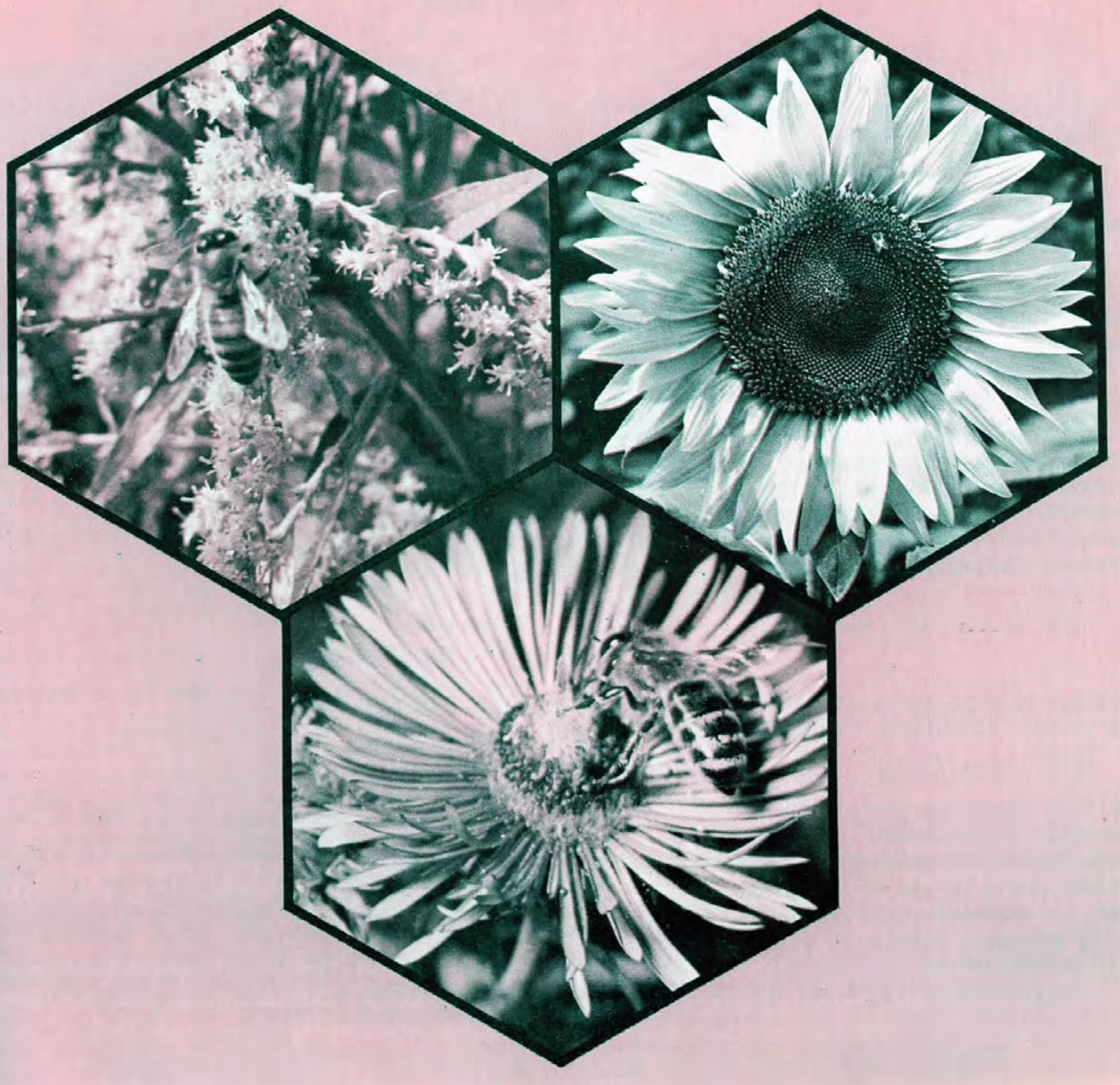
GLEANINGS IN BEE CULTURE

AUGUST 1983



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GLEANINGS IN BEE CULTURE

August 1983 *(ISSN 0017-114X)* *Vol. 111, No. 8*

Since 1873

Created to Help Beekeepers Succeed

111 Years Continuous Publication by the Same Organization

Contents

Cover Story

August honey plants bring in Autumn surge in nectar gathering. Pictured on the cover: sunflowers, aster and goldenrod.

NOTES FROM THE BEEYARD

Is There More To Beekeeping Than Filling Boxes With Bees And Cans With Honey?

Many who will read this article have an interest in some particular or specific phase of beekeeping as not all beekeepers have similar interests. I have noted from the sampling surveys taken by *Gleanings* that many beekeepers enjoy building and creating the material things of beekeeping such as hives, feeders, mechanical gadgets and other equipment items. This is understandable. At least up until the present, we Americans have been the building and creating leaders in the world. America has led in the development of technical equipment as well as the ordinary consumer goods which have made life for people everywhere a little easier, safer, healthier and more enjoyable. Several generations of Americans have developed many technical skills which have carried over to their hobbies. Many beekeepers have home workshops, some with excellent shop tools which allows, or challenges them, to build out of wood and metal the relatively simple boxes, tops and bottoms needed to house bees. Experimenting with making hives and other beekeeping equipment is made to order for the amateur. Bees accept the loose-fitting joints, slight errors in spacing and housing with knots and splits. No complaints are received from irate tenants or from buyers as would be the case should non-professional work be offered for sale or rental. In other words, to many, beekeeping offers a welcome opportunity to be creative and innovative without having to suffer the penalty of having someone pass critically on the product. Casual workmanship or unworkable ideas are of concern only to ourselves as bees are very tolerant; in fact, sometimes appear grateful for extra exits through poorly fitted joints, for additional ventilation caused by ill fitting covers and extra space beyond the usual bee space in which honey can be stored or brood reared when the keeper fails to provide that extra super. When we build our own apiary or honey house extras, if not hives, the product need not be competitive, artistic or necessarily functional as must be a commerical product offered for sale.

What this analysis is leading up to is to attempt to have a better understanding of ourselves as beekeepers; our backgrounds, and why we like (or don't like) bees and beekeeping. We need to understand ourselves in order to remain commensurate with our goals whether our interests are in hobby, part time commercial or fully commercial beekeeping.

Naturally, all beekeepers are not dedicated, or as equally dedicated, to the creative or constructive aspirations attributable to many good beekeepers. For every half-dozen beekeepers estimated to enjoy building things there are others who do not, and yet; have the skills, experience and are very successful at keeping bees. There are those who cannot drive eight nails in a frame without bending over at least one. Perhaps one of those is the fellow who began using a jig and a stapling gun to assemble frames, thereby improving on the accepted procedures that had been advocated in beekeeping literature for years and years. Such individuals may be skilled bee handlers, understanding animal (bee) behavior to the degree that new management techiques will be developed and taught to others who have less tolerance of honeybee's sometimes bizarre and unpredictable behavior, which causes many people to give up a hobby or promising business that they would otherwise enjoy. Many specialized skills show up among beekeepers who are sometimes in the minority as compared to the "doers". Unfortunately some of these types of beekeepers are skoffed at in the "sage (and often salty) reports of the observant beekeepers who have been in the business for many years", as quoted from a letter to the Editor in one of the bee journals. A beekeeper's talent is not always measureable in terms of how many boxes he has filled with bees and the number of containers of honey he fills. However, it is true that due to the competitiveness of commercial beekeeping the person who falls short in certain essential skills does not remain in business long. No one can authoritively list and designate a listing of these skills but I am sure they are partly intuitive and at least partly self or institutionally taught. If this is true there is certainly the need to give a uniquely qualified individual a chance to supply information about new ideas by way of a publication beamed to other beekeepers who at least remain receptive and can afford to be innovative since they alone bear the penalties of failure and often revell in the stimulation of making something work or achieving a result that the "sage and salty oldtimer" said could not be done. As an editor of *Gleanings* I hope that it will continue to be the policy of at least one magazine to give space to printing at least some "profound observations of new and small beekeepers", again quoting from the reference cited above.

Accepting A Challenge

Book after book is written on how to keep bees, and very well done, too, but some of the peripheral phases of what is a very complex subject have been neglected in both our teaching and our writing. The time has come to invite some of the non-traditionalists into what has sometimes tended to be the sole domain of staid, immovable followers of the "this is how to do it" school of thought. Of course established and proven principles cannot be dismissed as antiquated. Sometimes it is a fine line of discrimination between traditional truths in beekeeping and unreliable speculation. Despite the inherent risks in giving free voice to sometimes untried or untested ideas it dispels the notion that everything in beekeeping that can be learned is already stored in the greying heads of the oldtimers (and Editors). Progress means a willingness to teach, learn and practice some of the newer arts in addition to the traditional ones. Otherwise beekeeping is going to be led into the undeserved fate of anachronism.

Whether we like it or not, we beekeepers are going to have to remain part of society, as will our bees, which certainly complicates our public relations. The image of the beekeeper as somewhat of a recluse, practicing the mystical rites of tending to honeybees does us no good in the eyes of the public. Unfortunately (at least for the sake of our public relations) our bees sometimes sting someone other than ourselves. The public is often ignorant of or is confused about the role of the honeybee in agriculture and nature, having many oddly conceived notions that have little basis in fact. We beekeepers sometimes inadvertently add to this aura by repeating warmed-over folksy tales about bees, bee handling and bee behavior which only border on the truth; though in actuality these tales often come

from sources which are better versed in repeating folklore than interpreting information about bees and beekeeping for public consumption. If beekeeping is to increase its creditability in the eyes of the public (and like it or not, this is important in our society for survival) we must meet the demanding standards of other catagories of skilled tradesman and professionals. We cannot continue to pulmugate half-truths but must rise above our self-imposed limitations to gain the respct of other sectors of society.

What is needed to carry us past a stalemate, toward progress in beekeeping, is to introduce new concepts in beekeeping, improve public relations between beekeepers and the other 99% of the population, and improve beekeeping training. Training should be expanded to include many subjects now barely touched upon, or ignored.

Cooperation

Horticulturists, for example are not in a continuous running battle with the chemical companies who provide the chemicals needed for protection. Sprays improperly applied kill plants also. The growers of fruit, vegetables and ornamentals have come to the realization that there must be controls on pests if we are to continue to feed a growing world population which increased in 1982 by the size of the population of Mexico. Chemists and ecological scientists are willing to work with both beekeepers and the chemical companies if given our trust and cooperation. Coexistance with others who are in the business of feeding a fair portion of the world's population is a responsibility beekeepers are going to have to live with in the years to come. Beekeepers may have to make some adjustments, as others in agriculture must continuously do, because our society is in a continuous change from rural to urban, which began to accelerate several decades ago. Beekeepers have an additional handicap beyond those of others, such as keepers of small livestock, in that bees are far ranging and have the potential for stinging. For this reason beekeepers are in the need of good public relations advice. We need less of the hard core, fundamentalist domination of the industry by individuals who are ready to fight the world at the mere drop of a word of threat against what is considered by some to be exclusive rights. Defiant beekeepers, without a logical cause for protest, are going to be beaten every time, in or out of court, unfair as it may sometimes appear to be.

Adjusting

Swarming time has just passed and this is always the most opportune time for beekeepers to come face to face with the public. Our requests to pick up swarms come from people who are, or seem to have, at least one in their families who are "allergic" to "bees", in a surprising number of instances. To the average non-beekeeper, insect stinging, those who are truly allergic aside, is something that is considered as totally unacceptable inconvenience. The term "allergy" in relation to venomous insect stings has come to mean any physiological reactions ranging from the usual small red welt left at the point of the sting to the more serious reactions indicating a true allergy. Growing public concern about the possibility of the introduction of a more aggressive bee in the form of the African-Brazilian hybrid bees may add to these pressures on beekeepers. The axiom that "anyone can keep bees anywhere" may be subjected to some revision in the future. The defianace of a single beekeeper in a community, especially in objecting to some common sense restrictions, could bring about total abolition of beekeeping in certain communities. The idea that "honeybees are dangerous" could become undeniably imprinted on the public consciousness. A plethora of "cannots" then becomes the rule in a society where a desire for "security" blinds people to the cost of losing some of our freedoms in the process.

Since beekeepers are going to have to continue to live in a changing society which may not always be to the liking of the old time "sage and salty" beekeepers, we had better give a little more attention to our new generation who are pliant in both mind and body and can adapt to the changing conditions.□

L. Goltz, Editor

Gleanings In Bee Culture Photo Contest

We are pleased to announce that, from a surprisingly large number of entries in our photo contest, we have selected five winners whose work will be used as cover photos for upcoming issues of *Gleanings*. Additionally, these photographers will be awarded $25 each, upon publication, for their winning entry:

Marlin Klein, Linwood, MI
Richard Zaleski, Carbondale, PA
Carl Moore, San Antonio, TX
John Eckroth, Medina, OH
Leonore Bravo, San Francisco, CA

Additionally, we have selected a number of photos we feel have high potential for use with future GBC articles. In the event a photo is used, five dollars will be paid, upon publication, to the photographer.

Photographs accompanied by a self-addressed, stamped envelope have been returned. All others will be retained in our picture files.

Thank you, very much, to all who entered. Please submit again when we hold our next contest. Until then, watch for the winning photos on upcoming covers of *Gleanings*.

A Simple Method For Rendering Wax

By THE EDITORS

Many beekeepers use a double boiler for rendering wax. For those without a boiler, or one of adequate size, there is a very simple method for achieving a desirable end result.

Materials Needed:

One sack made of porous material such as burlap.
Several bricks or stones of sufficient size to weight the bag down and keep it from floating.
Large tub of stainless steel or heavily coated tinned iron. (Do not use brass, copper, iron or zinc, they will tint wax and make it unsuitable for wax products.)
One sturdy stick, several feet long.
Access to a burner capable of accomodating the tub.
Access to a water source.
Thermometer

Instructions

1. Place cappings or combs into the sack, along with the bricks or stones, and tie the top shut. Remember: the lighter the wax the better the price. Avoid rendering cappings along with old dark combs.

2. Place tub over burner, put sack of wax into the tub and add water to within several inches of the tub's top.

3. Bring water to a boil, but avoid heating wax over 185 degrees F. Continue boiling until the contents of the sack are melted and have passed through the pores of the sack and collect on the surface of the water. Always be certain the liquid wax is several inches from the rim. Wax overflows can cause serious problems.

4. Always be sure that the weighted sack remains below the surface, several inches, to allow room for gathering wax.

5. Check the sack periodically by jabbing with a stick. When it is nearly empty, shut off the heat and allow the tubful to cool. This will take at least 12 hours.

6. After it has cooled, the wax block on top of the water surface can be lifted off and the residue in the sack discarded.

This method of rendering will not process 100% of the wax, but for some beekeepers, the advantage of requiring minimal equipment more than compensates.□

Monthly HONEY Report

LAWRENCE GOLTZ

June 10, 1983

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 — **Reporting Regions**

Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	1	2	3	4	5	6	7	8	9
60 lbs. (per can) White	42.00	25.80	35.40		36.00	38.50		35.50	34.50
60 lbs. (per can) Amber	42.00	22.80	34.80		34.00	37.50		34.00	33.50
55 gal. drum (per lb.) White			.59		.58	.60		.57	
55 gal. drum (per lb.) Amber			.52		.54	.52		.54	
Case lots — Wholesale									
1 lb. jar (case of 24)	28.50		25.50		26.40	25.50		24.50	32.10
2 lb. jar (case of 12)	27.50		23.90	24.30	25.50	24.50		23.50	30.40
5 lb. jar (case of 6)	30.00		27.80	26.55	28.00	26.00		27.25	30.00
Retail Honey Prices									
½ lb.	.90			.95		.79		.89	.99
12 oz. Squeeze Bottle	1.50	1.39	1.19	1.39	1.25	1.55		1.35	1.39
1 lb.	1.50	1.50	1.39	1.59	1.50	1.60		1.42	1.69
2 lb.	2.70	2.50	2.59	2.89	2.55	2.30		2.70	2.89
2½ lb.	3.35					2.89	3.25	3.15	
3 lb.	4.00	4.25		3.39		3.75	4.50	3.85	4.09
4 lb.	5.00		4.95			4.50		5.00	
5 lb.	6.00			5.39	5.75	5.00		5.99	5.89
1 lb. Creamed			1.67	1.69		1.39		1.59	1.75
1 lb. Comb			2.56		1.87	1.75		1.99	
Round Plastic Comb						1.75		1.69	
Beeswax (Light)	1.25		1.10		1.25			1.25	1.20
Beeswax (Dark)	1.00		1.00		1.15			1.15	1.10
Pollination Fee (Ave. Per Colony)	25.00				20.00	21.00			18.00

Misc. Comments

Region #1

Much swarming in the Northeast. Good honey flow from black locust. Summer honey flows are promising at middle of June. Honey sales down due to economic conditions. Early season bee work was behind due to frequent rains.

Region #2

Bees in excellent condition in New York State. Short honey flow during mid-June with some colonies storing up to 30 lbs. Ground water supply is good. Much swarming. Swarming heavy in Pennsylvania, but bees stored good early season crop of raspberry, locust and tulip poplar. Honey sales in Pennsylvania are off from past years.

Region #3

Alternating dry and rainy periods have hindered honey flow in most of Ohio but a good crop is being stored despite this. In Indiana the bees did well on early honey flows but flows from the clovers is spotty, not as universal as 1982. This year's honey crop may be down from last year. Swarming was up from last year in Indiana and Ohio. Indications are for a good honey crop is Wisconsin from report at the end of June.

Region #4

An up and down season in Dakotas through June. Some scattered bloom in alfalfa the middle of June but no honey coming in unitl then. Pollen plentiful. Feeding common through early June and before. Weather has been unstable.

Region #5

Honey flow has been reduced by bad weather in the Carolinas. Poplar, raspberries, persimmon and clovers did not produce a lot of nectar this year. Most honey sales are being made at local farmer's markets. Prices are slightly up on honey, reflecting cost of supplies. Rains generally plentiful in Florida and honey crop has been good. Orange and tupelo honey in good demand at wholesale. Some producers are placing gallberry, palmetto and orange on the loan program, but due to large crops much is held until the money is needed.

Region #6

Good honey flow from white clover in Tennessee. Very light in color. Honey sales holding steady. Bee supplies selling well. Good sumac and sourwood honey flows reported in central Alabama. Crop being extracted in Alabama is better than last year's. A good honey flow in progress in much of Kentucky during early July,

Continued on next page

Monthly HONEY Report

Continued from page 397

especially in north-central area. Honey being extracted early to provide additional space. Honey sales are average.

Region #7

Honey flow is very light and erratic in Oklahoma and there may be a short crop. Summer honey flow from cotton and alfalfa may improve colony average. Temperatures 10 degrees below normal with an average rainfall through June in Oklahoma.

Region #8

Most of Montana has below normal moisture but are hoping summer rains will aid nectar flow in areas now too dry. Feeding in progress through middle of June. Cuttings of alfalfa in irrigated areas are made prior to full bloom, depriving bees of opportunity to gather nectar from the blossoms. With warmer weather in Colorado at the end of June the bees are off to the start of the honey flow in most areas. Early June rains have helped clover and the bloom is good. Alfalfa is late but the bloom is excellent. Bees are in good condition for honey flow. Retail honey sales are about normal.

Region #9

Wax prices have dropped. Retail honey sales are up slightly. Much rain in Oregon which may cause reduction in the honey crop.

Marketing Honey: How You Can Help With A New Project

In keeping with one of the most pressing problems in beekeeping, there exists the need for a comprehensive, practical manual on honey marketing. Information on honey marketing is fragmentary in the literature. Aside from several articles in the journals recently, including a current series in *Gleanings* by Sidney Gross (begun in June, 1983 *Gleanings,* titled Honey Marketing) and the article, Advertising—Some Why's and How's, by Joan Olstrom in this issue, the subject has been treated sparingly.

Rather than the allocation of funds for formal studies by marketing experts, or perhaps in addition to these studies, we feel that the honey industry should look into what is being done within the industry at present and proceed from there.

We are interested in what the hobbyist beekeepers are doing in marketing as well as knowing about the methods used by the large volume packers. If you are doing any advertising, displaying your product, or, simply pack your product with an unusual label, please tell us about it. Send sample of labels, display materials and photographs of displays or promotion materials. We will return material upon request.

This is an opportunity for you to contribute to the good of the bee and honey industry. *Gleanings* will collect, analyse and compile this marketing information into a manual which will be available as a permanent record. All contributions of ideas, photos, data or marketing methods will be credited either in the text or by reference list. We will respect any information given in confidence, revealing only that part that you wish to become a part of the manual.

The proposed marketing manual will likely include subjects similar to the following: Preparation of honey for exhibition and sales; advertising and promotion; market analysis (statistical and demographic information as related to the geography of sales); production, distribution and sales information on the honey buying (or non-buying) public, and information on honey as a product. Most importantly will be the personalized reports of what you as individuals or associations are doing; something in which we ask your cooperation. Send us a note, a long or a short letter or a formal article. Don't worry about typing it or the wording. We are interested only in your ideas, experiences or practices, either your own or what is being done elsewhere. You will be given credit as the source of information or the practicer of the method, in the manual, unless desired otherwise.

We have much information to research and to compile so please send along any information you have as soon as possible. We may not be able to acknowledge everything received but proper credit will be given if used in the marketing manual.

Mail information to: Honey Marketing Manual, *Gleanings In Bee Culture,* P.O. Box 706, Medina, OH 44258.

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First Flights

New Ideas & Products

Queen Rearing Aid Cell Punch Grafting Tool

From Australia, this transfer cell punch grafting tool proports to be an improvement on all prior designs. The circular punch (pictured below), is affixed to the end of a metal stem embedded in a rounded wooden handle. Basically, the tool works by punching around the cell of a desired larva. The entire section is then removed from the punch and adhered to the cell bar block of the queen rearing frame. Advantages of this method over conventional needle grafting are: little disturbance larvae, 100% removal of larval food, ease of transfer, less chance of chilling or dehydration. Available for $9.95. For tool or additional information, write: Bill Montgomery, 2519 Huntington Ln., Redondo, CA 90278.

Cell cutting punch for queen rearing.

Removing punched cell from tool.

Attaching removed cell to cell bar block.

No-Foam Filling Unit

From Maxant Industries, P.O. Box 454, Ayer, Mass. 01432, a mechanism for holding honey bottles so honey runs down the side until nearly full when the bottle straightens out for final topping off. As with pouring beer, this technique eliminates foam. It alleviates the need for putting air into honey which results in foam ring at the top. Counterbalancing with adjustable weights provides control for one pound to five pound jars. This product was developed by E. Mogle, a North Carolina beekeeper. Write for pricing and other information to the address above.

