one of those beautiful September days when the summer heat had cooled down to a nice 95°F, and it was so dry that you could spit and it would evaporate

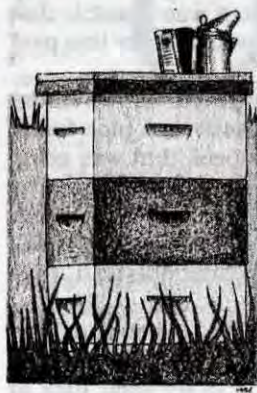
before it could hit the ground. Joe, Kelly, Mike, Jamie and I were sitting around, killing time when the phone rang.

I reached over and picked up the phone – it was Gene.

TALE

Continued on Page 338

🐝 BEE CULTURE



BEE TALK

richard taylor

The Taylor Principle - It overwinters colonies, and makes honey!

I want to talk about wintering. I know this is not the time of year for that, but I want to talk about it now, while this past winter is still fresh on people's minds. And I have another reason for bringing it up now, which will become apparent shortly.

The winter losses, at least throughout the northeast and probably farther west, were the worst in the memory of many beekeepers. Reports from Ohio speak of winter losses of 50%. Around here good beekeepers lost half their colonies, sometimes more, sometimes a bit less, but there were few exceptions to the general picture. At a meeting of beekeepers yesterday I asked about losses, and they all confirmed this.

These reports had begun to reach me some time ago, and I made the rounds of my apiaries the other day with considerable apprehension. It had been too wet and too cold to get around to them sooner. The yards didn't seem, from casual glance, to be in very good shape. There were lots of dead bees on the ground. Melting of the snowfalls had left everything wet. Water and melting snow were up to the hive entrances in some cases, mingling with all the dead bees. And yet, to my great rejoicing, bees were flying from most of the hives! In some cases they were flying, not from the entrance, but from cracks and holes, but that's okay; some of my equipment is pretty old and decrepit. The point is, they were flying. They had survived. I checked the other hives, by lifting the hive cover, and they were alive too! Every colony in the first apiary had survived, some of them apparently weak, but still, alive.

And it was the same at my next apiary, five miles away - every colony had come through. And this is my biggest apiary. So on to apiary number three. Here I found two dead ones. One was in a single story, a swarm I'd hived. I've lost track of the history of the other. But most of the bees in this yard were established from stray swarms I picked up last summer.

Now how come? Is it because I carefully nursed my bees along? Is it because I gave them lots of sugar syrup last fall? No. I'm not a fastidious beekeeper. I'm a rather sloppy beekeeper. And I did not feed my bees anything last fall. I never feed sugar syrup or pollen patties or anything of the kind, and I never use menthol.

So what did I do right? It's very simple, and I've said it in these pages many times. I left all the late summer and fall honey on the hives. I harvested no supers after the first week of August except those that were still unfinished at that time, and there were not many of those. The hives went into the winter heavy as lead, with *honey*. I didn't wrap them. Winter preparation was minimal - just a wedge of hardware cloth in the entrances to keep mice out, a scrap of tar paper loosely stapled to the front of the hive to keep wind from blowing into the entrances, and a scrap of wood under the back of each hive to tip it forward a bit - that's all. Lifting the hives from behind to slip that scrap of wood underneath is what told me they were all heavy as lead. With *honey*, gathered on the late flows. I don't think I spent even two hours on these winter preparations.

The bees had done all the work, gathering that late honey to get them through the winter.

That is the so-called "Taylor principle", on which my hopes for everlasting fame have long rested. It seems to me that the winter we just emerged from proves its value, though I have yet to taste any of the fame that I have craved so long.

Actually, I didn't discover it. I got it, by accident, from Charles Mraz, who has been keeping bees most of this century. One year, I heard him say, he got so behind with his extracting that he didn't get the late honey off the hives in one of his yards. It stayed there all winter. And come spring, the bees in that yard were the strongest, by far, of any of his yards. Note: He didn't say merely that they had all survived. They came through alive *and strong*.

And there is the whole secret of honey getting - *strong colonies*. Not just strong in June, but strong in May and even, as far as possible, in late April. Those are the colonies that will be ready for the earlier nectar flows, which are usually the heaviest flows and which yield the finest honey.

