EAS JOURNAL

EASTERN APICULTURAL SOCIETY OF NORTH AMERICA, INC.

JANUARY, 1975

FUMIGATION WITH ETHYLENE OXIDE TO CONTROL DISEASES OF HONEY BEES

H. Shimanuki, D.A. Knox and E. W. Herbert, Jr.
Entomology Reserach Division, Agr. Res. Serv., USDA, Beltsville, Maryland 20705

ABSTRACT

Fumigation with 1000 mg of ethylene oxide (ETO) per liter for 48 hr. at 43 degrees C resulted in recovery of 24 of 25 colonies of honey bees, Apis mellifera L., infected with American foulbrood (AFB); 5 unfumigated control colonies had active AFB within 1 month after the test began. One fumigated colony became diseased after 5 months. Also, 7 of 8 colonies fumigated with ETO remained free of nosema disease; all 8 unfumigated colonies became diseased. The unfumigated colonies showed an average net weight gain of 1.4 kg per colony at the end of the season compared with the fumigated colonies which had an average weight gain of 9.7 kg per colony.

The losses suffered by beekeepers as a result of diseases and pests of honey bees, "Apis mellifera" L., cannot be assessed. It is reflected in a decreased honey crop, fewer bees for pollination, and loss in the production of beeswax. In addition, various States expend thousands of dollars annually to inspect colonies for bee diseases, and beekeepers must currently maintain a supply of Terramycin to prevent and control European foulbrood disease (EFB) and American foulbrood disease (AFB), a supply of sulfathiazole to control AFB, Fumidil-B to control nosema disease, and ethylene dibromide or p-dichlorobenzene to control the greater wax moth, "Galleria mellonella" (L.).

Michael (1964) was the 1st investigator to recognize the potential of ethylene oxide (ETO) as a general fumigant for control of diseases of honey bees. Moreover, he demonstrated that ETO could destroy spores of "Nosema apis" Zander, "Bacillus larvae" White, and "B. alevei" Cheshire and Cheyne, and all stages of the greater wax moth. Tabarly and Monteira (1967) subsequently sterilized material infected with AFB in 6 hr. by first exposing it to humidification for 135 hr. and then fumigating it at 45 degrees centigrade and a rate of 100 mg. of ETO/liter. When no preliminary moisture was used, a 48-hr. exposure was necessary. Another approach has been pursued (Shimanuki 1967, Shimanuki and Lehnert 1968, Foote 1968) in an attempt to reduce the level of "B. larvae" present on the honeycomb rather than trying to achieve sterility. (Such an approach lends itself to use of an inexpensive chamber and less rigid environmental conditions.)

Also, heat treatment was effective for control of nosema disease (Cantwell and Shimanuki 1969), and the treated colonies produced 43% more honey than the untreated colonies. Thus, similar elimination of spores of "N. apis" from the honeycomb (in this case by ETO) might lead to increased production of honey.

Tests were therefore made to determine the value of ETO for control of AFB and nosema disease and to establish the environmental conditions necessary to decontaminate hive equipment.

Materials and Methods - Tests against AFB - Thirty hive bodies with combs were obtained from colonies infected naturally with AFB. Also, combs containing scales of larvae diseased with AFB and contaminated honey were distributed in the hive bodies. Five were then set aside untreated as controls.

The treatment of the 25 hive bodies was accomplished in a permanent fumigation chamber. After a preliminary dwell period of 24 hr. at an RH in excess of 60%, ETO was maintained at the level of 1000 mg/liter for 48 hr. (temp/43 degrees centigrade) with makeup gas added automatically. Following the treatment, a 3-lb. package of Italian bees was installed on each of the 25 fumigated hive bodies, and 5 similar colonies were established on the 5 infected and untreated hive bodies.

All colonies were inspected weekly from May 20 through the end of September 1968 for signs of

(continued on page 4)

IF YOU DON'T HAVE ENOUGH WOES, TRY FRETTING ABOUT BEES

By Joseph M. Winski

Staff Reporter of

The Wall Street Journal

Remember the old saying about how a horse and rider were lost because somebody neglected to tend to a small matter like a missing horseshoe nail!

Some scientists and agriculturists are worried that the same sort of ballooning consequences may stem from what many people probably consider to be a minor irrelevancy: The nation's honeybees slowly but steadily are being exterminated.

Not on purpose, of course. But as the honeybees forage for pollen and nectar they increasingly are gathering poison also - pesticides that farmers apply to protect their crops from destructive insects.