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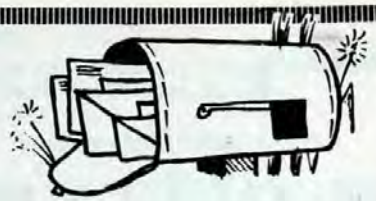
Gleanings Mail Box



Ultraviolet Light Effects

Dear Editor:

In the April '83 issue of GIB Richard Taylor commented that the reason that bees are found in the snow in front of hives on bright sunny winter days is that that was nature's way of thinning out the old and weak bees. Well, could be, I guess. Stranger things have been known to happen in nature. My thinking on this matter runs along a similar line.

In a letter to the IBRA dated August 14, 1979, I wrote, "It's been reported to me that occasionally bees will be seen emerging from brush and crashing onto the sand on beaches. We have white coral here. This coral sand is very reflective. Is it possible that the reflection of the sun off coral sand somehow confuses the polarized light gathering sensors of bees?" It would seem that I had recorded the result of occasional navigational errors. Perhaps the culprit was ultraviolet light. Let us consider for a moment the ultraviolet spectrum of light which bees see.

The long-wavelength ultraviolet light from 320 nm to 400 nm (termed uv-A) contributes considerably to the celestial navigation abilities and color vision of bees. The short-wavelength ultraviolet light from 280 nm to 320 nm (termed uv-B) is not mentioned in the bee literature that I have access to. Short-wavelength uv-B is biologically potent in that it is this type of ultraviolet light which can give you the most sunburn/snow blindness per unit of exposure time.

While thumbing through a recent National Research Council publication which, for the most part was way over my head, I gleaned that sand reflects around 40% of uv-B and that snow reflects some 80 to 90% of uv-B. It was also said that water does not have a high uv-B reflectance whereas the foam near the surf does have a high uv-B reflectance. Unfortunately a percentage figure was not assigned to the term "high reflectance".

I think that the bees that had been reported to fall to the sand here after emerging from the brush were temporarily blinded or confused by the combined effects of the reflected uv-B from the white coral sand and the lagoon water. Reflected uv-A could also be an additional factor although I have no supporting data for this belief.

Now then, to stretch my reasoning a bit further let's speculate that, if the circumstances are right, the high reflectance of uv-B off the snow on a sunny winter's day may utterly confuse those bees that venture off the landing board of a hive. They then fall into the snow which lowers their body temperature and renders them unable to fly back to the hive. I believe that another beekeeper recently had the same idea about reflective snow. Wish I could remember in which bee publication I had read about this idea.

Anyway, I would suppose that there could be contributing factors to all this. There are winter, summer and even daily variations in intensity of uv-B to be considered. The position of the hive entrance could possibly be a factor too. The presence of shadows could have some effect as could clearness of air. I won't even begin to speculate on the possibility of variations in the functioning of the ultraviolet sensor organs of older or weaker bees. Why that path of reasoning could lead one to conclude that it was nature's way of thinning out the old and weak bees!

Louis E. Hitchcock
P.O. Box 161
Wake Island, HI 96898

Hive Ventilation

Dear Editor:

In answer to R.C., page 310 of June *Gleanings,* it is stated that bees will plug with propolis a screen tacked over the escape hole in the inner cover in the fall.

It has been my observation that the opposite is true; bees will not plug a screen in the fall, whereas they will plug it solid during the honey storing season.

This suggests certain conclusions: (1) bees desire top ventilation in the winter, and (2) they desire no top ventilation in the summer, which will interfere with the honey ripening process, proven by the fact that they will store no honey under the open hole.

Leaving the hole open at any time is an invitation to being stung when the telescope cover is removed. To avoid accumulation of ants on the inner cover elevate the telescope cover at least one-half inch above the inner cover. This procedure should be followed year 'round to allow escape of moisture in the winter time and top circulation between the two covers in the summer which will diminish the piling up of bees on the front of the hive.

In summation, for best results, cover the escape hole in spring and summer with a piece of wood, and with a screen in fall and winter, but restrict the air space to not over one square inch. My sixty-nine years of experience have proven these conclusions.

Clarence Kolwyck
James Bldg.
Chattanooga, Tenn. 37402

Live And Let Live

Dear Editor:

If you lived here in Northwest Iowa you would soon come to believe that there are only two plants in the world and these are corn and soybeans — one would never begin to guess that there are thousands of different kinds of plants with all kinds of potential value to mankind.

Here is a brief illustration of what I'm talking about. Last summer we were driving our pickup truck to Rock Valley to get a load of water — it was dry and our well ran dry. On the way my son Frank said, "Stop Dad, there is a wild rose I want to pick and bring home to Mom." I told him that the wild rose was the Iowa flower and protected, that by leaving it there it would not die and everyone who passed could enjoy it.

On the way home from Rock Valley with our load of water we saw the highway department spraying the roadside — and it had already sprayed the wild rose, and it was already shrivelled up. I feel I need not say more, but I do.

Some people are not content unless they can destroy every vestige of vegetation if it is not corn or soybeans and I assure you that very quickly we will not only have no topsoil left, but quicker than that, we will not have any plants. And corn and soybeans are not native and will not reproduce themselves. The paranoia about the Canadian Thistle — which has deep roots and holds the soil — and has tremendous commercial potential in its own right and is also an excellent honey plant and as beautiful as the rose — shows the extent the commercial "Agribusiness chemist" has gone to destroy the bounty given us by God.

Garry De Young
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The System, Part II—Management

by BRUCE WRIGHT
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Last month we delved into the making of woodenware bee equipment. Also discussed were the advantages of using all supers of the same size, and the superiority of shallow and medium equipment. This month we will focus on the management of this type of hive for the beginner and sideliner. I use the medium depth supers for almost everything, and will use that size in this article. Use of shallows (5¾") can be used interchangably in almost all management.

Starting with package bees is a common entry into beekeeping. The use of shallow or medium depth boxes give several advantages over a single deep hive body. As the bees draw out their combs they seem to start at the top in the center. As combs are drawn out they can be rotated by putting a frame or two of sealed brood in the center of the lower box, and bringing frames of foundation in close to the broodnest. This enlarges the brood area in a vertical plane so heat from the bees goes up to help keep the eggs and larvae warmer. At this time the use of an entrance reducer is a good idea. I like to keep the opening to one side, as the bees tend to use the center. If the brood nest starts at one side keep the opening on the other side.

A strong overwintered colony is usually the most desirable way to begin the spring. Let's start with a good strong hive that has come through the winter in three medium depth or four shallow boxes. These have served as brood and food chambers for the preceding fall and winter. The comb area is the same or a little greater than two deep hive bodies.

In Northeast Ohio, where I live, most beekeepers use either a two story or story and a half to winter in. The story and a half has enough honey to make it through a normal winter but many of those hives starve out in the spring when they start raising brood and the weather keeps them in for an extended period.

In most springs these hives will still have a two or three inch band of honey left in the top box. This will act as a natural queen excluder. Rotation of the bottom supers will add to the area used by the queen to lay in. If maximum honey production is your goal, start supering when the apple blossoms turn pink. My supers have six drawn combs and three sheets of foundation.

I place the foundation in the second, fifth and eighth positions in the super. This gives me an accurate timing as to when additional supers are necessary. When these three frames are drawn out it is time to super again. The six drawn frames draw the bees up into the super, and as a flow starts they will draw the foundation. This procedure will help eliminate swarming and the build-up of burr comb. The extra room and foundation give the young bees a place to go, and something to do with the foundation to draw. They don't need the burr comb if bee space is observed between the top of one layer of frames and the bottom of the next.

Swarming is the bees' natural way to expand their population. Swarming is undesirable to the beekeeper as it weakens the hive and lowers honey production in most instances. If you catch the swarm at least you can start a new hive or add it to a weak hive to help build it up. Many methods of swarm control have been advocated. Most are labor intensive and time consuming. Adding supers of drawn comb helps give more room but often isn't enough. Adding only foundation works best when there is a good flow on. Adding mixed supers as above gives the best of both aspects.

If, in spite of giving plenty of space as above, you find swarm cells, it is time to expand somewhat. These cells can be used to make queen rearing nucs, or bigger splits, as you wish. Nucs are started using the frame with the cell and two more frames of predominantly sealed brood with clinging bees. These are placed in a single box with foundation and its own bottom board. The three frames of foundation are placed back in the parent hive to one side of the brood nest. Up to three of these nucs can be taken from a hive without noticeably cutting into the honey production. You've, consequently, weakened the hive and they will be less likely to swarm. Plus, you've gotten some young queens at a minimum of cost and labor. In two to three weeks these queens should be laying. Any nucs not laying after three weeks should be reunited with another colony. Many nucs will grow strong enough to winter over on their own if you don't need them to requeen. Another use for these nucs is to combine two of them into a two-queen hive for the main flow such as Goldenrod. The unused nucs too weak to winter on their own can be combined or wintered over a strong hive with a double screen.

Splits made in the spring and given a laying queen from the south will usually build up enough to give a super of honey surplus. These are made up around mid-May with six to eight frames of brood in two boxes and the rest of the frames drawn comb, several with honey and pollen. Mid-May usually corresponds with the start of the fruit blossoms and the reduced prices on queens from the south.

This year I am experimenting with using four medium supers to winter in. I have already found several hives in two deep hive bodies that are close to the top of the hive and need feeding. Now I can take four frames of honey from a hive that doesn't need it and place this honey over the cluster that does. I don't need to worry about the bees building comb up there for quite a while. Then I can fill in with comb or foundation as I see fit. The unused honey in spring will be used to make splits so I don't have to feed them.

I stated earlier that I used almost all medium depth supers. I do, however, have deeps and shallows that I purchased with bees in them. These are used in conjunction with hives that I take care of for other people on shares. My procedure is to try and get all of their equipment into use for brood and food chambers, then I supply the supers. I get half of the honey and half of the splits. When making the splits I use my own equipment for my share, and to replace the frames I remove from other peoples equipment.

When I buy a hive or have a split in a hive other than medium depth I work them into the medium depth supers in several ways. The easiest is to just super them with six inch boxes. As the bees move up the bottom boxes are pulled out from under the hive. This works very well in early spring. The bees have moved up over and by early March in Northeast Ohio, the bottom box can be pulled out. This is a modification of the Stanley Brothers, of Iowa, management.

Again I will be happy to answer questions and hear your views. If you wish an answer please include a self-addressed, stamped envelope.□

Research Review

By DR. ROGER A. MORSE
Research Editor of Gleanings
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First Eastern Wildlife Damage Control Conference

"Control of wildlife damage is of increasing concern to farmers, rural and suburban homeowners, and resource managers who attempt to keep such damage at acceptable levels." This statement is from the brochure announcing the above-named conference to be held at Cornell University, Ithaca, NY, September 27-30, 1983.

Dr. James Caslick, who is in charge of the program, told me that this conference has already drawn far more attention than most recent wildlife meetings in his area. For years damage by wildlife has "taken a back seat" during evaluations of conservation programs, according to Caslick; most wildlife specialists have hoped the problem would go away, but in fact it has been growing worse. Conferences similar to this have been held in California in recent years, but this is the first time there has been interest in the East.

Beekeepers suffer damage from several forms of wildlife. Mice are the most destructive animals, but skunks and bears are the most talked about. There is seasonal variation, of course, but sometimes man's activities have long-term impact. Pennslyvania has changed its bear managment scheme in recent years to provide more bears for hunters, and as a result more bears are wandering around that state and into neighboring New York, where they are causing some problems for beekeepers. This, of course, is only one example.

I'm looking forward to this conference and will be reporting on some of the lectures. The call for papers indicates that a great variety of topics will be discussed.

An Attempt At Wax Moth Control

The greater wax moth is one of the more destructful insects with which we in the beekeeping industry must cope. However, the life history of this insect has received little study and interesting aspects of its biology are still being discovered.

The male wax moths release a sex attractant (pheromone) that attracts the female. Among animals this is unusual; Under most conditions it is the female that attract the males. Adult wax moths do not feed; it is only in the larval stage that the insects take food. When the adult wax moths emerge they leave the beehive and fly into the trees in the vicinity. Mating may take place within an hour of emergence. Mating has been observed frequently in cages in the laboratory but not under field conditions.

The chemistry of the sex attractant is known. In the paper below an attempt was made to reduce wax moth numbers by trapping the females using synthetic pheromone. The results were not good. The traps captured 50% of the females released in a laboratory wind tunnel, 4.2% of those released in a greenhouse but only 1% of those released outdoors in an apiary. Obviously, under the conditions tested, the pheromone traps were not effective. However, as the authors point out "trapping female moths for population control has theoretical merit". Hopefully these results will not discourage others from continuing research in this area.

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Bee Breeding Program Underway

According to Dr. Eric H. Erickson of the USDA laboratory in Madison, Wisconsin a new program has been initiated to produce a better line of bees. Thirty-five queens are being chosen from across the country to produce a stock that will be selected for three characteristics: "produce lots of honey, overwinter well and resist disease". A computer study indicated this number of queens was necessary to prevent inbreeding that could have an adverse effect on brood production. Instrumental insemination will be used to maintain stock purity.

The 1981 farm bill made it possible for the USDA to release breeding stock to queen producers. Some of the first will be released this year. The article I have before me does not indicate or give any information about cost or how the releases are to be made.

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The Four Basic Methods Of Clearing Bees From Supers

By THE EDITORS

1. Brushing Or Shaking

Soft, pliable brushes with flexible bristles can be used for clearing bees off frames. So, too, can the method of individually removing and shaking each frame to dislodge bees. The advantage of either method is that so little equipment is necessary and the methodology is simple. One disadvantage is that brushing or shaking require considerable, time consuming handwork. Additionally, the active nature of these methods could increase the possibility of robbing and general bee irritability.

2. Bee Escapes

Escapes are devices that allow bees to move down into brood chambers or directly outside the honey super.

Mechanical trapping devices can often be fitted into the center hole cut of the standard inner cover. Other escape boards accomodate two or more escape devices, usually placed in the corners. Cone escapes are sometimes used in place of mechanical trapping devices. The advantages of escapes are that they are easy to install, inexpensive, safe and non-irritating to bees. The principle disadvantage is that this method of honey removal requires two trips to the bee yard: one to place the escapes on: the other, usually within 48 hours, to remove the honey.

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Bees and Gardens

Now that the harried gardener-beekeeper has nearly everything under control; the garden planted and growing, the weeds under control(?), supers piled on and swarms hived we can pause to contemplate where we stand for the year. After a relatively mild winter in most of the United States, which was apparently due to some disturbance in the Pacific Ocean, we began the spring season with rather widespread, cloudy, cool weather. Bees wintered well and were as strong in late April as they normally are around the first of June, at least in our area. For a period of time around here it was a question of whether our colonies would survive the spring rather than whether they would live through the winter as is usually the case. Abundant spring bloom made up for the fewer flying days and allowed colonies to survive the seemingly endless cool, cloudy weeks. Hopefully, the bountiful number of swarms came from unattended hives and "wild" colonies rather than yours and mine. During a recent inspection several of my colonies showed the low adult populations characteristic of swarmed colonies, but, typically, the combs were filled with brood. There is little question that they will build back up for the fall honeyflow and go into winter in full strength but there will be no honey crop from these swarmed colonies this summer. Divisions were made in late April in some apiaries and I suspect this deterred colonies from swarming. No doubt dividing a colony in the spring or otherwise removing part of the brood from the brood chamber is quite an effective swarm prevention method, as many claim.

While we were worrying about our beekeeping chores, gardens were awaiting their share of attention. Very few opportunities were available to plow or work the soil early in the season as is sometimes possible, but somehow it eventually got done. Preparing the gardens for planting may have been a rush job, between days of rain. Some low-lying plots are still lying fallow, I notice, because of the water table being so close the surface. Many garden plots were worked despite the wetness and failed to work down into the finely pulverized condition what most gardeners like to see. A lumpy surface may not be harmful to some garden plants but this seems to be repugnant to most gardeners who prefer to work the garden surface into a finely prepared seed bed, if possible. This was one time when it was preferable to have a garden soil with a high percentage of sand, rather than clay. Sandy soils drain off excess rainfall quite quickly and warm up much sooner. This not only benefits the gardener but also favors certain crops. Soils with a coarse, gravely composition afford the same advantages, if sand is present, and may be even more porous should the clay content be low. Heavy clay soils, if they can be properly worked, are superior during dry seasons for some vegetable crops. The light sandy loams, however, are generally the best for the average gardener. Unfortunately not everyone is blessed with such an ideal condition. We have an unusual area in north central Ohio, known as the mucklands, where several vegetable

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Bees and Gardens

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crops are grown during the season. We have noted another such an area in Ontario, Canada, just north of Toronto. The rich, organic soils are sites of large scale vegetable growing. The light, sandy soils favor the cucurbitacae: Melons, squash, watermelons, cucumbers and pumpkins. Potatoes do better for the home gardener in light, sandy soils as do many of the root crops as beets, carrots and radishes, for example. Sandy loam soils are best for strawberries and many of the small fruits such as the brambles, blackberry and raspberry.

Soil types aside, the proper conditioning of your garden plot should be the primary object of your attention, particularly during the soil formative years if you are just beginning to garden a tract of land. Adding organic material, or humus, to a hard, packed soil, one with a high percentage of clay, may go on for several years before the best condition is achieved. Extensive use of mulches and various types of fertilizers may be required to bring the soil up the the proper tilth, or condition, for cultivation and plant growth. The object of adding organic material to the soil is to add nutrients, of course, but the other purposes may be equally important, those of incorporating such gaseous elements as oxygen and increasing the water-holding capacity of the soil. Atmospheric nitrogen, introduced to the soil by legumes, becomes readily available if soils are well conditioned by the addition of organic matter. Soil additives such as peat moss or other soil conditioners are fine, but the home gardener cannot usually afford to purchase these in quantity. By checking around your community you may locate livestock farms, horse stables, poultry farms or industrial plants which have manure or other organic materials such as wood shavings which can be purchased cheaply or obtained free of charge. When using the soil conditioners with a high percentage of cellulose, as in wood shavings, it is best to add extra nitrogen to encourage the decomposition of the material. Better yet, hold the material in outdoor bins which can be continuously replenished as grass clippings, leaves, raw manure and other organic materials decompose in the compost pile and are added to the garden plot. Don't turn down the possibility of growing a green manure crop during the period when vegetables are not being grown.

Most *Gleanings* readers who have gardened are already acquainted with these rather basic principles — but who knows — beekeepers turned gardeners may not be knowledgeable about the soil and plant sciences, and even some of the best gardeners may be interested in learning more about the agricultural sciences.

There are many excellent sources of information on both beekeeping and gardening at the public library, at the county Agricultural Extension Office and from publishers. An understanding of the how and why of beekeeping and gardening is closely allied with the principles of natural and agricultural sciences taught in entomology, biology, zoology and botany. Beekeeping and gardening are not totally unrelated in the utilization of what is taught in the basic natural sciences. Both endeavors represent these disciplines at work, just as bridge building, mining, aviation and manufacturing, for example, are the application of many of the principles of the physical sciences and other arts and sciences. While fewer and fewer people are directly involved in agricultural production it is still the largest industry in America today. By participating in gardening and possibly beekeeping as well, you are expanding your personal understanding of many things which are important to staying healthy and happy in this crazy world. If more of the people were involved perhaps we would see a reversal of the seemingly self-destructive and suicidal paths our civilization threatens to take.□

L. Goltz

Capping The News

THE EDITORS

"Beekeeping Small Talk"

Yellow Rain? We've Heard Of It Raining Cats And Dogs, But.....

Every so often, bees become a political issue. Recently, one of the more unusual chapters in that series of periodic occurences became public.

As a consequence of reports, coming from Cambodia and Laos, in the late 1970's and, more recently, from Afghanistan, that poisonous yellow clouds left thousands sick or dead, the U.S. State Department concluded that the Soviet Union is guilty of direct or indirect uses of chemical warfare. Moscow has denied charges.

Early in June, a new dimension was added to the dialogue on this subject. Biochemist Matthew Meselson of Harvard, and entomologist, Thomas Seeley of Yale, presented evidence that "yellow rain" may not be the ominous result of chemical warfare. According to them, the downfall might actually be bee excrement. "Yellow rain" spots apparently have a pattern and coloration very similar to bee droppings. Additionally, pollen and bee hair have been contained in the yellow spots.

Supportive of their theory is the fact that bees, in temperate regions, have made cleansing flights in massive swarms, which might account for a reported seasonality in incidents of "yellow rain."

Yellow stains, found on vegetation in areas where reports had been made, were proven to contain mycotoxins, poisons thought to be part of the Soviet chemical arsenal. Meselson and Seeley claim, however, that certain native fungi spores could land and grow where bee excrement fell and, through natural growth and decay processes, release toxins mistaken for man-made chemical agents.

What the bee excrement hypothesis does not answer, is the confirmed existence of mycotoxins in the bodies of alleged victims, or how several Soviet gas masks, discovered in Afghanistan, happened to be contaminated with such poisons.

Regardless of whether it is ultimately determined that this is a military activity or a natural phenomenon, resolving the problem of "Yellow Rain" might be an ongoing challenge for some time.

Madison Bee Research Lab Temporarily Saved

As of June 22nd, 1983, the Madison, Wisconsin Bee Lab is in a "holding pattern," says Science and Education Management Budget Chief, John R. Victor. In reacting to the USDA's 1984 budget, the U.S. Senate has instructed that the Madison lab be maintained and that no termination proceedings be taken. Conference action involving similar comment from the House of Representatives, is expected shortly.

This news is likely to please those who felt that the Madison lab, located in a northern environment, is necessary from the standpoint of its research on wintering management.

More On The Africanized Bees

A report released after the recent Apiary Inspectors of America Conference, presented the following implications of Africanized Bee migration into the U.S.

1. Africanized bee **characteristics** may reach the U.S. even if the bee itself does not.

2. Colony management techniques will change in the U.S.

3. Liability Insurance will probably be necessary.

4. Labor costs will increase.

5. Apiary sites will change and be difficult to obtain.

6. Livestock will be fenced away from apiary sites.

7. Substantially increased production costs will be realized.

8. Queen stock quality will be difficult because of the competitive mating edge of AB stock.

9. Problem areas caused by AB characteristics: Stinging, lower honey production, swarming, absconding, colony "take over" habits and current AB identification methods.

10. AB Swarm nests as reservoirs of disease.

Because Africanized drones gather closer to the apiary than European drones, a European queen, in an integrated environment, is more likely to mate with an Africanized drone. On a more positive note, despite the fact that very small swarms of Africanized bees can take over a weak European colony, strong colonies are not likely to be negatively influenced by Africanized bees, and requeening an Africanized colony with a European queen can be easily accomplished.

A Bill To Repeal The Honey Price-Support Program

Senate bill #1257, introduced earlier this summer, by summer, by Senator Conley, Chairman of the Senate Agriculture Committe, would repeal the honey price-support program if enacted. As contrast, the current Farm Bill stipulates that honey be mandatorily supported at 60% of parity. This would increase the price support, per pound, for this season, and reports approximate that the government will buy approximately one hundred million pounds of honey. Some opponents of the price-support system see the subsidy program as unhealthy and advocate a substitute program whereby the domestic honey production could flow in more normalized trade routes.

