Gleanings in

MAY 1980

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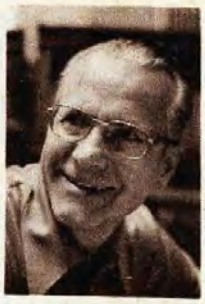

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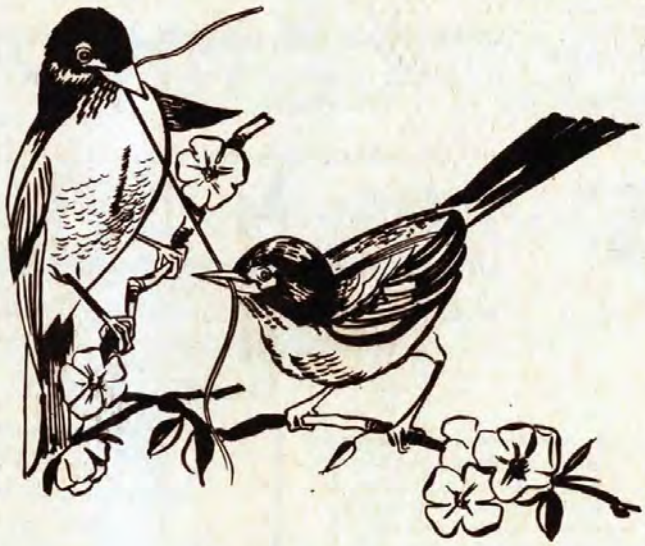
COVER STORY

Sally Buck checks a hive cover of one of the colonies which she and her husband, D. William Buck, keep in Portugese Bend along the Los Angeles County California Coast. Marineland is about two miles from this location.



Gleanings in Bee Culture

May 1980 (ISSN 0017-114X) Vol. 108, No.5
Created to Help Beekeepers Succeed
107 Years Continuous Publication by the Same Organization

CONTENTS

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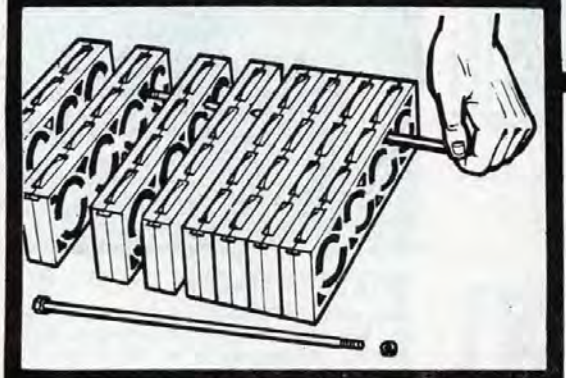

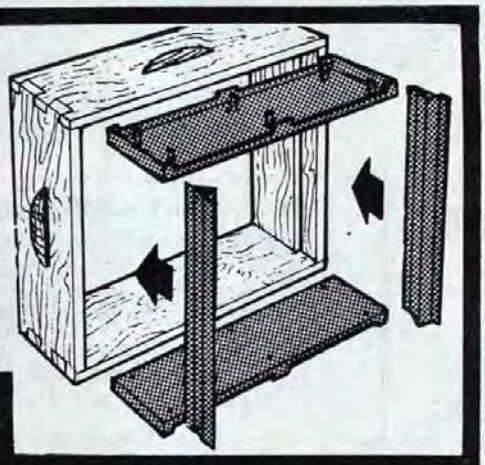

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Monthly HONEY Report

LAWRENCE GOLTZ

April 10, 1980

The following figures represent the current prices reported by beekeepers and packers over the country. They are based on reports from many states averaged out for each region. Where insufficient information is received no price is shown. The retail prices represent the price of each size jar.

Wholesale Extracted Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	Reporting Regions 1	2	3	4	5	6	7	8	9
60 lbs.(per can) White	42.00	30.00	32.20	31.75		34.60	30.70	30.90	28.80
60 lbs. (per can) Amber	42.00	29.50	32.40	31.00		32.20	27.10	28.80	28.20
55 gal. drum (per lb.) White		.51	.55	.53		.55	.54	.51	
55 gal. drum (per lb.) Amber		.48	.52	.50		.51	.51	.48	
1 lb. jar (case of 24)	24.50	21.50	22.70	24.05	33.60	21.80	22.10	21.50	23.50
2 lb. jar (case of 12)	24.00	21.15	20.00	19.32	33.00	20.00	21.90	18.45	20.75
5 lb. jar (case of 6)	29.00	23.00	23.25			24.35	19.70	21.88	24.45
Retail Honey Prices									
½ lb.	.90		.78	.69	.80	.68	.74	.73	.81
12 oz. Squeeze Bottle	1.35	1.15	1.25	.99	1.50	1.19	1.20	1.14	
1 lb.	1.35	1.28	1.44	1.15	1.75	1.20	1.21	1.21	1.39
2 lb.	2.55	2.39	2.25	2.09	3.45	2.09	2.25	2.00	2.65
3 lb.	3.80			2.85	5.15	3.32	3.50	3.11	3.75
4 lb.	5.00	4.49		4.09	6.80	4.57	4.30	4.49	
5 lb.	6.00		5.40		8.50	5.15	5.25	4.69	5.65
1 lb. Creamed			1.40			1.38		1.30	1.45
1 lb. Comb	1.75		2.05		1.87	1.65	1.80	1.49	
Round Plastic Comb	1.50		1.65			2.00	1.75		
Beeswax (Light)	2.00	1.90	1.90	1.92	1.85	1.80	1.80	1.85	1.80
Beeswax (Dark)	2.00	1.75	1.85	1.78	1.75	1.75	1.75	1.80	1.75

Misc. Comments

Region 1

Spring honey sales improving but high costs keep profits down. There should be many swarms this year as colony strength is building rapidly during March and April. Ground moisture conditions have improved. The mild winter brought well-fed bees into spring in excellent condition.

Region 2

Bees have wintered well. Some feeding has been necessary. Bees have had some flights. Good moisture conditions. Honey market is sluggish. Plenty of honey available to buyers-packers.

Region 3

Honey sales slow to average. Brood rearing underway in March and April with bees bringing in pollen from the middle of March on. Beekeepers checking colonies closely for food shortages during early spring. Winter losses are about 5 to 10% or less. Purchase of package bees is heavy.

Region 4

Most bees wintered well, the best in years, has been reported from Minnesota. Early feeding has been required in most states of the region because colonies have large populations coming out of winter. losses reported as 5 to 10%. Moisture conditions good. Honey sales are only fair with more movement of the smaller packs of honey than the larger sizes.

Region 5

Fruit trees, maple and willow trees blooming at the end of March, giving the bees an early boost. Some feeding being done and stores being used rapidly.

Region 6

Cool, cloudy and moderately wet conditions coming after an early spring. Winter losses have been light in Kentucky, bees reported to be in good condition throughout the region but much feeding has been required. Prospects reported good for spring honey flow in Tennessee. There is going to be a swarming problem. Honey sales about average.

Region 7

Spring weather was on cool side with cloudiness in Oklahoma and Texas. Recent rains have brought on ground flowers and horsemint in Texas. Orange trees are in bloom at the end of March in Texas. Bee feeding has been needed but the colonies are in great shape in Arkansas in the early spring. Swarming will be a problem. Honey sales slow.

Region 8

Less winter kill from milder winters reported in Montana and Idaho. Bees being fed due to the increased activity.

(Continued on page 289)

SIX SPRING SPECIALS

ROUND COMB SUPER & ALL

Complete round comb super . . . ready-to-use . . . all it needs is painting! Includes Select grade super . . . 18 half-frames to hold . . . 72 rings and . . . 9 sheets of foundation. At harvest time use the 36 opaque lids and . . . 36 transparent lids to package the 36 round comb sections each super holds. We give you 40 two-part labels to complete the packaging. You'll use and re-use our super and half-frames over and over again. *(Replacement cost of rings, lids and labels at these sale prices would be $4.82 for enough to produce 36 round combs in the same super next year. Add foundation and that's under 18¢ a section!)* **SALE PRICE . . . complete super** and all above **$30.** *(See replacements offered elsewhere in this ad.)*

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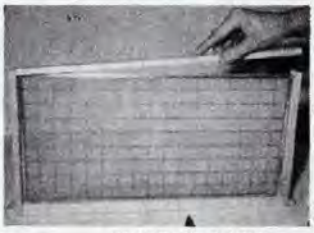

Photo: Readycomb Foundation Note quilt Edge at four sides. Full depth only.

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The Honeybee Queen

By GRANT D. MORSE, Ph. D.
Saugerties, N.Y.

MANY RESEARCH students have labored to provide us with our present knowledge about the honeybee queen. This information can help all of us operate our colonies more understandably.

Over the long years that have elapsed since the early ancestor of our queen was a solitary bee, the queen has become a social creature that has surrendered to the infertile workers of the colony nearly all essential functions except egg laying, and the excretion of some unique glandular fluids which signal to the workers that she is capable of serving as their queen.

One consequence is that the workers then make no move to supersede her, or to attempt to become producers of eggs. Also, at swarming time a pheromone given off by the queen's mandibular glands serves to provide cohesiveness to the swarm, and helps the workers in identifying her and maintaining contact as they fly along together to the new nest site.

One evidence of the honeybee queen's concentration on egg laying is that her abdomen accounts for a major portion of her total weight — 68.1%. Her ovaries contribute 55.9% of her abdominal weight.

So great is the egg laying capacity of the queen that in the spring when a rapid build-up of worker population is desirable, she is capable of producing approximately 2000 eggs daily. In a single day the weight of the eggs she produces may be as great as her total weight.

As the nectar season approaches, the queen inclines in most geograhpical areas to taper off somewhat from this high rate of egg production until when September is over she tends to lay very few eggs up to the time she begins egg laying again, normally in December or January.

Just what factors trigger a decline or an increase in the rate of egg production is not quite certain. Probably it is dependent upon the season of the year. Characteristics of the season which might serve as signals include higher or lower temperatures, and length of day.

The reduction in brood rearing in late fall, followed by a near or total cessation, is closely correlated with a decline in the queen's weight. Even during the period of non-laying, some researchers believe that the queen produces some eggs but that she often reabsorbs them; or if they are layed, it is believed that the workers destroy them.

Some observers state that they have noted that as the queen lays fewer eggs, the workers feed her less frequently, and may at times fail to feed her altogether. In contrast, it is noted that she is fed every few minutes when at the peak of her production.

The sugar content of the food fed to the queen in winter time is small, glandular secretions of the workers serving in part as substitutes.

What Will This Egg Become?

So far as any researcher has been able to determine, it is nurture (difference in feeding) that solely determines whether any given fertilized honeybee egg shall become a worker or a queen. In either case, as the queen releases an egg, sperm is provided from the spermatheca into the vagina where fertilization occurs.

The egg usually hatches in three days. During the following days, the larvae that are to become queens, receive royal jelly throughout the period. Worker larvae receive "young worker food" during the first several days. Thereafter, worker larvae a mixture of glandular secretions, pollen, and honey.

Students who wish to study the content of royal jelly will have no difficulty in finding several good authorities on the subject. Some of its characteristics are that it has a considerable quantity of minerals, but low levels of pollen.

Queen larvae appear to be fed more liberally than worker larvae, a happening which is not difficult to understand when one reflects upon the fact that the period of development following the egg status of a queen is 12-13 days whereas that of the worker is approximately 18 days. Two researchers, Dietz and Lambremont (1970), have showed that the food consumption of young queen larvae is 13% greater than that of young worker larvae, and that this difference increases to 40% after six days. They found that queen larvae consumed 19% more royal jelly than worker larvae.

Mating of the Queen

A queen usually emerges from her cell 15-16 days after the egg was layed. Usually she feeds herself rather promptly from honey stores in open cells. She then turns her attention to destroying rival queens. In some cases in which the workers of the colony want temporarily to retain more than one young queen, they prevent her from destroying her competitors.

Some time between 3-5 days after emerging the young queen usually takes her first orientation flights. These flights are usually not too long and only on rare occasions does the queen become mated during these trial journeys. Roberts (1944) reported that exploratory flights last an average of eleven minutes — a short time indeed, to acquire an adequate knowledge of one's location and of the surroundings of one's habitation.

When the young queen is 5-14 days old, she normally makes a serious effort at securing a mating. If a queen waits as many as 29 days before trying to secure mating, she is likely to fail altogether. Roberts (1944) found the length of the mating flight to vary from 5-31 minutes, with an average of 14.4 minutes.

The word "waits," as used here, may not be the best choice since the queen waits to mate when mature only if the weather or some other external influence beyond her control compels her to defer her mating.

Young queens seeking union with one or more drones normally journey to a "drone flying area" where drones tend to congregate each afternoon year after year in favorable weather. There she usually mates with 7-10 drones in succession. Such unions may require trips by her on a second or even a third day.

Multiple matings are evidently required in order that the queen may be provided with male sperm in sufficient quantity to last her for the rest of her lifetime since she is believed never to seek matings subsequent to her initial efforts. Her spermatheca (sperm storing sac) is capable of accommodating approximately 7 million sperm.

Soon after mating, the queen's ovaries start to develop and she begins to lay eggs

within 2-3 days. However, egg laying may be deferred for as many as eight days.

Egg Laying Habits of the Queen

At first, the queen's rate of egg laying is low, but accelerates within a few days to enable her to produce as many eggs as the strength of the colony can accommodate. A queen evidently does not follow a fixed pattern in depositing her eggs, often retracing her movements to use the cells which she has just passed by.

Before laying an egg in a cell, a queen thrusts her head and forelegs into a likely cell, and if she finds it is of the right size, and has been properly prepared by the workers, she inserts her adbomen into the cell and releases an egg. This she presses down firmly on the bottom and center of the cell. Only beginner queens deposit more than one egg in a cell.

Several factors help to determine how many eggs a queen will lay over a short period. Included among them are: Numerical strength of the colony, temperature, supply of food, availability of cells, and the attractiveness of the area in which the cells are available. The liberality of her feeding by the workers will also influence her egg laying rate.

Over a given season a queen in a strong colony will normally lay 200,000 to 260,000 eggs. Allen (1955) found an average egg laying rate of 22 eggs per hour; with an average 4.8 feeding per hour with and average duration of 37 seconds. Caron (1970) found the mean time for egg laying varied from 15.2 to 18.2 seconds for four different queens. He found that queens were fed at average intervals of 22.1 minutes.

The number of workers attending the queen is usually greater when she is not in motion. Caron (1970) found that bees under ten days old normally feed the queen. A queen solicits food by placing her proboscis between the mandibles of a worker. The food they give her includes royal jelly.

The Queen During the Winter Season

Her custom of clustering with other members of the colony has enabled the honeybee over the millenia to survive the cold of winter. Actually, one can scarcely think very long of a single bee. Each one of them is so dependent upon the others that it is the group, or some considerable part of it, which thrives and survives, not the single bee.

During the winter months the normal length of life of a typical honeybee (normally about five weeks) is lengthened to 4-7 months. As a rule, a cluster begins to form when the temperature drops to 57 degrees F. Below 57 degrees F. the cluster becomes progressively tighter as the temperature declines, the bees on the outside remaining comparatively quiet, those at the center more active. Heat generated at the center of the cluster tends to spread through the whole mass and helps to keep the bees on or near the surface warm enough to survive.

As the surrounding temperature drops, the cluster usually contracts. When brood rearing begins again about the middle of January on the comb at the center of the cluster, the temperature there is maintained at nearly 90 degree F. (32 degrees C). As egg laying declines it stops altogether in the late fall, the queen's weight declines.

The Queen and Swarming

Swarming used to be encouraged by beekeepers since it brought them new colonies. Today, beekeepers prefer to start their colonies by making up nuclei.

The causes of swarming are still being debated. The more likely causes include: Time of year; crowding; prospect of nectar flow adequate to enable a swarm to succeed; age of queen. My theory has been that when all conditions point to the conclusion that a swarm can succeed, swarming is likely to occur.

Young queens which produce the pheromone 9-oxodec-**trans**-2-enoic acid in greater quantity than older queens tend to inhibit swarming.

One of the more interesting facts about queens in relation to swarming preparation is their necessary loss of weight and slimming down in order that they may be physically able to accompany their swarms.

Loss of weight at such times entails a partial reduction in egg laying rate. A good number of authorities declare that at these periods some workers apply physical force to the queen in an effort to help her in the slimming process. The workers feed her less food, and provide it at less frequent intervals than usual.

Caron (1970) notes that the decrease in egg laying may reach as much as 60 percent during the period between the beginning of cell construction, and their being capped. At such times workers have been observed guarding queen cells against attack by the queen. During the slimming period a queen may lose as much as ⅓ of her weight over a stretch of five days.

One consequence of the queen's decline in consumption of food is that she must usually be fed after the swarm clusters out side of the nest, and before departure for the new home site in order to have the necessary energy to endure the flight.

It is believed, too, that many swarms stop in transit because the queen needs either additional food or rest, quite often the latter.

Obervers have noted that in many, if not possibly most, instances the queen is forced out of the nest and thereby induced to join the swarm cluster. Fell (1977) reports having on two occasions seen the queen literally pulled out by 3-4 workers.

Over a period of approximately five days before swarming there is usually a decline in the foraging activity of the workers. This decline in foraging reaches a climax on the day of swarming. Combs (1971) found that of colonies preparing to swarm, workers engorge themselves, beginning to do so in frequent cases as many as 10 days before the swarm issues. This falling off in foraging leads to what beekeepers commonly call "hanging out" by the bees — which gives the operator very often an inkling of the colony intention to swarm.

We have here the evidence to show why colonies that swarm during a nectar flow, as many do, gather so little surplus prior to departure. It is evidence, too, of the fact that no beekeeper can with profit knowlingly tolerate a colony's getting itself into a swarming mood if such can be prevented. For several days prior to swarming, colonies don't work very much.

Ambrose (1975) states that the place where a swarm gathers prior to departure for a new home is typically a short distance from the old nest — usually 75-100 feet. If the queen does not join the swarm, they will return to the nest. Also, if during flight they find the queen missing, they will turn back and attempt to find her. Morse and Boch (1971) state that a stable cluster formation is maintained by an interchange of pheromones from the mandibular glands of the queen and by the Nassanoff glands of the workers.

After the swarm has departed, the assemblage remaining in the old nest promptly takes on an appearance of order and quiet. The most physically active of the virgin queens seeks out her rivals and destroys them unless restrained by the workers.

When the swarm has clustered, the scouts that have previously been seeking a likely new home site, sometimes over a

period as long as two weeks, dance on the surface of the cluster to advertise the merits of the several (usually) choices. The scouts agree (usually) on one site, and the swarm departs.

Whether there has in some cases been a total or partial agreement on a new site prior to emergence of the swarm from the nest is not definitely known. My own belief is that this is often so, otherwise the time necessary for reaching a consensus **after** emergence would be often so great as disadvantageously to detain the swarm in a cluster for an extended period. This does occur on occasion, but not too often. Lindauer (1961) states that a swarm must cluster so that a consensus on a new home site may be reached.

At the new home site the queen begins to lay as soon as the workers can construct a few cells.

The "Oneness" of the Queen

The honeybee queen prospers, or suffers, from her oneness. Her oneness is like that of any individual of whom, or of which, there is but one in a group. Kings and queens of state are human parallels.

Being the only one of a kind in a group often makes one extremely valuable, even indispensable until replaced. That is doubtless why Nature surrounds the honeybee queen with safeguards such as not being called upon to do any tasks except her few — egg laying, and serving as a central unit around whom all the other members of a bee colony can rally.

Many honeybee queens make only two extended trips into the out-of-doors. These trips are to mate, and to accompany a swarm. Both trips are fraught with danger. A queen's rather large size attracts the attention of animals that prey on bees such as dragonflies, damselflies, and a few birds such as the titmice, the woodpeckers, and a few others.

A queen gets little orientation, as a rule, before making her one of three nuptial flights. For a swarming journey she has no out-of-doors preparation whatsoever unless her brief nuptial flight (s) be considered such. Getting lost thus becomes one of her major perils. If she enters a wrong hive in a row where they are neatly arranged, she will be killed usually.

Because of her oneness, the workers of the colony cherish her, giving her grooming, and keeping her largely confined to the more habitable areas of the nest. In cold weather she is always at the warm center of the cluster.

When the workers attack or ball a strange queen, it is done out of instinctually great loyalty to the one they regard as their own.

The workers feed the queen various foods some of which have not been too definitely identified. But they do see that she receives mostly a predigested diet that includes royal jelly, and some glandular secretions, particularly during the winter season.

Some Unique Qualities of the Queen

One of the more amazing facts about a honeybee queen is that she can lay two kinds of eggs at will — fertilized eggs, and unfertilized eggs.

Her importance to the colony has prompted Nature to compress her prebirth days to 15-16 as opposed to 21 for a worker and 24 for a drone. Up to a few years ago most writers on these subjects thought that these and other development times for honeybees were exact and precise. Now we know that some flexibility needs to be recognized.

She is possessed of a sting which she is seldom prompted to use. Her death is lamented by audible evidences of mourning on the part of all the workers.

The honeybee queen is an attractive individual, scarce in number, beautiful in body, gentle in behavior, the unifying force that keeps the members of a colony happy and energetic and efficient.

Sources Consulted:

Ambrose, J.T., 1975. A Study of Honeybee Swarms While in Transit to a New Homesite. Ph. D. thesis, Cornell University, Ithaca, N.Y.

Caron, D.M., 1970. A Study of Swarming and Behavior of Swarming in Honeybees. Ph. D. thesis. Cornell University, Ithaca, N.Y.

Dietz, A. and E.N. Lambremont, 1970. Caste Determination in Honeybees. **Annals of the Entomological Society of America.** 63: 1342-1345.

Fell, Richard D., 1977. M.S. thesis, The Study of the Biology of Queen Honeybees, Cornell University, Ithaca, N.Y.

Morse, R.A. and Boch R. 1971. Pheromone Concert in Swarming Honeybees. **Annals of the Entomological Society of America.** 64: 1414-1417.