So there are 20% fewer honeybee colonies in the U.S. today than there were 10 years ago - about four million versus five million. (A colony contains between 25,000 and 60,000 bees.) In California, the leading bee state, as much as 20% of the state's honeybees have been killed in some recent years - a mortality rate double that of the early 1960s.

All the indications are that it's going to get a lot worse," says Ward Stanger, an apiculturist at the University of California at Davis. "It's a serious situation," Mr. Stanger says - so serious that he's seeking to have the honeybee declared an endangered species.

It is even more serious in another respect: Nearly 106 crops with a farm value of $1 billion annually depend on honeybees for pollination; another $3 billion worth benefit from bee pollination in terms of higher and better-quality yields. Among these crops are apples, cherries, plums, broccoli, cucumbers, cabbage, melons - indeed, virtually all fruits and berries as well as many vegetables and even some livestock-forage crops such as alfalfa.

Thus, at a time when boosting food production is becoming a global priority, the fate of honeybees takes on some of the significance of the proverbial horsehoe nail.

Floyd Moeller, research leader at the North Central States Bee Laboratory at the University of Wisconsin, says that the economic value of honey bees as pollinators is twenty times their value as honey makers. Far from being an esoteric ecological concern, the dwindling number of honeybees bodes ill for the nation's food supply. "You just can't pollinate as efficiently with fewer bees," Mr. Moeller says.

(Bees pollinate inadvertently by dropping bits of pollen, which they gather for food, as they fly from plant to plant. This cross-pollination, which is also performed by other insects, the wind and hummingbirds, produces crops genetically superior to those produced by self pollination. Nectar, the bees' other main food, is the one they make honey from.)

Some crops already are threatened by a lack of bees. Most notable is the California almond. Each of the 200,000 acres requires two colonies of bees for pollination, but there are now only 300,000 colonies in the entire state. Last year, almond growers had to import more than 100,000 colonies of bees, some of them hauled from as far away as Montana in big tandem-trailer trucks to pollinate their fields. "This obviously isn't a very practical way to do things," says the University of California's Mr. Stanger. "I just don't know how long we can keep it up."

Researchers almost routinely are uncovering more evidence attesting to the honey-bee's contribution. For example, Mr. Moeller and his colleagues at the University of Wisconsin discovered a few years ago that cranberry production could be tripled with efficient bee pollination - whereupon Wisconsin cranberry growers rushed out and rented 2,000 bee colonies and increased the cash value of their crop by $4 million. (Rental fees since have double to $30 per colony currently.)

An even more dramtic and significant breakthrough may lie in the potential effect of bee pollination of soybeans, the country's second most important feed crop and a critical source of protein. Some observers expect a new hybrid soybean that would double present yields to be in common use in

(continued on page 3)

EAS JOURNAL

Eastern Apicultural Society of North America, Inc.

President K.G.A. Andersson
Old Crawford Farm
Northboro, Mass. 01532
(617) 393-8897

Vice-President Fred Magee
148 Turnpike Street
West Bridgewater, Mass. 02379

Second Vice-President Homer Powers
203 North Governor St.
Richmond, Va. 23219

Acting Secretary-Treasurer Marie Morse
Cornwall Bridge Rd.
Sharon, Conn. 06069

Historian Marie Morse

Director of Public Relations David C. Newton
Central Conn. State College
New Britain, Conn. 06050

Editor J. C. Matthenius, Jr.
516 Victory Avenue
Phillipsburg, N. J. 08865

Co-Editor J.R. Wojciechowski
109 No. Feltus Street
South Amboy, N. J. 08879

Published Monthly at 109 No. Feltus St., South Amboy, N. J. Second Class Privilege applied for.

E.A.S. Journal $2.00; Member $3.00*; Joint membership $4.00*; Family Membership $6.00*; Commercial Membership $50.00*; Life Membership $100.00*; Association Membership $25.00*.

*Of which $2.00 is subscription to Journal.