Botulism and Honey Labels

Earlier this spring it was reported that the USDA's Food and Nutrition Service (FNS), had ordered a labeling requirement for honey distributed through the government's surplus commodity distribution programs. The statment read: "It is not recommended that honey be used in foods for infants under one year old." Now, according to Henry Rodriguez, director of FNS, that label statement has been dropped in favor of a printed fact sheet that will accompany shipments of honey and will be made available, as public information, by regional and state officials responsible for distributing the honey. According to Mr. Rodriguez, the FNS felt that, because no such labeling requirement exists for commercial honey, none should exist for honey processed and packed for government distribution. However, statistical data on infant

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bolulism deaths, obtained from the Center For Disease Control in Atlanta, lead the FNS to believe that they should provide consumers with what information is currently available. Mr. Rodriguez acknowledges that honey is not conclusively linked to specific infant botulism deaths, but that the possibility mandates public awareness. □

Pesticide Damage In Illinois

In early June, bees belonging to Vernon Miller of Cutler, Illinois, Alan Byrd of Steeleville and Alfred Trost of Waterloo, were harmed, in great numbers, by an application of pesticide that Chief Illinois Bee Inspector, Eugene Killion, has confirmed to be methyl parathion. Between the three beekeepers, approximately 170 hives, at a capacity of about 30,000 bees each, were killed, and others were left in a seriously affected condition.

Cecil Bannister, a nearby farmer, admits to hiring an applicator to aerial spray for alfalfa weevils, buts says he was told, by Southwestern Coal Corporation, from whom he rents the land, and from both the pilot and feed store worker from who he bought the chemical, that such spraying was recommended and had been conducted before. Furthermore, he claims, nothing was said about toxic effect on bees, nor does he remember a label warning.

According to Inspector Killion, the state's next step will be to determine whether a warning, an administrative hearing, or criminal charges will be the appropriate course of action.

Honey To Be Part Of The "Give Away Program"

As part of contracts awarded, earlier this summer, by the Commodity Credit Corporation, honey will be included, along with cheese and other commodities, in the free food program of the Emergency Food Assistance program. 4.59 million pounds of honey were awarded, on contract bids, for packing and distribution under that program.

Reducing Hazard To Honeybees

Union Carbide Agricultural Products Company, Inc., recently released an 8½ x 11", full color, glossy publication entitled: "Reducing Hazard To Honeybee." Unquestionably, the value of such a printing, from Union Carbide's standpoint, is that of good public relations. Beekeepers reading "Reducing Hazard To Honeybees" are likely to notice that the suggested precautions for beekeepers are a third longer than suggested precautions for applicators of pesticides, and that suggestions such as relocating colonies that might be exposed to pesticides, or trapping contaminated pollen to reduce colony losses, may not, in many instances, be practical or prudent management. None-the-less, the publication contains 11 pages of information worth reading. Particular emphasis is paid to explaining the hazard reduction in the application of SEVIN® . Moreover, "Reducing Hazard to Honeybees" is an example, despite all other motivations behind it, that there is a growing sensitivity to the bee/insecticide problem. Because such problems are more often resolved by cooperative communication than by hostile confrontation, the emergence of related literature, be it from the beekeping or chemical producing communities, is a healthy portent. The publication is available from Union Carbide, Box 12014 T.W., Alexander Dr, Research Triangle, NC 27709.

A New Alfalfa

After 30 years of research effort, scientists at the University of Florida's Institute of Food and Agricultural Sciences have developed FLORIDA 77, a new alfalfa that is proported to resist prime diseases and will persist up to three years without replanting. The crop does demand rotational grazing, which means that, when not in use by grazing animals, bees could take advantage of a full blooming period. The nectar producing abilities of FLORIDA 77 are not, however, well-documented. Those interested are advised to consult their local agriculture officials first.

Bees And Cherry Virus

A recent issue of THE WASHINGTON STATE BEEKEEPERS ASSOCIATION newsletter, included the following information from Gaylord I. Mink, Plant Pathologist:

Research at Washington State University has shown that bees which are used to pollinate various stone fruit crops in California can be a potential source for infecting sweet cherry trees in Oregon and Washington with either of two pollen-transmitted viruses: Prunus necrotic ringspot virus (NRSV) and prune dwarf virus (PDV). Over the past three years we have found that most of the hives which enter Washington in the spring from California contain pollen that is highly contaminated with one or both viruses. In addition, we found that some of the bees which emerge from these hives shortly after arrival can carry virus-contaminated, viable pollen on their bodies. Thus under conditions where the bloom dates in California and Washington coincide it appears that at least a portion of the bees are capable of delivering virus-contaminated pollen to flowers of healthy trees in Washington. On the positive side, we have been unable to detect infectious pollen either in hives or on emerging bees when samples were taken 14 days after exposure in California. Even though research in this area is still incomplete, the results suggest that the potential for infecting Oregon or Washington trees with contaminated pollen acquired in California can be drastically reduced, or perhaps eliminated, by scheduling a minimum of 14 days between exposure to stone fruit pollen in California and pollination of cherry trees in either Oregon or Washington.

Increased Tariffs On Foreign Honey

Representative Richard Shelby (AL) has introduced a House Resolution (#1217) calling for increased tariffs on foreign honey. Senator Pressler (SD) has filed a companion bill in the Senate that would increase the tariff from 1 to 10 cents per pound of honey from "Favored Nation" status countries and from 3 to 30 cents per pound from other foreign producers.

These legislative attempts are in response to the increasing ill-affects of honey imports. It is also an alternative to the proposal by the USDA that the Secretary of Agriculture have "discretionary authority" over the Honey Price Support program. Proponents of that option believe the import difficulty could be solved by allowing the Secretary to set price support levels where it would be unprofitable for foreign honey producers to export honey to the U.S. Critics of that suggestion claim that domestic honey producers will be too seriously affected by the time the necessary economic impact would come about.

The tariff concept, too, has opposition. Many who doubt its wisdom recall dismal failures of past agricultural tariffs. Others feel it to be philosophically against the concept of free enterprise. Still others are of the opinion that it is an artificial quick-fix, and what is truly needed is a long range program for effectively promoting and marketing honey in such a way that the industry can compete against all outside forces.

Two Tone Chevy For Sale

From time to time we hear reports of person whose cars become besmerched by the results of bees making cleansing flights. Certainly, we often hear about it from A.I. Root Company employees who park their cars near the company beeyards. Now, from THE WISCONSIN BADGER BEE, comes word that several car dealers in Western Wisconsin have experienced fecal droppings so intense that the situation was reported to police. One

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Bee Talk

by DR. RICHARD TAYLOR

Trumansburg, NY

The campus of the University of Rochester is covered with European linden trees, and not far away is a street, appropriately called Linden Avenue, that is lined with lindens — or basswoods, as they are also called — both American and European. Years ago I lived between these two places, where I had about a dozen hives on the roof of my garage, right in the city, and I harvested beautiful comb honey so fast that I could hardly keep up. The European lindens, a common ornamental tree, bloom first, in late June, and then the entire campus of the University is saturated with their fragrance. The American lindens, which are very large, gorgeous trees, usually start blooming around the fourth of July, and we usually get an intense flow. Nectar comes so fast that the bees continue gathering it even during light rains, and the blossoms are protected from the rain by their structure. They appear underneath the broad leaves, and hang downwards.

Every June, when I step onto the campus and am assailed by that fragrance of basswood, my head begins to spin with thoughts of moving some bees up there. I could put maybe eight or ten hives on my little trailer and back it into some out-of-the-way spot when no one was looking, leave my name and telephone number there, then be prepared to move it as soon as some irate manager of buildings and grounds tracked me down. By that time I'd probably have my honey crop anyway.

But I've never followed up on that. It remains a pipedream. I noticed the other day that the basswoods there are building up, that even more trees have been planted, and soon the air will begin being filled with their fragrance. But my bees will be 80 miles away.

Actually, I've never had much luck with migratory beekeeping. A few years ago a farmer drove up to my house to say that his vast fields of buckwheat were about to bloom, and didn't I want to move some bees in there? I put about eight hives on my trailer and parked it right next to the fields — and didn't get a drop of buckwheat honey. A couple of years later I discovered another big field of buckwheat and did the same thing again, making sure I got the bees up there well in advance of the bloom. And again, not a drop of honey! That was sort of hard to believe, when every once in awhile I get buckwheat honey in my supers when I'm not even aware of any fields nearby.

Then last year I discovered a magnificent opportunity to do a bit of migratory beekeeping. I found, a few miles away, several immense fields of sunflowers, not yet in bloom. Sunflowers are known to be a superb source of honey, and I had myself, in previous years, gotten out of my car to inspect such fields, to find bees all over them, sometimes four or five bees on a blossom, sipping nectar. I became quite dizzy with excitement this time, for I knew I was going to be in plenty of time to catch that bloom. I loaded five hives onto my little trailer and parked it right near the middle of the biggest field of sunflowers, supered up, and went home to await the great harvest of sunflower honey.

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Dr. Taylor on his experiences with migratory beekeeping. Trying for buckwheat honey and getting none — trying for sunflower honey but getting buckwheat!

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What happened? I didn't get a drop of sunflower honey, but got, instead, a few supers of buckwheat! All of which confirms, in my mind, that the ways of nature are mysterious, and the ways of bees more mysterious still.

The thought of moving bees around from one nectar source to another always fascinates beekeepers, but you seldom hear of great success at this. One of the heroic attempts was made in the last century by an enterprising gentleman from Chicago named C.O. Perrine. In 1878 he bought a steamboat and several barges in New Orleans, hired a crew of fifteen men, and set off up the Mississippi with a thousand hives in tow on the barges. His idea was to catch the bloom as he moved northward with the season, harvest immense crops of honey and make himself rich. Just about everything went wrong, with engines breaking down, bees drowning in the river, until this enterprising beekeeper found himself down to 600 hives and no honey, a total failure. Other beekeepers have had a little better luck living on barges with their apiaries and moving about on the waterways, which is a romantic picture. Their efforts are all described in a chapter of Frank Pellett's delightful *History of American Beekeeping*, now unfortunately out of print and scarce.

The idea of moving bees hither and thither to the great nectar sources, as they come into bloom, is a fascinating one, but I don't think I'll try it again until I hear of someone else who has tried it with success. But I know the idea is not going to die easily in me. The next time I smell the fragrance of basswoods and see someone else's bees on the blossoms, or see a vast field of sunflowers or buckwheat, my head is going to start spinning, and I'm going to have to remind myself that I tried it three times, and lost each time. □

Dr. Richard Taylor showing the inside of a hive to future beekeepers. Photo by E.W. Pollman.

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Welcome

We are pleased to welcome Dr. Richard Taylor to our *Gleanings* staff as a Contributing Editor. Dr. Taylor's articles and monthly columns have been a favorite of readers for many years. Those who have benefited from his informative and natural style of writing can look forward to sharing his expertise, in new and varying ways, through the pages of this publication.

Beekeeping Technology

By DR. JAMES E. TEW
The Agricultural Technical Institute
Wooster, Ohio

Hive Top Feeders Simple And Efficient

Ideally, a discussion on a particular type of feeder should be written from the aspect of preparedness—of forethought. My association with hive top feeders resulted from an angle of acute desperation.

Ohio's late, wet spring resulted in a considerable number of colonies that had good strong population and practically no honey stores. Obviously, we had to feed—and feed we did with all types of feeders.

Except for open pit feeding (which seemed to feed most of the bees in Northeast Ohio), we quickly found the best results were achieved with top feeders.

Top feeders are not a new idea, nor is there a shortage of top feeder designs. The main features all top feeders have in common are: (1) They are positioned on top of the hive, and (2) they have a passageway that allows a controlled number of bees in the feeder.

Figure 1. Basic Hive Top Feeder.

One of the simpler designs is shown in Figure 1. The feeder rim in this particular model is 2½" (6.4 cm) deep, but the depth can vary depending on the amount of feed one wishes to give a hive at a single feeding. The center "island" with the entrance hole should be approximately ½" (1.3 cm) shorter than the height of the rim. The bottom was made from tempered masonite, and in this case was sealed with paraffin. As with other feeders to be discussed, fiberglass served as a better sealant. Smith (1972) described a feeder of this design, but the island had a 3" (7.6 cm) square opening instead of a round entrance. This particular feeder had the disadvantage of allowing a considerable number of enthusiastic bees to fly out to greet the beekeeper with the syrup. However, it has the advantage of floats in the syrup to prevent bees from drowning. Wheat straw worked well for us.

Figure 2. Brother Adam Type Feeder.

A second design, only slightly more complicated than the feeder just described, is used by Brother Adam at Buckfast Abbey in England as shown in Figure 2. The rim is 3" (7.6 cm) deep. The island is round with an auger hole bored as an entrance to the feed.

The "island cap" is a cut-off can that allows approximately ¼" (.6 cm) between the can wall and the island. Obviously, a larger auger hole (A, Fig. 2) would allow more bees access to the syrup. The island cap has a slight indentation (B, Fig. 2). As the syrup gets low, bees can get into the feeder proper to completely clean all syrup from the feeder. As in the previous feeder, the can height should be approximately ½" (1.3 cm) lower than the rim walls. Otherwise the can will stick to the hive top resulting in a brief moment of excitement at feeding time. This particular feeder has a ¼" (.6 cm) plywood bottom. The inside of the feeder is waterproofed with paraffin. Even though I have not personally tested it, I suspect the square island with the round entrance (Fig. 1) could be covered with a can thus preventing bees from drowning.

Szabo and Neilson (1982) described the feeder shown in Fig. 3. Rim sides were 3½" (8.8 cm) deep. A rectangular entrance measuring 1" (2.5 cm) x 4" (10.7 cm) was surrounded by a frame as shown in A, Fig. 3. Inside side walls were recessed ¼" (.6 cm) and are ¼" (.6 cm) shorter than outside walls. When the outer frame is placed over the inner frame, spaces result on both sides that allow controlled numbers of bees to feed without bees drowning or without great numbers of bees flying out when the cover is removed. The outer shell is removable to facilitate cleaning dead bees from the inner frame. A notch was cut to allow bees to clean all sugar syrup from the feeder (B, Fig. 3). If continuous feeding is desired, the notch can be plugged thereby keeping all bees inside the shells.

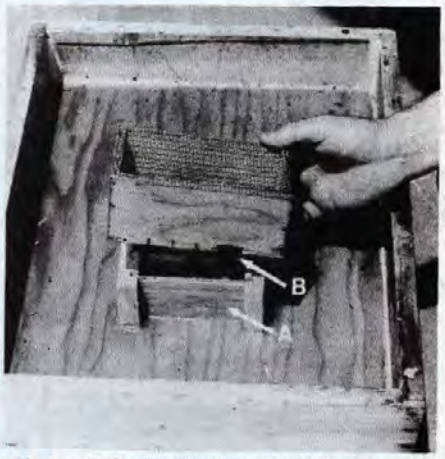

Figure 3. Szabo Neilson Modified Feeder.

A feeder referred to as the "Fox" feeder, Burgess (1973) had an entrance across the entire end of the feeder (A, Fig. 4). Hardware cloth (8 mesh) covered the entrance and folded over the inside wall and went down to the feeder bottom. The feeder shown in Fig. 4 is simply a shallow super with a bottom made of sheet metal. Fiberglass resin was used to seal all joints inside the feeder. The metal bottom did not work particularly well. When the feeder was removed from the top of the hive, the bottom would bulge. Leaking was always a problem with this feeder. The feeder design was not at fault—simply the material used to make the bottom.

The four top feeders that are described are by no means the only variations possible. Coggshall (1953) positioned two customed designed aluminum pans in a shallow super. A narrow slit between the pans at the center of the super served as

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BEEKEEPING FOLK ARTS

Honey & Hive Products For Cooking And Other Home Uses

By AMOS ARBEE

Someone along the way of my travels told me the following little story that I would like to share with the readers of *Gleanings*. It seems there was a certain man that was riding on his donkey down a narrow and rather steep road somewhere in Asia. A passerby slowed down and remarked, "Why don't you get off the donkey and carry him as he is too small to ride?" To which the man complied. Some time later during his travels another passerby slowed down and remarked, "Let the donkey down and you ride him as it should be intended." At this time the poor man was totally dumbfounded. The moral to this particular story might be that whatever one does someone will surely object. This probably has been true in regard to using honey in cooking and baking.

Some people may be inclined to say that it's entirely too difficult to work with honey compared to sugar. But actually, the opposite usually seems to be the case.

And the end result quite often changes one's habits in favor of using honey in recipes.

"Squirrely Honey Bread"

7 cups flour
½ cup honey
½ cup butter
2 tsp. salt
2 pkgs. dry yeast
1½ cups hot water
1 cup warm water
1 cup chopped pecans or walnuts

Dissolve butter, honey, salt in hot water. Dissolve the yeast in the warm water. Add to the melted butter when cooled. Add flour gradually until soft dough and add nuts and knead until smooth. Place dough in a greased bowl and let rise about 1½ hours or until double in bulk. Punch down and form into two loaves. Put into greased bread pans and let rise again until about 1½ inches above the tops of the pans. About one hour. Bake at 350 degrees for about 45 to 50 minutes.

Serve warm if desired with lots of homemade butter, apple butter and cottage cheese. A lunch in itself.

Beeswax & Outdoor Sports

Now for some uses of beeswax for the sports-minded person. If you are contemplating a new gun stock and would like a beautiful finish, beeswax is a must. For almost any item used in the outdoors that has a tendency to spot rust, a thin film of beeswax applied on the item will usually do the trick and prevent rust from reoccurring. A cake of beeswax carried by the hunter or fisherman almost always finds a variety of uses even if its only purpose is lubricating that stubborn latch on the pen containing the hunting dog.

A cake of beeswax requires almost no space to carry with one but finds untold uses on your travels.

"Bee-wise and carry some on your next trip outdoors."

Heads Of Grain From Different Fields

A Guest Column

By STANLEY LOYER
VELMA CLINTON
and
C.M. COOK

Harvest Time

By STANLEY L. LOYER
RFD #2, Box 5690
Winthrop, ME 04364

The happiest time of the year for most beekeepers is that time of the year when the crop is harvested. Only then can one assess new techniques, the value of different strains of queens and all the calculated gambles and luck that are connected with keeping bees.

Removing Honey

Before the honey is processed into extracted, cut comb, or comb honey, it must be removed from the hive. After shaking and brushing, using bee escapes, blowing them out with a vacuum cleaner and using repellents, my preference is definitely for the latter. Benzoldehyde, a commonly known as spirits of almonds, has been used since it appeared on the market. "Bee Go" is probably as good and more readily available.

A few days before removing the supers one end is lifted about 45 degrees and any burr comb scraped off with the hive tool. All supers are treated in this manner and returned to their original positions. In a day or two all supers can be removed without honey dripping. All burr comb should have been immediately retrieved, to prevent robbing.

A fume board or cover is made of one inch lumber with the same length and width as the super but two inches deep. Celatex or ceiling tile are nailed or stapled to this frame.

When the time comes to remove the supers a couple of tablespoons of bee repellent are sprinkled on the underside of the cover of the fume board. The board is then placed over the frames of the top super, a couple puffs of smoke under the fume board seems to facilitate the bees' hasty departure downward. Working with two fume boards, a dozen shallow supers can be cleared of bees in less than 30 minutes.

Ammonium nitrate is a readily available

Stanley Loyer removing supers.

fertilizer and when heated, generates laughing gas (Nitrous Oxide). To rid the super of those last few bees, place it on a bottom board and cover it with a solid inner cover. A tablespoon of Ammonium nitrate in the smoker will generate a white cloud of laughing gas which must be directed at the entrance under the super. Plug the entrance with a rag. In a minute or two jolt each end of the super up and down a few times and the sleeping bees will drop to the bottom board. The bees should be dumped in front of their hive where they will soon regain consciousness. ***Editors Note: Use of Ammonium Nitrate should be approached with an awareness that the great mass of stupefied bees can create a situation that causes smothering within the pile of bees.**

Robbing

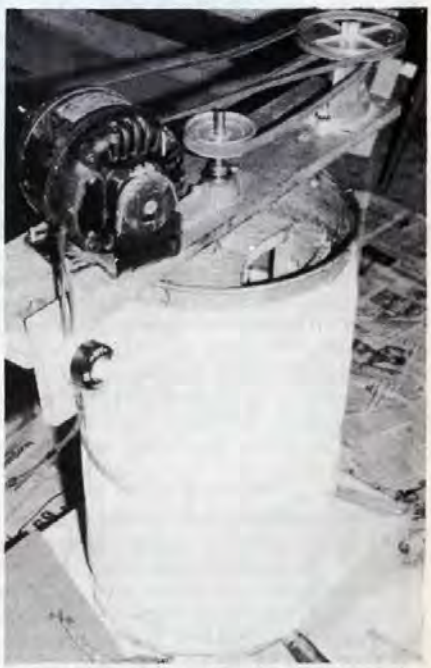
In the vicinity of Winthrop the honey flow suddenly stops about July 20th and from then until about the second week in August when it slowly starts again every precaution must be taken to prevent robbing. Once it starts the large hives go crazy, stinging and robbing everything in sight. For this reason its a good idea to reduce the entrances of weak colonies and restrict nucs and queens mating hives to an entrance when removing supers just large enough for two bees to enter. If robbing starts plug entrances of nucs with grass.

Extracting

It always takes longer to set up the equipment to extract than it does to remove, extract and bottle three to four hundred pounds. The extractor must be secured to a rugged box or platform by three turnbuckles and baler twine running from the top of the extractor to screw eyes in the platform. Weights in the form of lead, granite blocks, rocks etc., must be placed on the platform next to the extractor to stabilize it when combs of unequal weight are extracted. Two hot plates salvaged from an old electric stove modified so they have legs, are set on a box. Two honey tanks are set on a rugged 15 inch platform. One thickness of tricot nylon and four thicknesses of cheese cloth are secured to the tops of the tanks with nylon twine with a loop in one end. Burn the ends with a match to prevent unlaying of the twine.

To remove the cappings you just can't beat an electric knife. For many years, yours truly used one butcher knife and one uncapping knife. You need a gallon can of water setting on a source of heat to keep the water boiling. One knife is used while the other is heating and switch knives every 30 seconds.

My extractor is a home made job run by an electric motor and one person can average 100 pounds per hour running the whole operation. Every container of honey from the extractor is heated in a hot water bath until it's about 120 degrees and then quickly poured into the tank through the cheese cloth and nylon.



Stanley Loyer's extracting equipment.

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Honey Marketing

Part III

Out-Of-Home Sales

By SIDNEY GROSS
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St. Charles, IL 60174

If you are a small beekeeper — someone who produces two tons or less in a season — your major selling location will be directly out of your home. In discussing out-of-home sales I will leave aside a set of problems which you will have to resolve for yourself beforehand: the consent of your spouse, the availability of a small space to be used exclusively for display, and the willingness to deal with people who may come knocking on your door at odd hours (I still remember a good customer in the midst of divorce proceedings coming around after 10:00 PM and talking nonstop over two hours). Once you've settled the above issues you can consider a variety of sales locations.