Roberts, W.C., 1944. Multiple Matings of Queen Bees. **Gleanings In Bee Culture** 72: 255-259, 303.

American Honey Producers Convention

By LOIS MOORE
Marysville, Ohio

ON FEBRUARY 2, 350 members and guests of the American Honey Producers made their way towards the beautiful island of Hawaii for an eight day visit. Everyone had an enjoyable time and only mentioned "jet lag," when they got back home.

One Sunday afternoon the Board of Directors meeting was held. At this time, Marge Ferguson, bookeeper-beekeeper, Lawai, Kauai, Hawaii, gave the history of beekeeping in Hawaii. In 1857, two hives of German black bees were brought around the Cape. The first commercial bee operation was in 1892, worth $356,000. By 1943 it had increased to $1,357,000 and beekeeping is on the upswing today.

Jack Meyer, Jr. President of the Association called the convention to order on Monday, February 4, with prayer and the salute to the flag. He gave the president's address, bringing out the importance of cotton pollination and the problems of pesticides being used by the cotton growers.

Dr. Tom Heneberry, Director, Western Cotton Research Lab, Tempe, Arizona, spoke on pesticide free cotton production. Honeybee poisoning is a major problem. The major pests in the U.S. are the boll weevil, boll worm, and the tobacco worm. The hardest on cotton is the pink boll worm. No single method is completely effective and acceptable, therefore, a combination must be agreed upon. He ex-

plained several methods being tried at the lab.

John Farias, Jr., Director, Hawaiian Board of Agriculture, explained Hawaiian agriculture. He informed us mainlanders that 60° was too cold for Hawaiian winters. This assured us that everyone has winter, some not as cold as others. Hawaii's main income is derived from sugar, pineapple, and until the close of World War II, the U.S. Military, followed by the tourist trade. Hawaii's secondary income comes from coffee, papaya, macadamia nuts and floriculture. His department is very interested in the beekeeping industry and willing to help further its cause.

Joe Parkhill, Berryville, Arkansas, explained his latest book **The Wonderful World of Honey.** It took over twenty years for his lovely wife and seven sisters to test each recipe that went into the book. It can be purchased from Country Bazaar Publishing, Route 2, Box 190, Berryville, AR 72616 or Phone: 510-423-3131, for $6.95 plus $.75 for postage and handling on each book. **Health, Beauty, and Happiness, How to Have it,** is $5.95 plus $.75 for postage and handling. Both books are done in good taste and have received good recommendations.

Don Schmidt, Winner, South Dakota, reported on South Dakota's experience with the government subsidized grasshopper control program. A committee was set up twelve to eighteen months before the actual government-sponsored spray program. The Federal Government grants one-third of the moneys. The state of South Dakota picked up two-thirds, or, one-third with the landowner and/or township footing a third. The program had many disadvantages. One major dissatisfaction came from disinterested people who had to pay for spraying. Another disadvantage was that spray dates were not definite so beekeepers could not remove bees from aerial spray areas. Moving colonies of bees is expensive. Three days before the spraying the extra supers are removed from the hives. The next two days are spent preparing the new yard, moving the bees, cleaning up the old yard and returning the supers. Mr. Schmidt placed two apiaries in one location for four weeks waiting for spraying to be done. The bees were sprayed from an unannounced spraying. After four weeks the hives were returned to their original permanent locations. He reported it cost him 40 cents a mile for the truck and $7.50 per hour for labor. He has 40 locations placed in the spray area and several relocated yards received spray damage while waiting for the orginal locations to be sprayed. He noted that one Nosema-infected grasshopper ground up with the bran and water can treat two acres. Mr Schmidt would like to see funding for beekeepers such as the cattlemen receive to move livestock in and out of aerial spray areas. A bilogical control type method is being studied by Dr. John Henry, Boseman, Montana and Dr. Onsager, Montana State University.

Front left, Jack Myers, Jr., President of AHPA. Right front, Roy S. Weaver, owner of Kona Queen Company.

Left to right, Julio P. Diaz, Production Manger of A. H. Myers & Sons, North Dakota, Marian Chun and Dr. Herb Marupani of Hawaii Dept. of Agr. and Jack Myers, Jr., President of AHPA. On far right is the foreman of Powers Apiaries.

James Smith, Yuma, Arizona, reported on how honeybee losses have affected Arizona agriculture. Mr. Smith is a small farmer by choice, farming cotton and alfalfa and therefore experiences both sides of the coin. His father stated "When I have to start spraying my crops every 5-10 days I will quit farming." The present situation came about after his time, although some spraying was going on when he passed away. There was no spraying to mention in Arizona until 1966-67. "I would like to blame them (the sprayers) for the interruption of the natural habitation of insects." Mr. Smith said. DDT was a friend of the beekeeper for a few years as it did not effect the honey yield as do other pesticides today. With a delicate balance of proper timing, type of application, and selection of material, honeybees and spraying can go on together. He cited one incident where the cantalope growers wanted to use spray. They asked a beekeeper to move his bees out along with some other beekeepers. He told them the beekeepers would move the bees but he expected the growers to pay to have them moved back in. Pollination was paid for from that time on, starting at $5.00 per hive. Within one year melon yields had dropped from 170 crates to 60 crates per acre. "Notification" is the key word when using sprays. It doesn't do any good to keep hives for three weeks and then lose them the fourth week due to spray. Also, it isn't good for the seed crop to lose its pollinators. Covering the hives will work in dry climates if the owner is notified in time. So what is the furture of beekeeping in Arizona? An excellent cotton crop can be produced and it takes the honeybees to do it, but we had better stay with our research programs, realizing there will be some pitfalls.

Clarence Benson, Oracle, Arizona, gave an update on the bee pesticide problem. He stated that after talking to the Congressmen he found there is not enough money to pay beekeepers for their losses from pesticides. He asked the question "What can be done about it?"

Tom Ross, Dadant and Sons, Hamilton, Illinois, commented on the outlook for the future of beekeeping. He stated that there is less land for agriculture. United States agriculture will be working at capacity in the 80's. Sugar prices are going up. Beeswax is holding a fair market price. Adulterated foundation is coming onto the market. Sunflowers are becoming an important seed and honey crop across the country. IPM-integrated pest management — will be the researchers' goal in the next fifteen years.

Richard Adee, Bruce, South Dakota, gave an update on the Africanized bee. Semen from Brazil was brought to Baton Rouge, Louisana in 1960-61. Two hives reached a stage of 93.75% Africanized bees, at which time they were destroyed. The lab reported that the bees in no way were different from other strains being worked at the lab. Upon visiting Brazil they found a well developed commerical beekeeping industry that went back as far as 1936-1944. Dr. Harold Esch, University of Notre Dame, reviewed the reports of many beekeepers who have had first hand experiences with the Africanized bee and he found they all reported the same view. the natives laughed at their reports. It was stated that NBC used the Africanized bee story for publicity. Orley Taylor is head of the research grant to study the Africanized bee, which runs out in 1981 and he will probably be seeking more funds for this doubtful project.

Roy S. Weaver, Navasota, Texas, told about commerical beekeeping in Hawaii and the Kona Queen Company which is in it's fifth season. the Hawaiian beekeeper finds very rough terrain on which to locate hives. The bees will reject queen cells more readily than on the mainland. Hives must be 18 inches off the ground as toads and long legged ants, which have no nest but are always on the move, will chase the bees out. Black ants similar to the fire ants in Texas will get into the hives. The climate is too hot to use 6¼" supers so full depth supers must be used. Queens are produced the year around. Drone management plays a very important part in the Kona Queen operation because feral bees living in cracks in the rocks mate with domestic bees. There is a lot of pollen, but it is not good food. Canadian pollen is the best to produce drones. It takes 6,000 to 7,000 feet elevation to produce drones. The demand for queens is greater than the supply. Honey production is a migratory operation, which is difficult and because of the rough terrain migratory workers can be hurt easily. There have been several accidents. Tropical bees are meaner, expecially in late afternoon. Three p.m. is the best time to work bees. Hawaii is a very nice place to work bees as every lunch break is a picnic and a chance to get a tan.

Jim Hubbard, Onsted, Michigan, spoke on adulterated honey which he called "funny honey". To assure his company and the public against receiving "funny honey" each load is checked and recorded for (1) date of purchase, (2) number of drums, (3) seller, (4) color, and (5) moisture. This coded record follows the honey through the bottling process to the consumer's table. Ninety-eight per cent of the beekeepers and packers are honest, but everyone must be protected from the 2% that are dishonest. Let's get together and get this 2% stopped.

Jim Robins, AHPA Director, Kennett, Missouri, reported on adulterated honey pointing out that one of the largest packers of honey, maple syrup and sorghum is in operation in the southeastern states but products can be found on shelves in the northern states as well. Samples of suspected products must be picked up and turned into the State Health Department, Department of Agriculture or may be sent to Jack White, Honeytech, Inc., P.O. Box 1059, Navasota, TX 77868, Phone 713-825-2124.

Dr. Herber Marutani, Department of Entomology, University of Hawaii, reported on the harmful and beneficial insects affecting Hawaiian agriculture.

Glenn Gibson, secretary, AHPA, gave the annual secretary-treasurer's report. The resolutions were set in order and the meeting adjourned.

Glenn Gibson was master of ceremonies for the banquet. As everyone planned to enjoy the Hawaiian climate and scenery, as much time as possible was given to this and there was no guest speaker. However, a real tribal chief, in full dress, spoke a few words — in English.

The Executive Committee met Friday morning selecting Las Vegas, Nevada as the location of the 1981 American Honey Producers Convention. It will be in conjunction with the Apiary Inspectors of America meeting.

The officers for 1980 are President Jack Meyer, Jr., 202 North West 7th, Madison, South Dakota 57042; Vice President, Berna Johnson, Socorro, New Mexico 87801; Glenn Gibson, Box 368, Minco, Oklahoma 73059, Executive Secretary.

Book Review

POLLEN EN SU SALUD by Dr. Alfonso Oropeza Z., Editado Por Florimiel, S.A. Apartado Postal 710 Puebla, Pue. Mexico, 1979, 60 pages, $4.75 postpaid.

In Spanish, this soft cover book describes pollen, its composition, and discusses some of the nutritional and medical benefits which are being ascribed to pollen.

Full page color photographs of some of the floral sources of pollen brighten this compact little book.

Group Hospital Insurance For Gleanings Subscribers

Introducing "BEELINE" . . .

HERE'S IMPORTANT news for all **Gleanings** subscribers: The A.I. Root Co. has just entered into an agreement with All American Life & Casualty Company of Chicago, Illinois, to provide you with group hospital indemnity insurance.

The new plan — "BEELINE" — is available to any subscriber beginning June 1, 1980, on a purely voluntary basis. Acceptance is automatic upon receipt of a completed enrollment card. There are no health questions.

If you're under 65 years of age, "BEELINE" pays you $25, $50, or $75 a day, depending upon the benefit you select at the time of enrollment, **in addition to** any other insurance you now have, including health insurance at work, Blue Cross, private insurance, Medicaid, or Medicare.

The plan pays double benefits — that is, $50, $100, or $150 a day, according to the plan you have selected — if you require intensive care or coronary care, or if you are hospitalized for cancer.

Benefits under the "BEELINE" Plan begin with the very first day of hospital confinement — there are no "waiting periods." You receive benefits for up to one full year per covered confinement, even if you're in and out of the hospital. Another full year's benefits are payable for a different diagnosis, or for recurrent illness after you've been out of the hospital 90 days.

Coverage in like amounts is offered to your spouse, and to your dependent children between the ages of 14 days and 24 years.

At age 65, "BEELINE" converts automatically to a special supplement to Social Security Medicare. This over-65 supplement pays many of the inhospital deductibles and coinsurance charges not covered under the Government program.

For example, anybody insured under Medicare normally must pay a $180 initial deductible upon admission to a hospital. (Government hospitals, including V.A. hospitals, are in exception.) That $180 deductible is reimbursed under "BEELINE."

If your hospital stay should last 60 days or longer, you'll be charged a **daily** deductible, starting with the 61st day of hospital confinement, of $45. "BEELINE" reimburses you for this daily room-and-board charge.

After 90 days of hospital confinement during a given benefit period, Medicare benefits are used up unless the so-called "lifetime reserve" is used. The lifetime reserve is a "bank account" of 60 **additional** covered in-hospital days for which the government will pay all room-and-board charges except for a daily deductible of $90 per day. Here again, from the 91st through the 150th day of hospital care during the benefit period, "BEELINE" reimburses the $90 daily deductible.

After 150 days of hospital care, all room-and-board benefits under Medicare are exhausted. "BEELINE" now begins paying you $50 a day, up to a maximum aggregate of $25,681.

"BEELINE" helps pay doctor's bills, too. For those 65 and over, the plan pays the 20% of reasonable and customary in-hospital doctor's visits and surgeon's fees not covered by Medicare. In other words, if the reasonable and cutomary fee for a gastric resection (stomach operation) were $1,000, then Medicare would cover $800; "BEELINE" would pay the balance.

This new plan of group insurance also pays for room-and-board charges in a extended-care facility (qualified nursing home) — $22.50 a day not covered under the Government program, beginning with the 21st day and continuing for up to 100 days of care in such a facility.

Money Is Paid To You

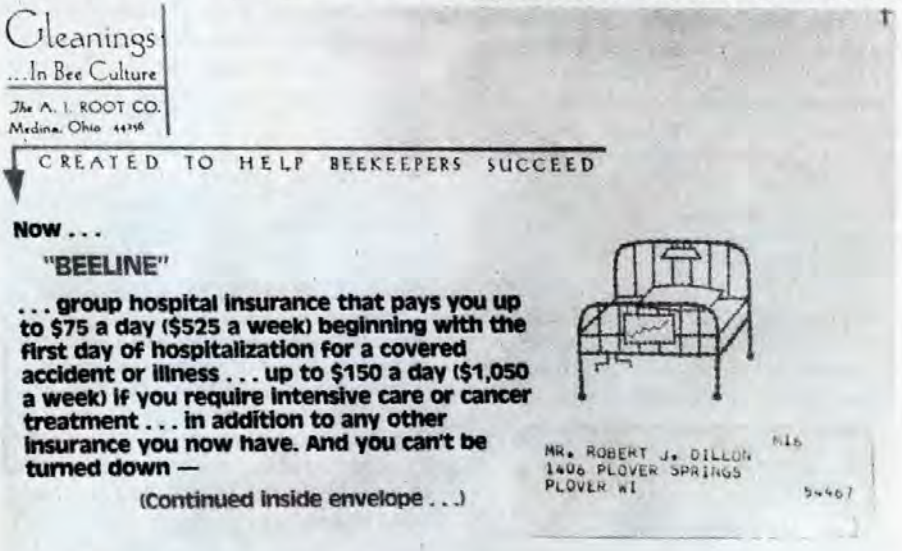
All benefits under the "BEELINE" plan are paid directly to you, and you decide how to spend the money. If you prefer, however, benefits may be assigned to your provider of care, and the insurance company will pay your doctor or the hospital directly.

Please note, too, that "BEELINE is **not** an "accident only" type of policy: Benefits are paid for accident **or** illness. (That's an important distinction, because some supplementary plans pay benefits only for accidents!)

Of course, there are some exclusions and limitations under the plan, but these are few and of the kind you'd expect to see. Not covered are: Suicide and attempts there-at, hospitalization due to acts of war, cosmetic surgery, and normal pregnancy (Although complications of pregnancy **are** covered). There's a 30-day limitation on in-hospital benefits for mental and nervous conditions.

Every **Gleanings** subscriber is eligible to enroll in the plan — regardless of health history. This means that you can become insured even if you now have a serious health problem. In order to maintain the financial soundness of the plan, however, pre-existing conditions — conditons which required medical advice or treatment in the 12 months prior to the effective date of your "BEELINE" coverage — won't be covered until 12 "treatment-free" months (ending any time after the effective date) elapse. In any case, **all** conditions, including pre-existing conditions,

(Continued on page 289)



May Management in the Northern States

By ROGER A. MORSE
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THERE ARE MANY ways to manage bees. Some beekeepers put supers on their hives and hope for the best. For me that's no fun. I like to have every hive produce at full capacity. For those who feel as I do, May is a critical month in the North. It is also the time when the beekeeper can do many things to make the rest of his year easier.

Why is May so important? The answer is simply that during late May the colonies produce the bees that will gather the surplus honey in July, when their populations are at their peak. Five or six weeks are required to produce a field bee: Three weeks in the egg, larval and pupal stages, and two to three weeks as a house bee.

Colony populations are still small in May, which makes colony manipulation easy. May is also a delicate month. One must be careful not to encourage colonies to grow too rapidly. It is very easy to chill brood in May by opening entrances too wide or by placing too many supers on colonies too fast.

Yard Work

It is worthwhile to spend a little time in May attending to the physical aspects of beekeeping. I don't like to have my colonies and apiaries overgrown with weeds and brush. I also like to have colonies receive a maximum of sunlight at all times of the year. This is a good time to move colonies a few yards or to cut trees so as to give colonies more sunlight.

In winter we wrap our colonies with black tarpaper. When we unwrap the colonies in the spring, I put the old black paper on the ground in front of the colonies so the grass will be prevented from growing and blocking colony entrances. I tuck one side of the paper under the hive stand; the other edges are held down with stones. If one doesn't wrap colonies, much the same objective can be achieved with cardboard. If one uses hive stands some cardboard or black paper can be put under the hive stand itself, again to prevent grass from growing between and close to the colonies.

Clean Supers

May is the best month to exchange, scrape, and clean supers, bottomboards, and innercovers. I don't like to manipulate frames and supers all stuck up with burr comb and propolis. When I go to an outapiary in May I carry extra supers and hive parts. As I make colony examinations I exchange hive parts and set the frames I've checked into a cleanly scraped super.

I think it pays to paint hive parts every five to seven years. I don't like to paint the hive with the bees inside. I much prefer to treat each bottomboard, hive body, cover, and innercover individually. Paint on the top and bottom edges of supers will help to deter rot and decay. It will increase the life of a super to fill the holes made by staples or nails with putty before painting. Commercial beekeepers do not have the time to give detailed attention to each and every hive part. However, a hobbyist can — and by doing so increases the value of the equipment and makes manipulations easier. As an example of the value of such detail, I clean out the propolis behind the rabbets in each super, and when I paint the super I coat the rabbet with paint too. This deters the deposition of propolis in this area for a year or more and makes the manipulation of frames much easier for the same length of time. However, It is not advisable to paint the whole hive interior.

Culling Combs

Because there are fewer bees in a hive in May, this is a good month to weed out poor and damaged combs. There have been two good research papers in recent years that show that having many drones in a colony does not harm honey production; still, I like to see combs with worker-size cells in the brood nest. What does one do when one finds a comb in the brood nest with worker brood and also a large quantity of drone brood? I suggest the best thing is to move it to the side of the brood nest, perhaps to the side of the super if the colony is strong enough to keep the brood in it warm. May is usually too early to take such a comb and work it up into a honey super, but one can mark the top bars of poor combs with a thumb tack, an X with a hive tool, or a dab of paint, and remove the combs in June or July. We have many old combs, some predominantly drone comb and others with broken lugs or bottom bars, that we retain in honey supers until it is convenient to dispose of them. When one is short of combs an old comb will work better than no comb at all for honey storage.

Brood Patterns

The most important thing to check in May is the queen's brood pattern. One cannot determine how good or bad a queen is by looking at her, but by looking at how and where she lays her eggs one can tell a great deal. A good queen has a compact brood pattern. Too many empty cells in the middle of a frame of brood is a bad sign. Such a void indicates disease, eggs failing to hatch, or the queen's failing to lay properly.

Within a colony, the brood nest, which covers several frames, is the shape of a ball. In a normal colony pollen is stored above and around the brood. The reserve of honey is above the pollen. Any deviation from this normal pattern indicates something is wrong.

Diseases

In most states in the country, American foulbrood is under control, but only because we have developed strong, vigilant programs in most areas. The beekeeper plays an important role in this program, and one should always keep a watchful eye for anything that appears abnormal. We have come to understand that European foulbrood, nosema, chalkbrood, sacbrood, and perhaps some others are diseases that become serious only when colonies are under stress. The best prevention is to make sure colonies receive a maximum of sunlight, have dry bottomboards, and, where necessary, are provided with a windbreak. Good air and water drainage are also helpful. Every beekeeper should arm himself with at least one book or bulletin about diseases to aid him in identification; one should never

hesitate to call in an apiary inspector when a problem or question arises.

Weak Colonies in Early May

What does one do with a weak colony in early May? By weak, I mean a colony with a pound (three to five thousand) of bees and a queen. The best thing to do is to combine it with another equally weak colony. This means that one queen will be lost, but the result will be a colony that will produce instead of two colonies that will barely survive the season. One of our problems, as men living in warmed houses, is to realize that colonies of bees in May in the North are still fighting low temperatures outside and trying to keep their brood nest at 90° F. or slightly higher. No one has yet devised a hive heater that is worthwhile and I doubt if anyone will do so. Honeybees are not domesticated animals; they are animals we have learned to manage, and no one has yet designed a hive heater that works within the bounds understood by bees. (That last sentence is not written as a challenge to some engineer to try to invent such a unit, for many have tried and failed; it is meant merely as a simple fact. I repeat, the honeybee is not a domesticated animal!)

Entrance Cleats

On the first of May almost every colony should still have an extrance cleat in place. Sometime during May it should be removed, except in the case of a very weak colony. I wish I could be more specific, but seasons and colonies vary; part of being a successful beekeeper is learning when to remove the entrance cleat. As a guide, it is well to remember that honeybees control the temperature of the inside of the brood nest, not the temperature of the inside of the hive. If the colony is in a single super, this may mean the brood nest occupies the whole super; however, most colonies occupy two, three or four supers in May.

Making Increase

It is helpful to have a few queens in reserve should a queen fail in a producing colony. The best time to make increase or to make up reserve colonies is in early May. As one finds colonies that are strong and may swarm, one sets a frame about one-quarter to one-half full of brood, a frame of honey, and bees from about three frames into a nucleus box or a super with a division board so the unit can be crowded into three or four frames. A colony this small will usually accept a new queen in a queen cage, provided the cage candy is prepared so that it will take the workers 24 to 48 hours to eat the queen out of her cage.