Vol. 2, No. 6, November, 1974

eybee declared an

in another respect:
n value of $1 billion
)ees for pollination;
benefit from bee
er and better-quality
are apples, cherries,
, cabbage, melons -
ıd berries as well as
some livestock-forage

)sting food production
the fate of honeybees
ance of the proverbial

leader at the North
'y at the University of
ınomic value of honey
y times their value as
; an esoteric ecological
)er of honeybees bodes
ıpply. "You just can't
th fewer bees," Mr.

tently by dropping bits
:r for food, as they fly
ss-pollination, which is
nsects, the wind and
)ps genetically superior
)ollination. Nectar, the
e one they make honey

threatened by a lack of
lifornia almond. Each of
two colonies of bees for
w only 300,000 colonies
, almond growers had to
:olonies of bees, some of
way as Montana in big
linate their fields. "This
ical way to do things,"
fornia's Mr. Stanger. "I
: can keep it up."
)utinely are uncovering
to the honey-bee's
, Mr. Moeller and his
of Wisconsin discovered
ɛrry production could be
pollination - whereupon
s rushed out and rented
:reased the cash value of
(Rental fees since have
ırrently.)
amtic and significant
e potential effect of bee
e country's second most
critical source of protein.
new hybrid soybean that
s to be in common use in

)age 3)

Try Fretting About Bees--

(continued from page 2)

several years. Unlike present varieties, however, the new hybrid will require honey-bees for pollination. With all-out production, about two million colonies of bees - half of the country's present total - would be required for just this one crop.

In a way, it's surprising that honey bees are declining in numbers because they in effect have been a protected species for years. Their protectors have been the dedicated practitioners of the art of beekeeping, a form of animal husbandry whose beginnings are lost in antiquity.

But the economics of beekeeping have taken a turn for the worse in the last 10 years or so, largely because of the sharply increased possibility that a beekeeper's bees could be wiped out by pesticides. Changed farming practices (such as using chemicals for fertilizers instead of plowed-under legumes, which while in blossom are excellent sources of nectar, and the continuing spread of suburbia into what used to be open fields also have contributed. "The bee just doesn't have enough flowers she can visit," says John Root, whose family has been in the beekeeping supplies business in Medina, Ohio, since 1869. Another factor, until the last couple of years, has been a depressed honey market.

"There's just been no incentive for a guy to stay in the business," says Robert Banker, secretary-treasurer of the American Beekeeping Federation in Cannon Falls, Minn. The result, he says, has been "a steady decline" of full-time beekeepers to about 3,000 and of all beekeepers, including those with one or two colonies, to about 150,000. A rise in honey prices in the last two years appears to be attracting more people into beekeeping, though so far apparently not in substantial enough numbers to reverse the decline of either bees or beekeepers.

Researchers have suggested various protective measures to beekeepers, such as keeping bees in hives and feeding them pollen supplements when nearby sprayed crops are flowering, installing pollen traps that knock the poison-tainted pollen off the bee when she returns to the hive and even draping colonies with wet burlap when pesticides are being applied.

But there isn't a simple solution to the poisoning problem. "It's a complicated situation," Mr. Banker says. "We want to protect our bees but we fully recognize that a grower has a right to protect his crops" from legitimate threats. "Something's got to be done, but we're not sure what," says a spokesman for the National Wildlife Federation in Washington D.C. He recalls that "last summer bees were dropping off like flies in Virginia."

All this doesn't mean that the honeybee faces extinction, however. They no doubt will be around as long as there are people who are intrigued by them. "I have several observation hives mounted in windows," says Mr. Root, the Ohio supplier of beekeeping equipment. "I can sit and watch them for hours."

Some people spend lifetimes watching bees. Foremost among them is Karl von Frisch, a professor at the University of Munich who has devoted virtually all of his working years to studying bees and other insects. Last year, Mr. von Frisch received a Nobel Prize for his work; it was the first time the prize was given to an animal behaviorist.

The bees' rigid social order (the females do all the work while the males do nothing but mate with the queen and die soon afterwards) and industry (a bee will make 30,000 trips, averaging up to 800 an hour, to gather enough nectar for a pound of honey) are well documented. But Mr. von Frisch found that bees also have a language facility for communication "which, as far as we know, has no parallel in any other animal."

Specifically, Mr. von Frisch found that a foraging bee can tell others in the hive when she has found food, how much, whether it's near or distant, and if distant how far away and in which direction her fellow workers should fly to find it. She does this by dancing - around in circles if the food is close, or with vigorous tail-wagging and varying rhythms if it's far away. (Bees frequently gather food a mile or more away from the hive.)

Later, a student of Mr. von Frisch's, Martin Lindauer, found that bees - again by dancing to communicate - are able to arrive at a community decision on a new home after they swarm from their existing one (usually because of overcrowding). Those bees who have inspected the best potential sites dance more vigorously than those who have examined mediocre spots; this causes more bees to inspect the site of the excited dancers, and if they agree they will return and dance in an equally vigorous manner. Eventually a consensus is reached wherein the whole swarm is throbbing with ecstasy and they fly off to their new home. One swarm studied by Mr. Lindauer considered 21 possibilities and took two weeks to decide.