I refer to locations in the plural intentionally; although you may think of your home salesroom as **the** location of your business you have to make people aware of its existence. One very effective way to do this is to have satellite outlets which are more public. When people buy your honey at, say, a health food store, they can read the label on your honey jar and discover for themselves your home phone number and address. You should look at any secondary location as a sales aid, like an ad or a sign.

Speaking of signs, once you've decided to go into business the first thing you should do is to place a HONEY FOR SALE sign right outside your house. If you are located on a busy street the sign will pay for itself rapidly. I used to live on a state highway and the reflectorized sign I used paid for itself within hours on the very first morning I set it out. Honey signs are available through many bee suppliers and I recommend them highly. Reflectorized signs work day and night and function well in conjunction with a self service stand which you might eventually want to set up on your front porch. If you live in a more suburban area, a routed wood sign is more tasteful though less likely to catch the eyes of passersby. One problem that people have raised with me as far as placing signs is concerned is that they are afraid of complaints by neighbors or that they may be violating a local ordinance. My advice is that we assume the truth of the adage that "he who hestitates is lost" — go ahead, display the sign and wait for someone to holler; most likely they won't!

Aside from placement outside your home, put a sign in each of your out yards. Even if these are in obscure country places, probably hundreds of people drive by them each day, thinking about bees and honey each time they see the hives. By putting your phone number and address on the sign you are telling such individuals how to locate you and buy your product. Out in the country you will want a fairly large, durable sign. An excellent source of these are real estate agents who have an accumulation of damaged metal signs complete with prongs that shove directly into the ground. If you know a real estate agent (and who doesn't?) see if you can take a few of these damaged signs off his or her hands. When you get them home, repaint them with anti-rust paint. I've found black lettering against a yellow background to be particularly effective.

One final place for a sign is on your motor vehicle. Magnetic signs were a fad several years ago but are still readily available, and they have the advantage of being instantly removeable should you be ashamed for the parking attendant to see it when you drive up to the Ritz for dinner. Ideally, you should place three of these signs on your vehicle, one on each side and one on the trunklid or tailgate. Since people will be reading these signs mostly at stoplights, keep the message brief, e.g., PURE HONEY FOR SALE. CALL (your phone#). Magnetic signs are very effective, judging from the many calls you'll get from people who will phone for directions to your home. I myself once picked up an excellent commercial account who happened to see my truck parked last summer on a Chicago street. Again, magnetic signs are a sales aid which will rapidly pay for themselves.

I mentioned earlier that as a small beekeeper your home is your major selling location but that you need other outlets. Your home is not a public place, but a store is. The main reason that you want your honey in other outlets is to increase the number of people who ultimately come directly to you. A storekeeper is a middleman who naturally takes some of your profits. What you are getting from the outlet is increased public exposure. Remember that your label must show a customer how they can locate you directly, so be sure to include your address and phone number on it, along with the actual food-related information.

One very obvious place to sell honey outside the home is where you work. The fact that you keep bees is a natural topic of conversation with your co-workers, and pretty soon they'll be wanting to purchase honey from you. If you want, keep a few jars handy in desk drawer so that you can sell on the spot. Personally I take a more conservative approach to selling on the job: If someone places an order I bring the honey the next day. I do this intentionally because I don't want anybody to conclude that I'm setting up shop at work; your own approach to retailing will depend on your personal job situation.

I mentioned health food stores earlier as good outlets for your honey. Small (independent) grocery stores, drug stores, and even gas stations with convenience sections are other possibilities. To nail down outlets of this sort you will need to do a lot of pavement pounding unless you have personal contacts in your community. Many small retailers are happy to diversify their inventories, while you of course gain the advantage of publicizing your product and your home location.

If you sell to an outlet you must provide the honey below retail. Notice that I didn't use the word "wholesale". Wholesale prices are what you read in the USDA reports published each month in *Gleanings*. These prices reflect bulk shipment and container exchange. As a small producers you are paying full price for your honey bottles and you would be in the red if you sold packaged honey to your outlets at wholesale. My pricing policy is to take my highest prices per pound (the one pound jar) and offer a 25% discount off that for jars in any size range (the retailer is of course free to set his own price in the store). I do not charge for delivery within ten miles and I am always prompt in filling orders. I offer 30 days net to established accounts. In the business world these terms are more than reasonable (especially since shipping is usually extra at the wholesale level). If a dealer balks at your terms my advice is not to sell to him but to look elsewhere.

Other places to sell your honey and make yourself known are fairs, bazaars, and farmers' markets. If you've ever done this you know that it's very hard work although you will almost certainly move a lot of honey in a short period of time. Be prepared to spend many hours on your feet, keeping up a stream of chatter about bees and honey. Dress casually and try to project a "country image" (I wear a ten gallon hat for this purpose — which in-

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Honey Marketing

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cidentally wards off sunstroke outdoors). Have a jug of water handy and also come to the fair with adequate change since change making facilities may not be available on site. A mechanical change maker on your belt is a godsend and a cashbox for the paper money (even a cigar box) is a necessity. Never put away any money until you have made change and your customer has accepted it. I have a detailed discussion of selling at fairs and farmers' markets in my book *Honey Marketing: Tips For The Small Producer* which is available from the A.I. Root Company.

Let me close with one observation about retailing: once you've started to retail your honey you've made a commitment to supply your customers whenever they order from you. Whether it's an individual or an outlet, once somebody buys from you they expect that you will have honey to provide the next time they order. You must supply your customers even if you run out of your own stock. Despite the fact that people will tell you how wonderful it is that you're small and have limited production, the first time you are unable to sell to them they will drop you forever. To obviate this, make contact with a large honey distributor who can supply your needs either in cans or barrels when your own stock is gone. Continued business from reliable customers is worth more than the smaller profit made when selling someone else's honey. Of course should you be so successful that you do run out before the new crop is in, think ahead and increase the number of producing colonies for the following season so that you decrease your dependence on an outside distributor. □

The Four Basic Methods Of Clearing Bees From Supers

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Also, if escapes are not tightly fitted, the slightest entry can serve as an invitation to robbers. Tape can be used to reinforce placement of escapes. One additional drawback is that, occasionally, drones or fighting bees clog the escape. In hot weather, this can cause trapped bees to smother. Ventilated escapes and boards are available for use in such weather. They serve a double benefit of helping to prevent wax from melting.

A Ventilated Escape and Moving Board

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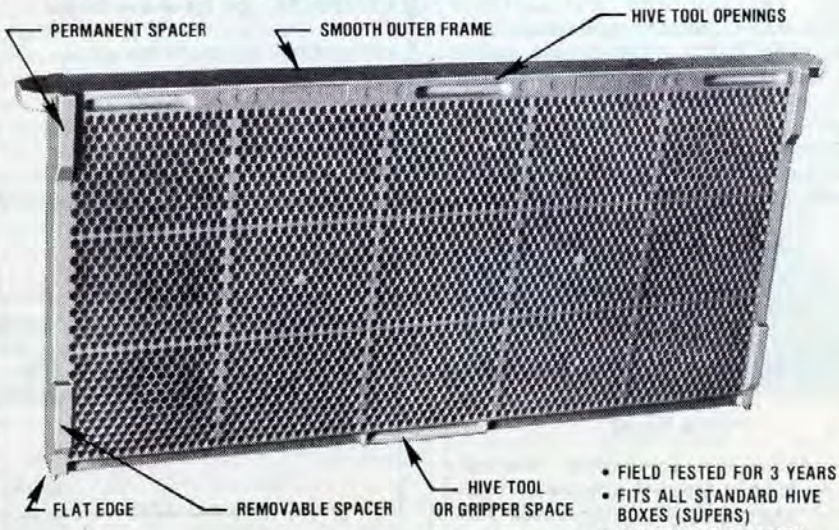


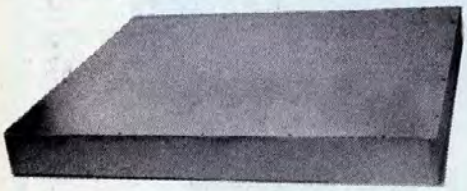
The Four Basic Methods Of Clearing Bees From Supers

Continued from page 417

A conical bee escape is a one way valve with no moving parts. The bees enter the large opening and exit through the small opening into the super below. Used with a rim two or more inches high allows for quick emptying of the super.

3. Chemicals

This method involves the use of chemical repellents. Chemicals used include: benzaldehyde and butryric anhydride (marketed under the trade name of BEE-GO®). An absorbent cloth is saturated with repellent and placed on a board which is then situated over the top bars of the honey super. Within approximately five minutes the fumes will have driven bees from the super. The obvious advantage of this method is quickness.



Fume Board

There have been complaints, however, that repellents are not completely successful when used on deep supers. Furthermore, temperature can have an effect on how well these chemcials work. To leave a fume board on more than five mintues is to risk stupefying the bees to such an extent that the colony will be harmfully disrupted. Follow directions, on chemical containers, very carefully.

4. Bee Blowers

Bee blowers operate from compressor units powered by truck engines or by self-contained units which can be wheeled or carried on the back. Blowers deliver strong blasts of air that can be directed through a super to clear bees.

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Questions and Answers

Q. My apiary is located in an area which is close to a river. I have had many calls to pick up swarms at a local industry which is right along a river. The question has been raised whether bees will fly over a large body of water and I would like your response to this query.

Another question which a group of us has differing opinions on is whether a group of bees would return to their original hive after swarming if the beekeeper could locate the queen among them and kill her.

Your opinions would be appreciated. K.M., PA.

A. How far a swarm of bees would fly to cross a body of water is something that could vary with circumstances, I am sure. No doubt a swarm would cross a river of moderate width and possibly a small lake if circumstances demanded that it do so. Large bodies of water over several miles wide or between points of land would certainly be a barrier to swarms.

It is possible that a swarm deprived of its queen may return to the hive from which it came but under some circumstances may not. I imagine if the swarm has flown a mile or more from the parent hive they would be unlikely to return, even if something happened to the queen. I have read of no experiments along this line so what would happen is probably pure speculation on our part. A recently emerged swarm, clustered near the parent hive would quite likely return to the original hive if deprived of its queen.

Q. Can your body accumulate venom over a period of time, until one day your body says "Enough!" If this fact is known then sone of us don't know this and it should be published periodically. If I am stung too many times I take *Diphenhydramine.* I get an itching sensation beginning in my feet and spreading. Some beekeepers say **any** antihistamine will work. Should one take a capsule every time one is stung? Do they alleviate and does it cleanse the venom from ones system? Is their anything that will cleanse ones system? Some think you can build up an immunity, and maybe you can up to a point, then your system rebels. R.A., Idaho.

Q. Venom from bee stings cannot "build up" in our bodies. It is just a case of whether or not our body can cope with the injected venom at the moment it is received. What causes changes in the status of ability to cope is apparently not clear to medical scientists. Of course it is possible to increase our capacity to cope and this is being done daily to many people who have a sensitivity to bee venom. We suggest that you check into this possibility yourself. The technique is relatively new. Your physician should refer you to an Allergist for testing and perhaps a series of injections. Advice on the administration if any emergency medicine should come from your physician.

Q. I have one hive of bees and the drones have yellow eyes. The eyes are about the size of the pollen balls bees carry. Is this unusual? J.S., New York.

A. It would appear that the yellow-eyed drones may be the result of a mutation or genetic abnormality. It is unusual.

Corneal pigment cells located under the corneal lens of the compound eyes apparently give the eyes color.

Capping The News

THE EDITORS
"Beekeeping Small Talk"

Continued from page 408

car dealer claimed that such incidents had occured before, but that he had no idea what the droppings were. Their concern comes from the fact that bee excrement causes extra cleaning work and, if left unattended, can actually etch car paint. Beekeepers should be sensitive to this problem, primarily because, if ignored, it could result in anti-beekeeping ordinances in affected areas.

Can You Fool Mother Nature?

Can You Fool Mother Nature?

Honey and hive products have always enjoyed a reputation of being good for the health. In fact, the "natural" and often romantic attributes create a mystique that those who market what comes from the hive have manipulated in a wide variety of ways.

It is somewhat understandable that others should attempt to captitalize on the reputation of honey — even if the product they are representing is artificial. "Apicultural Abstracts (1983, Vol. 34 No. 1) includes a report summary from "Food Product Development" (1979), 13 (8) 34, 37 [En, B] ADM, in which it is claimed that "honey-flavored" fructose sweetener or honey flavored liquid fructose (containing 90% high fructose corn syrup) has the sweetness and flavor of honey but is easier to handle. Specific applications were cited for baking, spreading, pouring and use in beverages for athletes.

In the same issue of "Agricultural Abstracts," a German Federal Republic Patent method for producing beeswax substitutes was summarized. Presumedly, the economic considerations, in this instance, apply directly to the cosmetic industry.

These items should serve as yet another reminder of how crucial it is becoming for the American bee and honey industry to develop strong, effective marketing and promotion programs. Competition now is not only from within the world of those who produce natural hive products, but from those who replicate nature through man-made technology.

Changes In Colorado Bee Law

Colorado has enacted changes in existing law to provide, among other things, that beekeepers in a previously exempt hobbyist category, will be required to control contagious diseases in their bees. All Colorado beekeepers will be required to purchase a license, the fee of which will be determined by the number of colonies owned. The top end of that scale, for 1,001 or more colonies, is $50. The ammended law also provides for state inspection of all beehives in Colorado. Previously, unlicensed beekeepers could not receive inspection even if they requested it. Testimony, by beekeepers, in favor of these changes, helped legislation pass.

Bee Postcards

The Institute of Honeybee Science at Tamagawa University in Japan offers two sets of full color post cards, eight cards per set. One set features a series of colorful bee postage stamps from around the world. The other set includes excellent photos from within the hive: nectar transfers, comb construction, egg laying, pollen processing, as well as foraging and swarming behavior. Both sets are distributed by Beekeeping Education Service, Box 817, Cheshire, CT 06410. $3.95 for one set. $5.95 for both.

Mating Mailed Virgins In Your Own Yards

By MEL DISSELKOEN
P.O. Box 9552
Wyoming, MI 49509
U.S.A.

In 1982, virgin queens that I produced were introduced in the International Mating Nuc™ and mated in my yards. In 1983, I bought virgin queens from a queen breeder and introduced these mailed virgins into the International Mating Nuc and mated in my yards.

There is a great beekeeping principle that has either been ignored or forgotten for half a century. It is a tremendous asset in introducing virgin queens. The principle is this: "Queenless and broodless bees, when confined for four hours, will usually accept any queen given them." This was stated by Sladen and repeated by Snelgrove and I am telling you again now. Queenless and broodless bees when confined for four hours will usually accept any queen given them. Every beekeeper in the world can now mate their own queens whether they produce the virgins or buy them.

The International Mating Nuc was designed only for mating virgin queens and its functional purpose is only 2-3 weeks or until the queen is fertile. If the queen is not fertile in three weeks I disassemble the nuc as she will probably not mate at all. If a virgin cannot mate and lay in three weeks as is done in nature I don't want her and neither should you. Virgin drone layers will probably not start laying until after 21 days old. Most queens are laying at 14 days old and the nuc is disassembled. The bees are brushed off the combs and used for queen banks or returned to their parent hive. The larva soon dries up and the nuc is used again. Therefore, this is a broodless nuc so it can be operated in northern climates where nights can get down in the 30's and 40's F. With no brood to incubate at 92 degrees F., the tremendous stress is eliminated. The full force of 1 cup (500-600) of bees is defending the nuc against robbing and half or less would have to nurse brood. Being broodless it also interrupts the mite breeding cycle and takes less feed. The patented International Mating Nuc takes three commercially available round section combs that slide into the housing. It keeps the combs at beespace from each other and also from the housing. The bees will not plug it up and the combs can be removed. You can use finished or unfinished round sections but it is not necessary to have sections at all as six rings are sold with the International Mating Nuc. You can tape two rings together and insert comb into them. If you don't have enough honey in the round sections, queen cage candy or a non-runney-mixture of sugar and high fructose syrup can be dumped into the bottom of the nuc. This will sustain the bees for two or three weeks. There are two lids — one a perforated transporting and confinement lid and the other entrance lid. The nuc slides into a sunshield holder that can be set on the ground to prevent rolling or can be hung from any ¾ inch board stock (beehives, fences ect.)

Stocking the nuc can be done several ways. I recommend one cup of bees, by taking bulk or package bees and spraying them with sugar water. Then dip a cup of bees in the prepared nuc. I like to take the prepared nuc right into the yard. With a funnel and a package cage that has one screened side removed you can brush bees right off the comb into the nuc. You then quickly put on the confinement cover and introduce the virgin four hours later. On a standard full depth frame well covered with bees there is approximately two cups of bees, one cup on each side. Last summer I had a 90% success rate with one cup of bees and mated 29 out of 33 with only ½ cup of bees 87.87%. The power that one cup of bees had during the honey flow; with no brood to rear, is amazing. Therefore, you will be better off going less than one cup instead of more. A cup and a half or two cups may cause congestion during the flow. In a test I took ½ cup of bees and put in the refrigerator over night at 30 degrees F. and put on original location during the day. They would go into a winter cluster and condensate the nuc somewhat, but when I put them outside they soon warmed up and had no apparent ill effects. The queens mated and oviposition took palce normally.

THE INTERNATIONAL MATING NUC.

On May 22, Mr. John Caulk of Wooster, Ohio mailed me virgin queens that emerged that day. I received them on May 24 and introduced them into the International Mating Nuc. On June 7, when the queens were 16 days old I made a V.H.S. video tape of operating the nuc. I showed harvesting and caging the 16 day old fertile queen. The tape can be available to clubs and associations for viewing. The weather was extremely bad with lows in the low 40's and only 55-60 degrees F. in the daytime. I only mated 50% of these queens. What happened was that eight ounces of honey in one comb was not enough feed for these bees. With 40 degree lows and rainy days the bees could not forage and ran out of food. When a broodless nuc runs out of food it will issue a starvation swarm. If it had brood it might starve on the brood. I hived several of these starvation swarms that day. They end up mated but I lost a few of these swarms only because they ran out of food. It is difficult to tell you how much food to leave in the nucs; it depends on the time of year, geographic location, or whether there is a flow on or not. One cup of bees during a good flow doesn't need any supplement food. As stated earlier, in cold, wet weather the bees need more feed. Only you can make that common sense judgement. I am only telling you that if they run out of food they will abscond. What effects other baby nucs also effects these; so provide a little shade. This week it is in the 90 degrees F. and virgins I got from John Caulk emerged June 4th and six have already ovipositioned as of this date June 15th — eleven and nine days old.

If you buy virgins you can just introduce them in the International Mating Nuc. but I would like to see everyone especially kids like myself, ten years or older, know how to raise their own queens — either naturally as with the Miller method, or grafting as with the Doolittle method. Either way you should have at least 20 cells so you will need 20 nucs. I have made arrangements with an American incubator manufacturer to give an incubator to everyone that orders 20 nucs, strictly as a promotional item for the International Mating Nuc.; and not for retail. It's an egg incubator but can be adjusted to 92 degrees F. and emerge queen cells. If you take a two inch thick sponge rubber pad and drill ½ inch holes in it. Then put $^1/_8$th

Continued on next page

Mating Mailed Virgins In Your Own Yards

Continued from page 420

hardware cloth on the bottom of this sponge rubber you can put the sealed cells in this ½ inch hole so the virgin can't get out. Use little inverters that convert 12 volt DC as in your car or truck to 110-120 volt AC to run the incubator. These little 40 to 100 watt inverters plug into the cigarette lighter. You can then transport cells anywhere in the country and take the incubator into your motel room at night if you stop. These inverters even work without the car running.

In a test I am running now I simply go to a hive and pull out a frame well covered with bees. I then take two prepared nucs and put in a caged virgin queen with the candy punctured with a nail and exposed. I then put these nucs on the ground at the back corners of the parent hive. Then I brush one side of the comb in front of each hive. The old bees will return to the parent hive thus helping forage. The younger bees crawl into the nuc and release the virgin. Two weeks later the fertile queens are caught and the borrowed bees brushed off the combs so they can return to the parent hive. Maybe the parent hive could spare three combs or six nucs with two facing in each direction.

The International Mating Nuc as it appears when installed.

The foraging strength of the parent hive will not be hindered and these fertile queens can be overwintered in the parent hive to be used for splits in the spring.

This was proved by Mr. Emmett R. Harp of the U.S.D.A. Madison, Wisconsin in his article "Storage of Queen Bees" printed in the July, 1967 issue of ABJ.

You can mate virgins as long as there are warm enough days for mating flights and sexually mature drones to mate with. In 1982 I mated my last queen October 4th. Beekeepers can now buy virgin queens from their favorite breeder and mate them in their own yards. I can't raise every queen in the U.S. and Canada so please let me know if you want to sell virgin queens. I will pass that information on to prospective buyers.

If you have any questions I am only a postage stamp away.□

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IT PAYS TO KNOW

How to . . .

By P.F. THURBER
5522 127th Ave. N.E.
Kirkland, WA 98033

How To Foil Yellow Jackets Or Robber Bees

If you think a hive, even a strong one, cannot be robbed out, or if you think yellow jackets cannot kill off a hive, you had better think again. For sure they can and if, up till now, you've ever lost a hive from either of those causes, count your blessings! Me, I lost one hive, and I have heard of or seen a good many others wiped out. You would think a strong hive should be able to protect itself, and generally they can, but if they are demoralized due to queenlessness or pesticide damage or other reasons, they do not always put up a good defense. When they are under attack by yellow jackets, they are at a severe disadvantage because bees are not in the same league as yellow jackets when it comes to fighting or flying ability.

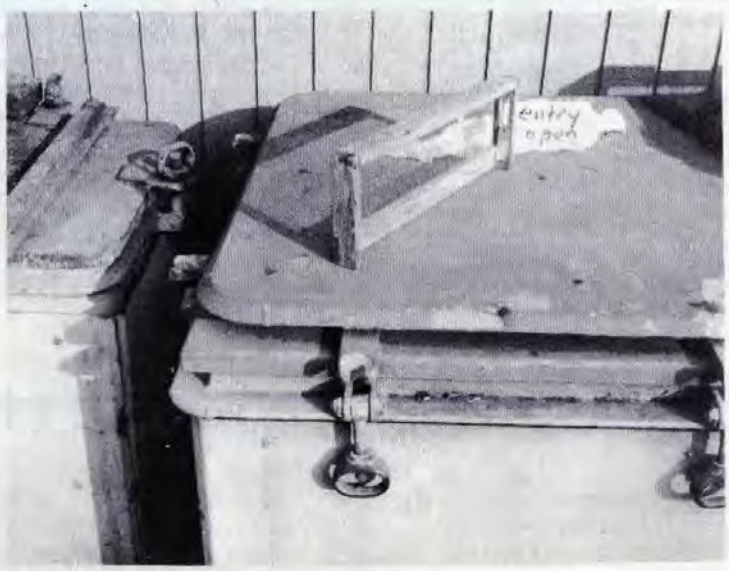
If you are skeptical go take a look at your landing platform and in the grass in front of your hives when there are numerous yellow jackets in your area. Often you see bees which have literally been bitten in two. The front end of the bee — the head and thorax complete with legs — is walking around; the abdomen is missing, Oh? Yep, a yellow jacket bit through the bee and took the abdomen which is high in carbohydrates to her nest to feed her brood. When yellow jackets attack heavily, you see them actually walk into the hive where they are attacked by bees. Generally, though, the yellow jacket gets food and comes out again to fly away. Incidentally, I do not know why bees apparently make no effort to guard their queen, but I have seen a yellow jacket make straight for a queen and attack her while I held the frame in my hands! Whether this is common I do not know, but yellow jacket attacked hives are often left queenless.