Small colonies prepared in this manner can be used as needed, and if not needed for requeening, they can remain in the apiary where they will grow and become full-fledged colonies by fall. Many beekeepers have told me that keeping about ten per cent reserve nucleus colonies on hand is not too many just to keep one's colony numbers the same during the spring and summer. More will be needed to replace winter losses and to increase the number of colonies.

Supering

Writing about supering is as difficult as is writing about entrance cleats. The first of May is about the time supering starts. In our area in Ithaca, New York, the primary swarming season starts May 15 and lasts through July 15. Swarming is caused by congestion. Supering aids in relieving congestion. The rule in supering is always to be one step ahead of the bees. Supering in late April in the North is risky; by the end of May good colonies may be in three of four supers.

The simplest method of swarm control involves a combination of reversing supers, supering and sometimes spreading the brood, which is done by raising a single frame of brood into a third super. Spreading the brood breaks up congestion, but if it is done too early brood can be chilled. It is important to remember that it is natural for a queen to move her brood nest upward in the spring. It is possible to have a colony in two supers, with the top super filled with honey, bees, and brood, and the bottom super empty, and still to have a colony that is congested.

Food

In almost all northern states and Canada there is an abundance of pollen during May. I cannot recall ever finding colonies in the Northeast in need of pollen during this month. I suspect much the same is true of the rest of the North.

Honey is another matter. On rare occasions colonies may need feeding in late May and early June. A colony should never have less than ten pounds of honey in reserve. Proper fall feeding is good insurance. If a colony needs food, never give it less than two gallons of sugar syrup. Boardman (entrance) feeders, which are sometimes useful in the South, are worthless in the North. When a colony needs feeding, it is best to feed it rapidly and in such a manner that the colony will take and store the food in two to four days. If it takes longer than this for the colony to absorb the food from the feeder(s), the feeding is being incorrectly done or the colony is too weak to take the food.

Summary

May is a month of opportunity in beekeeping in the North. The weather is usually good and colony populations are still small, both of which make colony manipulations simpler. A maximum honey crop will be obtained from those colonies that do not swarm and the grow to maturity rapidly as a result of proper manipulation by the beekeeper in May.

Stalking A Wild Colony

By FRANK COWLES, Jr.
Franklin, NC

IT WAS A cool, cloudy day — just the kind of a day they say to stay away from your bees. But it was Saturday and the only day our friend Ernest was off, so we decided to go ahead with our plan to capture a wild swarm of bees who were making their home in a mountain shack in the woods not far from our home on the outskirts of Franklin, North Carolina.

"Wrenching off this plank with it's rusty nails, made a fearsome racket, and by now the colony was thoroughly aroused."

We had been keeping an eye on the wild colony for some time, with a view to capturing it. The bees had taken up residence between the inner and outer walls of the shack, going in and out through two knotholes. From the activity at the knotholes, it looked like a good-sized, well-established colony.

While we could have ripped off a couple of boards and battens of the mountain shack, robbed the honey and destroyed the colony, we wanted if possible to save

the bees and hive them. We knew if we could capture the queen we would have a better chance of hiving the colony — but how to do this?

Everyone had a different idea as to the best way to go about capturing the colony. I brought it up at the monthly meeting of our Macon County Beekeepers Association, but no two members could agree on the one best plan.

"You could make a hole on the inside wall of the cabin," suggested one member, "then blow smoke into the hole and force them out the other side. If you had a hive nearby, they might go into it."

"They wouldn't go into the hive unless you could get the queen out," said another member, "and the queen isn't likely to leave no matter how much smoke you use."

Still another member brought up the idea of using Bee-Go or a similar product to force the bees out of the colony.

Finally, however, the five of us who were going to gang up on the wild colony — Ernest Talley, our neighbor; Lewis Sanders, an experienced beekeeper, and Bill Estevez, Rich Bankston and myself, relative newcomers to the art of beekeeping — held a council of war to determine the best course of action.

It was Lewis Sanders who eventually came up with the plan we used, an uncomplicated, straightforward method.

"First, let's put a hive with three or four frames of drawn foundation near the colony," he suggested. "Then we'll pry the boards off the shack as gently as we can, so as not to disturb the bees any more than we have to. With the boards off, we can look for the queen and try to get her into the gum — and try to get some of the other bees into it also."

All agreed this was about the best way to go about it, though we realized it might be difficult to get the all-important queen from the shack into the "gum"

With the plan of action agreed on, we scrambled into Ernest's Jeep pickup with our gear, fully equipped with bee suits, hats, gloves, pry bar and smoker, and drove up the winding clay road to the site of the shack and the wild colony.

We set up the hive, a single brood chamber with four drawn combs, about 12 feet from the knotholes where the bees were busy going in and out.

Ernest, using the pry bar and a claw hammer, slowly began to take off one of the battens on the shack while I manned the smoker.

"Easy does it," Lewis cautioned. "The quieter we can be and the less jarring there is the less stirred up the bees will get."

As Ernest pried off the first batten, the bees, sensing that something was happening to their home, dispatched a corps of investigators to check on us. A few puffs of smoke into the crack the batten had covered calmed them down, and Ernest began to work again with the pry bar.

Soon two battens had been pried loose and it was time to tackle one of the nine-inch-wide boards which made up the outside wall of the shack.

Wrenching off this plank, with its rusty nails, made a fearsome racket, and by now the colony was thoroughly aroused. I kept Ernest covered with a cloud of smoke as he worked, but the bees were definitely on the warpath and I was thankful our suits, helmets and gloves were stoutly made.

The other members of our crew kept in the background for the most part, Lewis giving directions to the two of us at the shack wall, Bill taking pictures of the operation, and Rich dashing forward from time to time to grab a bit of comb honey to sample.

By now the main part of the colony was exposed, and we could see it was a good one, with plenty of honey. The comb occupied an area about a foot and a half wide by three feet high, and the comb had been made in two layers, with a space between.

"Put some of that comb into the hive as bait," Lewis said, and as I lifted off the hive cover Ernest dropped in a chunk of comb honey, with some bees still clinging to it.

"Any sign of the queen?" asked Rich.

"Not yet," Ernest said.

With the colony exposed, Ernest began trying to transfer the bees to the hive, brushing them off the comb into an old shoebox he had found at the site. While I lifted off the cover, he shook them into the hive, after which I quickly replaced the cover. We repeated this over and over until most of the bees had been shaken into the hive.

The colony consisted of between 10,000 and 20,000 bees, we estimated, and though they were by now fully aroused, never did they get overly angry. We judged this to be due partly to the smoke and partly to the gentle manner in which Ernest pried off the cover to their house.

Some of the honey in the wild colony was capped, and the best of this we put in a plastic dishpan to take back with us. The remainder, after shaking the bees off it into the hive, we left outside for them to feed on.

With most of the bees transferred to the hive, we figured we had also transferred the queen, though no one ever spotted her. The bees seemed to be accepting their new home, going in and out the entrance — though one rather sizable clump remained at the site of the old colony, which now was stripped of its comb.

We surmised that we had now done all we could to hive the wild colony, so we began to load our gear into the pickup and get ready to take off. The plan was to leave the hive there a few days to see if the bees would accept their new home, then move it to a permanent site.

When we got back home, we weighed the capped comb we had brought back with us. It came to 24 pounds. We put it into jars and divided it, making sure to put some aside for the owner of the shack, Jack Kincaid, who had given us the okay to try to capture the colony.

Next day, I walked up the road to the shack to check on "our bees." While some were goin in and out the hive entrance, the clump on the wall of the shack was still there. I thought then that this meant trouble. Was the queen by any chance in this clump? We hoped not, but decided to give them time to make up their minds.

During the next few days, Ernest and Lewis kept a close watch on the hive, trying to determine if the bees were going to stay.

All of us were hoping the bees would accept their new home, but it seemed they had a different idea. So, unlike a storybook tale, ours has a disappointing ending, for a couple of days later the bees left the hive and went elsewhere — leaving us without a colony but with some delicious mountain honey as a reward for our efforts. As we enjoyed it that night with some hot biscuits that Ernest's wife sent over to us, we agreed that the expedition had been well worth the trouble, even though we didn't manage to capture our wild colony of bees.

Expendable Bees

The History of Five Hives for Ninety Days

By ED WOLFE
Houston, TX

IN A BIG city, especially if you live in a city that has a large population of amateur beekeepers, you have hundreds of swarms in the spring.

Both the amateur and the commercial beekeepers as well as the suppliers of beekeeping equipment are acutely aware of the necessity of keeping a low profile. Centainly no responsible beekeeper wants the community up in arms over proliferating bees. In many instances it's what to do with them after you have removed a swarm from someone's residence or place of business, especially if you are restricted to a limited number of hives.

Therefore this little history.

Our first hive was ready; painted, new frames glued, nailed, with new foundation wired into place, new bottom boards and telescoping cover, when we received our first frantic call from a Houston housewife. Her husband was at one of the local motels and afraid to come home because of a swarm of bees in their front yard. This was on April 1st, '79 and for us it heralded the beginning of the new swarm season.

Two days later we received our second call; we did not have a hive ready but we had a deep super, so in the second swarm went. We just used the newspaper method with two queen excluders and bored a 1¼" hole in the top super about ½" from the cover. We had not intended it that way but we had a ready made two-queen hive that for some reason worked.

By the first of June we had recovered enough swarms to have five brand-new two-queen hives with thousands of bees working themselves to death for us and for the first time we were faced with two new problems.

One of the hives had drawn out twenty full size frames and was running out of space; the other was what to do with new swarms coming in.

By this time we had removed the queen excluders on the first hive. We had expected this hive to swarm but it did not; however, there was no doubt that the bees were out of space and we were forced to put on our first honey super. We had our first hive with two deep supers of brood and one honey super.

From the 10th of April through July 30th we had put together 5 hives. The extra hive came later.

But it didn't stop there. That very day we received another swarm call. We did not have any more space for additional hives so back we went to the two-queen hive; our first hive again became another two-queen hive.

Before the week was out we had to put honey supers on all the hives and we had to add more swarms to the other four hives. Before we really understood what had happened to us we had five two-queen hives with two brood supers, and three honey supers and the swarms still coming in every day.

For some reason which I probably will never understand, we had an exceptionally heavy nectar flow from the tallow trees and the ligustrums in our vicinity this year. We did not know what was happening and had no idea, or at least didn't really understand about the tallow trees; we did know about the ligustrums because we could see the bees gathering nectar from the blooms.

Most assuredly we had no idea what really fine honey we had until we extracted our first five supers on July 20th, a slightly reddish honey with a really delightful taste and a grand aroma.

On the 30th, of July we extracted five more supers of the same quality of honey and we had visions of endless supers of honey, when the flow stopped. The bees were working like mad and two days later it was over.

From the tenth of April through July 30th, we had put together five hives with two brood supers each; fifteen supers for honey had been drawn out and we had extracted ten supers of honey.

I wish that it were possible to say something nice about the balance of July,

August and the first half of September but I can't. Thank goodness however for the goldenrod that started flowing about September fifteenth.

The five hives are doing well, they will go through the winter with each hive having two brood supers and one shallow super full of goldenrod honey, which should see them through the winter very nicely.

All in all we put thirty swarms of bees in the five hives during the swarm season and as every beekeeper knows, that is a lot of honeybees. Most of the original bees were dead by July fifteenth; the hives were stabilizing with the usual progeny from one queen, but they had served us well. One hundred full size frames had been drawn-out and filled with brood, pollen and honey. One hundred and fifty shallow frames had been drawn and filled with honey. Also the prospects of mixed flower and goldenrod honey in the fall.

There will be beekeepers who will be critical of our use of so many bees to hurriedly establish five hives. Our position however, is that this is better than seeing them go to waste. We could have established many more hives and received little honey this year since we had to start with all new foundation.

Hopefully next year we can establish another small apiary in the city somewhere not too far away and not too inconvenient.

Do we plan to re-queen our hives next spring? Well, not really; how does double-queening with spring swarms sound to you?

It will be interesting to watch what happens next year when the bees do not have to draw out combs and can devote all their energies to just gathering honey; pray for another big tallow nectar flow and if anyone is interested we will be glad to let you hear what happens in 1980.

Swarming and the Hobbyist

By FREDERICK H. THOMPSON
Grand Island, NY

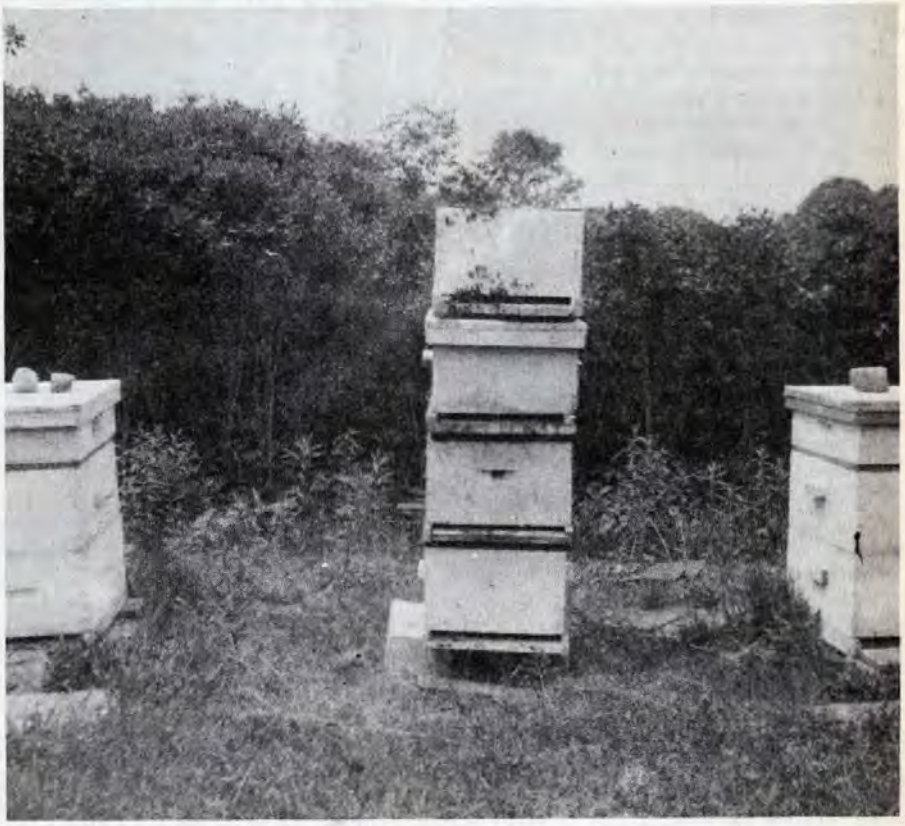
IN THE NORTHEAST, May and June are the months for swarming. Beekeepers with outyards really don't know how many of their hives swarm unless they are examined several days before the event. By this time, the hive contains little young brood and the bees are lazily hanging around the hive. If a swarm is spotted close to a number of hives, it is very difficult to determine which one it came from, especially if all the hives are of equal strength.

The potential for swarming increases as the age of the queen increases. This factor seems to be greater than weather conditions or honey flow. Expanding the brood nest helps, but if the bees have determined to swarm, drastic action has to be taken to stop their desire. The age of the queen, weather, crowding, honey flow and time of year all determine swarming. So, the beekeeper will have to put up with swarming to more or less of a degree regardless of how well he manages his bees. The greater the number of hives, the greater the potential that some may swarm.

What do you do with the swarm you collect? If you want to expand your bee yard, this is your opportunity. However, you reach a saturation point, especially if you are a hobbyist, where you just want to maintain the number of hives you have. Expansion means more space for hives and increased equipment costs. Also, additional time and storage space become important factors.

To maintain a specific number of hives, swarms can be used to build up weak colonies — weak meaning hives which have failing queens, not those which just swarmed. Swarms combined with hives containing young queens may swarm again within a few days if one queen is not killed. If no weak hives are present, it may be desirable to combine several swarms. Those caught the same day can be shaken together, or the newspaper method of combining may be used. It may be simpler to keep each swarm separate and combine later in the season, if required. Single story hives can be stacked on top of each other with a bottom and top board (see picture). This requires very little space. If you know of a hive that needs building or requeening in the future, a swarm can be placed on top of this hive. The bees can then be combined at a later date using the newspaper method. Swarms can come in very handy for the small beekeeper!

Swarms stacked one atop another



Queen Rearing Made Easy

By WALTER CRAWFORD
Massillon, OH

MANY OF US who have kept bees for years have tried the raising of a few queens for our own use. Most have no doubt succeeded where their understanding of the conditions and requirements was sufficient. However, the mass production of queens of good quality requires the grafting of very young larva into artificial cell cups and complicated management of the colonies used in the process. The transfer of larva to the cups requires good eye sight, a very steady hand, controlled heat and humidity, and a lot of experience for satisfactory results.

For the hobby beekeeper, the most practical method is to supply a strong queenless colony with a frame of eggs from a selected queen and let the bees do the rest (fig. 1). A good time to do this is about the first of May in the northern states. The weather is fairly well settled, the colonies are strong, nectar and pollen are available and drones have been produced for mating of the new queens. By this time too, a strong colony can be selected, whose queen has produced bees of mild temper, good production, quietness on the comb, color and other qualifications desired. In order to be sure no older larva are used, a frame of new comb containing no brood at all, is placed in the center of the brood nest of the selected colony. A colored thumb tack is pressed into the top bar to identify it. On the third day this frame is removed, the bees shaken from it to be sure the queen is not on it, and placed in an empty super. It should be inspected to ascertain that a satisfactory number of eggs are in the cells.

Several frames of sealed brood **with no young larva** are placed on both sides of the frame of eggs, the bees having been shaken back into their brood chamber unless the queen was found, in which case she should be returned to the bottom box after the sealed brood and bees have been placed in the empty. Fill the bottom brood chamber with empty combs or place frames of foundation on each side of any combs available. A queen excluder is placed on this and the super containing the frame of eggs on top. Put the cover on and wait about an hour so that the bees can return to the brood above. Then place a super of comb or foundation between the excluder and the top super. Thus separated, the bees will build a number of queen cells on the marked frame and if no eggs or larva were included with the brood brought up, no other queen cells can be present. Better check to be sure.

Mark the date of this operation on the cover of the hive and also add ten days and mark this date. One the tenth or eleventh day the queen cells can be carefully cut out of the comb and placed in mating nucs provided with a least three frames of sealed brood, pollen, honey and bees. When making up the nucs, be sure no queen has been included. All nucs should have a very small entrance. Place a handfull of grass over the entrance using a small stone to prevent it from blowing away. This will help prevent strange bees from robbing them out and cause the field bees to check their new location when they have worked their way through the grass. The queen cell should be attached to the side of a center comb in the nucleus by scraping to the midrib an area large enough to insert the queen cell so that the pointed end is free for the young queen to emerge. A pin can be used to hold the cell in place but be careful not to injure the queen within.

If the weather is cool, it will be advisable to use supers for the mating nucs, placing them on strong colonies over inner covers with the center holes screened on both sides. A small opening in the rim of the inner cover must be provided for an entrance. The warmth from the colony below will prevent the chilling of the brood in the nuc. Place the entrance at the rear of the colony and close it for a day or two. If no nectar is being collected, robber bees will find the nuc and destroy it if they can get in before the nuc can protect itself.

If the bees are wintered in a full depth and a shallow, the shallow should be full of brood and can be used for the nuc, if your sure the queen is below. Place a full depth super or two shallows with comb or foundation on the brood chamber and set the nucleus over the double screen. Allow about three weeks for the new queen to hatch and mate. By this time some sealed brood should be present and you can evaluate the quality of the brood pattern. If the nuc is to be used to requeen the colony below, remove the old queen and clip the wings or one wing of the new queen and remove the double screen board. If used to requeen a strange colony, use a single sheet of newspaper between them. Cut a few slots in the paper with the hive tool. If the old queen is not removed, the young one will usually succeed her but it's safer to get rid of the old one.

The new queen should have emerged from her cell by the fourteenth day and you may check the cell to be sure but don't disturb the nuc for about three more weeks. If the nuc is examined when the queen has just begun to lay, the bees sometimes become excited and kill her.

Now if you want to raise a greater number of queens (fig. 2) use a strong double brood chamber hive. Separate the frames so that all eggs and larva are below, and the frames of sealed brood is above. The queen must be in the bottom. Turn the bottom board with the entrance to the rear and place a double screened inner cover between the chambers. The rim of this inner cover should be cut away on one end to provide an entrance to the top. With this opening to the front of the hive, all the field bees will return to the upper chamber. A feeder with one to one sugar syrup is placed over the inner cover hole of the top brood chamber. It will become crowded with the returning field bees and the emerging brood. This duplicates conditions under which colonies will swarm and is ideal for the building of queen cells. A piece of tin slipped under the bottom inner cover at the entrance will provide a platform or ramp for landing and ventilating the top chamber.

A shallow frame of new comb is placed in the center of the brood nest of a strong colony of desirable qualities. Mark the frame with a thumb tack and check it on the third day to see if eggs are present. Prepare a full depth frame with three horizontal wood bars about ½" x ¾" to pivot on a small nail through each end bar and about two inches apart. Thin 1¼" nails are driven through these bars about 2 or 3 inches apart. Strips of comb from the shallow frame with three-day-old eggs are pressed onto these nails with the cells in a vertical position. Destroy the surplus eggs in the cells, leaving a row of eggs about one inch apart. The bees will build queen cells around these.

On the tenth day the queen cells may be cut away and used as needed. Those cells which are large and long will be the best queens. All runts are discarded.

At the time supplying the frame of eggs, the cell building colony will have had three days to build queen cells if any eggs

or young larva were brought up with the sealed brood so check each frame and remove any cells found. Any queen that would hatch from these will either go out with a swarm or kill all the queens in the cells bars.

Fig.1.