It seems so hard to persuade beekeepers of this. They find all that honey on the hives in the fall, and they can't resist harvesting it. Then they imagine they can cheat the bees by giving them lots of sugar syrup. That is their first extra cost, in time and money - fall feeding. Then, come spring, they spend more money feeding the weaklings that have resulted from their folly, and spend even more

Continued on Next Page

on package bees and nucs to redeem their winter losses. They get themselves back in business again, with a lot of still-weak colonies, on which those wonderful early nectar flows will be largely wasted.

The Taylor principle, as I am fond of calling it, works wonderfully for a comb honey beekeeper like me. The late flows, from goldenrod and aster, are not good for comb honey anyway - the sections are too waxy, and they granulate, and they are dark - very poor quality. But the honey is fine for wintering, and an excellent investment on next summer's early crops.

The evidence is pretty strong that this system (if it can be called a "system") helps combat mites, too. I had losses from tracheal mites three years ago, but haven't since, to any significant extent. The general principle here is that things that are strong and healthy, whether you are talking about people or animals or bees, resist stress, whether from parasites or whatever, better than things that are weak and struggling. This does not mean that this Taylor principle will solve all disease problems, but it certainly looks like it helps. ☺

He had a ranch just south of San Antonio near a place called Jourdanton, and he was asking us for help in removing a colony of bees that had become attached to one of his oil wells. Well, this sounded like a real Texas challenge so we agreed to drive down to his ranch and take care of his bee problem.

We gathered all of our beekeeping gear together, threw it in the back of the pickup, and proceeded south to Gene's ranch. Gene was waiting at the ranch gate. He said the bees must have come in this year because he hadn't seen them before. He was afraid that some of the field workers would get stung and wouldn't pick up his oil anymore, so you can see that he was in a real Texas dilemma.

We followed Gene down this cow trail that some people call a road, and scraped the bottom, sides and in some places the top of my truck with mesquite, several varieties of acacia trees, prickly pear cactus and other assorted brush. The thorns on the mesquite trees were so big that we took some home to use as skewers for shishkebobs. We also saw a few roadrunners, some quail and deer. About two miles later, we reached a small clearing with some oil storage tanks. The tanks were about 24 feet tall and each had an attached exhaust. These pipes were about 15 feet long and eight inches in diameter, with a cover to keep the rain out.

Attached to one of the pipes was a cluster of honey bees, and their comb hung down about three feet and was about 14 inches square. I climbed a ladder and looked into the top of the pipe. The comb actually ran from the

top of the 15 foot pipe and protruded out the bottom. The comb at the top was very white so it was possible that the bees had moved in there this past spring.

Gene had wanted us to remove the colony, but with that pipe full of honey, wax and bees that was going to be too much of a job. Therefore, we decided to remove some of the bottom part of the nest, take a sample to see if they Africanized or not, and leave the rest.

Joe, Kelly, Mike, Jamie and Gene didn't have any bee experience, but they were willing to try their luck at working bees. I showed them how to suit up, explained the importance of remaining calm and how the smoke would keep the bees calm. Then I climbed up the ladder and demonstrated bee handling techniques. Mike and Gene were taking pictures, Kelly listened very carefully, and Joe was in charge of the smoker. Jamie took my place, and cut out some of the honey comb. We took turns, then sat around like bears and ate comb honey.

The only excitement came when Joe realized that not all of the bees were on the outside of his veil. He stood very still while I untied his veil, reached inside and removed the bee.

Before we left we took a nearby oil pump and attached it to the pipe. When we turned it on, it started pumping honey out of the pipe and into a five gallon bucket. The flow rate is not very high, but it does produce about a barrel a month. Gene now has one honey of an oil well.

Well, the bees turned out to be European, and according to Gene they are doing fine. Unfortunately, the price of honey is like the price of oil not as high as we would like. ☺

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QUESTIONS?

Storing Comb Honey

Q. Can comb honey be stored almost indefinitely until a sale is made, so long as it does not granulate?

Henry Yoder
Flemingsburg, KY

A. Yes, provided it is completely free of wax moth eggs, which it will be if you have given it the deep freeze treatment.

Chalkbrood?