If you read the bee books, they describe normal robbing of bees by bees and silent robbing of bees, and they have suggestions as to what to do. They mention restricting the entrances. That works, generally. You take a piece of metal window screen about two inches wide and any length you think appropriate. Take as a good suggestion a screen 16″ long. Bend it back on itself to 12″ long. Then bend the screen in half widthwise so you have a 12″ long "U" bend in it. Tuck this screen into the entrance with one end tight against a side rail of the bottom board and the bend of the "U" facing into the hive. This lets the bees have all the air they need, but they now have only a 2¾″ entrance so they do not need so many guards. The other suggestion in the bee books is to throw grass or straw over the landing platform. Robbers then have to crawl through the grass or straw to get in and that puts them at a disadvantage. Another suggestion from the books with which I have not had any luck is throwing flour on robbing bees or bees fighting on the landing platform. What you are supposed to be able to tell is what hive is robbing by checking other landing platforms. The hive with bees flying with flour on them is the aggressor. Then you are supposed to pick up the robbing hive and put it exactly in the place of the hive they have been robbing and put the robbed hive where the robber was. I guess I am not lucky because I never was able to tell which hive was robbing. In fact the time I tried to do that apparently three hives were robbing one. At least I think that was what was going on.

Yet another suggestion was pick up the hive being robbed and move it more than two miles away. Well — for sure that is a lot of work, but I guess it would work, but if the robbed hive was badly hurt, maybe it would be so demoralized it would get robbed out somewhere else. I just do not know.

Now actually I do know what to do when a hive is being robbed or attacked by yellow jackets. What I do never fails. I have anti-robbing screens. I made them first when I started seeing my queen mating nucleus hives wiped out. It is obvious a mini nuc with as few as 100 bees had not many guards — maybe up to a dozen. When those are killed, there goes the nuc. So, you must have anti-robbing screens if you want to keep mini nucs and full size hives close by. My mating nucs were all within 75 feet of my bee yard. After I made the anti-robbing screens I had to learn one other thing, and that was do not open mating nucs when the big hives were close by and there was no honey flow. Open the nucs only at dusk when the big hives have stopped flying. If you forget this, you will find a robber from a big hive flys into the mating nuc and then when you put the lid on the mating nuc, the robber finds out how to get out of the nuc and finds the exit to the anti-robbing screen. Then the robbers come and go at will. There goes your nuc.

With the anti-robbing anti-yellow jacket screens you have to put on the screens when you see the problem but you leave the exit closed. Then at dusk you remove the screen and the robbers fly out and to their own nests. Then you open the exit to the anti-robbing screen and reinstall the screen. The following evening again at dusk you will find a few of the bees in the



Box entrance screen modified into an anti-robbing screen.

Continued on next page

Continued from page 424

hive you have been protecting got out and did not remember how they got out. No problem. Remove the anti-robbing screen momentarily and let the bees in and then reinstall the screen.

Now how do you make an anit-robbing screen? That is easy. Remember there was an article on how to move bees and one installment showed a Laidlaw box entrance screen (*Gleanings*, Feb. 83, p. 83)? Well, take an entrance screen and cut a slot in one side of it. Do not make the slot too big — say ½" by two inches. Cut the slot up near the top because you cut a piece of sheet metal and drive a nail in one end so you can rotate the metal to open or close the slot. That way you not only can use the screen as an anti-robbing screen but also use it as a moving screen.

How long do you have to leave an anti-robbing screen on the hive? I cannot tell you for sure, but I have removed them after four or five days and robbing did not start again, but play it safe and restrict the entrance with a tuck-in screen. Oh, I want to warn you that I do not think it is smart to just remove a victimized hive from the bee yard and simply take it away. Yes, that probably may work but there is a good possibility that the frustrated robbers will start on another hive so if you take a hive away do this: put an empty hive exactly where the hive being robbed was. Put some honey in it — not a lot, but maybe two or three partial frames. The robbers will rob it out and when the honey is all gone and has been for two or three days, the bees will no longer show any interest in it. Then you can remove it and put the components back into storage.

Now let me make some suggestions. Try not to let robbing start. Be careful with working bees during a dearth. Use anti-robbing hive manipulation cloths if need be. Do not take a frame out and lean it up against a hive during a dearth. Put it in a work box with a hinged lid. If you take off honey put that in a work box and carry the work box closed to your truck or where ever and then transfer it to empty supers there. Be sure you have a closed bottom under the super and put a lid on it as soon as you can, but at least do not expose honey near the hives. Second, do not throw bits of burr comb around the bee yard especially during a dearth. Third, do not over-smoke bees and demoralize the guards. Robbers just might take advantage of the situation. Work at dusk if you can.

Now about yellow jackets: Friends tell me beer, with an inch left in the bottle and shaded so rain does not get in is a good answer. They say bottles will be full of dead yellow jackets very soon. However, don't be like friends of mine. They bought three cases of beer and no empties up to a Barnaby thistle location. By the time they had drunk most of 72 bottles they were so tipsy that had to sleep it off laying on the ground under their truck. An English publication suggests taking a pint jar and placing a tablespoon of jam in the jar. Fill each with water about half full and shake well. Then take a screw driver and poke a ¼# hole in the lid. In warm weather the jam and water will ferment quickly and attract the yellow jackets who drown in the jar. This I have not tried.

Another suggestion: if you can find the yellow jacket nest, kill the colony at the pest site. I have been able to find half a dozen yellow jacket nests nearby our home bee yard in the last three or four years. Fortunately they were ground nesters nearby and I just poured three or four ounces of 1% malathion or Diazinon in the hole.

If you have a situation like commercial beekeepers encounter here in the Barnaby thistle where yellow jackets almost seem to out number bees, all I can suggest is tuck in a screen and perhaps Dial-A-Prayer.

One last comment: while wet supers left uncovered at least 100 feet from a yard will probably not cause robbing, DO NOT DO IT! Bees from AFB hives could have organisms on their mouth parts and could put disease on the combs which your bees might pick up and lug home. The risk may not be great but why take an unnecessary risk? Either put wet supers on your hives at night or store them till next year.□

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Figure 4. "Fox" Type Feeder.

the feeder entrance. Coggshall indicated feeding rates were better during cold weather if the feeder were positioned beneath the cluster. Jones (1956) referred to a Wyman-Miller feeder that was two compartments above the brood nest. Mention was made of using the feeder to feed dry sugar. Stricker (1957) described the simple technique of pouring dry surgar in the feeder and then pouring water—no mixing. If the bees gave out of one ingredient, just add more of it.

After this discussion and our experience with these feeders, I and the other beekeepers at ATI have the following reflections on the topic.

Great care must be employed in constructing new feeders or modifying supers to serve as feeders. By the very fact that a beekeeper is giving his colony supplemental food indicates an absence of a flow. Robbing is always a real and imminent problem around leaking feeders.

Paraffin was okay as a waterproofing agent, but not particularly good. Fiberglass resin or possibly approved epoxy paint always resulted in a better seal.

Hive tops that are in good condition are a necessity. On many occasions, we returned to feeders to find them filled with drowned robbers. We are considering tacking a piece of tempered masonite to the feeder rim to cover the feeder. In this regard, the feeder would actually serve as the top. A filler hole capable of being covered would be used to fill the feeder.

Normally, top feeders work very well. Occasionally a particular colony never "caught on" to exactly what was happening and did not take the syrup, but these instances were rare.

We were successful in feeding dry sugar to colonies in top feeders with the screens or cages removed. Others have reported that pollen substitutes could be fed. Reference was also made to filling top feeders with insulation to help insulate wintering colonies.

All in all, the top feeders were very successful and have established a permanent place in our operation.□

Acknowledgements

I wish to thank Jack Kuehn for his information on the Brother Adam feeder.

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Honey Processing Methods For The Hobby Beekeeper

By THE EDITORS

Extracting

An extractor, a mechanical device which whirls the uncapped combs of honey, is one of the basic needs of every beekeeper. If an extractor cannot be purchased, some arrangement can perhaps be made with another beekeeper.

After removing the capped combs from the hive they should be extracted as soon as possible. If they must be stored for several days the supers of honey should be covered to keep out dust, mice or other insects, including robber bees. Store the full super in a dry, warm room. Just before extracting be certain that the combs are warm, and the warmer the better, up to the point where the combs begin to soften. Attempting to extract honey from cold combs is an experience that no one should have to endure. If artificial heat is needed place a shielded light bulb under a stack of supers for several hours before extracting, or heat the room before extracting.

Uncap the combs and place the combs over a pan or tray to catch the drip; or place directly into the extractor. Spin the combs until the cells are reasonably free of honey. Older, tougher combs will stand much faster spinning than newly-drawn combs. Honey will be released faster from warm combs.

Straining

During extracting a small amount of wax and other material may be mixed with the honey. A coarse strainer with a mesh about the texture of window screening will remove most of this material as the honey flows from the extractor. The honey may then be heated following this preliminary screening, if desired. A low degree of heat is usually sufficient to control most granulation for a reasonable period of time. Under 140 degrees F. is preferable for most honeys processed at home. Always heat honey in a container which is jacketed or contained in a water barrier to protect the honey from the effects of direct heat. Strain the heated honey at once through a single or double layer

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Wintering the Honeybee Colony Introduction: Ventilation

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INTRODUCTION

The conclusion by R. Huish in 1815 that "Man may be considered as the principal enemy of the Bee..."[1] is never closer to the truth than when the beekeeper harvests surplus, and undertakes to prepare his colonies for winter. Huish admonished leaving adequate honey for the colony's use, substantiating the point with a reference from the first English book on bees published in 1609[2]. An abridgement of Huish was included in *The Farmer's Manual*[3], a newcomer in 1821 to the small list of books published in America containing material on bees and beekeeping[4].

The first American compilation devoted exclusivey to beekeeping by J. Thacher advocated that beekeepers provide sufficient bees to maintain colony warmth, in addition to adequate honey[5]; advice that needs underscoring even today. The manual for E. Townley's patent hive included Thacher's preface verbatum, as well as Thacher's description of how to bury hives for wintering[6].

In the small book that accompanied his Vermont hive, J.M. Weeks recounted his experience with 94 successive days of cold weather: he placed screens under the hives, and carried them into a warm room to permit them to feed and recluster on new combs of honey[7].

The first substantial volume on beekeeping in North America, published by T.B. Miner in 1849, had slightly more than one page on the subject of winter management with an introductory sentence which is still appropriate: "This is a critical season for bees, and their proper management is but very imperfectly understood at this period"[8].

M. Quinby's 1853 text included fundamentals to be considered in determining how best to winter bees; a promise Miner did not fulfill in his book. Quinby's advice on wintering in a repository above ground, first published in 1848 in the *Dollar Newspaper* (Philadelphia), is as contemporary as that appearing in recent bee journals[9]. In the autumn of 1850 Quinby had communicated his methods to Miner, who tried them and published an essay on the subject one year later[10].

L.L. Langstroth is often quoted on wintering. In the first edition of his book (1853) he advocated a protector: a trench with stone, brick, or wood walls in which to house his double walled hives. They were to be provided with bottom-board ventilators to avoid extreme changes of temperature "without removing them from their stands, or incurring the expense and disadvantages of a covered Bee-House". He judged it "second only to my movable frames', and believed that "combined with doubled hives, it removes the chief obstacle to the successful culture of bees in cold latitudes"[11]. Although he had intended to secure a patent, by the second edition (1857) he indicated the portector proved too damp in winter[12].

Langstroth devoted considerable space to the problem of wintering in his second edition, but had no suggestions to add to the plans of others except a plug that his hive made it possible to replace empty combs with combs of honey in the center of the hive (which could also be accomplished in the earlier bar hives). He quoted J. Dzierzon on the use of cellars[13], and Quinby extensively on the use of above ground repositories. By the third edition (1859) Langstroth reduced the Quinby quotation to two sentences, and added Rev. Scholtz's directions for burying bees in a bee-clamp or earthen covered pit; a translation from the German by Langstroth's associate S. Wagner[14]. Dzierzon had also referred to Scholtz in his book.

The report of the first convention of beekeepers held in America (1860) recorded that the initial question was: "What is the best mode of wintering bees?"[15] The question still ranks second only to the interest that beekeepers have in genetic improvement of their stocks[16]. The dramatic increase in overwintered colonies in the Prairie Provinces of Canada since 1975 from 5 to 37% reflects the equally rapid increases in prices of package bees, queens, and sugar for feeding; as well as the uncertainty of securing packages in the first instance[17]. Alaskan beekeepers are trying all sorts of methods of overwintering, and are requesting editors of bee journals to publish information about wintering[18].

The authors shall endeavor to review the literature that might shed some light on the answer to the above century old question, and test E. R. Root's contention that "....many important subjects are misunderstood for the simple reason that they have not been amplified enough[19]. That ventilation is the first topic to be discussed is appropriate since this was a major subject at the 1977 Apimondia symposium on beekeeping in cold climates[20]. Those who ventured opinions at the convention in 1860 had various experiences with burying hives (clamps), placing them in cellars, or using double-walled hives; but all were unanimous on the need for adequate ventilation.

Hive Conditions

Since bees do not hibernate, they consume honey to provide energy for shivering, fanning, or contacting muscles isometrically (without shortening). These activities release heat, carbon dioxide and water vapor. The consumption of 50 lbs. of honey during the winter will produce nearly 25 lbs. of water as a result of the chemical reactions in the muscles and other cells, plus approximately 9 lbs. of free water already present in the honey[21]. Thus, approximately $^2/_3$ of the honey consumed by bees results in the formation of water; a smaller proportion than most foods.

Since air expands 1/490 of its volume with each increase of 1°C[22] and water vapor has a lower density than air, moist air in the hive rises to the top where it diffuses into the wood of the roof and walls, penetrates cracks and gradually gets out. R. Frisch calculated that 36 lbs. of honey consumed during seven winter months in Norway would produce a total of 13,422 cubic feet of water vapor (63.6 cubic feet per 24 hours, or an averae of 2.6 cubic feet per hour with a range of 1.4 to 7.1) requiring replacement of the air in the hive 6-8 times per hour with a winter's investment of 2 lb. of honey for energy.[25]]

It requires 60-70% of the honey consumed to raise the temperature of the bees, and 20% to evaporate the water resulting from the metabolism of the honey producing the heat. The 10-20% of heat in excess of that required to maintain the cluster temperature might as well be used to get rid of excessive moisture. If retained in the hive, the colony will eventually overheat and be forced outside to perish[24]. J.V.C. Smith included the account of such a happening in his 1831 "essay". The colony had been confined for one day to prevent the bees from coming out on the snow. Although the temperature was "10 degrees below freezing", there was honey running out of the hive from melted combs.[25]

The volume of carbon dioxide produced equals the volume of oxygen needed to metabolize the honey. The carbon dioxide mixed with the water vapor and warm air from the cluster rises to the top of the

Continued on next page

Ventilation

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hive. When the carbon dioxide level reaches 10%, the bees ventilate by fanning which draws in fresh air from the ouside[29]. T. Cowan used a frame with a tube that carried the incoming cold air through the warm cluster before entering the hive at the top. A second tube with a funnel opening near the bottom of the hive provided a passage for the warmed air as it was displaced by the fresh air coming into the top of the hive.[27].

When exterior temperatures fall, the warmer air inside is cooled as it strikes the walls of the hive and its ability to hold water vapor lessens. The excess water condenses on the cold surfaces of the hive and combs, and will form frost when temperatures are at freezing or below. The amount of such condensation is an indication of the size of the colony. It required four days for one of G. Mendel's best colonies to melt the ice that had accumulated on the bottom observation window of the hive[28]. When temperatures in the hive permit the frost to thaw, water will drip down on the bees clustered below. The effects of moisture on overwintering of bees in cold climates have been discussed by beekeepers for a very long time, but mainly on theoretical grounds without much objective data[29].

An analysis of choices of nesting sites by honeybee swarms indicated no preference for shape or whether the bottom was wet or dry, but those with wet tops were rejected[30]. Rotten wood is removed by the bees so that combs are established on sound wood, and a coating of propolis and wax serves as a barrier against moisture penetrating the wood[31]

The ventilation provided by 25 holes each ¼" in diameter in the front and side walls was not preferred by the bees, did not affect hive temperatures significantly, and the holes were soon filled with propolis. Swarms showed a preference for boxes placed at a height of 10' and feral swarms were found in cavities of trees at even greater heights. Entrances were often at the base or toward the middle of the cavity, and had less cross section area than entrances of manufactured hives. The 1¼" entrance hole used in the boxes was acceptable, and consistent with Avery's experience that swarms ignored his 8-frame decoy hives until he reduced the wide open entrances to ⅜ x 1½"[32].

When given a choice bees prefer a draft free hole in the ground to a wooden building but a wall is preferable to a straw basket[33] Whatever housing is available, they seal up cracks and crevises with propolis except for the entrance. Caucasians are known for their propensity to close even large openings such as the entrance with curtains of propolis[34]. Natural nests in tree hollows, or other cavities, generally have a single entrance which is often toward the bottom of the nest, and is usually a knot hole located high enough so that it does not become blocked with ice and snow. Honeybees do not provide for ventilation of their nests in contrast to the stingless bees (*Meliponidae*) which incorporate vents as they construct their nests in the open or in cavities[35]. Instead, honeybees alleviate overheating or remove excess carbon dioxide by fanning to create currents of air[36]. The smoke used in uniting colonies is visible as it is fanned out from the lower entrance[37]. Huber used a small tin windmill to keep a candle burning in an enclosed jar to demonstrate the function of the fanning he had observed when bes were confined in a transparent hive, and that he had heard within the hive during the winter[38]. This behavior enables bees to inhabit a much wider range of nesting sites than they could if ventilation was an essential consideration. When a hive is buried in snow, the current of warm air from the entrance melts the snow until there is a large cavity in front of the hive[39]. An outgoing and an incoming current of air provides ventilation through the single opening as demonstrated by burning a lighted candle under a bell jar with a divided aperture at the top that provides a down current at one side and an up current at the other side enabling the candle to continue burning[40]. D. Jeffrey demonstrated the importance of wind action in creating a suction to draw air from inside the hive through a top auger hole fitted with a plastic T-tube[41]. But it may not be necessary to use the plastic T-tube. On a windy day, the authors placed a smoker in the bottom of a stack of hive bodies with a single opening; smoke streamed out of the auger hole in the uppermost hive body directly. Since the temperature within the hive is somewhat warmer than the external air, the differential will provide a chimney effect even in the absence of a significant wind.

End Of Part I

Editors Note: Part II of this three part series on Ventilation, will appear in the September, *Gleanings In Bee Culture*. Featured in that section will be beekeeping practices related to ventilation and the question of reduced or no ventilation.

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The Four Basic Methods Of Clearing Bees From Supers

Continued from page 418

Surprisingly, bees usually are not unduly upset by the process and quickly re-enter the hive. The greatest advantage of this system is that is does the job quickly with no damage to honey or bees. The strongest disadvantage is that blowing machines cost more than any of the other bee removal methods.□

A portable bee blower is a quick method of removing most of the bees from a super.

Honey Processing Methods For The Hobby Beekeeper

By THE EDITORS

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of fine mesh cotton or nylon. The strainer cloth may be placed over the honey storage tank, allowing a deep fold within the tank. The strainer should be pinned to the rim of the tank or supported by a sturdy wire screen support. Warm honey will quickly pass through the strainer cloth if it has been screened previously through the metal strainer. The residue in the strainer cloth should then consist of only the finest of remaining material, making it unnecessary to change or clean the strainer cloth except after several strainings.

Bottling

As the honey settles in the tank the air bubbles or particles of wax which manage to pass through the strainer cloth will come to the top of the honey in the form of a light foam. This foam can be removed easily and completely be spreading a clean, dry cloth over the surface and then lifting off the cloth. The layer of foam will cling to the dry cloth. Before straining honey through a cloth the cloth should be dampened with water.

At the end of the settling period, several days is best, you may bottle the honey. There should be no foam at the neck of the jar after handling the honey in this manner. The honey will be clear of air bubbles and have good clarity.

This rather simplified procedure of extracting and processing honey is not necessarily complete in all detail but does provide some guidance for those who have had little or no experience in harvesting and processing honey. As experience is gained your methods may be refined which will improve your speed and efficiency. Some very elaborate and costly items for processing honey are available as the volume of honey processed increases but for the hobby beekeeper with only several colonies a quality honey can be packed without a large monetary investment. Aside from an extractor and possibly a honey tank the heating and straining equipment can be obtained in the beekeeper's own community.□

The Antennae Of The Honey Bee

By DR. MARK E. HEADINGS
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Have you ever wondered why the honey bee (like most other insects) has two thread-like appendages attached to the front of its head? Those two structures are called antennae (antenna — singular). Mites, ticks and spiders, for example, do not have antennae; however, they are not classified as insects either. There are a variety of sizes and shapes of antennae found on insects; however, the ones present on the honey bee are called elbowed or geniculate antennae. This is because they are distinctly jointed or hinged and remind one of the elbow of an arm (Figure 1). Ants which are close relatives of the honey bee have the same type of antenna.

Physical Structure — The first segment of the antenna (attached to the head) is much longer than the other segments and is called the **scape.** The second segment is called the **pedicel.** The major joint in the honey bee antenna is located between the scape the pedicel. The remainder of the antenna is called the **flagellum.** This portion is flexible between segments but not to the extent of the elbowed joint between the scape and pedicel. Female honey bees (workers and queens) have 10 segments in the flagellum plus the pedicel and scape for a total of 12 segments. Male honey bees (drones) have 11 segments in the flagellum plus the pedicel and scape giving a total of 13 segments. There is some question as to whether these segments in the flagellum should be called segments or subsegments. The reason is that they are only connected by a strip of membrane and have no muscles attached to them for movement. In contrast, the joint between the scape and pedicel is hinged with the scape containing two muscles which attach to the base of the pedicel thereby enabling the honey bee to move the flagellum about.