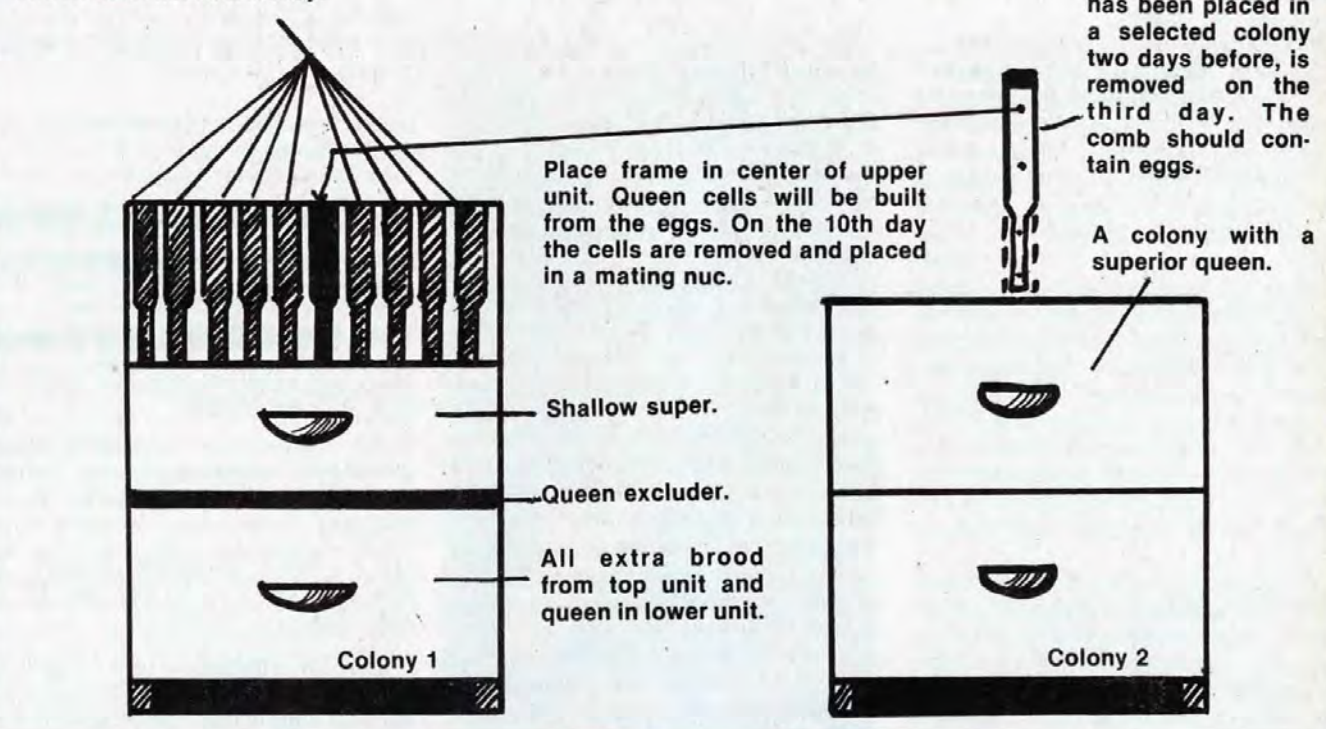
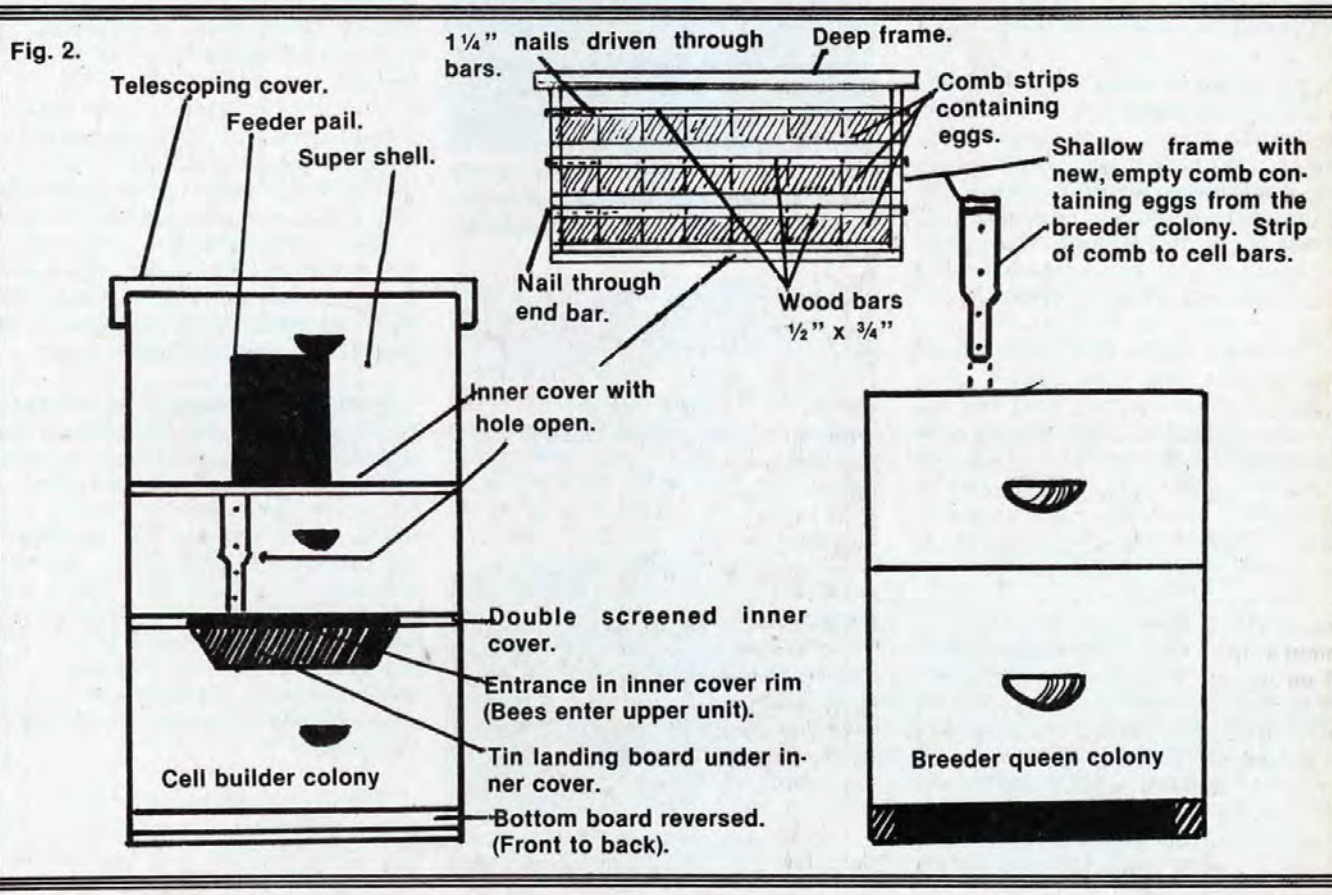


Fig. 2.



Pagoda Tree Update

By BERNIE HAYES
121 Miller St.
Wellsville, NY 14895

IN MY "JOHNNY APPLESEED" seed giveaway for the winter of '78-79 I mailed out 341 packets of tree seeds reaching most every state. This interest in an unknown species I consider unusual and indicative of the growing interest in increasing nectar resources.

Germination of tree seeds is not shown on seed packages when purchased from seed supply houses and the problem is more complicated since the seed's germination rate increases as spring approaches, however, since last year, I have found out how to improve the pagoda germination to about 80%. (It is evident that the seed is much more difficult to germinate than the common locust seeds.)

To do this, it is necessary to nick, file or grind each seed until a spot of white inner portion shows on the seed. This will allow moisture to enter and swell the seed and this process is known as "scarifying" in the nursery trade. If you receive seed you may treat as aforementioned and either sprout it in damp paper before planting, sow in a prepared flat or garden row.

Interestingly, after my Dec. '78 original article on this species, some beekeepers located this tree in their areas. In appearance its shape is very similar to our fast disappearing American elms, vase-shaped and with graceful pendant limbs. Rhoda Eberle of Edgertown, Mass., sent me a photo of a giant specimen which must have been at least 100 years old.

Historically, in the 1800's, the wooden ship captains from New England often brought back seed or trees which they admired in the Orient. There are two giant pagodas at Sag Harbor, Long Island, one of which may be the largest in the Western Hemisphere, measuring 18 feet 6 inches in circumference — and still growing at the rate of one foot increase in diameter every ten years!

Normally, in eastern soils, a spacing of one foot in the row is adequate for tree seedling. Soil should not be on the acid side or this tree, a legume, will not grow its best. Soils that do not grow a vegetable such as beans will need a legume inoculant, available at most garden centers.

Unlike vegetables, trees and shrubs do not require a rich soil. In fact, this often promotes a soft lush growth and sometimes winter-kill in some species. If seedlings are left in the row two or three years, they should be limb pruned in the fall for better top growth. This cutting of the lower branches has to be continued until it is established at the desired height.

Mulching in the summer is an ideal plan for small trees though it will attract rodents in the winter time.

If borers are a problem with any species, the caterpillars can be gassed by placing a few moth balls in the dirt at the base of each tree. This treatment, plus wrapping them with a paper wrap, gives nearly full protection.

Rabbits and mice, in the winter time, easily destroy trees and hardware mesh, though expensive, is the best permanent guard. Roofing paper, or four thicknesses of newspaper can be substituted, if necessary. Remove for summer however since black will attract too much heat. If ground mice are plentiful, snap traps in open ended tin cans give good control.

All trees should be staked, when set, to protect from mowers, ice formation, etc. Trees that mature to be over 30 foot high, should be spaced at least 30 feet apart. A smaller "filler" species may be interplanted until they crowd, such as the Russian or autumn olive flowering crabs, etc.

Early flowering is much to be desired and young trees should be treated for it at about four to five years of age. To do this, proceed as follows: In mid-June (Northeast) when the bark slips from the wood readily, at 4 inches from the ground, on the north side of the tree, make a cut through the bark to the wood so that a piece of bark ½ inch by three inches can be removed. (This treatment alters the flow of sap so that the flower buds are stimulated, to simplify the process.) The cut area will heal properly in one growing season. Single limbs, when large enough, may be also treated this way.

Beekeepers may write to me at once for seeds of pagoda, paulownia, mountain mint, honeysuckle or tallow. Please enclose a SASE. Postal Zip is 14895.

Incidentally the American Forestry Association advises that the pagoda (*Sophora japonica*) is an excellent medium-sized grower for street or shade tree planting under city conditions and it has a minimum of insect problems. It can be grown in the following regional areas: New England, Middle Atlantic, East N. Central, S. Atlantic, E.S. Central, W.S. Central and Pacific Coast. This covers a plant hardiness zone area from Maine to Florida.

Pagoda will do well on dry soils, as do most of the locust family.

News Bulletins and Instruction Media

IBRA has published two new Reprints, from 1979 **Bee World:**

M100 **Honeybee Poisoning By Chemcals: Signs, Contributing Factors, Current Problems and Prevention** By Dr. C. A. Johansen

M101 **The Honeybee Colony In Winter** by Dr. T. S. K. and Mrs. M. P. Johansson

Since Dr. Johansen's 1966 "Digest on bee Poisoning" in **Bee World**, much work has been done in many countries to reduce the hazards of insecticides to bees, and Reprint M100 describes some of the successes of this research. It also explains extra hazards bees now face from some new pesticide formulations. In the USA, where Dr. Johansen works, large-scale methods of agriculture, with advanced mechanization, amplify some of the problems, but the findings he reports apply world-wide. They will be of special value in developing countries, where availability of materials has outstripped knowledge about their proper use, and a great many bees are killed unnecessarily by insecticides, to the detriment of crop pollination.

Reprint M101 sets out the principles for winter survival of the honeybee colony, including the temperature control mechanisms involved and the ecology of the winter cluster. Subjects include food storage, heat conservation, metabolism and temperature, water content and water recycling in the individual bees, water recycling within the cluster, enzyme action and physiological modifications, and movements of the cluster of bees in the hive. It provides the biological basis of successful and unsuccessful wintering of honeybees.

The Reprints are available direct from IBRA, Hill House, Gerrards Cross, Bucks SL9 0NR, England. The price of each reprint is 75p or $2.00, post free.

Canada Tops World Honey Production

By ANNE HUTTEN
Kentville, N.S. Canada

ALTHOUGH THE U.S. produces a lot of honey, it is a net importing nation. As such, it has become the main customer for the eighteen to twenty million pounds of Canadian honey exported annually. This constitutes about one-third of the nation's total production. Canada consistently obtains the highest yields per hive of any country in the world, year after year, and the honey which flows from its hives is tops in quality. It is a mild, light honey of a desirable density, uniform and of a delicious flavor.

A recent interview with Endel Karmo, one of Canada's top apiculturists, added some interesting detail to these bare facts. Endel retired two years ago from the post of provincial apiculturist in Nova Scotia after three decades, but maintains one hundred and sixty hives of his own. He remains active at the end of a career which began with university training in his native Estonia, followed by two and a half years of training in bee diseases in Switzerland and Germany. He worked in Denmark for two years before making the move to Canada.

According to Endel, climate is a major factor in producing good honey. Canada's main beekeeping land is found in the Peace River area, which extends across the top of Manitoba, Saskatchewan and Alberta into B.C. Here, beekeepers manage up to four thousand colonies each, and obtain maximum yields in a season which may be as short as six weeks. The honey flow begins in early July, and is often terminated by killing frosts in the third week of August. Yet yields of 120 to 170 pounds per hive are standard.

Nectar comes largely from huge acreages of rape and alfalfa grown for seed, legumes which provide the best tasting honey found anywhere. Other parts of Canada may have different sources. In Endel's province, the earliest blooms are found in the Annapolis Valley's apple and pear orchards, with dandelions an added attraction. This is followed by blueberry blossoms in Cumberland and Colchester counties, supplemented by wild raspberry and blackberry plants. Other wild sources such as sweet clover, which used to be much more prevalent in former years, add their own unique flavor.

Endel Karmo

Nova Scotia's damp climate causes occasional problems with moisture content in the honey, but this is solved by turning on the dehumidifiers in honey houses for seven to ten days while the supers wait for extraction. Much of the honey is sold in its natural state. Endel sees this as the ideal way to consume honey.

"Pasteurization kills some of the yeasts found in honey", he says. "Not only that, but it evaporates some of the aromatic oils which add flavor". Nova Scotia consumers appear to agree with him, supplying a strong demand for all the raw honey produced by beekeepers who may have seven or eight hundred hives. Most of them have less colonies than that, with some urban dwellers keeping only one or two hives in the back yard.

Canadian beekeepers have depended extensively on package bees from the southern U.S., but with increasing costs and uncertainties about gas supplies, wintering of bees is on the increase. At several research establishments work is being done on developing strains of bees suited to the northern climate, and management techniques to match. Endel's work while with the province dealt with pollination and disease control.

He winters all his own bees in a back yard sheltered by tall evergreens all around. After experimenting with various methods, he now clusters the colonies into "apartment houses", with as many as eighteen hives under one plywood roof. This is working out very well.

Although retired, Endel spends winter days wielding a power saw in one of his four woodlots. Here, he clears the land and allows it to grow up in wild blueberry plants. In summer, these yield luscious

(Continued on page 289)

Huge acreages of rape is an important source of nectar in Western Canada

Beekeeping Technology

By DR. JAMES TEW
Technology Coordinator
Commercial Beekeeping ATI.
Wooster, Ohio 44691

Pneumatic Staplers: Their Use In The Beekeeping Industry

AS THE COST OF practically everything continues to increase, beekeepers are forced to re-evaluate old practices that have been taken for granted. At the same time, new ideas or techniques that could make an operation more efficient should be carefully evaluated.

One such development that has gained interest among beekeepers during recent years has been the use of air-powered nailers and staplers. At least seven major companies have marketing and service networks across the U.S. Staplers, generally more popular than pneumatic nailers, have become popular for two major reasons: They are reported to be four to five times faster than hand nailing, thus substantially cutting labor cost; and because of various adhesive material coating the fasteners, they should provide considerably more holding power. Staples may be coated with epoxy or special nylon coatings, resulting in superior holding power. These adhesive materials vary in composition and strength from one company to another.

Normally, two staplers are required. One is used to assemble hive bodies, supers, bottom boards — in general, anything larger than frames. A staple with a 7/16 to ½-inch crown and 2-inch legs is required for ¾-inch lumber. Staples of this size are made from 16-gauge wire.

Smaller air staplers are required to assemble frames. A staple with a 7/16 to ¼-inch crown with a 1⅛-inch leg made from 18-gauge wire is sufficient. As is commonly done with nails, a staple should be driven through the end bar into the raised part of the top bar. This cross fastening procedure greatly increases frame joint strength. If a "super joint" is desired, air staples used in conjunction with hot glue result in a bond so tough that end bars are virtually destroyed if the frame has to be disassembled.

Costs of staplers and staples vary somewhat. The larger staplers range from about $250 to $420, while smaller staplers run somewhere around $150 to $230. Used staplers are often available at considerably lower cost. Staples for pneumatic drivers normally cost about two and a half times the cost of hand-driven fasteners.

Demonstrating the use of a hive stapler at the Agricultural Technical Institute, Wooster, Ohio.

Air requirements can generally be met with small to medium sized compressors. Air requirements for the two guns discussed range from 60 to 110 P.S.I., depending on the type of lumber being used.

Package and queen producers probably use staplers more than other types of beekeeping operations. Not only are hives and frames assembled, but large numbers of shipping packages are also required. Staplers are also handy when used to secure package bee loads on trucks for long distance hauls. Slats are stapled across packages after being arranged on a truck, thus securing them in position. This type of custom loading assures better package shipment. A 75¢ refund is usually allowed if the purchaser furnishes used, empty packages. It has been observed in some cases that after packages have been used for several years, cages assembled with common nails appear to hold up better than staple-assembled packages. Possibly the use of adhesive coated staples could alleviate this situation.

In some cases, special mounts have been designed for commercial beekeepers to speed the assembly process even more. One such frame mount consists of two staplers simultaneously stapling the top bar to end bars with one trigger control. It was reported that one man can do more fastening with this special gig than two men — and save two hours' labor per day.

Staplers are readily available. A few bee supply companies are carrying a line of air stapling equipment also. If a beekeeper decides pneumatic equipment has a place in his operation, locating and purchasing a stapler should not be a problem.

Acknowledgements

Paslode, Spotnails, Inc., and Senco Fastening Systems.

Baling Twine — A Good Smoker Fuel

By ANN HARMAN
Laytonsville, MD

THE NEVER-ENDING search for a really good smoker fuel frequently produces questions about the suitablility of a particular material. Gone are days of burlap bags. In their place, farmers now have feed supplied in colorful plastic "imitation burlap" bags or in paper bags. If you are lucky enough to live in an area of pine trees or a forest with a continual source of rotten wood and dead leaves, then smoker fuel may not be a problem, unless you haven't got the time to rake and bag those for later use. One material is, fortunately, still quite available throughout the country, and accumulates in huge, worthless piles. That material is baling twine, used for tying up bales of hay and straw. Some plastic baling twine is used today, but the old-fashioned type is still plentiful.

Baling twine must be treated to be of value to the farmer. Rot-resistance and insect and rodent repellency are necessary or the carefully stacked bales soon become a gigantic mound of untied hay or straw. Since I am a chemist I knew there were several substances that could be used to treat baling twine. And since I am a horse owner I found the growing pile of used twine very tempting to use as smoker fuel. So that I would not harm my bees, I investigated the material used to treat baling twine.

The substance used is a familiar one — creosote, the amount used, termed "harmless to cattle", is only about 0.45% of the total weight, including twine. Creosote is the traditional nasty-smelling preservative paint for fence posts and lumber. What many people may not realize is that in very low amounts creosote was also used to treat burlap feed bags which needed the same rot resistance and rodent repellency as baling twine. In those low amounts, creosote will have almost no odor and the natural odor of the twine or burlap will hide it.

Burlap and baling twine produce the same products of combustion in the oxgen-poor atmosphere in the smoker. Similar combustion products will be obtained from other fuels, such as pine needles, leaves and rotten wood. The products of combustion are many, including creosote itself that forms a coating on the inside of smoker tops.

Will there be any problems in using baling twine as smoker fuel? No. Baling twine will be very similar to burlap. However, one precaution must be observed. Under certain circumstances, a farmer might use a more costly twine treated with copper naphthenate, the same preservative used for fence post and construction lumber THAT HAS A GREENISH COLOR. The baling twine will also have a greenish color and feel slightly sticky just as the treated wood does. Since the greenish color is the color of copper naphthenate, the color indicates such treatment. DO NOT USE COPPER NAPHTHENATE TREATED BALING TWINE AS SMOKER FUEL.

In a search for smoker fuel, synthetic fibers or plastics may have been tried by a beekeeper. Synthetic fibers and plastics must NEVER be ignited or burned. Toxic fumes are readily given off by certain plastics, and it is difficult to know which fiber or plastic you have. Toxic fumes will certainly harm bees, but worse, you can be severely harmed. Use plastic feed bags for garden mulch or holding rubbish, but do not burn them. Caution must be used also on paper feed bags, such as horse or cattle food or dog food. These bags can have a plastic coating or a plastic liner.

Fresh baling twine can be difficult to ignite and kept glowing in the smoker. When glowing properly, baling twine produces large amounts of cool, white smoke. Weathering baling twine, by hanging it from a tree limb through several good rains, will lessen effects of treatment and considerably improve burning. Weathering can also be done by simply soaking the twine in a bucket of water, changing it daily for about a week, then drying. The dry, weathered twine is then ready for use in your smoker.

Both my bees and I have had no problems with baling twine as smoker fuel.

A photo process of filtering eliminates the usual color spectrum and records the ultra-violet spectrum. The honeybee is able to see the ultraviolet light and this may aid her in detection of the most concentrated nectar sources available.