Though the research that led to these discoveries was conducted primarily for its scientific interest, the findings may have significant practical benefits." When some day in the future food grows scarce," Mr. von Frisch writes, "People . . . should recall that in their own language bees can be aroused to greater industry and can be dispatched . . . in accord with the wishes of the beekeeper and the farmer."

Some scientists have pooh-poohed such findings of what might be called intelligence in these "lower animals" as bees are categorized. But Donald R. Griffin, a biologist at Rockefeller University in New York and an early skeptic himself, duplicated the von Frisch experiments and came up with the same conclusions. Mr. Griffin says "I am willing to entertain the thought that perhaps the bees know what they are doing."

FUMIGATION WITH ETO--

(continued from page 1)

active AFB.

Tests Against Nosema Disease - After 10 spores of "N. apis" were sprayed on each of 60 drawn combs, 3 of the contaminated combs were placed in each of 20 hive bodies. Then 10 hive bodies were fumigated with ETO in a sterilizing chamber (conditions identical to those used for the AFB test) and 3-lb packages of nosema-free bees were installed on the 10 fumigated and the 10 unfumigated hive bodies. These uninfected bees were obtained from Yuma, Ariz., and examined again just before installation on the bee equipment.

Samples of 10 bees were then collected periodically at the entrance of each colony and macerated in 5 ml. of water. Then 0.01 ml. of the suspension was examined microscopically (450X) for the presence of spores of "N. apis". If spores were present, the suspension was placed on a Neubauer counting chamber, and the number was determined. This number was then used to obtain an average number of spores per bee.

Weight gains were recorded for each colony by taking an initial weight May 10, 1968, and a final weighing Aug. 9.

Results and Discussion - Tests against AFB - After fumigation, the combs were examined closely before the bees were established on the equipment. At that time, we noted that some honey and pollen had been extracted from the cells. There are 2 plausible explanations. It could have occurred while a vacuum was being established in the fumigation chamber before the ETO was introduced, or it could have occurred also when the ETO was being evacuated from the fumigation chamber. We believe that the former is the more likely cause. The difficulty can be eliminated by evacuating the chamber of steps and allowing the contents of the cell to breathe. We also noticed that the treated combs had tiny wrinkles as if they were waterlogged, undoubtedly because of the high humidity. Such humidification could make it easier for the honey bees to remove the scales. The appearance of the combs did not affect their acceptance by the bees.

Sacbrood disease, a disease of viral origin, was seen in all colonies throughout the test. Thus, ETO would probably not be effective against this disease.

Within 1 month, all 5 control colonies showed active AFB disease, but the fumigated colonies appeared normal, and the population continued to build up rapidly. Although weight gains were not recorded, the fumigated colonies were obviously benefiting from the fumigation.

It was only at 5 months after the colonies were established that 1 treated colony showed active AFB disease. This infection could not be traced, but it probably came from within the colony. Then, in this instance, the fumigation had not sterilized the contaminated equipment. However, the number of viable spores of "B. larvae" had certainly been reduced.

No further disease has been found in the 24 other colonies to 1 year after fumigation. We therefore appear to have recovered 96% of the colonies successfully with fumigation.

Tests Against Nosema Disease - Within 2 weeks after the beginning of the test, 2 colonies each absconded from the unfumigated and fumigated colonies. These losses were believed to have been the result of something other than nosema disease. Therefore, only 8 colonies were used for the comparison.

Table 1.—Average number of *N. apis* spores per bee in unfumigated and fumigated colonies.[a] 1968.

Sampling dates	Treatment[b]	
	Unfumigated	Fumigated
4/20	0 (0)	0 (0)
4/26	0 (0)	0 (0)
5/10	7.45×10^6 (8)	1.06×10^5 (1)
5/17	3.84×10^6 (8)	3.75×10^3 (1)
5/29	2.20×10^6 (6)	0 (0)
6/6	5.90×10^5 (4)	0 (0)
6/14	1.20×10^5 (2)	0 (0)
6/20	0 (0)	0 (0)
6/28	0 (0) [c]	0 (0)
7/5	0 (0) [c]	0 (0)

[a] Avg of 8 colonies, 10 bees/colony; fumigation with ETO at a rate of 1000 mg/liter.
[b] Figures in parentheses indicate no. infected colonies.
[c] Avg of 7 colonies, 10 bees/colony.