The antenna is connected to the head in a manner similar to a ball fitting into a socket. The ball-end of the scape is held in the head socket by a strip of membrane and is pivoted on a single hard pointed structure. Four muscles are attached to the ball-end of the scape thereby enabling the honey bee to move the entire antenna (Snodgrass, 1978).

Function — The antennae of the honey bee are covered with a variety of sensory organs or receptors which serve the functions of touch, smell and possibly even taste. These organs appear as hairs, pegs and plates. Certain sensory hairs on the antenna detect contact with an object by sending an impulse through a nerve attached to the base of the hair. There is also a group of cells in the pedicel of the antenna called the Organ of Johnston which is thought to detect movements of the flagellum (Snodgrass, 1978). Having organs of touch on the antennae in front of the head undoubtedly helps the bee avoid smashing its head into objects and to find its way around. This would especially seem important when moving about inside of a dark congested hive. One might compare it to walking in a dark room with your arms extended out in front in order to avoid abruptly bringing your nose into intimate contact with the wall.

Dr. Mark Headings, Agricultural Technical Institute, Wooster, Ohio.

According to Karl von Frisch (1971), the organs of smell on the worker honey bee antennae are located only on the eight outer segments of the flagellum. In other words, the scape, pedicel and two first segments of the flagellum have no organs of smell. He demonstrated this by cutting the antennae off at different lengths and then observing the bees' feeding response to scented sugar water. There are estimated to be approximately 3,000 plate-type organs of smell on one antenna of a queen bee, up to 6,000 on a worker bee antenna and 30,000 on a drone bee antenna (Snodgrass, 1978). Perhaps the greater number found on the drone antennae are necessary in order to help find the queen in the sky during mating flights. The sex pheromones of certain female moths can apparently be detected by sensory receptors on the antennae of the males at considerable distances. Gypsy moths have reportedly come to a female released 2.36 miles away (Chapman, 1971). That's what you might consider a keen sense of smell.

The sensitivity of smell in the honey bee may not be all that much different from that of human beings. In most instances, bees probably can see floral colors at greater distances that they can smell floral scents. Even flowers having a weak scent are probably detected by the bee once the antennae are brought into close

The Antennae Of The Honey Bee

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Propolis Production & Roland Bell

MR. ROLAND BELL of 6901 Robinhood Lane, Fort Worth, Texas 76112 is a beeman full of novel ideas. One of his latest inventions is a propolis trap which he calls a "gatherer" and as such applied for a U.S. patent. In response to my article in the April 1983 issue of "*Gleanings In Bee Culture*," entitled "Experimenting with Propolis Production," in which I detailed the construction of my own collector and its trial use, Mr. Bell mailed me two of his wooden devices, along with an aluminum harvesting tool, out of the clear blue. Received on April 13, I promptly installed them on two hives two days later (see photo for application). My object was to test his equipment against my own.

Mine is a screen format that replaces the inner cover and is left on location until the mesh is entirely full or until the advent of cold weather. Harvested at the end of an 88-day period, my three collectors yielded a grand (!) total of 4.5 ounces (27.57 grams).

What the Fort Worth resident sent was a three-quarter inch piece of lumber, 3½ inches wide by 19 7/8" inches (the length of the hive). It has eight slots, each about 17 inches long, the width of a 3/16-inch saw blade. It attaches to the side of the bee box when a similar piece of wood is sawed out and is held in place by wing nuts. As soon as the openings are propolized shut, one removes and puts on a spare.

Before I could install the Bell devices, I was forced to harvest the Texas bee glue that filled one completely and the other about half, using the excellent tool furnished. The first took 4.29 minutes to unload and yielded a half ounce of particles, dust and wood slivers, while the second only 2.20 minutes (more experience!) and surrendered the **same** amount. Denuding the traps was tremendously easier and faster than unloading mine; however, my devices did not gift me with free lumber, just propolis. Stamped out of metal, the Bell gatherer would eliminate the undesirable foreign material.

Photo 1: Roland Bell's propolis gatherer.

Inventor's Resinous Glue Trap Put to Field Test

By J. IANNUZZI
Elliott City, MD 21043

Some Unanswered Queries

The big question in my mind was how long did it take those little ladies to plaster shut those slits. The Lone Star stater answered that one in the missive heralding the arrival of his equipment: "Seven to 10 days" (the apian masons close only a sixteenth of an inch of the three-quarter inch deep slot).

In the same epistle, he also replied to several other unpopped queries:

1. He employs two different size traps: a 1" x 6" with 13 slots for the brood chambers and the "half-depth" size, which he sent me, for the supers (however, I installed them on the top part of my double brood chambers, just below the handholds.).

2. He works "12 hives, 4 boxes high on both sides top to bottom (8" gatherers per box) " never "wearing a net."

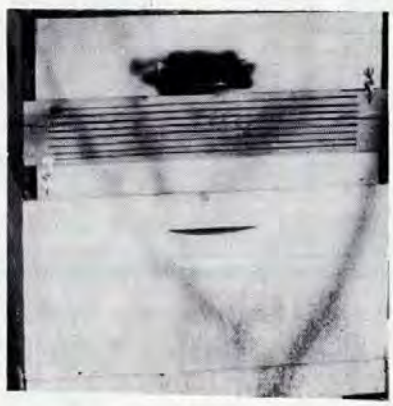
3. Harvesting was "every Monday in '82 starting in April through Sept."

4. PROPOLIS, USA purchased $75 of his output at $3 per pound until August when "the market went sour."

5. Two other concerns — "Queensland" and a place in California (not specified) — received seven pounds each of his output but have yet to pay up.

Testing the Bell Traps

From mid-April until the present (June 9) I have been operating two Bell traps on two separate hives, ten feet apart. Because of the cold weather early on, I stapled plastic curtains over them (I was also worried about the rain infiltrating). Removed May 5th, the one trap yield ¼ ounce of propolis, the other nil. On the last four Sundays of May, my experience was virtually the same with respect to harvesting. But the failure of one of the devices puzzled me. Both were on two-story (deeps) colonies of about equal strength but the producing trap was on the north (or cold) side whereas the other on the south. That was my only explanation.



Bell trap installed on northside of hive: very effective.

Bell device on southside: very ineffective.

In warm weather, what the enterprising inventor states about trap-filling is about right—seven to ten days; however, contrary to what he says, removing traps and installing replacement blanks has turned out to be a very stinging operation, especially in May when the bees were very active during the locust/poplar honeyflow.

Conclusion

During the period of the experiment with the novel Bell gatherers, my own type (screens) have been on three separate colonies. If harvested today, the yield would be just about zero. I must conclude that, within my own limited experience, the Roland Bell traps are the best device I have seen and tested for beeglue collection: they are fast and efficient; easy to harvest; however, they yield more debris (wood shavings) and add much more unwanted bee venom to the human body than my own!

One big question mark still remains in my mind, the answer to which I did not read in his unexpected epistle. Is his device weatherproof and does he leave it on over the winter or does he replace them with solid blanks?*

***Editors Note: Mr. Bell has left his gatherers on for three years without problems. He does, however, stop gathering on October 1, to allow bees time to fill cracks before winter.**

Antennae Of Bees

Continued from page 430

contact with the flower. One might expect that in this case sensory perception would be enhanced as a result of the organs of touch and smell being located in the same structure (antenna). Foragers entering the hive undoubtedly carry the odor of the flowers they have been visiting thereby stimulating other workers to seek and recognize the nectar source. Karl von Frisch (1971) suggests that bees can be trained to pollinate certain flowers (even red clover) if they are fed a sugar water solution scented with the flowers of the plants you want them to pollinate. One technique described is to soak the flowers in sugar water solution, them remove the flowers and feed the solution to bees in the hive. He has reported increased crop yields and increased honey production where this has been tested. This technique has apparently been practiced in the past in some countries, especially in the USSR. Bees obviously use their senses of smell and touch effectively in the hive to communicate and to perform work. As you may be painfully aware, it doesn't take long for bees to respond to the message imparted by the alarm pheromone once it has been released by other bees. It is also amazing how a bee can build a perfect wax cell in the dark even with a sense of touch. □

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Heads Of Grain From Different Fields

Continued from page 415

After the tanks have cooled, the cheese cloth and nylon are removed and the tanks covered with plastic similar to saran wrap with masking tape. All air must be excluded as honey has an affinity for moisture and if left uncovered even for a couple days it will absorb considerable moisture from the air and increase the possibility of fermentation.

The honey should set 48 hours before bottling to allow the air and pollen to rise to the surface. Most raw honey granulates in a couple weeks to a couple months unless it's put in a deep freeze, as is cut comb honey.

Cut comb honey can be processed by laying a comb on one-half inch mesh hardware cloth stapled to a wood frame, resting in a pan. A grapefruit knife kept hot in a can of boiling water cuts the comb readily. The cut combs should be separated, allowed to set overnight and heat sealed in cellophane or placed in plastic boxes.

The basement or a separate building which is BEE PROOF is superior to the kitchen because of the probability of honey overflowing, dripping etc. All bees brought into the extracting room should be killed or each one will return with a dozen of her compatriots. One thing vitally important is to spread two to ten layers of newspapers on the floor. The honey flowing out of the extractor will overflow at least once. Whenever necessary one or more layers can be rolled up and disposed of to be burned later. If gas or gasoline stoves are used the danger of fire is increased and appropriate means of extinguishing any fire should be available. A 500 watt plastic heat tape wrapped around the extractor, separated and secured in place with masking tape and then covered with newspapers for insulation and then wrapped with a waterproof covering helps the honey clear the extractor.

A cooperative effort between several small beekeepers might be advisable and can prove to be a lasting benefit in all areas of beekeeping.□

Plan Your Manipulations

By VELMA L. CLINTON
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If you are a hobby beekeeper, you probably often find yourself doing something you have never done before. There are so many manipulations that are necessary to keep your hives happy and productive that, as a novice beekeeper, you frequently run into the need to do something that is new to you, such as requeening, making a divide, combining hives, or that exciting moment when you remove your first frame of honey.

Anything new which the beekeeper wants to undertake should be thoroughly planned in advance. Written notes recording each step in the proceedings and a list of the equipment that will be needed can save a lot of grief. Your ideas on how to handle the situation should be committed to paper, so you can go over them again and again. Often additional steps, procedures, precautions or equipment will come to mind as you study your notes. You should research your beekeeping books and magazines for guidance and if you are lucky enough to know a more experienced beekeeper it's a good idea to show him your notes and ask for advice. Someone who has actually done the maneuver you are planning is in a good position to spot the strengths and weaknesses of your outline. These should also be written down and the entire procedure reviewed again, until you have a logical sequence of actions and are satisfied that you have covered everything.

For example, I recently decided to make a double-queen hive. I wanted to get section comb honey from the hive, but it just wasn't strong enough so I thought a second queen could make the difference. After mailing my order for the queen, I sat down and wrote out a list of things to do, which read: "Put two-three frames of sealed brood, plus a frame of honey and pollen in deep super with frames with foundation, replacing frames in old hive with frames with foundation. Shake nurse bees into new brood box. Place double screen over hive, place new brood chamber on hive with exit hole facing rear. Close hive and wait three hours. At the end of three hours, spray bees with sugar-water, spray new queen with sugar-water and release her on a brood frame (with unsealed brood, if any). Close hive. Equipment needed (in addition to usual smoker, etc.): Deep super with exit hole, five to seven frames, double screen."

That was a pretty good start, but while re-reading my notes, ramifications kept occuring to me. I thought that the new brood chamber would be much the same as a nuc and would probably need feeding with sugar-water, so I added a division board feeder with sugar-water to my list of equipment. Also, instead of needing only five to seven frames, I realized that I would need nine since I wanted to have a complete new brood chamber (with feeder, which takes up the space of one frame) and needed to replace the frames taken from the parent hive.

Again, nowhere in my notes had I reminded myself to make sure the old queen was not on the frames removed from the parent hive, a vital move which, if left undone, could prove disastrous to the whole project. And, where the notes indicated that it was time to add the new queen to the hive, there was nothing in them about getting rid of the workers who had come with her. Their presence could cause trouble with her acceptance, so they have to go. This information was added to the notes.

I soon became aware that these steps did not complete the manipulation. It established a nuc, but did nothing toward actually strengthening the hive; it weakened it in fact. A second set of steps was needed for combining the nuc with the parent hive, thus creating the two-queen hive I wanted. So I wrote out my ideas covering those steps and added them to the above revisions.

I checked my notes every now and then, trying to picture each move in my mind, until I was pretty sure nothing had been left out. My final notes read:

1. Set new deep super (with exit hole) on double screen in wheelbarrow. Deep super should contain six frames with foundation and division board feeder with sugar-water. Place remaining frames in wheelbarrow.

2. Locate old queen and set frame with her on it aside.

3. Take two frames of mosity sealed brood and a frame of honey and pollen from old hive and place in new brood chamber.

4. Shake two or three frames of nurse bees from old hive into new brood chamber. Replace the frame with old queen on it and fill empty places in parent hive with new frames, but make sure the foundation is not placed next to unsealed brood.

5. Place double screen over existing hive (less covers). Place new brood chamber, with exit hole to the rear, over double screen. Close hive.

6. About three hours later separate new queen from her escort, take cover and inner cover off the hive and spray bees in new brood chamber with sugar-water. Spray new queen with sugar-water. Release new queen onto a brood frame (onto unsealed brood, if any). Close hive. Equipment needed (other than usual smoker, etc.): Deep super with exit hole, nine frames with foundation, division board feeder with sugar-water, double screen and spray bottle containing sugar-water.

7. Two weeks later, place queen excluder over top of the old hive's original brood chamber, place new brood chamber, with double screen removed, over the queen excluder with the exit hole facing the rear of the hive. Place the supers for section comb honey over the new brood chamber. Close hive. Equip-

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Mistakes Some Beginners Avoid

It is natural that a beginner at any business as complicated as beekeeping should make mistakes. In the article which follows I have enumerated just a few of the areas in which mistakes are often made.

The Use Of Queen Excluders

Beginners in beekeeping often are perplexed as to whether they should use queen excluders. A beekeeper should use an excluder only when he definitely wants to keep the queen from laying eggs in a particular super above the brood nest.

When might such a need occur? Some operators may wish to keep their queen confined to one hive body. In such an event they may wish to place a queen excluder directly above that hive body. If so, they will probably have to elevate frames of capped brood periodically from that hive body or the brood nest may become crowded and bring on swarming. There is no reason why this cannot be done, of course, if one is willing to perform the work when it is needed.

One occasion that might prompt the operator to confine the queen to one hive body is when he wants to harvest a particular honey flow, as, for example, from sourwood, basswood, sumac or raspberry, rather than let this crop be used later by the bees, or mixed with one or more other flavors.

But the chief purpose of using an excluder is to keep the queen from producing brood in the midst of the frames that the operator wishes to extract under a normal program. If the honey flow is sufficiently extended to drive the queen down out of the area, her laying there may, under some circumstances, do no harm. But some queens are persistent in continuing to lay in the frames intended for extraction.

Too often the operator will find capped brood, or even eggs and larvae, in the center of a fine comb of honey. Usually he doesn't discover this until he is in the process of extracting. Then he is almost forced to set aside such combs and return them to a hive. By that time the chances are that brood is dead and wasted, and the honey cannot be extracted.

Most beekeepers operate under the plan of using two hive bodies of combs as a brood nest, and to provide room for stores for wintering. Under this method of operation the placement of an excluder above the second hive body will help keep brood out of the area in which combs of honey for extraction are being built by the bees.

By GRANT D. MORSE, Ph.D.
Saugerties, NY

How About Wearing Bee Gloves?

Should the beginner wear bee gloves? My experience gives me this answer: Wear them if you must, otherwise don't. And the don't is a strong one.

You may ask, why not? The fact is that the wearer of gloves tends to go at his work in the wrong way. He is so well protected, seemingly, that he fails to smoke the bees properly, both at the beginning of his operation, and periodically afterwards. He tends also to treat the bees with less consideration than they deserve. Soon he has them so thoroughly aroused that they may be inclined to sting right through his clothing.

The beginner tends to forget that honey bees are physically and instinctively well-equipped to defend themselves—up to a point. Even more than themselves it is their nest and their resources that they are inclined to defend. They are among the few creatures of the earth that habitually build up stores that a wide variety of enemies find worth stealing if permitted to do so. Nature has endowed the honey bee with a sting as protection against any being that threatens to appropriate her stores. Man is no exception to being regarded by the bees as belonging in that category.

As an operator approaches a hive he should first disarm the guards by applying a few moderate puffs of smoke at all the entrances. Before he removes the inner cover he should pry up one edge slightly and apply smoke to the opening, then pause long enough before lifting the inner cover to give the bees a chance to engorge themselves with honey and become calm.

The operator should keep the smoker close at hand and use it again as soon as any bee shows aggressiveness. If the operator is wearing gloves he tends to be neglectful of one or more of these details.

I realize that many beginners are so fearful of being stung that they decline to go without gloves. Experience will usually teach the beginner that being stung a few times is not such a disasterous experience as to be shunned totally. One's attitude of mind is important in this matter. A beekeeper, even a beginner beekeeper, who hopes to operate one or more colonies of bees without ever getting stung is, I feel, going at the business in the wrong way.

However, even many commercial beekeepers use gloves at times, particularly when the weather is unfavorable, or they are in a hurry.

The Importance Of Pollen

Many beginners fail to recognize the importance of pollen. This is true for colonies short of this food in early spring when even the earliest natural sources are not yet available. It's true, too, for nucs.

If a beekeeper is located in an area where pollen sources are normally plentiful, there is little to be concerned about in this matter, for colonies that were well established the previous fall will usually have stored adequate supplies at that time, covering it over with a bit of honey to keep it fresh.

In making up nucs and bringing them to an early productive status some operators forget that a rapid build-up calls for pollen as well as honey or sugar syrup. Most beginners are aware that it pays to feed nucs lavishly, and for an extended period in order to make it unnecessary for their limited working force to forage. At such a time a nuc can use a frame of pollen to advantage.

Feeding Dry Sugar

This has been a cold and wet spring. Bees have been confined to the hives for a large part of many days. Some colonies have become short of food. Many a beekeeper has experienced dwindling, or even death, of colonies, even in June. There are years when early June in this area provides scanty sources of both nectar and pollen. Today, June 3, most of the local sources are out of bloom — dandelion, fruit trees, yellow rocket. The clovers and raspberry are not yet in blossom. Yellow sweet clover will come along first but it is not usually a very prolific source.

The best way to feed colonies at such a time is with sugar syrup, unless, of course, one has surplus frames of honey saved out for the purpose. If feeding syrup is too difficult, a few pounds of dry sugar placed on the inner cover, with the hole of the cover left open, may save a colony. It's true that most colonies will not use dry sugar unless so compelled, but if they are in distress for food they definitely will do so. And the weather is usually warm enough to permit them to do so. I found it true once more today when I inspected my small yard of bees. A few colonies had nearly exhausted their supply, but it had kept them alive.

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Beginners Mistakes

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The Importance of "Extras"

By "extras" I mean nucs and additional equipment. Many good beekeepers of experience consistently plan on building nucs not only to replace old failing colonies but also to use for requeening. Adding a nuc to a queenless colony does more than just provide a new queen; it also provides a boost in forces. Some build nucs late in summer, wintering them over strong colonies with the inner cover of the old colony screened to permit the passage of heat, not bees. A four or five frame nuc will normally winter well over an old, strong colony.

Many operators build their nucs early in the spring so as to give them a long build-up, and not weaken too much the colonies from which brood was taken. But queens are more expensive in the spring. It is for this reason that many operators resort to using capped queen cells when they discover a colony that is planning to swarm. Such cells if produced from the right ancestry and in large, strong colonies, can yield superior queens.

Often there is no reason for haste in building up such nucs. They are allowed to develop naturally and at their own speed, sometimes being helped along a bit by being fed syrup. How valuable such units are when a failing queen is discovered, particularly if laying workers have not been operating too long.

Extra equipment is equally important. Many beginners make the mistake of not having available a supply of extra frames of comb or foundation, extra supers, bottom boards, and so on. Lacking such extras, they can't perform many of hte manipulations that the occasion calls for, such as establishing a nuc, splitting a hive, or adding a super.

The Value Of An Inner Cover

Some beginners (and veterans, too) try to get by without using an inner cover. It can be done. I can remember one commercial operator of several years back who used a piece of burlap as an inner cover. It didn't work too well but I suppose it saved a few cents.

What good is an inner cover? It can serve a multitude or purposes. For example, it can serve as a good means of upward ventilation; it keeps the cover clean; the bees find it easy to seal for winter protection; it makes smoking the top of the hive easier; it serves as an excellent medium for using a bee escape when taking off honey; it provides a place to feed dry sugar; it acts as an instrument for the passage of warmth upward to a nuc that needs such help in winter. The inner cover can also function as a bottom board for brood elevated from the brood nest below for the purpose of relieving congestion there. In such an instance, an upper entrance is usually provided. Some operators use a piece of zinc queen excluder over the hole in the inner cover. Some screen the hole with wire cloth. Usually the inner cover is removed later and the two parts of the colony reunited.

Upper Entrances

Beekeepers vary in their use of upper entrances during the months when the bees are active in foraging.

It is my observation that most beekeepers prefer to provide only one entrance for the foragers—a lower one, except possibly to afford additional accessibility and ventilation during the height of the gathering season.

Many bees seem to prefer to leave and enter by way of an upper channel. Why do they have this apparent preference? It may be because an upper entrance makes it unnecessary for them to climb through the combs of the lower hive body, a waste of effort, perhaps, where there is considerable congestion. Such a trip through the lower hive body entails crawling over brood cells in their three stages, which may not be too good for the welfare of the brood, and certainly is an obstacle to the nurse bees functioning there. Confining the bees to the use of a lower entrance may also discourage the queen from using the cells near the entrance.

Perhaps the best procedure is to provide only a lower entrance and exit until the busier part of the gathering season. This question warrants some research study.

Don't Assume Your Colonies Will Not Swarm

Many beginners, particularly the "leave-aloners", tend to trust their colonies will not swarm because they give little outward evidence of planning to do so.

Not too much time or effort is necessary to determine during the swarming season whether there is a swarming tendency on the part of an individual hive. Simply choose a time when the sun is shining warmly, lift up the back part of one or more of the hive bodies that house the brood nest, and check the bottoms of the frames for the presence of queen cells. Unless there is considerable honey above the brood nest, this is not a particularly arduous task—and it may save your honey crop.

The safest procedure is to assume that every colony will swarm, and take time to assure yourself that it is not so. Early in his career every beekeeper should apprise himself of the more intense swarming period in his area, and act accordingly.

Laying Workers In Nucs

In making up nucs, I would suggest that the use of any bees from a colony that harbors laying workers be avoided.