Strictly Backlot

By CARL CALLENBACH
135 College Avenue
Elizabethtown, PA 17022

IT'S MID-MARCH and I'm raring to hit the backlot and garden. But the cold chases me into the cellar for one more bit of winter frenzy, a project for the backlotter who has the couple of additional honey supers and hive bodies already knocked together, the three nucs built for some rather unscientific experimentation, and the comb honey supers ready to go; the tomato, pepper, celery, onion, and egg plant (try Stokes French Imperial) seeds tucked in earth near kitchen windows or under plant lights. (And overhead, two huge flocks of snow geese pass over the Susquehanna River — one heads north, the other, south!)

This particular bit of tinkering is based upon an assumption that because honeybees can draw out wax in squares, rectangles, and circles, they can successfully cope with other geometric forms.

Materials and Procedures (Loosely):

A couple of frames (Photo #1). I'm using comb-honey size frames. Large or medium frames would probably make more sense.

Some scraps of plywood (Photo #2). I'm using ¾" plywood. One-half inch would probably make more sense.

Sabre saw and clamps. A good jig saw (or better sabre saw) would make more sense. Simply clamp two pieces of plywood together and drill holes where ever you please. Then connect the holes with your saw! Note Photo #3, my first circle. Undaunted, I proceeded to rectangles and triangles — much easier, Photo #4. ("If there are two triangles proceeding a rectangle, place an x in the first triangle.") And Christmas trees (toadstools would probably make more sense!)

Photo #5 shows the completed frames. I placed wax between the two matching pieces of plywood and pressed them into the frame. If all goes well, I plan to frame the capped over trees (toadstools) pieces with molding — and perhaps, give them as Christmas gifts to friends who, as they say, have everything.

This sort of tinkering has infinite possibilties. For example, using numerous large frames, a backlotter with inclination could fabricate a classic HOME SWEET HOME wall panel decoration. Or a twenty-pound honey valentine. Enough!

Right now I'm fascinated by the uniquely rich propolis stains I found on the fresh plywood I used last season as spacers in my comb honey supers. But maybe I'll save that whimsy for next March when the geese are flying in both directions.

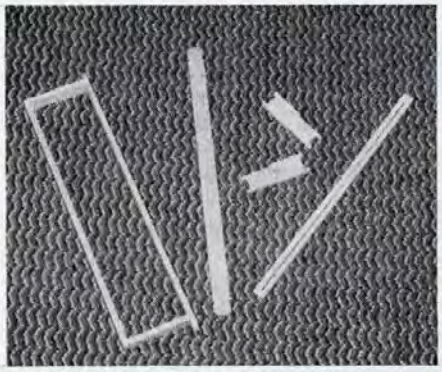


Photo #1

Photo #2

Photo #3

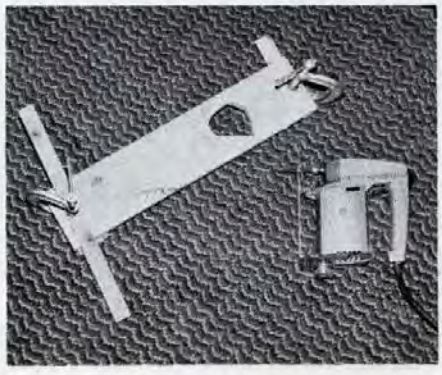


Photo #4

Photo #5

CHINESE EXPORTS COMPETING WITH HONEY FROM MEXICO

BOTH THE INCREASED export volume and lower Chinese prices are proving to be bitter competition for Mexican honey producers and exporters. In a story filed from the Mexico City Bureau of the News, Stephen Downer reported Mexican reaction to the increasing exports of honey to West Germany, for example, who purchased 12,707 metric tons from Mexico in 1979. The Chinese sold West Germany 7,669 metric tons in 1979, an 81% increase over 1978.

Mexico exports more than 90% of its total annual production of about 50 million tons and expects to earn some 31 million this year from honey sales. "Mexico is still the largest exporter but the Chinese are catching up" says the purchasing manager of one of Mexico's major companies that buys and exports honey.

The 1978 honey production in Mexico was down last year which relieved some of the competitive trading on the export scene. If both the Mexicans and the Chinese have bumper crops the prices are apt to drop. "Good Mexican honey will always get a good price" says the purchasing manager. "West Germany needs Mexican honey and so does the United States."

Siftings

By CHARLES MRAZ
Box 127
Middlebury, VT 05753

RESEARCH REVIEW IN **Gleanings** by Roger Morse is indeed a great source of information. Roger is one of the best researchers in the business and knows how to ferret out all this new information that most of us beekeepers never see. The April issue has interesting information on the various sugars used for baking, including the "new sweetener" isomerose made from corn starch. Chemically, this isomerized sugar is similar to honey in that it is about 50% each of dextrose and levulose, the two sugars found in honey. We all expected that isomerose would push honey right out of the bakery business, but, as Roger stated, this did not happen. While isomerose may be "identical" to honey chemically, it proves to be quite different in its physiological and metabolic properties, as well as physical differences, as Roger mentioned, in crystal formation.

It also turns out isomerose does not keep baked goods moist as honey does, it does not seem to be hygroscopic, absorb moisture from the air. Health food stores even sell crystallized levulose (synthetic, from isomerose) and it seems to have very little affinity for moisture in the air, so different from the levulose in natural honey. It is just about impossible to crystallize the levulose in natural honey, it just will not crystallize. Dextrose crystallizes readily, in honey.

Some nutritionists have assumed that the levulose in isomerose and levulose in honey are identical in all respects. Apparently this is not true. I recently spent some time in Florida with a beekeeper that used isomerose to feed his bees. He told me that after feeding the bees isomerose for about two weeks there was evidence it was killing the brood, the bees would remove the brood from the hives. Hives fed with regular sucrose (cane-beet sugar) at the same time, in the same apiary, showed no such mortality to the brood. Have any others had experience of this kind? I have heard other reports that isomerose killed brood when fed to the bees. Obviously it is not "exactly like honey". To bees it seems to be actually toxic and kills the brood. Some nutritionists have actually carried out feeding experiments with synthetic levulose with none too good results. Therefore, some concluded, honey is no better than any other sugar. When will researchers learn better? It may be identical in the test tube but have a completely different metabolism in the body. A chemist may not be able to tell the difference but Mother Nature sure does.

Recently, a soft drink company has permitted the use of isomerose for sweetening its soft drinks. Have any experiments ever been carried out to see what the long term effect of isomerose would be in the diet? I doubt very much if any such experiments were ever carried out. Seems to me they would check this out before any adverse effects show up in people that consume large quantities of this soft drink over a long period of time, especially in children.

For some time now I have been receiving correspondence from a beekeeper in Poland on research that is being done in Europe on the therapeutic activity of various bee products. Propolis has been researched there for quite a few years. He wrote me about an interesting case of a Polish girl student. When she returned from a trip to Bulgaria she developed "Crohn's disease", a serious disease of the intestines, apparently incurable. Two medical centers in Poland confirmed the disease. The usual treatment is with cortisone that does not cure, but only suppresses the symptoms. She was treated by him for 8 weeks with 15% alcohol solution of propolis (in water) that produced complete recovery. Six months later, X-Ray examinations by specialists showed nothing to indicate that she ever had the disease.

Since such a preparation is harmless where ethyl alcohol, (grain alcohol) is used, there is no reason why such a treatment should not be tried by anyone suffering from this disease. They have nothing to lose. Other infectious and inflamatory conditions were described as being helped such as in the mouth, stomach and lungs. We indeed have a lot yet to learn about our little friends the bees. I agree with our friends in Yugolslavia, bees are indeed one of the worlds greatest pharmacists. Again, it is the same old problem, there is "no money" to be made in bee products. Most of these products are available to anyone with a hive of bees. The wonders of the bees never cease. I wonder why we are so slow to learn these wonders!

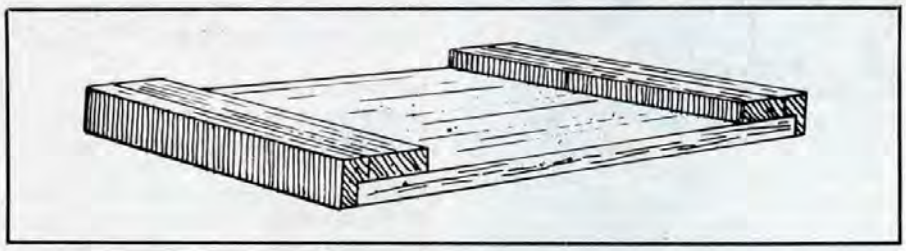
Any beekeepers that can read and write Polish that would like to correspond with this beekeeper in Poland, his name and address is:

Olewinski Tadeusz
59-900 Zgorzelec.
Lubanska, 43 m.6.
Poland

This picture of a "gum apiary" was taken several years ago by C.A. Divelbiss during his travels. It is not known if the apiary still exists. In any event keeping honeybees in log gums does not meet with the approval of the disease inspection service in most states.

Bee Talk

By RICHARD TAYLOR
R.D. 3, P.O. Box 549
Trumansburg, NY 14886



A very simple hive cover.

I'M DOWN ON the Mexican border, where it's hot (mid-March). Back home my bees are still locked in by the winter, but here they have been busy quite awhile on the early desert plants. The eucalyptus trees outside my cabin are filled with bees every morning. The great horned owl who makes his home in those trees, and can be found there every morning, doesn't mind them. He hoots all night, his sounds mingling with the yelping of coyotes off in the distance.

I would feel as though I were getting a start on spring, except the landcape here is so different that it seems more like a different world. You always feel most at home when your surroundings are like those of your childhood. Somehow the early blooming cacti and other strange plants cannot replace, for my feelings, the dandelions and cherry blossoms. It takes more than warm air and the hum of bees to make a spring.

Still, there is an apiary of a couple dozen colonies nearby, and when I'm standing there next to a busy hive then all the good feelings of over forty years of beekeeping flow in. I don't know who owns the apiary. I wish he'd come by, so I could talk with him. I get the impression from his apiary that he knows what he's doing. His bees are bringing in white, yellow and orange pollen pellets.

I don't know much about beekeeping in the southwest, but one thing I have noticed is the superiority of the hive cover they all use out here. It is the essence of simplicity. The cover just consists of a pine board or two with two cleats at each end, one pair of the cleats nailed over the top, at the end, so the boards will not warp, and the other pair nailed against the ends, to keep the cover from sliding forward or back. Nothing to it. And you don't need any inner cover with that kind of hive cover. Nor do you need to weight it down, because the bees stick it down with propolis. Moreover, the cover is flush with the sides of the hive, so if you want to move hives on a truck or trailer, you can shove them right up together, sideways. You can't do that with telescoping covers. Now that seems to me the way to make covers. You can make one in five minutes. Or you can telephone the lumber yard, tell them the lengths and widths you want the wood cut, then all you have to do is nail them up and slap a little creosote or cheap paint on them. That way you could make up a dozen of them before breakfast. And no more fussing around with inner covers, or having inner covers come to pieces when you pry them loose.

A commercial beekeeper I know back home has carried simplicity one step further. All he uses for covers are pieces of outdoor grade half-inch plywood, cut to the exact dimensions of the hive. Can you imagine anything simpler than that? All you need to do, if you need a few hive covers, is call the lumber yard, tell them what size you want the plywood cut up to, and then pick them up on your way to the yard. No need ever to paint them.

And did you think of this: That covers made either with boards and cleats, like those down here, or those that just consist of a piece of plywood, require no metal roofing on them? So there is another timesaver, and a reduction in overhead, too. No more rusting, galvanized covers, or torn, aluminum ones. Simple.

Another thing you can do, if you want to carry simplicity one more step, is use covers that can serve as bottom boards too. To do that, all you have to do is nail a cleat on the sides and one end of a piece of weather grade plywood. Have the cleats on the topside when you're using it as a cover. Nothing to it. There you've got a piece of equipment that will do two jobs, and you'll never find yourself with plenty of bottoms but short on covers, or vice versa.

The only thing I've got against a cover that consists of nothing but a piece of plywood is that it looks funny. But that is easy enough to correct: Just nail a strip to each end, to hang down over the ends of the hive. Then it looks just fine. Trouble is, you won't be able to use it as a bottom board anymore.

If you go to England you'll find bee hives of every shape, size and description, one of them, the W.B.C. hive, unbelievably complicated and expensive but, it must be admitted, very beautiful, too. Still, I think that what is beautiful about a colony of bees is the bees themselves, their beautiful combs, their organization, and the way they parade in with colorful pollen loads, the way these bees are doing down here. The hive itself doesn't matter much. The lover of bees sees past that, to what goes on inside. And of course when it comes to honey gathering, the bees couldn't care less what their hive looks like, or what kind of cover it has, so long as the hive isn't coming to pieces, and the cover stays where it belongs.

I'm a great believer in simplicity, which means, getting the maximum result with the minimum trouble and expense. We don't live forever, so we might as well do the best that we can in the time that we've got.

NATIONAL GEOGRAPHIC MAGAZINE FEATURES PESTICIDE PROBLEMS

CALLING ATTENTION to pesticide problems, **National Geographic** (The Pesticide Dilemma, Feb. 1980) magazine described some of the current problems facing beekeepers. Photographs showed beekeeper Brian Ferguson of Visalia, California with bees that were killed by pesticide spray (page 173). More about bees on other pages (167-168) described the problems being encountered by beekeepers with pesticides and how the honeybees are being affected by sprays. The importance of honeybees to our food supply in their role of pollinators was mentioned. The article was well done.

Research Review

By DR. ROGER A. MORSE
Research Editor of Gleanings
Professor of Apiculture
Cornell University, Ithaca, NY 14853

Fruit Pollination

THE MARCH,1980 issue of **American Fruit Grower** has two excellent articles and four interesting advertisements pertaining to fruit pollination. People who rent out their bees for pollination, especially for apples, may be asked questions about these articles and advertisements when they move their colonies into orchards in the North in May and June.

Will Robinson, a graduate student finishing his research at Cornell, reports on the differences he has found between Delicious and other apple varieties. In the case of Delicious flowers there are gaps between the stamens (which bear the pollen) that allow bees to stand on the side of the flower to obtain nectar. When bees approach the flowers in this way, instead of scrabbling over the top of the flower, they do not contact the flower's sexual parts and there is no pollination. Robinson's advice is to increase the number of colonies per acre in Delicious plantings. There appears to be no other way to ensure good fruit set, as the flower's structure encourages many bees to take nectar without pollinating. We are aware that many eastern apple growers are already planning to rent more bees for Delicious pollination. The only other apple variety of commercial importance in the U.S. which has a similar flower morphology is Northern Spy.

Dr. Elbert R. Jaycox of the University of Illinois explains in another article that bees with open brood (especially larvae) are stimulated to collect pollen for food. Pollen-collecting bees are precisely what the orchardist wants as they make full contact with the flowers' sexual parts to obtain the pollen. Jaycox also points out that one cannot assess what is inside a colony from the outside. He advocates a random check of rented colonies by growers to determine their condition.

One of the ads is for a "concentrated nutritional attractant" that allegedly will attract bees from the hive to pollinate flowers on which it is sprayed. The idea is humbug but that doesn't prevent the company from promoting it or growers from using it.

Drs. John Free of the Rothamsted Experiment Station in England, and D. Michael Burgett of Oregon State University, have both done research on such "attractants"; the idea dates to the late 1940's and early 1950's. Their findings confirm that one may lure honeybees from their hive but unless the bees find the reward they expect, they will not forage. When one sprays a sugar syrup, enriched or not, it has been observed that the bees will sometimes collect the syrup from the leaves, twigs and branches it hits; however, such bees may spend no time on the flowers and are not pollinators.

There are three ads in the same journal for pollen. This is not pollen for human consumption, but hand-collected pollen which is used for cross pollinating. (Bee-collected pollen in the pollen basket loses its ability to grow and fertilize an ovule soon after it is collected.) One may buy pollen for the pollination of apple, pear, cherry, plum, walnut, apricot, pistachio, kiwi, pecan, almond, olive and peach trees. Again, the idea is not new; it was researched at Cornell in the 1920's.

Professors Townsend and Smith, at Guelph University in Ontario, have shown that hand-collected pollen can be used effectively by orchardists who made mistakes in their planting program by planting solid blocks of fruit trees which require cross pollination. It is interesting that despite all that has been written about pollination, new growers often make such mistakes. Different types of fruit trees have different requirements. For example, oranges (except tangelos) don't require cross pollination to set fruit. However, apples and most other orchard fruits grown in the North do. Those who have made errors in planting should interplant, graft in other varieties and, until these provide the needed flowers for cross pollination, use bouquets (large, two-inch-diameter limbs in flower placed in 50-gallon drums of water).

Obviously, people would not be advertising unless the financial return was sufficient for them to do so. In the cases of the enriched sugar syrup and the hand-collected pollen, some orchardists must be buying. This is too bad, because it is all a waste of the grower's money and indicates poor management.

I suggest that those who rent bees might find subscribing to the **American Fruit Grower** (Willoughby, Ohio 44094) worthwhile as it will tell them in March what growers, especially apple growers, may be thinking about in May.

For those who wish to pursue the subject, the papers in which the use of a sugar syrup spray have been researched are:

Burgett, D.M. and G.C. Fisher
An evaluation of beeline as a pollinator attractant on red clover. **American Bee Journal** 119: 356-357. 1979

Free, J.B.
Attempts to increase pollination by spraying crops with sugar syrup. **Journal of Apicultural Research** 4(1): 61-64. 1965.

Rapeseed Acreages Increase in Canada

THE OILSEED BOOM is growing not only in western Canada but in the Province of Ontario as well, according to information published in **Canadian Beekeeping**. Farmers are growing rapeseed as it is a short season crop and can withstand cool weather.

Excellent prices for edible oilseeds are partially responsible for cultivation of this cash crop. The oil is used mainly for cooking purposes, while the meal is used as a protein supplement in animal rations. Rapeseed yields much nectar. A new crushing plant in Windsor, Ontario, opened last summer, will purchase all the rapeseed that can be produced in Ontario, according to Professor R. J. McLaughlin of the University of Guelph.

Fundamentals for All

"Who Should Plan for Beekeepers' Meetings?"

By W. A. STEPHEN
Professor Emeritus
The Ohio State University

WHEN THE NAMES of the program committee for an important beekeepers' meeting appeared, a scientist friend of mine commented that no one on the committee was a beekeeper. It showed in the program and resulted in disappointment for some of those who attended the meeting.

When American cattlemen visit Europe, they want to see the foundation stock of some of the breeds we have in America and other breeds which we do not have. The same thing must be true of horse men. I know that it is true of hog and sheep breeders. There is something memorable in seeing livestock, bees included, in distant lands, but the same is true of anywhere away from home.

I recall vividly seeing orange, or reddish-banded bees in Cyprus; my first Carniolan colony at Ottawa; pure Italian queens in Italy.

I remember well seeing a colony in the University of Wisconsin apiary which was so populous that my co-worker always remarked that one queen only could not be responsible. We never saw more than one queen, although we saw the one, a marked queen, several times during the summer.

Not all memories are of the desirable quality bees. Most of us remember those which gave us the most stings. I have memories of searching for a queen in a poor colony. It required an unusual amount of looking to find her for she was scarcely bigger than a worker — the smallest queen I ever saw. And I remember one which I was looking for in a mean colony and was able to find by shaking the bees through a queen excluder — only to have her disappear through the queen excluder when I attempted to finish her off with my hive tool!

It may be that those who ask why try to find queens, or why examine the brood nest, or why look at colonies critically, just do not appreciate what goes to make a good colony. Not long ago, I attended a cat show. As I watched the judge, I was impressed, not with how much the judge knew, but about how little I knew. A good cat fancier would know what was going on. I did not. Knowledgeable beekeepers anticipate seeing combs, bees, brood, and queens — all of these — and watch for anything out of the ordinary.

After the International Apicultural Congress held in Maryland in 1967, I conducted an Ohio tour for about two dozen European beekeepers. During the three days, we visited extracting and packing plants, a beehive factory, but only one apiary which belonged to a commercial beekeeper. I failed to take into my preliminary planning that I would be hosting a group of amateurs (in the best sense of the word) whose prime interest in beekeeping was bees, not commercial apiaries and packing plants. I had not planned to visit my own bee yard, but suggested it to the group in my car. I was surprised at the enthusiastic "yes". When examining some of the colonies, I was further surprised at the anticipation of some of the persons to see the queens, the amount and character of the brood, and the behavior of the bees. I now find myself evaluating anyone visiting my own, or any other bee yard, by the evident anticipation of "reading the brood nest".

This all goes to point up that good beekeepers want to see bees, and the best beekeepers want to see individual bees and all the rest of the details which go into colony life. The ultimate is for each person to remove the combs and examine the colonies himself or herself — not just in one colony, but in several. This is hardly possible with a large group, but you seldom get more than two, or three of those best beekeepers in a group, anyway.

Apiaries, single colonies, and queens, of course, are not the only center of interest for beekeepers. Equipment and layout of the extracting plant and facilities for packing honey and handling capping are important to practically all. And, most certainly, innovative and unique equipment, arrangement, and techniques are not to be neglected.

It is important to make personal contacts possible, How disappointing to learn, after travelling many miles to a beekeepers' meeting, that you had missed seeing a well-known beekeeper, or scientist, or had failed to visit a nearby experiment station, or research center where important investigations in bee-behavior are being carried on. This occurred last summer when the Eastern Apicultural Society met at Ottawa. No mention was made on the program of the proximity of the Dominion of Canada Central Experimental Farm, nor how to get there. Many Americans, and I'm sure, quite a few Canadians were disappointed in not having an opportunity to meet the internationally known scientists at the Apicultural laboratories and to hear of some of the work being carried on there.

Once, at Pennsylvania State College, a World Congress was meeting at the same time as the Beekeeping Short Course. An amateur beekeeper from Britain, a delegate to the Congress, sat in on some of the beekeepers' meetings. I was disappointed that the visitor was not recognized and given a chance to speak. A world-renowned speaker was available for the Eastern Apicultural Society meetings in Ottawa last summer, but was not invited to participate.