Q. In late spring I harvested two supers from a hive and reversed the brood chambers, then added three more medium supers. In late July I found many white egg sacs scattered on the hive landing and the brood pattern was sparse, but I nevertheless harvested three more supers. What happened?

R.R. Angstadt
Whittier, CA

A. This sounds like an exact description of chalk brood. The "egg sacs" are pupae invaded by a white fungus and sometimes referred to as mummies. It can ruin a honey crop but is not, in my opinion, a very serious disease unless you happen to have only one colony. It does not easily spread from hive to hive, and the bees usually clean it out in time. Some beekeepers recommend requeening, others say to replace the infected combs, and still others say to set the hive in the open sun. My practice has been to do nothing, letting the bees deal with it.

Editor's Note: If the problem persists, or becomes worse, requeening is probably the best treatment. Purchasing a queen from a different strain of bees that may have some resistance to the disease is helpful, and so is the break in the brood cycle, while the bees clean up the problem. Chalkbrood left to its own devices, can ruin your honey crop and stress your colony to the point where other, more lethal problems can enter.

Comb Honey How-To

Q. I am just starting with comb honey. How many supers should I put on the hive at the beginning of the season? When the first super is nearly filled should I harvest it, or put it on top? And what do you think of harvesting the center frames first?

Maurice J. Walsh
Limerick City, Ireland

A. I am not sure that Ireland has the intense honey flows needed for producing comb honey. You should make sure of this. One super is enough at the beginning of the season, but as soon as honey begins to appear in it, a second super should be added under the first. The supers most nearly filled should then always be kept on top. Comb honey should be harvested as soon as capped over, to prevent travel stain, and the unfinished sections returned to the bees for finishing. On a good nectar flow the super fills fast enough so that there is no point in harvesting only the center combs.

Drawing Foundation

Q. What is the best way to get foundation drawn?

Larry Wadler
Oakland, CA

A. The best way is to hive a prime swarm on new foundation. Even a small secondary swarm will do a good job drawing it out if fed sugar syrup. The next best way is to put it in strong colonies during a good honey flow. During a dearth of nectar the bees sometimes chew foundation away instead of drawing it out. If you use two-story hives, always have any undrawn foundation in the upper story.

Botulism

Q. The manager of a local restaurant here is concerned that there could be botulism spores in unheated honey, but that pasteurized honey would be safe. Is there any basis for this view?

Jay Martin
New Orleans, LA

A. Several years ago a small infant, whose mother was using honey in its formula, got botulism, and it was then believed possible, though I believe never proved, that the spores might have come from the honey. Since then it has been a recommendation of pediatricians that honey not be given to infants under the age of one year. If you check any pediatrician's waiting room you are likely to see a sign to this effect. The sign makes no distinction between heated and unheated honey, and it makes very clear that the recommendation applies *only* to very small infants. It specifically says that, with this exception only, the value and safety of honey as a food is not questioned. There is no danger to adults, or to children over a year old, whether the honey is "pasteurized" or not.

Editor's Note: For a thorough overview of botulism in honey and medical problems associated therein, write for a reprint of an article entitled 'Botulism', published last year in *Bee Culture*.

Questions are welcomed. Address Dr. Richard Taylor, Box 352, Interlaken, NY 14847, enclosing stamped envelope.

ANSWERS!

Richard Taylor

Gleanings



JUNE, 1993

ALL THE NEWS THAT FITS

But Will They Help Beekeepers?

NEW PESTICIDE RULES IN EFFECT

After considerable deliberation and delay, the requirements for pesticide recordkeeping included in the 1990 Farm Law were finalized on April 9 and went into effect on May 10. Under the federal recordkeeping rules, certified private applicators of Restricted-Use Pesticides (RUPs) will be required to record the following information:

- The brand or product name, and the EPA registration number of the RUP applied.
- The total amount of RUP applied.
- The location of the application, the size of area treated, and the crop, commodity, stored product, or site to which the RUP is applied.
- The month, day, and year when the application occurred.
- The name and certification number (if applicable) of the certified operator who applied or who supervised the application of the RUP.

No standardized form is required for keeping pesticide records. This allows applicators the flexibility to fit the recordkeeping requirements into their current recordkeeping scheme. All necessary information must be recorded within 30 days of RUP application. Records must be maintained for two years from the date of application.