Such laying workers may cause the members of a nuc to reject a new queen when she is released from her cage. I am persuaded that the best way to dispose of the bees in a laying worker colony is to shake them out on the ground and let them individually find a new home in some colony in the bee yard. It is safest not to use a comb from a layer worker unit in a nuc unless it is totally devoid of bees.

Feeding Sugar Syrup

If you have ever fed sugar syrup in containers whose tops have been punctured with nail holes, you may occasionally have found a container whose contents were still intact after being in place for some time. This is usually because the holes were in contact with the tops of the frames, thereby shutting off access to the bees.

I have found that placing a long narrow strip of wood between the container and the tops of the frames will provide the bees with working space to get at the syrup. make the strips at least three eighths of an inch thick.

Bees and Our Neighbors

There are no two ways about keeping bees in areas where neighbors are close by. Few like bees. Most are disturbed by them. Some will not tolerate them.

I'd like to have a hive of bees in my back yard. I'd like to have the daily pleasure of at least glancing at them to see how they are reacting to weather conditions, nectar and pollen availability, seasonal conditions—heat, cold, snow. But I know better. If a certain one of my neighbors should be stung, he would sue me, I suspect. Another neighbor would be very upset if her clothes on the line were spotted by the bees. It isn't worth it to challenge them. So I keep my bees out in the country.

So my suggestion is, choose your bee yard with discretion to avoid offending neighbors, contacting bears, sweeping winds, lack of moderate shade, danger of flooding water, vandalism—chiefly by young boys, theft, and all others.

But don't be overwhelmed if you make a few mistakes. Most of us do.□

Heads Of Grain From Different Fields

A Guest Column

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ment needed: Queen excluder, two section comb honey supers

A comparison of my original and final notes shows that I would have run into serious trouble if I had gone off half cocked and tried to do something this complicated without giving it a lot of preliminary thought, and committing those thoughts to paper. As things turned out, I took the brood frames and nurse bees from another hive because the hive I wanted to run two queens in was even weaker than I had realized. With this change, the system worked very well. Although I got a late start on building a section comb honey producing hive, I removed a super of beautifully finished sections in late August, my first ever.

Often, even after extensive planning, when you actually do something for the first time you find an important detail or two was overlooked. Well, when you are busy working your hive you don't have time to worry about such things. You handle the problems as well as you can, as they arise. But you should make a mental note of anything unexpected and add it to your written notes as soon as possible, after you have closed the hive and stepped back to admire your work. While everything is fresh in your mind, you should revise your notes, adding and deleting as needed. Then, when the same type of situation occurs again, you'll have a complete guide to a system for handling it which, hopefully, experience has shown you is effective and efficient. □

Experience In Requeening — Novicely Speaking

By C.M. COOK
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I'd like to share my experience in requeening my hives. I am what you'd refer to as a "novice hobby-beekeeper". I've had bees for three years and up to this year I had three hives. I now have six. Three of these I share with another person and we split expenses and profits. I've been teaching him how to go through the hives, i.e., what looks good and what doesn't. This is a real classic case of the blind leading the blind.

To get to the story at hand, the Apiary Inspector wrote on one of my hives, "poor queen." So, I took his word and decided to requeen. Figuring I could get a queen quickly (as I had in the past) I killed the queen, planning to return tomorrow with a

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Heads Of Grain From Different Fields

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new one. I returned home and called around for a queen: no queens around. So, I called Georgia and asked them to send me a queen, "...by the end of the week?! OK, fine, send it." The queen came and I took it to the hive and removed all the queen cells that were built. But I didn't remove the attendants from the queen cage. I put it in the hive and left. During the week the weather turned cold and wet. Seven days later I came back and opened the hive. Queen cage was open, but no eggs, less brood, no queen cells, and no queen. Rats.

While I'm there I decided to look into the nuc to see how it's progressing. Look, look, look...no eggs, lots of larvae, lots of brood, queen cups, no queen. Lucky me, now I have two queenless colonies. I went back home thinking, what if the workers start laying? What if I put another queen in and they kill her too? What then, start uniting colonies? Things are looking a little dreary. So, I went home and called Georgia again, "send me two queens this time, please." "...OK, be there by the end of the week."

In the meantime, I looked at my hive at home. I can't get the supers apart, what's the problem here? Oh my, they're so heavy with honey they lift up my spirits. I can always count on old faithful at home. The rest of the week was cool and rainy. Next day I got a call from a friend, "Are you still looking for queens? I have a virgin queen you can have, and I have some queen cells too, ready to hatch." So I said, "OK, it can't hurt to try." The next day I went to get them. When I arrived at my friend's we went out in the apiary and he says, "Come on, we'll go through the hive and get the cells." We opened the hive, he took out a cell and he handed it to me. "Hold that," he said. So, I held it and then I felt something moving in my hand, "uh, uh, I think the queen is hatching!" He says, "put your finger over the end so she can't get out." I put my finger over the end and two seconds later I screamed and threw it, "she bit me!" My friend very calmly says, "Don't jump around, you'll step on her. Where is she? Just hold her in your hand and we'll put her in a cage." I held her in my hand: she thinks I'm a queen cell and she nibbles away at my fingers and it's tickling me, and I love it. I philosophize to myself, "Boy, this is the ultimate in beekeeping, I have a whole future hive right here in my hand." My friend hands me another cell — this one starts hatching too, but this time I put my finger over the end and let her nibble away. I took one more queen cell, not in hatching condition (unripe). With queens in cages and cell in hand I left. Later at the hives, I opened them up, wrecked all queen cells, doused them with sugar water, put the queen cages in. Then I closed them up and left. On Saturday the ordered queens arrived. I didn't cancel the order considering the rotten luck I'd had thus far. Come Monday I figured it was long enough, so I went back, and opened them up. In the first hive I opened, I took out a frame and a queen cage. The cage was empty so I looked at the frame — voila! There she was, alive and strutting around like she was queenbee, close it, quick. Then I opened up the nuc. The cage is empty, no queen around. But I see two queen cells: where'd they come from? I thought I wrecked those last time while putting in the virgin. Apparently I didn't touch the larvae inside the cells and they rebuilt them. This time I removed the attendants from the queen cage using the two cage method and put her in. Considering again the luck I've had, and despite the authoritative advice, I left the queen cells in tact and the queen in the cage. One of them has to be accepted and at this point I wasn't too concerned who won. So, today is Friday and I'm waiting for Monday to go back and check it out.

But now, I had an extra queen because one of the virgins was accepted. I took her home and checked around if anyone needed a queen. No, Ok, I had a hive at my Dad's that's on the nasty side, so I decided to requeen it. While all this was going on, I talked to various "knowledgeable people" about removing attendants from the queen cage. Open it up by a window, they all fly out, the queen is heavier and she flies but goes down. Don't worry about the attendants, they don't sting. Right. Okay, I'm real brave, I've had queens hatch in my hand and everything, now boy. So, I went on the porch, closed the door, opened up the queen cage. The queen came out with the attendants and they all flew around and the queen went down....as a matter of fact she fell to the floor. As I bent down to pick her up she ran under the door and out! Oh no, I opened the door and by the time I got out, she was up and flying. Golly, so long, queenie. Well, I didn't want to requeen that hive anyway.

So, I walked outside holding a cage with a bunch of attendants hanging on. They flew around and came back, flew around and came back. Then, I saw the queen flying around, and I held the cage up but she wouldn't land. She did the same thing, she flew away and came back, over and over. Finally, I started chasing the queen around the yard and I caught her, ha ha! I went back on the porch and put her in the cage — uh oh, it's not the queen! Guess what folks, they were right, the attendants don't sting! I went back outside and the queen was still flying around and I started chasing her again and finally managed to swat her and knock her to the grass. Then, I picked up the queen and put her in the cage and requeened the hive. I hope the hive accepts her. I think next time I do this it will be easier and more systematic. I just never knew requeening could be so much fun!! □

Advertising Some Why's And How's

By Joan Manes Olstrom
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The March 1982 CALIFORNIA BEE TIMES (State Beekeepers' Association newsletter) had a small article on advertising. Some folks go through the day choosing advertised food, clothing, cars, bedding, home appliances, etc. but refuse to advertise their own business saying "it doesn't pay." [Or I can't afford it.]

Yet if their business isn't profitable enough, these same people advertise that business for sale! "If you believe in your business and want to build it...ADVERTISE," concludes the article. How many will come to purchase your product if they do not know it is available or where to find it?

Recently I attended a Food Technology Day at Oregon State University in Corvallis, Oregon. Beatrice Marks, Vice President of Botsford Ketchum Co. of San Francisco, spoke on "How to Sell a Proper Diet." This company represents firms such as Hunts and Pillsbury. Generic advertising for Agricultural Commodity Boards (potatoes, for example) is also conducted; its main purpose is to get the food and its nutritional information to the consumer.

Generic, not brand, promotion is what the honey industry, as a whole, needs more of and that takes money and cooperation. However, honey promotion is something we beekeepers each can do in our own areas. With our individual advertising, we can "woo" the consumer to use our honey, pollination service, etc.

Even though we as individuals or even state and local associations, do not have food journal editors, technicians, dietitians, and other experts in the foods and advertising fields at our disposal, I think we can learn from the basic information presented at OSU by Mrs. Marks and our own individual or association promotions.

California is perhaps the only state with a Honey Advisory Board. A HONEY ANY TIME cookbook with home economist-developed and tested recipes, honey-using receipe leaflets, fairs and other displays, and TV-Radio-newspaper advertising are supported by a 10¢ per 5 gallons of honey assessment on honey produced or processed for sale in California.

ONLY REPSONSIBLE, ACCURATE (HOPEFULLY UNBIASED) INFORMATION MUST BE PRESENTED. Positive advertising can influence a consumer to try new foods or to think of new ways to prepare an old food. Advertising can tell a better, more economical use of a food and present ways to preserve the food's flavor, color and nutritive values.

Many foods need to be sold when ready—strawberries, for instance, and so may need a "crash" ad campaign. Honey can wait a bit—it isn't perishable like strawberries and so advertising at regular intervals is more appropriate.

SIMPLICITY AND REPETITION ARE THE KEY WORDS IN ADVERTISING. Advertising experts have found out that readers and TV watchers are casual observers of ads and not captive audiences! In fact, after a simple 30 second message 24% of the viewers will not remember it the next day. Immediately following an ad, 25% of the viewers remembered the **wrong** brand name. That is why the repetition. Furthermore, it is advisiable to stick to one fact per ad, two at the very most.

TELL A CONSUMER WHAT IS IN THE PRODUCT FOR HIM OR HER. Researchers have found that women (18 to 49 years age group) are the most influential persons in the family when it comes to foods. People are concerned about status, fitness, peer group pressures, family vs. single life style, health food vs. fast foods, is it fattening?, the taste, and does it look good enough to eat? As these factors influence what the person will purchase, advertising must appeal to these concerns.

An ad can get a consumer to try something once, but if this item does not satisfy a need for the person, there will be few repeat sales. Ads can also correct misconceptions; potatoes are **not** fattening—it is what we **do** to potatoes that makes them fattening (butter, gravy, sour cream, french frying, etc.) said Mrs. Marks.

Surprisingly many consumers will consider "Is it convenient or easy to fix?" before "Is it good for me" (Nutrition) commented Mrs. Marks. However, nutrition is apparently not of the first importance to many folks except for those who are on special diets (diabetic, allergy, etc.) [This is changing at least in Western Oregon; folks are becoming more nutrition conscious as evidenced by the growing numbers of people shopping at co-op, bulk food and/or health food type stores for whole grains, relatively unprocessed foods and organics. More recipes and articles in magazines and newspapers are appearing using whole grains, low fat and honey.

According to a recent new article, CONSUMER REORTS estimated that 7% of all processed foods in supermarkets (in 1980) were labeled "natural." supermarkets are trying to entice shoppers away from health food shops by selling health-food products and nutrition information. Consumers are becoming increasingly alarmed over the possible dangers of additives and preservatives in food products.

ADVERTISING MAY ALSO TRY TO CONVINCE A CONSUMER TO SUBSTITUTE A NEW PRODUCT FOR THE ONE S/HE NORMALLY USES. Can WE convince folks to substitute one form of sugar for another—honey for cane or beet? How? Sugar is cheaper. Some USDA findings now begin to point to the "simple sugars are better" direction. Can we capitalize on that?

Advertising—Some 'Why's and How's

Seventy-eight percent of people surveyed by Ketchum realized that excessive sugar consumption is a problem. This is something that affects the honey industry because honey is another form of sugar.

Recent USDA research (Eugene REGISTER GUARD, Eugene, OR, Sept. 1, 1981) reported that "table sugars have a more adverse effect on lab rats than the sugars of fruit, corn syrup, honey and starches." Double molecule sugars (beet and cane type molecules) caused rats to have enlarged livers, increased fat-inducing enzymes, high levels of insulin in the blood and more body fat. On the other hand, rats eating the single molecule sugars (honey is one) showed less evidence of these problems. Michaelis (at Beltsville) said the same effects have been observed in humans and that more research is being conducted.

How can we advertise that (1) honey tastes good, (2) reflects a young active life sytle, and (3) is good for our family's health? According to Marks, these are three of the primary, current concerns of many consumers.

RESEARCH IS IMPORTANT. In their advertising campaigns at Ketchum, research was first done to see what folks already **thought** about a product (potatoes, for example, were "too fattening, not nutritious, etc.) then advertising had to overcome the false beliefs consumers held by presenting the true facts. "Potatoes are **not** fattening; they are

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Advertising

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nutritious," etc.) The role of the potato's carboyhydrates and fiber in the diet were defined. Articles were prepared by home economists for ads for TV, radio, magazines, and newspapers. Ads were written with a specific audience in mind because different magazines, papers, and broadcasts are aimed at different—often very specific—groups of people. Faddism, sex discrimination,, and "talking-down to" consumers are all to be avoided.

ADVERTISING CAN BE A VERY EXPENSIVE UNDERTAKING. Classifed ads are often the least expensive type of advertising. Display ads—outlines, in black and white or in color with drawings, pictures, photographs—all add up to higher costs; the circulation of the publication will also help determine cost. Your local weekly paper and radio stations will have far lower rates than the *New York Times, McCall's* or CBS and are probably more suited to the local consumer you are seeking. Local newspapers may have a classified for as low a $1.25 to $2.15 per 15 or 20 words and display ads beginning at $2.10 per column inch. The advantage of a display ad is that you can use your logo or trademark as an effective attention-getter for your product. Radio ads begin around $4.00 per 30 second ad, five 30 second ads per week for a month at $130.00.

The Advertising Manager of a weekly newspaper told me that the advertiser must determine the marketing area (geographic and audience) to be covered and choose the method and placement of advertising accordingly. Newspaper ad rates are determined in part by circulation (numbers sold) and daily vs. weekly. A daily sells news and is a "throw-away" but the local weekly is kept around for ads, local occurrances, etc.

There seem to be two advertising formulas: KISS for Keep It Simple, Stupid and AIDA for get **attention,** develop **interest,** create **desire** (what it will do for you) and get **action** (to **buy now** by using words like "limited supply" and "this weekend only").

The amount of money a business should devote to advertising is dependent upon the sales levels and the type of business. One guideline—which seems a bit high—is 3 to 20% of the total volume (dollar intake before expenses). This is a guideline that the government will not question," the Newspaper Ad Manager told me, "and is a total dollar value of all advertising—newspaper, radio, TV, magazine, telephone, direct mail, and good will (give-aways, donations to charity, printed pens, and other gimmicks).

However, another source suggested the following percentages of the toal annual sales—.7% for bakers, 1.1% for food chains, and 1.4% for gift stores. Honey would fit in these categories and would represent $175 to $350 for a year's total sales of $2500. (Small business—small budget!) Other sources suggested using more advertising when times were good and purchasing up and less as sales decreased. When people have the ability and the desire to spend, advertising should increase.

A logo or trademark (drawing initials, etc.) helps identify your product or business. It can be used in a display ad and on your label and letterheads and probably needs to be registered with your State Dept. of Commerce. C and H, Greyhound a drawing of an arm and hammer, and The Rock are examples of well-known identifiers—sugar, bus, baking soda, insurance.

In an all-out campaign to convince more folks to try a new product or to use more of an old one, Ketchum found it helped (1) to get famous people to help publicize it and (2) to reach doctors, school lunches, and high school kids through Home Ec. teachers (with lesson helps, films, hand-out sheets and recipes.). We might also include the county home demonstration agents who have worked with some beekeeping associations on the state level to prepare and print honey recipe books, on a cost sharing basis.

Keith Sehnert, M.D. HOW TO BE YOUR OWN DOCTOR (SOMETIMES), Grosset and Dunlap, N.Y., 1981 gives us an idea of some nationwide advertising campaign costs. "Of course, some ad money is spent on health education. The Federal government spent $2 million in one recent year to educate the public to the perils of smoking. But....during that year, the R.J. Reynolds Tobacco Co. spent $50 million to introduce just one new cigarette. They plastered the country with enough display ads and posters to fill 130 box cars, distributed 25 million free samples of the new product, rented the biggest bill board in Times Square and hired a task force of 2,000 to call on tobacco retailers to boost sales. In "alcohol education" our government spent $140,000.00 in research and so forth while the alcohol industry spent 18.3 billion dollars (more than 100 to 1!) during the same time period.

Beekeepers don't have that kind of money for advertising, but there are more than 200,00 of us to be honey advocates ("honey pushers!") in our own areas. On local levels, we can—on a person-to-person basis—gently correct misconceptions about our product HONEY, not arguing and making enemies, however, we can educate our customes in new ways to use honey by sharing verbal or printed recipes and cooking hints. We can donate a honey cookbook to our local library and honey to the Meals on Wheels or Friendly Kitchens for the senior citizens. We can write about bees and honey (with a recipe each time) for our local papers, give talks when requested at various civic or hobby groups, put displays in public building, or a "Honey for Sale" sign on our house or property.

Our name and address—whether on a stick-on return address label, a rubber-stamped on, a home-made zerox-copied label or a fancy printed one—should be on every jar or honey and recipe we either sell or give away; it helps our customers find us when they have consumed the first jar!

We do not have to wait for "George" to do it (he informs me that he has more than enough of his own work to do), some state organization (ever try to get a committee

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The Dyce Process For Making Crystallized Honey

By ROGER A. MORSE
Dept. of Entomology
Cornell University
Ithaca, NY 14853

Elton J. Dyce was born and raised in Meaford, Ontario, Canada. He attended and graduated from Ontario Agricultural College, now known as Guelph University. Today's enrollment is much higher than when Dyce studied there. Dyce obtained his Master's degree from McGill University and came to Cornell University to study with the late Professor E.F. phillips in the fall of 1929. Dyce completed his Ph.D studies in spring 1931 and returned to Guelph where he became Professor of Apiculture.

Dyce came to Cornell to study honey fermentation and crystallization. At that time, large quantities of honey were lost annually because these phenomena were not understood. As honey granulates, only about 12% of the water present becomes part of the crystal, thus raising the moisture content of the part that does not granulate. If a container of honey granulates uniformly there is no problem, but if only part of the honey in the container granulates then the liquid portion has a much increased moisture content. Whenever the moisture content of a honey rises higher than about 19%, the yeasts present may grow and fermentation can occur. Yeast cells are always present in unpasteurized honey; once honey is fermented, there is no way it can be salvaged.

At the time Dyce started his studies, England was a major market for Canadian honey. England gave the commonwealth nations favored status, which allowed them to send goods to England without duty. That privilege was never enjoyed by the United States or non-commonwealth nations. The creation of the European Common Market, which England eventually joined, eliminated that favored status for Canada and certain other nations forcing their beekeepers to sell their honey on the world market.

The favorite honey in England was one that was light in color, mild in flavor, and granulated. The English preferred granulated honey with fine crystals and paid a premium for it over honey with coarse crystals. At that time, nobody knew how to control honey granulation, though some beekeepers because of the flora their bees fed on, and the resulting ratio of the sugars glucose and fructose in the honey, made a product that was consistently finer grained than other honeys.

When Dyce began his graduate studies at Cornell, he was a salaried lecturer at Ontario Agricultural College, a fact that later played a role in the dispostion of the patent he finally obtained on his process. Dyce had been appointed to the teaching post when he graduated in 1923. Sugar chemistry was still little understood at that time, as shown by contemporary textbooks.

Dr. E. J. Dyce.

Dyce's major contribution to our knowledge of honey was his discovery that one could control the granulation process by adding seed crystals. A seed crystal is simply a crystal with one or more sharp fractured edges where the crystal might grow larger. He also determined at 57°F. (14°C) is the optimum temperature at which granulation would take place. Pasteurization was required if the honey liquified partially upon long standing. Looking back on the situation, it is obvious to anyone today with a knowledge of physics and biochemistry that such a process could be controlled, but in 1927 this was a major breakthrough in honey processing and marketing.

In conversation, Dyce recalled that the idea for controlling honey granulation came to him one evening in Ithaca when walking home from a lecture. It took some time to determine the optimum temperature for granulation and to learn how to eliminate most of the foam that inevitably appeared on the top of the freshly crystallized honey.

After Dyce wrote his thesis, his research was published in Cornell Bulletin 528, **Fermentation and Crystallization of Honey** (Cornell University Agricultural Experiment Station, October 1931, 76 pages). I still have a few copies of the bulletin that are available for libraries.

During his later days as a graduate student, Dyce was approached by a fellow graduate student who asked him if he proposed to patent the process. Dyce indicated he had no such plans. The other student, unbeknown to Dyce, applied for a patent on the process. When the patent was received in the patent office in Washington, it was sent to Professor Phillips for comment and advice. Phillips had previously been in charge of bee research for USDA in Washington and was a well-known authority on bees and honey. The patent office was unaware that the applicant and the real author of the patent were both students of Phillips; its only goal was to determine if the idea was valid. Phillips, of course, was angry and dismissed from the University the student who had improperly submitted the patent. It was decided that Dyce should seek a patent or protect his discovery. Since he was a full-time employee of the Province of Ontario, he gave the rights in Canada to the Province and in the United States to Cornell University. A note at the end of his 1931 bulletin states, "For the purpose of safeguarding the quality of the product that may be obtained by use of the process described in this bulletin, the author has applied for patents on the process and product and has assigned these, if and when issued, to Cornell University for the use of the College of Agriculture in promoting similar researches."

On August 13, 1931 Dyce wrote Cornell President Livingston Farrand, stating "I request these funds" — if any are forthcoming — "be used for further development of the work of apiculture in the university." His offer was accepted, first by Provost A.R. Mann and later by President Farrand in letters dated August 21 and November 26, 1931, respectively.[1]

In 1944 Dyce came to New York State where he became the first manager of the newly formed Finger Lakes Honey Producers Cooperative, in Groton. One of his goals was to promote the sale of crystallized honey in the United States. Until that date, little royalty money had been received by Cornell University. Two years later Dyce joined the Cornell Faculty where he remained until his retirement in 1965.