When the American Beekeeping Federation met in Baltimore some years ago, the renowned Dr. A. Z. Abushady — "Poet, Bee-Master, Humanist" — was an official at the United Natons in New York. Dr. Abushady had founded the Apis Club and the Bee World, later, a complementary organization and a bee journal in Egypt. I, for one, would have been thrilled to see, hear, and meet him. It may have been that no one on the program committee knew of Dr. Abushady. Because of not including those of different interests on the program committee, much speaker talent is overlooked, as well as other items of beekeeper interest.

During the International Congress of Apiculture in Athens, Greece, in September, one day was set aside for a tour. It was much appreciated, but was centered on historic sites. For those who had some knowledge of Greek geography and history, or had a guide book, it was quite meaningful. The visits to bee yards were incidental to the historic sites. Those

(Continued on page 289)

Notes From the Straw Skep

By BESS CLARKE
Canton, PA

LINDA HACKENBERG IS helping her husband to super their bees in the Florida sunshine this spring. It's a job she enjoys, and it's also a job where her assistance is appreciated. Supering is so much easier for two people working together than for one.

Eight years ago, when the Hackenbergs were newly married, Linda helped a lot, accepting the occasional stings with the normal discomfort. But one day when they were moving a load of bees for pollination she suffered a severe reaction to a sting. She was sick to her stomach and then had difficulty breathing. Dave gave her an antihistimine he carried with him as a precaution and they got her to the emergency room of the nearest hospital. At that point Linda remembers someone saying, "I can't get any blood pressure."

After she regained consciousness and began to recover the doctor advised the Hackenbergs to seriously consider some other vocation. Linda resisted, feeling that she could find a way to cope with the situation. After all people were treated for allergies all the time and if she were careful to stay away from the beeyards she knew she could manage.

A schedule of desensitizing shots was planned but before they could be started, the Hackenbergs learned that Linda was pregnant. The shots were delayed; Linda stayed away from the bees; and carried adrenaline with her at all times. She needed it 3 or 4 times over the next two years while she was busy producing two sons: Davey and Kevin.

When Kevin was six months old Linda finally began a 3 year program of desensitization with whole bee extract from her family doctor. At the end of that time she was extremely discouraged to learn that there had been no change in her blood reaction. She was just as allergic as ever.

At this low point a friend, Priscilla Perry, told her about the help the Perry family had been getting at the Good Samaritan clinic at Johns Hopkins Hospital in Baltimore and recommended that she ask for help there.

The program was an experiment involving pure honeybee venom rather than whole bee extract, and it had been pioneered by Dr. Allen Benton at Penn State University.

Once a week for two years Linda made the trip from her home in Lewisburg, Pa. to Baltimore for minute amounts of the venom so that she could build her tolerance up to a maintenance level.

At about the time she got to maintenance the Food, Health and Drug Administration cleared the treament for general use and after that she needed to travel only the few miles to the Geisinger Hospital in Danville to maintain the level in her bloodstream. This meant, too, that she could now spend the winter in Florida; and check in at a hospital in Tampa every three weeks.

This spring the final countdown began. Linda was to bring live bees with her to the hospital where she could be stung under controlled conditions. If she showed no reaction she could arrange to get stung once a week at home and return to the hospital only for routine bloodwork.

Sad disappointment! Linda showed a slight reaction to a full sting from one bee. A week later there was no reaction to one full sting (left in her skin until all the venom was pumped out of the sac.)

The third week the reaction to one sting was negative but she developed breathing difficulty with the second sting.

The doctor believes that she can tolerate several stings which are scraped away, in the normal manipulation of beekeepers, so she is now ready to begin her maintenance program of one self administered full sting each week. Of course the adrenalin will be kept handy, and the blood tests will continue, but Linda is confident that she will be able once again to work alongside her husband in the business they both love.

Tropical Salad: 1 (3-oz.) pkg. lemon gelatin, 1 cup boiling water, ¼ cup mild flavored honey, 1 (11-oz.) can mandarin oranges, 1 (20-oz.) can pineapple chunks, 1 (3-oz.) jar maraschino cherries, ½ cup coarsely chopped pecans, 8-oz. dairy sour cream. Dissolve gelatin in boiling water. Drain fruits. Combine honey, fruits, nuts, and sour cream with gelatin. Pour into decorative mold and chill until set. Turn out on bed of lettuce to serve.

Questions and Answers

Q. I have searched for an answer to my question without much success. Could you please tell me where, in a swarm, the queen bee would be located? C.B. Maryland

A. I am not certain that anyone has investigated this, or, could answer your question with certainty. Quite likely she would be found within the cluster, in a protected place, although where in the cluster would be difficult to say.

★★★★★

Q. I operate my hives with two or three standard hive bodies and use 6⅝" supers for extracting. In late summer I realize I will be short of honey below the excluder but am unable to remove supers of honey above because it is uncapped. I, of course, can't mix different size frames for winter and feed sugar syrup in fall to build up winter feed. Do you have an answer to this problem? R.M. Minnesota

A. I assume you have only a limited, or no fall honey flow which means that you must manage your colonies so that the winter store of honey is placed in the food chamber(s) during the late summer. Since you choose not to feed sugar in the fall and cannot transfer full combs of honey to the food chamber you must be certain that the food chambers are filled from the summer honey flow to nearly capacity. Hatching brood in the upper brood bodies leaves empty comb space in summer. The method of management usually recommended under these circumstances is to confine the queen to the lower brood chamber at the beginning of the summer honey flow by a queen excluder. As soon as the brood hatches in the food chamber(s) above the lower body the combs will be filled with nectar and the honey capped. Due to the position of the food chamber above the brood nest, and underneath any supers added later, the food chamber will generally be filled and capped first, thus assuring a winter supply of honey.

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Q. I plan to trap some pollen this year. What should I do to insure that it will not spoil during storage? E.M. Georgia

A. It is very important to collect pollen from the traps at least every other day or every day if the weather is damp. Dry the pollen immediately. I find that fresh pollen will dry to the proper moisture content for storage if spread thinly on a paper in a warm, dry room. This takes from several days to a week. The pollen should be stirred continuously. For quicker drying the collected pollen may be placed in a dryer, such as an oven, but the temperature must be carefully controlled. Heating at 120 deg. F. (49 deg. C) for the first hour will retard fermentation but continue the drying at a reduced temperature (95-97 deg. F.) (35-36 deg. C.) for 24 hours. The dryer should be vented to allow moisture to escape. When sufficiently dry (10-12% moisture content) seal the pollen in airtight containers and store in cool place. Properly dried pollen pellets should not crush when pressed between the fingers and not adhere to each other when squeezed together. Air dried pollen will lose considerable nutritional value after two years of storage. Freezing pollen for 24 to 48 hours before storing at room temperature will destroy eggs and larvae of insects or mites. Fresh pollen placed in paper or plastic bags can be frozen and stored in a deep freezer. When used it is as nutritious as fresh pollen and can be kept for several years. When the pollen is removed from the deep freeze it must be used at once or dried. This information comes from the International Bee Research Assn. reprint M91 Feeding Honeybees Pollen and Pollen Substitutes (T.S.K. Johansson and M.P. Johansson, authors) available for $1.00 by writing to IBRA, Hill House, Chalfont St. Peter, Gerrards Cross, Bucks, England SL0 0NR.

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Q. I am planning on planting something close to my beehives that will make pollen and nectar. I want something that will not turn into a weed. Would rape (*Bassica napus*) be all right? Does this make good honey and where can I get the seed? M.F. Iowa

A. Rape is particularly adapted to cool northern climates. It may not be grown as a seed crop in Iowa but there is no reason why it cannot be grown for its nectar yield although its value may be limited unless grown to the extent of planting at least several acres. A small trial planting would serve as a test plot to judge its value as a honey plant in your state. Polish rape is the variety generally grown for rape seed. It is an annual and will produce seed the same year it is sown. The honey from rape is light in color and of good flavor. It does have a tendency to graulate rather quickly.

Rape seed may be obtained from the Earl May Seed and Nursery Company, Shenandoah, Iowa 51603. The cost is about $35.00 per hundred pounds. Other farm supply and seed stores may carry the seed.

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Q. I live on the southern edge of the Catskill Mountains in New York state. There are no commercial crops and no clover within three miles of my beehives. The area is mostly forest and brush. During July of 1979 my bees filled one super, which I immediately removed. I do not know what the bees foraged on. Three frames of this I crushed, strained and bottled. The honey was very thick, of light color and delicious. I stored it in the refrigerator until it granulated into very fine crystals within one and a half months. It was still delicious.

Three frames from the same super I stored in the refrigerator, in the combs, for three months. There were no unsealed foods in the refrigerator. When crushed and strained it also was very thick, light colored, however it has a grainy texture and taste to the extent it is not palatable. This honey strained out clear with no sign of wax particles in it. This honey took longer to crystallize (three months after bottling or five months after removing from the hive).

What would cause this honey to have this grainy texture and taste and is this a common condition? G. K. New York

A. First, we would advise against crushing combs of honey in order to extract the honey. Centrifugal extractors may appear to be a large investment to beekeepers with one or several colonies but the honey removed from the comb with extractors is of better quality since it does not become mixed with the crushed or melted wax comb. Perhaps cooperative use in an association or within a community can make an extractor available to a number of beekeepers. One possible objection to this may be the risk of spreading disease so a strict system of sanitiation must be practiced.

In regard to the differences in honey. If the comb was stored in the refrigerator at the normal household refrigerator temperatures, not in a deep freezer, there

may be the tendency for the honey to acquire undesirable tastes, most likely by absorption from the impurities in the wax comb or by chemical reaction between the honey and the wax comb impurities. The near zero temperature of the deep freezer is more likely to prevent this.

This is not a common condition although honeys sometimes acquire off flavors from the floral sources, not from storage. Granulation, an undersirable condition for some honey users, is brought on much more rapidly at the temperatures found in the household refrigerator. If you wish to preserve honey in the comb wrap it in moisture proof paper or place in plastic bags and store it in the freezer part of the refrigerator.

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Q. In none of the reference material I have do I find any mention of the mimosa tree as a nectar or pollen source. Is it, and to what extent? P.S. Texas

A. None of the literature we have on honey plants mentions this shrub/tree. Our latitude (northern Ohio) is usually too cold for this tree so I have no personal knowledge of this plant. Perhaps beekeepers in the South would be able to answer this question.

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Q. I am rather small and a full depth super is quite heavy for me when filled with honey. I have begun to use medium 6¾" supers over my full depth brood boxes. The question is would it work to use three medium depth boxes to replace the two deep brood boxes? In other words will the bees and queen be happy with medium depth brood boxes? Three mediums would seem to have a similar frame area as two full depth boxes. It would be nice to have all of my frames and boxes interchangeable and lighter at the same time. The only disadvantage I've noted would be looking for a queen on 30 frames instead of 20. J.K. Texas

A. I know what you mean about filled full depth supers and brood boxes being heavy. I am not as strong (or as young, I must admit) as I once was and your idea has merit. In fact I am now using this idea in my apiaries. Three 6¾" hive bodies give ample space for even the best queen and plenty of winter stores which we need in the colder regions. Shallow supers can be used above the 6¾" brood bodies if even less weight is desired for supering. Wide lumber is becoming more difficult to buy for making the full depth bodies so a lesser depth may eventually become more economical and common.

Honey Plants

By DEWEY M. CARON
Department of Entomology
University of Maryland

A Tale of Two Thistles

IN THE MIDEAST, a broad band of high limestone soil supports two excellent honey plants commonly called thistles. One desirable thistle, *Echium vulgare* abundantly yields a distinctive high quality light honey while the other thistle *Carduus nutans,* is a major economic weed on which many federal tax dollars have been spent on control. Suprisingly, the money has been well spent as the thistle biological control program has been moderately sucessful.

Blue Thistle or Vipers Bugloss

The beneficial thistle, commonly called blue thistle, vipers bugloss, bluedevil or blueweed thrives in weed-like abundance on thin soils with abundant limestone outcropping. This soil condition is found in the Shenandoah Valley of Northwestern Virginia and some neighboring parallel valleys of West Virginia and extends across the mid section of Maryland, arcs over the eastern third of Pennsylvania and terminates at the base of the Catskills in Northern New Jersey/extreme Southeastern New York. It also extends southward along the Virginia/West Virginia border into associated high limestone valleys of Kentucky and Tennessee.

Echium vulgare flowers are large and produce measurable amounts of nectar. Flowers usually last for 3 or 4 days. In early stages, the flower is male, producing a dark blue pollen; later the flower is female. The bloom is bright blue to violet-purple. Flowering extends from early June into the early fall but the flow is extensive only in the early part of the season.

In a study by Sarah Corbet in England, *E. vulgare* flowers were observed opening throughout the day; honeybees visited the flowers from 10 A.M.-5 P.M. on a day with low relative humidity. Sugar concentration was highest during this time span, and was closely correlated with

A typical overgrazed dairy pasture abundantly infested with musk thistle. The cattle refuse to eat the thistle and do not reach for edible plants growing near the thistle plants. (Photo by S.W.T. Batra, USDA).

temperature in the shade, half an hour earlier. Evidence suggests that nectar is secreted at 20-35% sugar; later changes in nectar concentration are probably due to equilibration with humidity of the air. Nectar volume per flower was 10-400 nl.

On a hot, humid, overcast day, nectar concentration remained low; honeybees visited the flowers from 8 A.M.-6 P.M. Honeybees were more numerous than on the dry day, possibly because the flowers contained a large volume of dilute nectar for the honeybees' short tongue to reach. Honeybees were also most numerous, in dry weather, on a patch of *Echium* with unusually short flowers. On this basis Corbet states that "the value of *Echium* as forage for honeybees in North America may depend on growth conditions that are poor enough to stunt the corollas".

Connoisseurs of honey taste, such as retired Maryland Apiary Inspector John V. Lindner, feel they can distinguish blue thistle honey from other light honeys. Several individuals actively seek beekeepers who produce blue thistle honey to obtain some of the product each season. The high limestone area represents our best beekeeping region and produces a consistent light honey yield.

The Thistle Pests

There are other thistles of the high limestone region but all are pest weeds. *Carduus nutans,* musk or nodding thistle, is the most common and serious pest. The pest thistles grow very well along roadsides, even outcompeting crown vetch planted for erosion control. They are also serious pests in the abundant but overgrazed dairy pastureland of the area.

Vipers bugloss or blue thistle (*Echium vulgare*).

Musk or hodding thistle (*Carduus nutans*) note the stone fence, built of limestone from an outcropping near Castalia, Ohio.

The musk thistle was accidentally introduced to the U.S. probably in dumped ships ballast. Although introduced to the high limestone area in the late 1800's it is not confined to this region. It is a pest, or rated as a potential pest, in 40 states and 12% of the counties in which it is found rate the musk thistle as an economic weed pest. Related plumeless thistles are reported in 19 states. Another relative, the Italian thistle is a widespread pest in California and yet another relative, the welted thistle, has established a serious infestation in Virginia. Musk thistles are also classified as pests in their native Europe and have been accidentally introduced and become a pest in Canada, New Zealand and Australia as well.

Serious biological control efforts on musk thistle began in 1961. A weevil that feeds on the thistle flower head, *Rhinocyllus conicus,* was first released in 1969 in Montana and Virginia. It has proven to be quite successful and has subsequently been released in an additional 18 states for thistle control. The weevil feeds on the flowering head and halts spread of the 1500 or more seeds disseminated by a mature flower.

Beekeepers are interested in the *Carduus* thistles and biological control programs of this pest because the thistle is a moderately good honey plant. The honey is light in color and has a nice flavor. The thistles bloom over the entire summer period and the dark blue-to-purple bloom of the large flower head is highly attractive to honey and bumblebees. The nectar is rich in sugar content and generally available throughout the day. Pollen is also collected from the flower.

Beekeepers have a large stake in continued success of the biological control program. The principle of biological control is that natural enemies keep a pest or potential pest population below an econmic injury level. Biological control agents do not eliminate but rather serve to reduce the pest species. If biological control efforts fail, then dairy farmers, state highway administrations and others will have to use herbicides to achieve thistle control. The herbicides will, of course, not only kill thistle but also other flowering plants that bees could use as forage. Successful biological control will leave a few thistles for our polylectic honeybee. The honeybee does not need thistle nectar but they help extend the nectar season. We need more such control strategies for beekeepers and our bees.

KentuckyBeekeepers Subject of Proposed Book

A BOOK which will be titled **Kentucky Beekeepers** is being prepared by author James Steed, Route #2, Box M22, Richmond, KY 40475. He needs all the information he can gather on the subject of the state's beekeepers. A questionaire will be mailed to anyone who is interested in contributing information to the book.

The Collector's Corner

by DARL and IVA STOLLER

WE RECENTLY spent two days at the American Beekeeping Federation meeting in Detroit. What a beautiful place, and it was good to see so many friends whom we have known for many years.

It seems to us that it would be a good idea for the local beekeepers who sponsor the National meeting, to have some sort of honey pot display. They would be close to home, and the danger of long traveling would be greatly lessened. We had displays of some of our honey pots at both the Orlando and the San Antonio meetings. We broke two of the honey pots on the plane going to Texas, and broke one, and one was picked off the table in Orlando. We then decided the best way to display them would be to put them under glass. We called the motel in Detroit before the meeting and found out they had no glass displays, so we decided not to take any of our collection. This would be something to think about as there are many who attend the National meetings, who look forward to seeing some of the many and varied honey pots and related items.

The picture was sent to us by our good friends, Ed and Shirley Fetch, of Dickinson, North Dakota. Shirley is making a nice collection of honey pots, and she describes the jars as follows: "I am sending you a picture of some beehive jars that I bought in an antique shop in Canada this summer. They are blue-green jars with a blue-green clear glass lid. The rim is much deeper than the old ones we are familiar with. This is a half gallon jar and a quart jar. I am interested in the pint jar, and would appreciate any information I can get on these jars."

If any of you have seen or know the age of the jars and where they were made write us or leave Ed and Shirley know in North Dakota.

We had the pleasure of talking to Eugene Killion from Illinois at the meeting, and he plans to send us a photo of some of his father's collection of honey pots. We were all saddened to hear of Carl's passing this spring and if his health would have permitted, Carl planned on sending us a story of his collection. Carl had put together one of the finest collections to be found, and he was one of the earliest collectors in this country. We eagerly look forward to Gene's article and pictures. Until next time, happy collecting.

PETITION TO CURB PESTICIDE USE SUGGESTED

MRS. ANN FORRESTER, president of the Franklin County Beekeepers Association of Massachusetts is leading a drive to circulate a petition to be directed to the Environmental Protection Agency. The petition forms are being sent to state and county beekeeping associations which she hopes to have signed by all concerned beekeepers.

"We are not trying to ban biocides" says Mrs. Forrester, "but simply trying to mobilize an existing public opinion to stop the worst abuses of the biocide industry, and to point out to **our** government that they should be protecting **our** interests, and not siding at every turn with big money and big business as it is obviously doing."

Copies of the forms for listing signatures may be secured from Mrs. Ann Forrester, RFD #2, 15 Athol Road, Athol, Mass. 01331.

The Wax Moth Scourge of the Hive

By HERBERT HARLEY SELWYN
Kirk's Ferry, Quebec

IN BEEKEEPING literature the wax moth seems to have received rather less attention than it richly deserves. Here is a small inconspicuous creature constantly present in the apiary and ever ready to take advantage when opportunity offers, of creating havoc, whether it be a failing colony or stored brood or extracting combs.

It is strange how the wax moth holds its own in spite of the vigilance of the bees and that of the beekeeper. It is doubltful if at any time can an apiary be freed of this cunning adversary, bent on the ultimate destruction of the colony. This, in a way, seems contrary to the preservation of a species, because, should it be a lone colony, the wax moth automatically destroys its wherewithal to survive.

The life of the wax moth is one of constant vigilance. The adult moth is evasive, extremely agile, nocturnal in its habits and rarely seen in daylight unless disturbed. On warm summer nights, if the beeman is keen of eye, he just might see this small dun-colored moth disappearing into the entrance of a colony. It is doubtful if the bees themselves recognize it as a potential source of danger. Only when the eggs, so skillfully laid in cracks and crevices deep within the hive, is there trouble in store.

As the moth larvae develop, feeding on miniscules of wax and pollen, they locate themselves just below the capping covering the brood cells, creating tunnels within which they can move quickly from point to point. This gives them great mobility in avoiding attempts on the part of the bees to come to grips with them and eject them from the hive.

It is thought that the Italian bee is more adept at repelling the intruder than the Black bee. That they are better housekeepers. In view of the fact that Italians are more gentle, less irritable than the Blacks, one might think the reverse to be true.

A distressing sight for a commercial beekeeper is to find a stock of thirty or forty stored, extracting supers infected with wax moth larvae. The speed with which these creatures work, and reproduce when conditions are favorable, are unbelievable unless one has had the experience. An individual stack of eight or ten supers may be so badly infested that they are practically glued together with the cocoons and webbing. If given sufficient time the larvae will cut channels or grooves on the inner side of the hive body and it actually takes a hive tool to dislodge them. They appear in serried ranks or rows in the nature of a herring bone.

If disturbed in the early stages of infestation before cocoons are formed and the supers are taken apart, these fatbodied, loathesome creatures, often approximating an inch in length, drop to the floor in hundreds, twisting and writhing their way in an attempt to hide.

A more satisfying angle to the constant war against the intruder is to pursue an individual larva along its tunnel below the capping until eventually it is forced, wildly wriggling, out into the open, there to be administered the coup de grace. An experienced beeman comes to recognize these tracings even when partially obscured by clinging bees and if consistently watched for can keep the larvae down to minimum.

It is however an unending struggle and no apiary can ever be considered completely free of infection. Stored brood or extracting combs may undoubtedly be kept free by the use of fumigants but the colony itself cannot be subjected to such treatment and the wax moth, alas, is assured of a safe abode to carry on its nefarious operations from year to year.

It is interesting to relate that in 1708, in a book entitled **A Treatise on the Management of Bees** by Thomas Wildman of London, England (dedicated to Her Majesty the Queen and subscribed to by a minority of the elite of the realm including Benjamin Franklin LLD, FRS) we find the following paragraph: "The bees being now delivered from their annual massacre by their most inhuman enemy man, I proceed to enumerate other enemies particularly the moth. My method of managing bees will be most effective preservative from this destroyer, who has baffled the ingenuity of ages, in their attempts to get rid of him . . ."