The federal regulations require all certified private applicators to maintain records of RUP applications. Some private applicators maintain comparable records under state regulations. But where state regulations are not comparable to the federal requirements, or in states that do not require pesticide records, private applicators must comply with the federal regulations.

All commercial applicators will continue to maintain the records they are currently required to keep under state or federal regulations. But they must now furnish a copy of either the state or federal record to their customers within 30 days of the RUP application. A private applicator who acts as a commercial applicator must do likewise.

Access to private-applicator records is granted to authorized representatives of certain state and federal agencies and to licensed health care professionals who need the information to treat a person who may have been exposed to the RUP. However, information that could lead to the identity of an individual producer is withheld.

State pesticide regulatory agencies are in charge of enforcing the recordkeeping regulations. Penalties of up to \$500 would be imposed for the first violation and a minimum of \$1,000 for additional violations.

From Doane's Report

USDA Scientist From Maryland

AIA HONORS OUTSTANDING RESEARCHER



The Apiary Inspectors of America (AIA) announced during their January 1993 Conference in Baton Rouge, LA, that Dr. Walter Steven Sheppard had been chosen to receive the AIA Outstanding Research Award. An inscribed plaque was presented to Dr. Sheppard by Bart Smith, Secretary for the AIA, at an apiary inspectors' workshop held in Beltsville, Maryland, on March 2, 1993.

Each year the Apiary Inspectors of America awards committee examines the work of outstanding scientists doing apiculture research. "Dr. Sheppard was chosen from a number of nominees because of his outstanding research contributions, especially his work dealing with the identification of the Africanized honey bees," according to award com-

mittee chairman Harry Fulton of Mississippi. "We are pleased to honor such a deserving person with this award."

Dr. Sheppard is a research entomologist at the Bee Research Laboratory, Agriculture Research Service, U.S. Department of Agriculture, in Beltsville, MD. His lab makes the final determination of new Africanized honey bee finds.

Dr. Sheppard received his B.S. in zoology from the University of Georgia, Athens, in 1975. He obtained a M.S. and PhD in entomology from the University of Illinois, Urbana, in 1979 and 1986.

Dr. Sheppard has authored more than 30 publications. In addition, he has made numerous presentations on a variety of apiculture topics.

Mid May Report

AHB MOVING WEST

An AHB feral colony was sampled and destroyed in Runnels County, TX. It was found in old oil field equipment that had been moved to the town of Ballinger from West Texas. The sample was identified as Africanized with European introgression. Because of the probability the colony may have been man-moved, TX Apiary Inspection Service did not place Runnels County under quarantine.

Closer to Arizona, the AHB has been detected approximately 160 miles south of Douglas, Arizona, and about 150 miles south of Nogales. There have been three new detections northeast of Hermosillo in the last two weeks.

The closest detection was made in the town of Ures near the Rio Sonora, about 50 miles northeast of Hermosillo. The second and third detections were made in Mazatan and Sahuaripa, Sonora. Both towns are east of Hermosillo about 50 and 100 miles, respectively. The town of Sahuaripa is located near the Sierra Madre Mountain range that runs into Arizona.

The number of bee samples identified during the reporting period increased noticeably. Fortunately, no detections have been made near the New Mexico border or the city of Houston.

from Elba Quintero,
AHB Program Coordinator

ROSE CLOVER TESTS OK

Field tests of rose clover show this forage legume could become a favorite with livestock producers. Rose clover survives summer drought in western states where it must compete with grasses for water. It provides grazing early in the season, produces

seed and is out of the way before warm-season grasses emerge. Intolerance of cold has kept it out of the midwest, but varieties from Spain have survived winter in OK of minus 12°F. Research shows rose clover does not bloat grazing animals and is nutritious.

Killer Bee Killer?

NEW LISTINGS

On the alert for leading indicators of where the country is heading? Check out the new category headings approved by the Yellow Pages Publishers Association for use in the '93-'94 directories: Asbestos Consulting & Testing; Automobile Alarms & Security Systems; Baseball Cards

& Sports Memorabilia; Fulfillment Services; Home Automation; Karaoke Machines & Tapes; Massage-Therapeutic; and Ski Tours. Nice to know you'll be able to find a massage easily if you wrenched your back while breaking into someone's car - or while being fulfilled.