By the time it expired in 1952, the Dyce patent had brought Cornell University $144,473.88. It is difficult to place a value on that sum in today's inflated economy; however, it is certainly safe to say that such a sum would have the purchasing power of more than one million dollars today. For several years, money from this fund was spent for research and student

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Dyce Process

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support. Upon his retirement, Dyce set aside part of the money as a permanent endowment for the library. A second sum was reserved for the construction of a laboratory. In 1968, with matching funds from USDA, Dyce Laboratory was built to house the apiculture program. The remaining money was invested in the Cornell investment pool where it continues to earn money that is paid to the laboratory annually for research on bees and honey. This has been an important part of the support for the apiculture program ever since.

Dyce wanted the granulated honey made using his process to be of high quality. He wrote little about the process, since he preferred to work closely with those who were licensed by the University. Only two formal papers were written and published on the subject. One was the bulletin cited above and the other was a chapter entitled, **Producing Finely Granulated or Creamed[2] Honey,** which appeared in the 1975 book, *Honey,* edited by Dr. Eva Crane.

In the 1940's, Dyce prepared the following summary of this process, which was never formally printed and appeared only in mimeograph form.

Summary of the Dyce Method of Processing Honey

"Honey should be heated until it is totally liquefied and until a temperature of about 150°F. (66°C) is reached. It should then be thoroughly strained through two or three thicknesses of fine cheesecloth, nylon, an O.A.C. strainer or some other medium that will remove all noticeable wax particles. The honey should be stirred constantly, yet sufficiently careful to prevent overheating and the incorporation of air bubbles. The agitation should be from below the surface of the honey. The honey should then be cooled as rapidly as possible to about 75°F (24°C), and here again some form of agitation will have to be used which will not incorporate air and which will remove the cooled viscous honey from the sides of the tank or cooling device.

"When the temperature of the honey is between 70°F. (21°C) and 80°F. (28°C), 10% of the starter, which consists of fine, creamy, previously processed honey, is thoroughly mixed with the honey which has been heated, strained and cooled. The honey used as a starter is thoroughly broken up in a grinder or sausage machine which will not incorporate air. The seeded honey is left to settle for an hour or two, thoroughly skimmed if necessary, and then run into containers of the size desired for market and stored at a temperature not higher than 57°F. (14°C) and not lower than about 45°F. until completely crystallized. This usually requires about eight days. The reason for leaving the honey to settle for a while before running it into containers is to allow the majority of the large air bubbles to rise on the surface of the honey. This precaution helps to avoid a frothy surface on the honey in the containers which have been filled for market.

"Honey high in water content should be blended with honeys low in water content, so that the honey will not have more than 17.5% or 18% moisture. This precaution will usually result in a spreadable product, which is not too hard or too soft. If the processed honey is too hard for table use, it should be placed at room temperature of about 80°F. (28°C), until it becomes sufficiently soft. Once it becomes soft it will not return again to its original hardness.

"This is a brief outline of the complete method of processing, but precautions must be taken to prevent overheating, darkening and impairing the flavor of the honey. If this formula is carefully carried out, the resulting product should be a fine, creamy, crystallized product.'

There are several considerations and problems in manufacturing honey that should be clarified. Some of these mentioned in the 1975 article by Dyce; others are little known. Dyce states. "Since dextrose crystals are pure white, honeys become lighter in color as the granulation progresses." This may also create a problem if the honey is not thoroughly strained, since any specks of comb, especially dark comb, are readily visible. Honey shrinks slightly upon crystallization and has a tendency to pull away from the side of the jar if it is packed in glass. Here the white crystals that are visible may appear as mold. Some buyers have rejected crystallized honey for this reason, thinking something is wrong with the product. Dyce advised that if the honey was packed in a clear glass jar one should use a label that wrapped fully around it. It is preferred to pack crystallized honey in an opaque container.

Dyce observed that if the moisture content of the honey was too low, the temperature too cool, or the product was stored in a refrigerator, it would not spread easily. Dyce processed honey made for use in the southern states, or the northern states and Canada in the summer, should contain about 17.5% water. Crystallized honey used in the cooler months should contain about 18% water. As indicated above, the best way to adjust the moisture content is to blend honeys of varying moisture content.

A serious problem with crystallized honey is that air bubbles may be incorporated into the honey when it is cooled and/or as seed crystals are added. This air may rise to the surface as the honey cools and before it becomes firm. Foam on the top of a package of crystallized honey gives it a bad appearance and may again cause a consumer to regect it. Some firms found that if they inverted the containers of freshly seeded honey the foam would form on what would eventually be the bottom of the container. In this position it was not visible to the consumer. More recently, several firms have begun to make crystallized honey in bulk containers, and after the product has become more or less firm, it is homogenized. This serves to give the final product a uniform appearance and is a step forward.

Dyce recommended that those who made crystallized honey use 10% seed; however, he was aware that many firms used only 5%. He found that if one had a grinder that would reduce the crystals to tiny fragements, one could actually make good crystallized honey using only 1% seed. Doing so required the honey be less than 70°F. (21°C) at the time the seed was added, that the seed by thoroughly mixed, and most important, that the seed be finely ground. Each manufacturer of crystallized honey must deal with this consideration in his own way.

We are often asked how one determines the best size crystal for Dyce processed honey. There have been no taste tests made recently as far as I know, but those conducted by Dyce many years ago indicated the crystals should be too small to be felt by the tongue. Not all beekeepers agree with that thought and I have known many who make their crystallized honey with larger crystals; however, I feel that this is because they did not have adequate facilities to grind the seed honey properly or to control the crystallization temperature.

I believe that we could sell much more crystallized honey nationwide if it were properly made. The most widely sold crystallized honey pack sold in the country today is that packaged by Sioux Bee. In my opinion it is a high-quality pack, though several other packers also do an excellent job. I suggest any beekeeper interested in marketing crystallized honey first try some of the Sioux Bee product.

There is no question that many people feel that Dyce processed honey has a different flavor; some say it is better. An important feature of crystallized honey is that it does not drip the way liquid honey does; this should be emphasized in promotion programs. In light of the great surplus of honey in the country today, brought about by imports, it is important to pay even greater attention to the quality of honey we market. □

References — Notes

[1]This and other papers relating to the process, patent and royalty income are contained in a bound volume under the title *Correspondence Concerning The Honey Process And Product Patent* in the A.R. Mann Library (SF 532, H7, D99).

[2]There is some question about the advisability and legality of using the term "creamed" today since it suggests a milk product. Certainly the word "crystallized" is more descriptive.

NEWS AND EVENTS

ALABAMA

The Alabama Beekeepers Association will meet, in Auburn, August 12-13, at the Best Western, Auburn Conference Center and Motor Lodge. Out-of-state speakers include: Charles Dadant, Hamilton, Illinois; Alfred Dietz, University of Georgia; Charles Mraz, Middlebury, VT; Dr. Thomas Rinderer, USDA Bee Lab in Baton Rouge, LA; Mr James R. Wilbanks, 107 Ramsay Hall, Auburn University, Auburn, AL 36749, #205-826-4370, is general chairman. Anyone interested in bees is welcome.

Deon Zumwalt, 1983 South Plains Honey Queen.

Deon Zumwalt has been selected the 1983 South Plains Honey Queen and will represent the South Plains (a 25 County area) in the Texas Honey Queen competition this November in Austin, TX.

Deon is the 18 year old daughter of beekeepers, Mr. and Mrs. Perry Zumwalt, of Floydada, TX. She will be a junior public relations major at Texas Tech this fall.

Deon plans to spend the summer promoting honey and the beekeeping industry on the South Plains. She recently accepted a position with Texas Agriculture Products (TAP) as a part-time employee and will be promoting Texas food products including honey.

Deon lists her hobbies as PROMOTING HONEY, beekeeping, cooking, sewing, reading and sports.

INDIANA

Greg Morris, Indianapolis, Indiana. The picture was taken by Alan L. King, vice president of the Indiana State Beekeepers' Association.

VERMONT

Beekeeper's Meeting

The Vermont Beekeeper's Association is holding its summer meeting on August 6th at the beautiful Shelburne Farms on Lake Champlain. Shelburne is about 10 miles south of Burlington on Route 7. Yellow bee meeting signs will direct you from Shelburne to the farm.

Registration starts at 9:00 a.m. Non-members will be charged a one dollar admission to help cover expenses. The business meeting (scheduled for 10:00 to 11:00 a.m.) will cover the election of officers, Eastern States and the Inspector's report. From 11:00 a.m. to 12:00 noon a panel of master beekeepers including Charles Mraz, Ed Hazen and others will answer beekeeping questions from the audience.

Our guest speaker, Melanie Odlum, starts around 1:00 to talk about how beekeepers can prepare of the possible Africanized bee problem.

The last hour (2:00-3:00 p.m.) will include demonstrations on bee hive management skillfully performed by the panel members. Live bees — bring your veils.

For further information contact:

Richard Drutchas
State Apiculturist/Plant Industry Division
Department of Agriculture
116 State Street
Montpelier, Vermont 05602
Phone: 828-2420 or 828-2452

NEW YORK

Kathy Smith recieves a plaque from Jim Conklin, President, for five years of devoted service as secretary-treasurer of the Southeastern Beekeepers Club, Middletown, NY.

WASHINGTON

W.A.S. Convention

The Western Apicultural Society (WAS) will hold its 1983 annual convention in Seattle from Tuesday, August 23rd through Saturday, August 27th. The convention site is the beautiful campus of the University of Washington. There will be ample space for commercial exhibits.

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Space will be provided at no charge to the exhibitors although we request donations of bee related ware to be used for auction and door prizes.

If you would like to reserve space, please state your commitment to participation and advise me of your space requirements, nature of display or exhibit, and special needs as soon as possible.

If you have any questions, contact Dennis R. Sampson at 206-367-5237, evenings or write: 3333 NE 202nd St., Seattle, WA 98155.

Subjects And Speakers For The W.A.S. Convention Will Be:

TUESDAY, AUGUST 23

Keynote Address — Dan Mayer — "Man's Best Friend: The Honey Bee."
Mike Smith — "Beginning Beekeeping Instruction and Slides."
Mike Burgett — "Requeening: Principles and Practices."
Sharon Collman — "Bees, Butterflies, Flowers and the Home Gardner."
John Edwards — "Let's Look Inside A Bee's Brain: How Does It Do All Those Clever Things?"

WEDNESDAY, AUGUST 24

Walt Peterson — "Queen Breeding for the Hobbyist."
Tony Menke — "Development of a Honey Bee Commission."
Roger Akre — "Yellowjackets and Bees."
Dan Mayer — "IPM and Bees."

Demonstrations

Bill Rahr — "Use of a Table Saw to Make Frame and Hive Body Parts."
Les Molnar — "Hertzog Foundation Mold."
Joe Fiamengo — "Beeswax Candles."
Roy Thurber — "Bear Fences."
Roger Akre — "Insect Photography."

THURSDAY, AUGUST 25

Dick Hunger — "Combining Colonies for Increased Honey Production."
Mark Winston — "Biology and Management of Swarming."
Cynthia Scott — "Wax Moths in the Pacific Northwest."
Lee Rogers — "Honey Bees and Power Lines."
Doug McCutcheon — "Overwintering Queens."
Jack Arrand — "Tree Fruit Pollination in British Columbia."
B.J.D. Meeuse — "Film and Comments of Pollination."

FRIDAY, AUGUST 26

Jim Bach — "Nosema and its Effects."
Diane Longanecker — "National Bee Industry Survey."
Carl Johansen — "Protecting Bees from Pesticides, including Pollinator Protection Film."
Joe Patt — "Pollination of Orchids."

SATURDAY, AUGUST 27

Bill Rahr — "Beekeeping in the Black Forest Area of Germany."
Mark Winston — "Use of Bee-Produced Odors in Colony Management."
Jim Bach — "Current Status of Africanized Bee, Varroa and Acarine Mites."

We will have campus maps and vicinity maps showing how to get to housing and the conference sight, and finalized information within two weeks. Zandy Neese, Secretary of WAS, 33 Lido Circle, Sacramento, and I will be able to respond on receipt of a stamped self addressd envelope. We will enclose registration forms. Dorm housing will be $94 double occupancy and $109 single. This includes $19 in meal tickets which will be enough for normal breakfasts and lunches. On campus parking for those in the dorms will be $5. Housing includes Tuesday through Friday nights, August 22 through August 26. Banquet and Salmon Bake will be $20 to $22 per person.

Registration will be $35 to $40 if received by August 1st. Ten dollars or more for late registration. Day registration $15 to $17.50 for the first day including program, name tag and syllabus. Additional day rate registration is $5 less because addi-

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tional day attendees will not receive additional programs, name tags or syllabus. We will just stamp their tag for day paid. ALL PAYMENTS MUST BE IN U.S. FUNDS or by check bearing the notation "in U.S. funds". (Sorry Canadian friends.)

Send conference pre-registration check made payable in U.S. dollars to: W.A.S. Host Committee, c/o Miriam Eash, 2400 Seattle Tower, Seattle, WA 98101. All fees are refundable if a waiting list exists, or if cancelled by August 1, 1983.

OHIO

Honey Festival

The 16th annual Honey Festival will be held, September 8-10, in Lebanon, Ohio, and will feature an enormous variety of honeys, apiary by-products, parades and shows. There will be continous entertainment, educational exhibits and a demonstration by Guiness record bee beard master, Don Cooke. For further scheduling or exhibition information, write: OHIO HONEY FESTIVAL, INC., Box 192, Lebanon, OH 45036, Ph: 513-932-6908.

MAINE

1983 Maine EAS Conference

Beekeepers, friends and members of EAS are invited to attend the 29th Annual EAS Conference Aug. 10-13, 1983 at the University of Maine at Orono. Known as the "Pine Tree State" and "Vacationland State", Maine offers one of the country's most thrilling vacation experiences.

EAS SHORT COURSE — Will be held Aug. 8, 9 & 10th in Nutting Hall at the Univ. of Maine Campus at Orono. If registered by the deadline of July 22nd., the registration fee is $45 per person. After that date, it is $55 per person not including lodging or meals. The Course is designed for beginners and advanced beekeepers. The teaching staff is Dr. Larry Connor (coordinator), assisted by: Dr. Clarence Collison, Prof. Al Avitabile, Mr. Karl Showler, Dr. Radclyffe Roberts and J.C. Matthenius, Jr. Pre-registration is recommended.

MASTER BEEKEEPERS CERTIFICATION PROGRAM — Testing for new applicants, or retakes of the 3-phase tests will be on Wed., Aug. 10th at 1:00 p.m. in Nutting Hall at the Univ. of Maine at Orono. All applicants must have been preregistered by May 10, 1983.

CONFERENCE REGISTRATION — To avoid penalty fees, pre-registration is recommended by the DEADLINE of JULY 22nd. The desk will be open in the lobby of the Wells Commons, 24 hours on Wed., Aug. 10th and may be open to midnight after that. Conference registration will be limited to 600 persons on a first come, first serve basis.

The full conference (3-day attendance) is $36 per person. One-day conference fees are $15 per pers, per day. Children 6-12 pay $12. There is no fee for children under the age of six. After the July 22nd deadline, a penalty fee of $10 per person will be charged.

HONEY SHOW AND COMMERCIAL EXHIBITS — Will be displayed in the North & South Lounn Rooms and North & South Bangor Rooms in the Student Union Bldg. Dick Corrigan is Honey Show Chairman. Registration for entries will be on Wednesday, Aug. 10th from 1:00 to 5:00 p.m. and Thursday morning, Aug. 11th 8:30 to 10:00 am. The Honey Show will be open to the membership after Judging takes place, sometime Thursday afternoon. Honey show rules will be published in the SPRING edition of the EAS Journal.

For EAS Short Course, Commercial Exhibitors space and EAS Conference preregistration forms, write: Mrs. Liz Rodrigues, EAS Sec.—Treas., 157 Five Point Rd., Colts Neck, N.J. 07722. For information, tel. no. 201-462-4591.

WISCONSIN

The Marinette Oconto County Beekeepers' Association present a book to each of the 15 High School agriculture libraries of Oconto and Marinette County on May 12, 1983. The name of the book is "What You Should Know About Honey" by Professor Walter J. Gojmerac.

In the picture Kay Oleson from Crivitz High School is shown receiving the book for her High School from the Marinette and Oconto County Beekeepers' Association Queen, Penny Kemke. Next to the queen is President of the Beekeepers' Association, Lawrence LaBrosse and then Mr. Al Clontz of Wallace, Michigan, who made this presentation possible.

Advertising

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to agreee on anything—one organization I know of has been **talking** cookbook for 25 years!), or even Uncle Sam (he's too expensive.) We can each play our small part, help our customes, help ourselves and the honey industry at the same time. Individually we can work toward a collective goal of promoting honey bees and selling honey. To rephrase Ben Franklin (or whoever), "If we don't all stick together, we'll get stuck separately!"

Advertise—you can't afford not to do some—even if only a very small scale.

ADVERTISING REVIEW

Tell when and where honey is available.

Keep it simple — One idea per ad.

Use repetition. Small consistent ads are more effective than sporatic flashy ones.

Stick to the facts.

Let consumer know what your product will do for him or her.

Include your logo and/or name and address on all products and handouts.

FINALLY — in advertising, as in marketing, we are advised to be attractively different—a jar, a different radio spot, an ad in the sports section instead of the food section. Establish your image and go!□

BUY & SELL

Classified rates, 49¢ per word, each insertion, payable in cash in advance. Each initial, each word in names and address, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it) count as one word. Not less than 10 words accepted. Copy or cancellation orders **must** be in by the **1st** of the month, preceding publication. Send classified ads to: The A.I. Root Co., Advertising Department, Gleanings In Bee Culture, 623 W. Liberty St., P.O. Box 706, Medina, Ohio 44258-0706.

FOR SALE

Protective Clothing for Beekeepers. Write now for brochure. B. J. Sherriff, Dept. GBC P.O. Box 416, Nacoochee, GA 30571 TF

INSEMINAION DEVICES. For prices write Otto Mackenson, Box 1557, Buena Vista, CO 81211 TF

80 Colonies with two hive boides and two supers. Wichita, KS, 1-515-876-6383 or 1-316-264-8202. CRN 8/83

For Sale: 300 Foundation Supers, Extra good. Call 1-317-962-8783 EA 983

For Sale: 500 Bottom Board Pallets for 8-frame colony, $8.00 each. 208-896-4552 Millet Apiaries 9/83

For Sale: Bulk Pollen. Minimum order 300 lbs. 806-896-4552 Millet Apiaries 9/83

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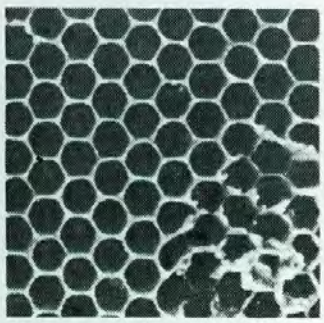

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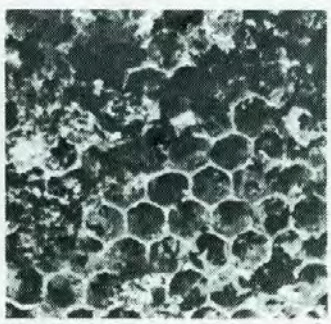

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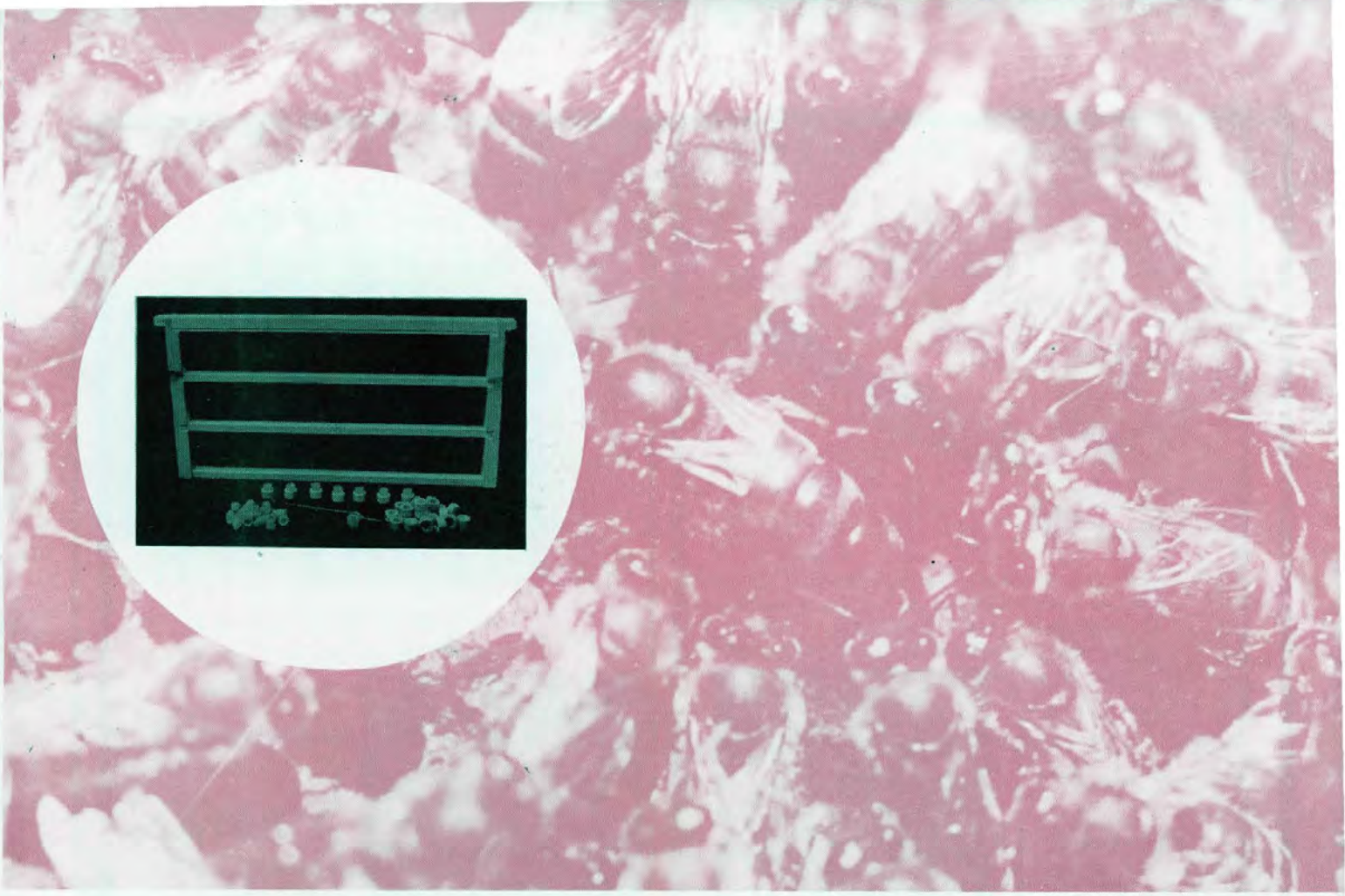

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