It is evident that the wax moth will be around for some time yet.

Editor's Foot Note.

It might be of interest to readers to know that the author has kept bees continuously for sixty years, having taken over his fathers's equipment in 1908 and first subscribed to **Gleanings** that year while living in Montreal. At that time A. I. Root was contributing a column from Sarasota, Florida not far from where Mr. and Mrs. Selwyn now spend their winter months.

Price Increase On Pollination Book

AN ANNOUNCEMENT has been received from Dr. L. N. Standifer, Center Director at the U.S. Department of Agriculture's (recently named) Carl Hayden Bee Research Center, 2000 East Allen Road, Tucson, Arizona 85719, that there has recently been an increase in the price of S. E. McGregor's pollination book.

The exact title, new price and source of this excellent 411-page paperback book is as follows:

Insect Pollination of Cultivated Crop Plants
by
S. E. McGregor
U.S. Dept. of Agriculture,
Agr. Handbook 496
Superintendent of Documents
U.S.Government Printing Office
Washington, D.C. 20402
(New price $7.00)

S. E. McGregor's book has received high praise from all over the world, from apiculturists, horticulturists, agronomists and others, on this book. Dr. Standifer says, "that even at this new price, the book is a bargain and should be in the hands of anyone interested in crop pollination".

Don't Blame the Bees

By JOE TRAYNOR
Bakersfield, CA

There are many inputs in the fruit setting process — bees are only one

IT HAS happened to any beekeeper that has been involved in orchard pollination long enough; the bees were in top shape, the bloom was good and the weather ideal, yet the fruit crop fell well below expectations. It is difficult to isolate the causes of such poor crops and often the bees are saddled with the blame solely for lack of any other explanation.

The pollination-fertilization-fruit setting process is not complex but it does require a rather lengthy chain of coordinated events. The bee's job, the transfer of pollen to the stigma, is but a small part of the fruit setting sequence. The entire sequence is described below.

The Summer of the Previous Year

The fruit setting process in a given year actually starts during the summer of the previous year when the fruit buds are first formed. The number of fruit buds set and the number of resultant flowers formed is not constant from one year to the next but can vary greatly. The major factor affecting the amount of fruit buds set is the size of the fruit crop during the season when fruit buds are setting. A light crop will result in a heavy set of fruit buds; a heavy crop often gives a light fruit bud set — probably due to competition for nutrients and growth regulators. Extremely high temperatures during the fruit bud setting period can cause abnormalities the following year such as doubles in cherries (2 seeded cherries). Most growers are aware of the previous summer's effect on fruit set the following year — some of the other stages in the fruit setting process are more subtle.

Late Summer and Fall.

After the fruit buds are formed, conditions during the late summer and fall can affect the quality of flowers that are produced the following spring. A study on apples showed that late summer or early fall fertilization with nitrogen gave flowers that were measurably stronger — the flowers had larger ovules and were receptive to pollination for a longer period of time[1]. A study on prunes showed that a fall spray of boron gave a significant increase in fruit set the following year even though trees were not deficient in boron; a spring boron spray during bloom had no effect on fruit set[3].

Inadequate soil moisture during late summer and early fall can adversely affect the following year's crop as can premature defoliation due to insect attack or water stress.

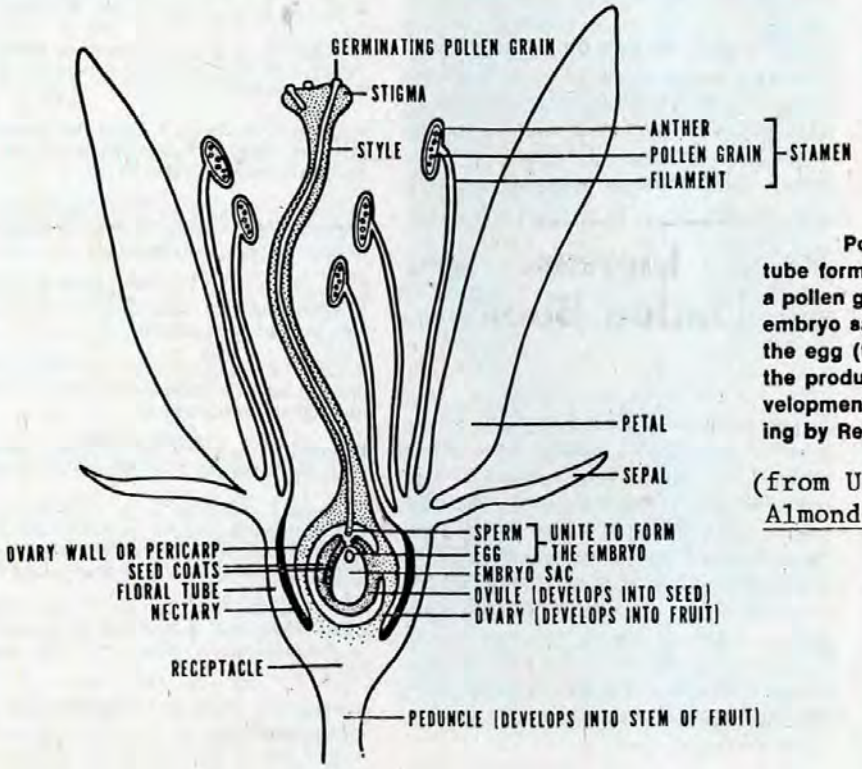
All of these studies point to the fact that the quality or strength of the flower is determined in the late summer or fall. There are undoubtedly strong (easy to set) flowers and weak (difficult to set) flowers. By the time winter starts the strength of flowers is largely determined.

Winter

Extremely cold winter temperatures can kill flower buds, and in California and other areas with mild winters, an unusually warm winter can cause flowers buds to drop prematurely in the spring. Dormant oil sprays applied too early (before wood has hardened off) or extremely caustic sprays can damage fruit buds. Most growers are aware of these winter effects on fruit buds.

The Bloom Period.

As indicated previously, once the bees have transferred compatible pollen to the stigma, their job is finished — pollination has been accomplished. The actual fruit setting process however is just approaching the embryo stage.



Pollination has occurred. The pollen tube formed by subsequent germination of a pollen grain carries the two sperms to the embryo sac where one of them unites with the egg (fertilization). This union results in the production of a seed (embryo) and development of the ovary into a fruit. (Drawing by Reid M. Brooks.)

(from U.C. publication #4092, Almond Orchard Management)

Once pollen has been deposited on the stigma, one or more pollen grains must germinate, sending out a pollen tube that travels down the length of the style so that the pollen tube nucleus can fertilize the egg (see diagram). This journey is not a quick one but can take from 1 to over 6 days; different fruit species and varieties within a species show different pollen tube growth rates. The rate of pollen tube growth is less under cool temperatures. In Italian prunes it took pollen tubes over 13 days to travel down the style during a cool spring[10].

While the pollen tube is making it's leisurely way down the style, the receptivity of the ovule to pollen is declining, a process that starts on the day a flower opens; ovule receptivity can vary from 2 to over 10 days depending on variety, strength of flower and temperature — the period of stigma receptivity is somewhat shorter. Here then, is a potential crisis in the fruit setting process: unless conditions are optimum for pollen tube growth, the ovule may have already deteriorated by the time the pollen tube reaches it. The race between pollen tube growth and ovule deterioration is a crucial one for some varieties and the outcome of the race a major determinant of fruit set.

The warmer the temperature, the faster pollen tubes will grow, however ovule deterioration is more rapid as the temperature increases (temperatures below freezing can kill ovules but not pollen). Nature has compensated for this apparent Catch-22 situation by insulating the ovules from temperature extremes and at the same time positioning the stigmas and styles in such a way that pollen tubes receive maximum heat from the sun. The petals that surround the style reflect additional sunlight on the style. These petals are white on spring blooming fruit species (apple, cherry, pear, plum) and thus better reflectors of sunlight.

Plants can absorb considerable heat during cool but sunny spring days Norman Ross, a California farm advisor, came up with the novel idea that the unprotected limbs of deciduous fruit trees were more susceptible to sunburn in the late winter than in the summer. Ross recorded under-bark temperatures of 112° F. on exposed limbs on a sunny day in February when the air temperature was 76° F.[1]. It is not unreasonable to assume that style temperatures on a cool sunny spring day would be considerably warmer than ovule temperatures. Fruit set can be better when the bloom period is characterized by cool sunny days (rapid pollen tube growth; slow ovule deterioration) as opposed to warm cloudy days (slower pollen tube growth; rapid ovule deterioration) or warm sunny days (rapid pollen tube growth; rapid ovule deterioration).

Also affecting the speed of pollen tube growth is the variety of crossing pollen. The pollen of some varieties grows more rapidly than others on the stigma of a given variety[9]. Self pollinated flowers are characterized by pollen tubes that grow part way down the style then stop; under ideal conditions it is possible that self pollination could occur on some varieties. There is also the stimulative effect of pollen itself with pollen growing faster when many grains of pollen are present[7]. Fungicides can kill pollen[4], however most growers are aware that the pollination-fertilization process is a biological one and avoid applying fungicides during peak bloom.

Post-bloom Period.

Environmental conditions during the week to 10 day period immediately after bloom can affect fruit set. A detailed study on apples showed a correlation between post-bloom weather and fruit set, with sunlight during the post-bloom period having a significant beneficial effect on set[3]. The positive effect of post-bloom sunlight on fruit set shouldn't be surprising when it is considered that the large number of small developing fruits obtain their nourishment from the carbohydrates produced by leaves during photosynthesis, a sunlight-dependent mechanism.

The apparent importance of sunlight in the fruit setting process shouldn't be surprising when it is considered that the plant kingdom as we know it would not exist without sunlight. What is surprising is the dearth of information on sunlight-fruit set relationships. In another context, E. B. White states: "A cat sunning himself in the doorway of a barn knows all about solar energy. Why can't man learn?" Were White a student of orchard pollination he might add, "why can't researchers learn of solar energy-fruit set relationships?"

Some old time growers believe that when the leaves come out too early in relation to the flowers (usually after a cold winter) the fruit set will be light. If true, this could be due to competition between leaves and embryos for nutrients. A key nutrient here might be calcium since competition between vegetative and reproductive growth for calcium has been shown to cause fruit disorders[8]; calcium is also essential for pollen tube germination[2]. There is a paucity of information on the effects of calcium sprays during or shortly after the bloom period.

June Drop

Many orchards experience a drop of large sized fruit in May or June that has been labeled "June drop." June drop varies from year to year and is believed to be caused by fruit competition for nutrients or hormones. Most growers are familiar with this drop and do not blame the bees for it. Hormone sprays have reduced June drop on prunes[6]. Once the June drop period has passed, the fruit that remains on the trees represents the fruit that should be harvested.

Summary

As can be seen, there are many other inputs besides bees that contribute to a good set of fruit and the beekeeper shouldn't hesitate to point them out to a grower that looks askance at the bees when his crop comes up short. Things, however, tend to balance out in life and there will be some years when the situation is reversed: The bees are not as strong as they could have been, pollination weather and bee activity are poor, yet a bumper crop results. What has happened, of course, is that most or all of the inputs **except** bee activity are near optimum. The beekeeper may well be the recipient of effusive praise for the terrific job his bees did under tough conditions. When this happens, it is probably best to remain silent.

References

1. Anonymous. 1971. Naked trees are vulnerable to wintertime sunburn. Country Life section of Modesto (Ca.) Bee. Feb 7, 1971.

2. Brewbaker, James L. and B. H. Kwack. 1963. The essential role of calcium ion in pollen germination and pollen tube growth. **Amer. J. Bot.** 59:859-865.

3. Callan, N. et al. 1978. Fruit set of Italian prune following fall foliar and spring boron sprays. **J. Amer. Soc. Hort. Sci.** 103(2): 253-257.

4. Eaton, G. W. and L. I. Chen. 1969. The effect of captan on strawberry pollen germination. **J. Amer, Soc. Hort. Sci.** 94:558-560.

5. Gardner, V. R. et al. 1949. Fruit setting in the Delicious apple. Michigan State College special bulletin 358, June 1949, 44 pp.

6. Kochan, W. J. et al. 1962 Control of fruit dropping in Italian prunes by foliar spray of 2,4,5-TP. Idaho Agr. Exp. Sta. Bulletin 378.

7. Lapins, K. O. and H. Arndt. 1974. Main causes of low fruit set in Delicious apples in 1974. **British Columbia Orchardist** 14(10): 8-9.

8. Shear, C. B. 1975. Calcium-related disorders of fruits and vegetables. **Hort. Science** 10: 361-365.

9. Socias i Company, R. et al. 1976. Effects of temperature and genotype on pollen tube growth in some self-incompatible and self-compatible almond cultivars. **J. Amer. Soc. Hort. Sci.** 101(5): 490-493.

10. Thompson, M. M. and L. J. Liu. 1973. Temperature, fruit set, and embryo sac development in Italian prune. **J. Amer. Soc. Hort Sci.** 98(2): 193-197.

11. Williams, R. R. 1965. The effect of summer nitrogen applications on the quality of apple blossom. **J. Hort. Sci.** 40: 31-41.

NEWS and EVENTS

Marlene Ruth King

MICHIGAN
Michigan Beekeepers' Association

Marlene Ruth King, 3506 Hartman Road, Sodus, was named the Michigan Honey Queen during competitions held March 21 at Michigan State University's Farmers' Week. Sponsored by Michigan Beekeepers' Association, the selection was made during the association's annual two-day state meeting. A sophomore at Central Michigan University, King will travel throughout the state during the coming year to help promote Michigan-produced honey. She is the daughter of John and Louise King.

NEW YORK
Beekeeping Course

(BIO 435.41) This course offers people an opportunity for a better understanding of the biology of insects and plants with which they are identified; and insights into aspects of maintaining honeybee hives as a practical venture.

The importance of bees in pollination of agricultural crops is examined, along with the effects of pesticides. Bee behavior will be examined in the context of the social order maintained in the hive and nectar and pollen collecting in the field. Honey and wax production will also be covered along with such other areas as the African bee, bee stings, bees in history, bee laws, honey nutrition and world statistics on honey production.

The course will meet in the College's bee laboratory after an initial meeting in Hartwell Hall. For the convenience of students, the class meetings will be held on three successive weekends in August:

	Saturday	Sunday
August 2-3	**8 to 4**	**Noon to 4**
August 9-10	**8 to 4**	**Noon to 4**
August 16-17	**8 to 4**	**Noon to 4**

(For additional information about this course, contact Dr. Edward Southwick, Department of Biological Sciences, Lathrop Hall, Suny College, Brockport, New York, 14420. (716) 395-2393.

Kelli Clark

CALIFORNIA
1980 Honey Queen

The 1980 California Honey Queen is Ms. Kelli Clark of Garden Grove, California. The 19-year-old daughter of Mr. & Mrs. Leroy H. Clark, and former Orange County Honey Queen, is a 1979 graduate of Garden Grove High School. She presently works at the Farmers and Merchants Bank of Garden Grove and is a student at Golden West College where she is studying for a degree in accounting. After graduation, Kelli hopes to find a job in the beekeeping or honey industries. In addition to promoting honey and beekeeping, Kelli enjoys snow and water skiing, horseback riding, motorcycles and football.

GEORGIA
Beekeeping Short Course

The annual beekeepers short course for beginners and more experienced beekeepers will be held on June 7, 1980, at the Universtiy of Georgia in Athens Georgia.

Topics and demonstrations will include honeybee biology and behavior, bee diseases, management for honey production, honey house operation, queen rearing and package bee installation.

The teaching staff will consist of several specialists including commercial honey and queen and package bee producers. The course fee if $20.00 per person. Advanced registration is requested by June 5, 1980.

Requests for additional information, program and registration forms should be addressed to Dr. Alfred Dietz, Department of Entomology, University of Georgia, Athens, Georgia, 30602.

CALIFORNIA
San Francisco Beekeepers Association

Hobby beekeepers of the Greater San Francisco Bay area are invited to join the San Francisco Beekeepers' Association at their annual picnic which will be held on June 1, the first Sunday in June, at the Sigmund Stern Groves, Sloat Blvd. at

19th Avenue, San Francisco. People who want to take part in the potluck luncheon which will take place at 12:30 p.m., should call 415-861-5636 for advice. Others can bring a picnic lunch for themselves and obtain coffee, tea, or lemonade for a small donation.

There will be speakers and exhibits of hobbyist-made beekeeping gadgets and inventions. Anyone wishing to participate in the exhibits should call the above number or write to L. Bravo, 47 Levant St., S.F. 94114. Advance notice is desirable but not absolutely required. We'll be happy to see any and all hobbyists and to see and hear from them whatever they have to contribute to our great avocation!

MICHIGAN
Michigan Beekeeper of the Year

Dan Guthrie (right), 46100 Ryan Road, Utica, was named Michigan Beekeeper of the Year, during special ceremonies that were part of the Michigan State University's Farmers' Week, March 17-22. The presentation was made March 21, by the Michigan Beekeepers' Association (MBA). Shown with Guthrie is Richard Hubbard, MBA member. Guthrie was cited for his contributions to MBA for the past 10 years and for his efforts in attracting the American Beekeeping Federation convention to Dearborn in January.

NEW YORK
Beekeeping Short Course

Cornell University, Ithaca, NY 14853
July 18-20, 1980
($10 Advance Registration Required — not refundable)

Friday evening, July 18
5:00-8:00 p.m. Registration
7:30 p.m. Movies on bees

Saturday, July 19
8:00 a.m. Registration
8:30 Honey and Honey Products
9:30 How to Start in Beekeeping
10:30 Seasonal Management

1:00 p.m. Bee Diseases and Pesticides
2:00 Rearing Queens
3:00 Producing Comb Honey
4:00 Honey Plants
6:30 Banquet (with speaker)

Sunday, July 20
9:00-10:00 a.m. Lecture: Beekeeping Equipment
10:00-12:00 Workshops
1:00-3:30 p.m. Open house and demonstrations — Dyce Laboratory

Instructors include Professor Roger A. Morse, Cornell Lecturer Jon C. Glase, New York State Chief Apiary Inspector Gerald Stevens, retired Extension Specialist in Apiculture at Pennsylvania State College, Professor W. W. Clarke, Author and Lecturer Bess Clarke, Author and Lecturer Dr. Grant D. Morse, Commercial Beekeeper Jonathan P. Ryan, and graduate students Richard Nowogrodzki, Kirk Visscher, Ken Ross and Gene Robinson.

Dan Guthrie (R) receives award from Richard Hubbard (L).

Participants will stay in student dormitories and eat in the University dining room. Lecture and demonstration rooms are air conditioned; the dormitory dining room and lecture hall are within a few hundred feet of each other. Enrollment will be limited. The total cost is $80 per person. This includes a single room for two nights, three meals on Saturday and two on Sunday, all instruction materials and the advance registration fee. Double rooms are $5.00 less per person (total $75). Full linen service is provided. Registration forms may be obtained from: Office of Apiculture, Department of Entomology, Comstock Hall, Cornell University, Ithaca, New York 14853.

Special Note:

A certificate of attendance is given to each participant. These will be available at Dyce Laboratory on Sunday afternoon only; certificates cannot be mailed.

During the open house at Dyce Laboratory, Sunday afternoon, with weather permitting, Professor Clarke and Mr. Stevens will demonstrate how to examine and inspect colonies in the nearby apiary. At the same time, graduate students will take groups of four to six people, who have never handled bees before, to remote bee yards where they may learn how to open and manipulate a colony. The colonies will be small units set off by themselves so as to reduce the chances of people being stung. Each person will be coached in how to open a hive, remove frames and make a routine examination. We will have veils, smokers, and hive tools available. We discourage the use of gloves; however, persons who feel they cannot make a colony examination without them may wear their own gloves.

The sessions with small groups will be repeated about every hour so that everyone should have an opportunity to examine a colony and to observe Professor Clarke and Mr. Stevens doing so. The Dyce Laboratory will be open all afternoon so that everyone should have ample time to participate in all the activities.

Participants are invited to bring samples of their honey for examination and comment on Sunday morning. A beekeeping equipment supply dealer will have his wares available at Dyce Laboratory on Sunday afternoon.

PENNSYLVANIA
Eastern Pennsylvania Beekeepers

Dr. Elton Herbert, a honeybee research specialist with the United States Department of Agriculture working at the Beltsville Maryland Bioenvironmental Bee Laboratory, will be the featured speaker at the June meeting of the Eastern Pennsylvania Beekeepers. Dr. Herbert's talk will deal with research he has been doing regarding honeybee nutrition.

The meeting is being sponsored by the Bucks County and Montgomery Beekeepers' Associations in cooperation with Delaware Valley College. The program will be held on Saturday, June 14, 1980 in the Mandell Hall Auditiorum on the Delaware Valley College campus located about one mile west of Doylestown, PA on Route 202. Dr. Herbert's talk will begin at 1:30 and it will be preceded by a bring-your-own lunch on the Delaware Valley College campus starting at 12 noon.

Over 100 people attended the Delaware Valley College, spring beekeeping short course.

The following Friday, June 20 through Sunday, June 22 will be the Delaware Valley College summer three-day beekeeping short course. Further information pertaining to the meeting and/or the short course can be obtained by writing Dr. Berthold, c/o Delaware Valley College, Doylestown, PA 18901 or by calling him at 215-345-1500.

Obituaries

W.A. Stephen

W. A. STEPHEN

THE BEEKEEPING community was shocked to hear of the unexpected death of W. A. Stephen on April 2nd, 1980 at his home in Worthington, Ohio. He was buried on April 5th from the United Methodist Church in Worthington, Ohio.

W. A. Stephen was a fellow of the American Academy for the Advancement of Science, Sigma Xi Honorary Fraternity and other professional organizations. He was a veteran of World War II, serving in the Royal Canadian Air Force. Stephen was a graduate of the University of Guelph with a degree in Agricultural Engineering and of the University of Toronto. He did graduate work at the University of Berlin and University of Wisconsin.