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In Leafcutter Bees

CONTROLLING CHALKBROOD What About Honey Bees?

Canadian researchers report that the fumigant paraformaldehyde has been shown to be the key to controlling chalkbrood, the serious disease of leafcutter bees.

Agriculture Canada reports that the supply of alfalfa leafcutter bees - important domesticated pollinators for alfalfa seed production in North America - has been threatened recently by the fungus *Ascosphaera aggregata*, which causes chalkbrood.

Bee larvae become infected after eating the spores of the fungus. More spores are produced on the diseased bee cadavers, thus contaminating nesting material and bee cells.

The most effective method for controlling the disease is decontamination of nesting materials and bee cells. However, until recently, the only way to decontaminate nesting boards and bee cells was to dip them in a solution of bleach. This can cause heavy bee losses and warps the nesting boards. As a result bleach dipping has not been adopted by many beekeepers.

Dr. Mark Goettel, insect pathologist with Agriculture

Canada, and Wayne Goerzen, a biologist with the Saskatchewan Alfalfa Seed Producers Association, have been conducting research to find a more suitable alternative for decontaminating bee nesting materials and bee cells.

"Fumigation with paraformaldehyde was found to significantly reduce levels of fungi and bacteria on nesting materials and bee cells," they reported.

This has led to the registration of paraformaldehyde for control of microorganisms in alfalfa leafcutter bee nesting material.

"Fumigation was 100% effective if the nesting material was kept at a humidity above 70%," the researchers reported. "When the humidity was lowered to 40%, efficacy dropped sharply, especially in nesting material at floor level."

"These results indicate that paraformaldehyde fumigation is an effective method of decontamination of leafcutter bee nesting material," the researchers said. "This technique will replace bleach dipping and will help to control chalkbrood."

ALMOST PERFECT!

A neighbor of ours runs a small winery and fresh vegetable stand. She recently expanded to serve a country breakfast on weekdays. The stand was on a two-lane state highway through some of Northern California's farm and wine country.

One morning, a dapper gentleman traveling from San Francisco in a business suit and tie, strolled into the stand and sat down at one of the tables spread with a red and white checkered tablecloth and fresh flowers. He ordered the country breakfast of a vegetable

omelette made with fresh farm eggs and veggies grown right there on the farm, toasted homemade bread, strawberry preserves, a side of fresh strawberries and cream, and pot of tea.

The man asked the owner for a bit of honey for his tea. To his surprise, she brought him one of those tiny, single servings of honey in the plastic, peel-back container.

"I'm surprised," he said, looking with disappointment at the honey, "that you only keep one bee."

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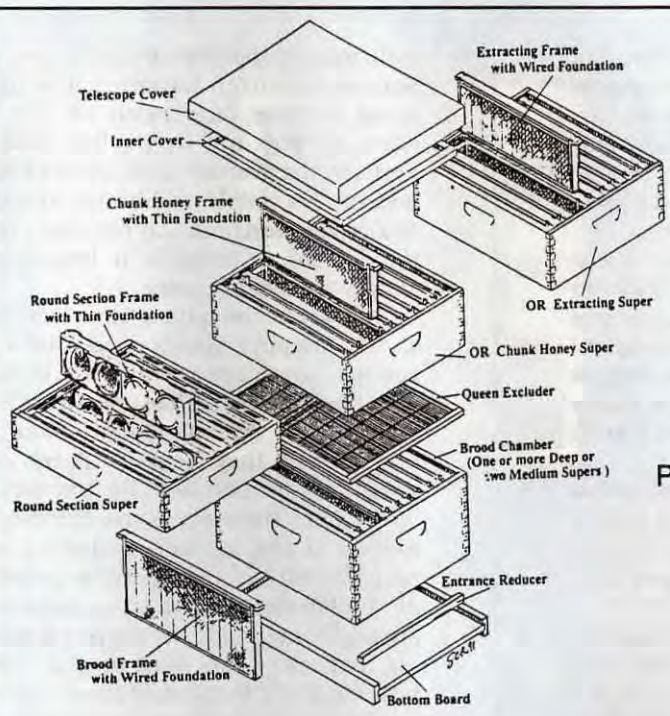
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The hive tool is a beekeeper's best friend. It's your constant companion when doing bee work. Always does the job and lasts forever. It can be cleaned off, shined up, sharpened, filed down. Never bends or breaks and only costs five dollars. There's never any updating, re-styling, add-on attachments, or advanced models. It's light and easy to operate – doesn't come with directions. It's your tool forever.