William (Steve) Stephen is survived by his wife Beth; a son and a daughter-in-law, Bruce and Ellen Stephen of Greenville, N.C.; grandchildren; a brother James Stephen of Toronto and a sister, Helen Dodds of Holstein, Canada.

Most readers of **Gleanings** will remember "Steve" as the author of the column "Fundamentals" which has run in **Gleanings In Bee Culture** for a number of years. Mr. Stephen served as extension specialist in apiculture in North Carolina from 1947 to 1963, before coming to The Ohio University in the same capacity in 1963. He was at Ohio State until 1972 from where he retired as Professor Emeritus. In 1972 he worked on a Church World Wide Service Project in Sparta, Greece and at the American Farm School at Thessaloniki, Greece in 1973.

"Steve" will be greatly missed. His column in **Gleanings** was one of the most popular. He was a master beekeeper and his knowledge of the science of apiculture was extensive yet he never lost his ability to communicate with those who wished to learn more of the practice of beekeeping.

(Continued on page 288)

OBITUARIES

(Continued from page 287)

WINSTON E. DUNHAM

THE STATE OF OHIO saw the loss of one of its better known beekeepers on March 31st, 1980. Dr. Winston E. Dunham, retired professsor of Apiculture and extension entomologist at The Ohio State University died in Madison County Hospital at the age of 77. He was the extension entomologist for a number of years until his retirement in 1963. After leaving his post at The Ohio State University he founded Deer Creek Honey Farm, near London, Ohio, operating apiaries in west central Ohio and an extensive honey packing business selling honey under the Deer Creek Honey Farms label. Deer Creek Honey Farms are now under the management of a son, Norman Dunham.

Winston E. Dunham

Dr. Dunham was preceded in death by his wife Cora. He is survived by his son and daughter-in-law Norman E. and Joann Dunham of London, Ohio; a brother, Wesley Dunham of Mendham, N.J.; a sister, Anna Blossom of Bethel, VT; two grandsons, Mark Christopher and Lee Dunham of London, Ohio

Dr. Dunham published research papers on a number of research projects conducted at The Ohio State University during his years as professor of apiculture at the college. Pollination studies on the clovers by honeybees led to much new information which was gained by conducting field studies of seed production at the university farms.

CANADA TOPS WORLD HONEY PRODUCTION

(Continued from page 269)

fruit as well as the nectar for many of his bees. The two lines, blueberries and bees, are complementary, he says.

"By and large, they fit in very well. Like right now, there's nothing I can do for the bees."

He is reticent about his achievements, but others within the industry hail him as an important influence on beekeeping practices in Nova Scotia and the rest of Canada. A member of the Canadian Association of Professional Apiculturists, he remains active in beekeeper organizational activities.

FUNDAMENTALS FOR ALL

(Continued from page 276)

on our bus saw a couple of bee yards, but I could not help but sense the disappointment voiced by an Australian beekeeper because we could not see into the brood chambers.

There is an island, which could have been visited in a day, which held much of interest for beekeepers. The island of Evia is covered with fir trees which have a scale insect which secretes honeydew. Thousands of colonies of honeybees are moved to the island when the flow of honeydew is at its peak and these colonies were there in September. What a memory for a beekeeper to carry away from Greece — thousand of colonies set down in every open space along the roads where buses could travel. It seems impossible to over-colonize the island!

The lessons we must learn in order to make our beekeepers' meetings the best possible: Include local talent; provide time for questions from the floor; include tours to bee yards, if the season is suitable; and give the best beekeepers a chance to evaluate colonies and techniques. These points are most likely to be followed if there is a practical beekeeper included in the planning committee.

I have said nothing about planning special events for the ladies, nor the arrangements for the meeting place, etc., These are very important and must be included and carefully worked out. But when the overall plans are being made, you mustn't forget the beekeepers who want to see bees, and extracting plants, and the techniques used by fellow beekeepers. This applies to beekeeping meetings — international, national, state, and local.

(Editor's Note — Due to the recent death of Mr. Stephen this will be the last "Fundamentals for All". Please refer to the obituaries column for information concerning Mr. Stephen.)

GROUP HOSPITAL INSURANCE FOR GLEANINGS SUBSCRIBERS

(Continued from page 260)

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Literature describing "BEELINE," including an enrollment form, has been mailed to every **Gleanings** subscriber. Look for the announcement kit (see picture, inset) in your mail during the month of May.

The charter enrollment period for "BEELINE" will be held during May and the first half of June. All enrollment cards should be in the mail no later than midnight, Sunday, June 15, 1980.

For further information concerning the "BEELINE" program, contact the plan administrator, Group Benefits Corporation, 1 Gibraltar Plaza, Horsham, Pennsylvania 19044. The administratior will also accept collect calls at (215) 441-5400.

Honey Estimates Cancelled

ACCORDING TO THE last report received the 1979 preliminary 1977-1978 revised honey report will be discontinued by the U.S.D.A.

Frank Robinson, Secretary of the American Beekeeping Federation suggests writing or talking to the representatives to Congress from each beekeepers' district regarding the reinstatement of this summary report.

MONTHLY HONEY REPORT

(Continued from page 246)

Above bee populations reported from Colorado at the end of March. Moisture is needed in Montana for spring flowering plants and for clover and alfalfa. Moisture is adequate in southern Idaho but short in the northern part of the state. Sugar is higher priced for bee feed. Honey sales are good. Increased container costs may force an increase in the retail price of honey.

Region 9

Honey sales slow at wholesale and retail. Honey handlers are faced with a serious cost-price squeeze as interest rates climb. Buyers are very cautious. Colonies in good condition generally in the Northwest and in California. Orange bloom began about three weeks ahead of last year. Prospects appear to be good for a honey crop in Oregon, other states have favorable conditions as well.

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10% Books order. Balance two weeks before shipping date. Write or call for prices and dates on truck load lots.

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1 - 25	$5.00
25 - 100	4.75
100 - up	4.50

After May 20th 1-25 $3.50 25-up $3.00

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THREE BANDED ITALIANS
Try them you Can't buy better Bees or Queens
Prices start May 20th 1980
This price includes Postage and Insurance.

2 lbs.	w/q	1-9	$15.75	10-24	$15.25	25-99	$15.00	100-up $14.75
3 lbs.	w/q	1-9	19.25	10-24	19.00	25-99	18.75	100-up 18.50
Queens		1-9	3.50	10-24	3.25	25-99	3.00	100-up 2.75

Fumidil-B fed to all package colonies and Queen nuclei.
Write or call for truck prices. Queens over 100 write or call for prices.

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Italians — Caucasians
March 15 — May 1

- *All colonies and nucs fed Fumidil-B
- *Double grafted cells
- *25 queens minimum per shipment
- *Shipped air mail insured
- *$6.25 each Tested queens add 75¢
- *Clipped & Marked free upon request
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Phone: 904-429-3996

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ITALIANS IN LOTS OF	QUEENS	PARCEL POST PACKAGE BEES & QUEEN 2-POUND & QUEEN	3-POUND & QUEEN	4-POUND & QUEEN	5-POUND & QUEEN	STARLINES
1	$6.20	$25.75	$31.50	$37.00	$42.75	
2-24	$6.20	$23.75	$29.25	$35.00	$40.75	
25-99	$5.65	$22.50	$28.25	$34.00	$39.75	

WRITE FOR PRICES ON 100 AND UP

PRICES INCLUDE POSTAGE, SPECIAL HANDLING, AND INSURANCE FEE.
STARLINES ARE 75¢ EXTRA FUMIDIL—B FED TO ALL COLONIES.

Tested Queens are NOT available until after May 20, and are $1.00 extra.
Marking and/or clipping of queens is 50¢ extra per queen.

PACKAGES AND QUEENS TO BE PICKED UP AT OUR APIARY

IN LOTS OF	QUEENS	2-POUND & QUEEN	3-POUND & QUEEN	4-POUND & QUEEN	5-POUND & QUEEN
1-24	$6.20	$19.50	$25.50	31.50	$35.00
25-99	$5.65	$18.75	$24.50	$30.50	34.75
100 & up	$5.15	$18.00	$23.50	$29.25	$33.50

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Frugal Productive
Disease Resistant
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Clip or Mark 25¢
LIVE DELIVERY GUARANTEED TO U. S. AND CANADA.

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Queens
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2-lb. Package with queen
1-4 . . . $20.00 ea. pp 5-up . . . $19.00 ea. pp
3-lb. Package with queen
1-4 . . . $25.00 ea. pp 5-up . . . $24.00 ea. pp
Queen prices include: AIRMAIL postage, special handling, insurance. Packages are shipped postpaid, special handling and insurance.
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Queen cells . . . $1.25
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CRAIN APIARIES
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LOS MOLINOS. CA 96055
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1-24 $6.25 25-99 $5.60 100-up $5.10

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8 ITALIANS
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3-lb. pkg.	w/q	23.20	22.80	22.40	22.00
5-lb. pkg.	w/q	35.35	34.60	34.10	33.60
Queens		6.10	5.90	5.75	5.60

STARLINE OR MIDNITE

		1-3	4-25	26-99	100-up
2-lb. pkg.	w/q	$18.75	$18.35	$17.95	$17.60
3-lb pkg.	w/q	23.60	23.20	22.80	22.40
5-lb. pkg.	w/q	35.75	35.00	34.50	34.00
Queens		6.50	6.30	6.15	6.00

Prices F.O.B. Jesup

Queenless packages — deduct $3.00 per pkg.

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Clipped and Marked 50¢ each.

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WRITE FOR FREE COPY OF SHIPPING RATES AND INFORMATION

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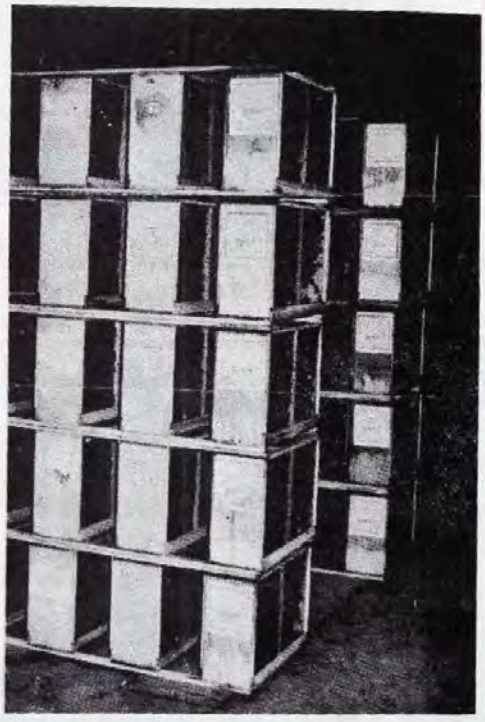

APRIL 1980

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY 1980

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	0	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE 1980

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

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FOR SALE: 33 frame radial extractor stainless steel, excellent condition, 1" bronze gear honey pump with pulley. Jonas J. Plank, Route 1, Box 179, Arthur, IL 61911.

FOR SALE: All or Part — 750 boxes, 8 frame super, 7" deep with top and bottom, comb and 6 oz. feed can for each of the 4 compartments. @ $21.50 each = $16,125.00. Nucs for Sale. 8 frame super; 7" deep, combs 11½" long — hang side to side (a) 135 live colonies to make up nucs $5,700.00, (b) 125 supers of comb @ 11 frames each $1,500.00, (c) 515 2-way Queen nucs with cans, division, top and bottom $3,500.00 = $10,700.00. Both total $26,825.00. 1000 8 frame supers; 7" deep with 8, 6¾" drawn comb each at $10.00 each. S & H Queens, 2179 Franklin Road, Yuba City, Calif. 95991, (916) 671-9330 or (916) 673-8125.

BEES & QUEENS FOR SALE

WE USE ALL POSSIBLE CARE in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

NUCS and PACKAGES — Deposit w/order $24 to $44 F.O.B. "Bees" Fayette, MS 39069. Delivery available.

NORTHERN CALIFORNIA Italian Queens, shipped airmail, postpaid and insured. April 1st to May 15th. 1-25 $5.00; 26-99 $4.75; 100 or more $4.50. After May 15th, 1-25 $4.50; 26-99 $4.25; 100 or more $4.00. Live delivery guaranteed. Ken Bachman (Bachman Apiaries), 1801 Calin Lane, Anderson, Calif. 96007. Phone: 916-365-4029.

ITALIAN QUEENS and package bees. Shipment begins April 1st. QUEENS 1-5, $6.00; 6-24 $5.50; 25-99, $5.25; 100-499, $5.00; 500 or more $4.50. 20% discount on queens after May 15th. 2-lb. package w/q $15.00 plus package. RICKARD APIARIES, Rt. 1, Box 2241, ANDERSON, CA 96007 PHONE: (916) 365-5551 or (916) 365-6556.

FIVE HUNDRED 5-FRAME NUCS W/QUEEN $16.95 IN YOUR HIVES. FRAMES EXCHANGED 500 QUEENS, $3.75 EACH. HUBBARD APIARIES, BELLEVIEW, FLORIDA, PHONE: (904) 245-2461.

ONE STORY hives of bees $60, 3-frame nucs $30, queens $6.50. Available June 1st. Quantity discounts. Norman Sharp, Fishers, NY 14453, Phone 716-924-2747.

NUCS AND PACKAGES — 15% deposit w/order. $24.00 to $44.00. No collect calls! 5 to 20% discount on orders over 50 units. F.O.B. "Bees" Fayette, MS 39069. Phone: (608) 271-7972, 2-8 p.m. Delivery Available.

Louisiana Italian Queens, $5.40; Ten or more, $5.00. **Hastings Carniolans,** $6.00 any quantity. Clipping and marking on request. Mornhiveg Apiaries, 1223 Convention, Baton Rouge, La. 70802. 504-344-4941.

ITALIAN QUEENS $5.25, West Georgia Bee Farms, P.O. Box 691, Carrollton, Georgia 30117, Phone: 404-832-7302.

ITALIAN PACKAGE BEES AND QUEENS, nuclei to be picked up here. Bring your cages & save. G. C. Walker, Rogers, TX 76569, phone 817-983-3468.

FIVE FRAME NUCS. April-May Pickup in Belmont, N.Y. Placed in your equipment. $35.00 — $5.00 deposit per nuc when ordered. DICK'S Bees, Upper South Street, Belmont, N.Y. 14814 — 716-268-7684

CLOSING BUSINESS — 25-30 Triple hives. Treated, painted, 1-3 years old deep 10 frames with bees. New frames, foundation and miscellaneous available. Earl Firmin 4725 Newlands Street, Metairie, Louisiana 70002, 504-885-1853.

TOP QUALITY ITALIAN QUEENS. Bred from hardy overwintered northern queen mothers. Produced in South for early availability. Vautin Apiaries, Rt 1, Box 80, Jasper, GA 30143, Telephone 404-692-6192. 1-24 $6.00 — 25-up $5.25. (reduction after June 1st) Member ABBA.

FIFTY — Story and a half colonies bees. 79 Italian queens, 79 average 142 lb. surplus. Myrton E. Gray, Saegertown, PA 16433.

SIXTY two story colonies, extractor, packing tank, many supers, wax and extras. For price and inventory: Prairie Blossom Honey, P.O. Box 27, Glendo, WY 82213, phone 307-735-4553.

QUALITY Italian Queens. April 1 — June. 1-25, $5.50, over 25, $5.00. $3.75 after May 15. Thousand Blossoms Honey Works, 215 Cherry St. Lodi, CA 95240, Ph. No. (209) 368-9876.

PENNSYLVANIA DOUBLE-GRAFTED QUEENS. Northern hardy stock. Mating nucs fed Fumidil-B. Book now with payment. Live delivery guaranteed! 1-5 $6.75; 6-up $6.00. Marking 50¢. James Mentzer, 717-354-8042, RD 2, New Holland, PA 17557.

THIRTY — 2 story colonies of Midnites, and equipment to establish 70 plus colonies, 147 drawn shallow supers, 48 section supers, and much more. One sale preferable — price negotiable. Details, complete inventory: (203) 259-9878 After 6:00 P.M.

ITALIAN QUEENS. $5.00 each. Shipped airmail, postpaid, insured. MARYSVILLE APIARIES, Ray Diltz, 3992 Mary Avenue, Marysville, California 95901. (916) 742-4545.

ONE HUNDRED three story colonies, shallow and deep supers. Roger Stenhoff, R 1, Spring Grove, MN (507) 498-5425.

FIFTY — HUNDRED colonies $50.00. Nucs in 5-6¼ frame. $25.00. Supers, honey house and handling equipment. Walter Eshleman, Moravia, NY 13118, (315) 497-1258.

FOR SALE — 100 two-story hives of bees. R. L. Klawuhn, RD 4, Titusville, PA 16354, PH: 814-827-1164.

FIFTY COLONIES of bees will be unpacked after May 1st. Ladd Lewis, Corry, PA 16407, 814-664-2506.

THIRTY-FIVE COLONIES double brood chambers, current inspection, ready June first. Harold Smith, North Rose, NY, (315) 483-8292.

FOR SALE: 400 colonies nearly new equipment. Most all 9 frame spaced, some 8 frame hives, supers for both. Also nearly new stainless steel extracting equipment. Can advise buyer about pollination leads. Call after 6:00 p.m. 1 (207) 778-6765.

THIRTY-FIVE double story hives, Italians with 2 shallow supers for each hive. Nine frame spaced and strong, good equipment. $75.00 each. Sell part or all. Phone 918-647-4181, Kenneth Ferguson, 204 College, Poteau, Oklahoma.

ONE HUNDRED — strong colonies — Double deep — Four Supers, 1 year Factory Equipment, 1979 Starline Queens. San Antonio, TX, 512-633-0580.

ITALIAN QUEENS $3.50, 25-up $3.25 100-up $3.00, Ryland Apiaries, Rt. 2, Box 215, Deville, LA 71328. Phone 318-466-5309.

VERMONT BEES. 100 two story colonies. 50 deep, 250 medium, 50 shallow extracting supers with drawn comb. 20 Cobana, 30 cut comb supers with frames, etc. 100 gal. stainless steel storage tank, etc., etc. All equipment in excellent condition. Best offer for everything. 802-446-2897; Martin McCuskey, RD 245, Wallingford, VT 05773.

FOR SALE

SQUEEZE BOTTLE — 24 ounce size with snip top spout and cap. 100 bottles 22¢ each, 200 bottles 20¢ each. U.P.S. Shipping weights 11 pounds and 22 pounds respectively. Samples $1.25. Hollowville Products, Hollowville, NY 12530.

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NEW SUPERS! 500 7¾ pine supers, each containing 9-frames with 2-3 frames of DRAWN COMBS per super. Painted and ready to use. $8,000.00 firm. Phone 509-476-3369 — located in North Central Washington State..

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NOW YOU can get your copy of expired carburator patent reputed to get over 200 MPG with V8 engine. Includes diagrams and drawings. Send $7.00 today to BRITT EDWARD ENTERPRISES, P.O. Box 1, West Olive, MI 49460.

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FOR SALE: 27 hives of bees and extra equipment. Phone 428-3603. Wayne. W Cooper, Rt 2, Box 86A, Definance, Ohio.

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All the extractors have V shaped sloping bottoms with large center drains. The extractor tank and reel are made of heavy 16-gauge 304 quality stainless steel. Note the continuous weld and reinforced construction on reel and tank.

Note the easy to use controls. The top dial is the speed control; the bottom dial sets the acceleration time.

Model Number	2401	4401	8001
Frame Capacity	24 D/44 Shal	44 D/60 Shal	80 Frames
Voltage Required	110 volts	110 volts	110 volts
Motor Type	¼ Hp.	½ Hp.	¾ Hp.
Drain Diameter	2″ FPT	3″ FPT	3″ FPT
Tank Height	34″	36″	38″
Tank Diameter	30″	38″	55″
Reel Diameter	28″	35″	52″
Shaft Diameter	1¼″	1¼″	1½″
Brake Type		Electric Disc	Electric Disc
Warranty	One Year Complete	One Year Complete	One Year Complete
Catalog Number	HO 61050	HO 61070	HO 6140
Price	$1250 Net	$1945 Net	$2790 Net

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★ Pick Up at Onsted Store Only!

2 Pound Package		3 Pound Package	
1-24 Packages	$22.50 ea.	1-24 Packages	$28.00 ea
25-up Packages	21.75 ea.	25-up Packages	27.25 ea.

*Package Bee Will be Available in Late April and Early May. No Deposit Required. Telephone Order In for Early Arrival.

QUEENS

1-24 Queens	$7.25 ea.
25-99 Queens	6.60 ea.
100-or more Queens	6.10 ea.

Queens are sent post paid air mail.
Telephone order in for early arrival.
*Prices subject to change without notice.

THE FOLLOWING ARE NET PRICES — NO DISCOUNT

		9⅛″	6¼″	5⅜″
100	Hoffman Top Bar Std. Frames, Commercial	$ 38.00	$ 38.00	$ 38.00
1000	or more Hoffman Top Bar Std. Commerical Grade	275.00	275.00	275.00
5	9⅝ Deep Bodies, 9⅛ Frame, Commercial Grade			28.85
50	9⅝ Deep Bodies, 9⅛ Frame, Commercial Grade			280.00
100	9⅝ Deep Bodies, 9⅛ Frame, Commercial Grade			375.00
5	5¹¹⁄₁₆ Shallow Bodies, 5⅜, Commercial Grade			22.00
50	5¹¹⁄₁₆ Shallow Bodies, 5⅜, Commercial Grade			200.00
100	5¹¹⁄₁₆ Shallow Bodies, 5⅜, Commercial Grade			375.00
5	6⅝ Shallow Bodies, 6¼, Commercial Grade			22.00
50	6⅝ Shallow Bodies, 6¼, Commercial Grade			200.00
100	6⅝ Shallow Bodies, 6¼, Commercial Grade			375.00

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Root smokers puff fresh air between the fire chamber and the outer wall keeping the smoke cooler. They come with; disposable fire chambers, a long well-directed nozzle, special galvanized steel for strength and durability, anti spark draft tube, convenient finger grip opening and durable, long lasting bellows.

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