The hive tool does everything. It's an all-in-one multi-purpose device; we need no other instrument. It pries open hive tops after long winters, pulls out the winterizing blocks and corks, scrapes burr combs off frames, cleans propolis off inner walls, yanks out staples, shears off queen cells, lifts frames for inspection, wedges frames for better depth-viewing, separates hive bodies, clears away bees for spotting the queen, crushes bothersome bees and it pulls out nails when redoing frames and hive bodies.

What a terrific tool to do everything, to be so useful, and yet so simple! Is there anything a hive tool doesn't do? Yes, you need a hammer to build frames (although in a pinch you can use the butt of the hive tool), but for your day-in, day-out use, a hive tool does it all.

Consider its beauty – the straight back, the tapered middle, the smooth curved hook-end, the broadened flanks, the front-and-back sharpened edges, the durable 1/8" thickness. Hold it and feel balance. Switch directions or turn it upside-down, and it still feels comfortable. Lay it on its side, and observe the clean lines. It can sit like a rising whale (color in underneath), or lie like a submarine (see its periscope), dangle like a hung man, or lounge on its side like an odalisque. It has heft, yet is light enough (five and a half ounces) to wield with minimum effort. Its thinness and 10 inch length makes it easy to keep in a pocket or slide under a belt. After a lot of use, its appearance – tarnished silver, faded paint, grey nicks and scrapes, traces of propolis – is that of an old soldier with a chestful of medals. Yet, made of spring steel, it is almost indestructible.

The fact that no other profession has an all-purpose tool that does everything – chipping, cutting, lifting, moving, inserting, wedging, and pulling – is nothing short of remarkable. It would be as if a surgeon used one all-in-one device to perform open-heart surgery, instead of trays of specialized equipment for every procedure. Yes, a surgeon performs more complicated tasks, but works on *one* life at a time. We play God over a society's existence. Certainly, this should give pause for consideration.

Besides its usefulness, the hive tool grips well, reminding me of the gun I've never owned. I now understand the love that gunslingers had for their weapons. I can almost see myself in a gunfight, holding my hand above the barrel end, whipping a hive tool out of my pocket so quickly the motion is invisible to the naked eye (maybe not the bee-eye cluster), and plugging my enemies (swarms? robber bees? foulbrood? pesticides? – take your pick). Perhaps that's the way we beekeepers should decide who's the best performer. Approach a hive, ready to draw, saying, "Okay you varmints, one false move and I'll blast you!" Wasn't it Paladin who made up cards, saying, "Hive tool, will travel"? Maybe not.

In the winter, my hive tool hangs on a hook through its nail-puller hole. It glares at me as a reminder of the upcoming season. Occasionally, it is used, even as the bees semi-hibernate. I have pulled nails out of a block, scraped caulking from the bathroom

wall, wedged apart two nailed boards, balanced a broken ceramic pot being glued together, and pried off hub-caps, all with my trusty hive tool. Perhaps the overuse (and misuse) is because it's visible and handy in my work space, but probably because my mind tends to jump to it first. It's simply my tool of choice.

I also like the name. 'Hive tool' is short, snappy, unadorned, hard-voweled, and easy to say. The term accurately describes the use. Nobody ever forgets the straight-forward handle once they hear it. There is never any question as to its function.

I notice there are some different models in the market, including a perfectly-flat tool and a double-curved Australian version. Many people have created home-made versions, claiming they make the work easier. I've tried them all, but found them lacking. For me, the original creation invented by Langstroth is impossible to improve.

While many people get excited about machinery – a cappuccino maker with valves and knobs, for its miniature distillery appearance, or a Mazda Miata sports car that can cruise at 80 mph, for its sleek styling – I love my hive tool for its simplicity, its absence of gears and adjustable parts. It's just a piece of bent steel, yet it does so much.

No I've never slept with it, but, now that I think of it, the menacing flanged blade could be just the weapon to scare away burglars.

Ode To The Hive Tool

howard scott

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