Table 2.—Net weight gains (kg) of unfumigated and fumigated colonies infected with nosema disease.[a]

Dates	Treatment[b]	
	Unfumigated	Fumigated
5/29	06	2.4
6/14	2.0	6.1
6/28	1.0[c]	7.2
7/11	1.1	7.4
7/26	1.0	9.6
8/9	1.4	9.7

[a] From 0 weight (weight on May 10; avg of 8 colonies), 1968.
[b] Avg of 8 colonies.
[c] Avg of 7 colonies.

After 3 weeks, all 8 of the unfumigated colonies had nosema disease. Thus our use of contaminated equipment was an effective means of disseminating nosema disease. One colony in the untreated group died out 2 months after the test was started. Since the weight gained in this colony was average, it is most likely that the colony died from the effects of nosema disease. One of the treated colonies became infected, but no attempt was made to determine the percentage of bees infected. However, nosema disease was present in this colony in only 2 consecutive samplings (it persisted for 5 consecutive samplings in the unfumigated colonies). Therefore the unfumigated colonies probably had a higher percentage of infected bees which resulted in a more persistent infection.

had certainly been

een found in the 24
fter fumigation. We
overed 96% of the
gation.
ease - Within 2 weeks
est, 2 colonies each
ated and fumigated
elieved to have been
han nosema disease.
were used for the

V. *apis* spores per bee colonies.[a] 1968.

Treatment[b]	
l	Fumigated
	0 (0)
	0 (0)
	1.06×10^5 (1)
	3.75×10^3 (1)
	0 (0)
	0 (0)
	0 (0)
	0 (0)
	0 (0)
	0 (0)

umigation with ETO at a
infected colonies.

g) of unfumigated and
1 nosema disease.[a]

Treatment[b]	
ed	Fumigated
	2.4
	6.1
	7.2
	7.4
	9.6
	9.7

; avg of 8 colonies), 1968.

of the unfumigated
ise. Thus our use of
s an effective means of
se. One colony in the
months after the test
it gained in this colony
y that the colony died
a disease. One of the
ected, but no attempt
ie percentage of bees
disease was present in
secutive samplings (it
ve samplings in the
efore the unfumigated
higher percentage of
d in a more persistent

Differences between the unfumigated and fumigated colonies were more apparent when the weight gains were compared. After 1 month, the unfumigated colonies had a net gain of only 0.6 kg., while the fumigated colonies had gained 2.4 kg. When the test was ended Aug. 9, the unfumigated colonies had gained only 1.3 kg., and the fumigated colonies had gained 9.7 kg.

The absolute weight gains of all colonies treated and untreated were relatively low. However, the relative difference in the increases indicated that fumigation with ETO was beneficial.

Nosema-free bees established on nosema-free equipment can therefore remain free from disease for at least 1 season. We have not yet determined whether clean equipment alone can cause increased production of honey.

OBITUARIES

Harlan E. Glidden of Beverly, Mass. passed away in his home on Oct. 22, 1974.

Mr. Glidden was for several years Chief Apiary Inspector of the Commonwealth of Massachusetts.

Mr. Glidden was a member of EAS and attended several Conventions. He promoted the use of honey for Mead and Fruit Wines.

Sam Hawkins, Nationally known apiary inspector and beekeeper Fort Deposit, Alabama, died August 31, 1974. Sam was 71 years old. Because of poor health, he retired as State Apiary Inspector of Alabama on March 31, 1973. He died following heart surgery at a hospital in Montgomery.

Sam had kept bees since he was twelve years old. He had worked part time as a bee inspector for ten or twelve years, and was appointed Apiary Inspector in 1962. He served in this capacity until his retirement.

Sam was elected president of the Apiary Inspectors of America in 1971. He was past president of the American Bees Breeders Association, and took part in all activities designed to improve the bee and honey industry in Alabama, the United States, and Canada. Sam is survived by his wife, Mrs. Kate Herlong Hawkins, and three brothers. Mrs. Hawkins lives at Route 1, Box 278, Fort Deposit, Alabama 36032. She will appreciate notes from friends.

It is with a great sense of loss that we announce the passing of Professor Edwin J. Anderson of 307 Garner Street, State College, Pa. Prof. Anderson passed away a few weeks ago.

Some Answers on Certification of Pesticide Applicators

Certification of applicators who use pesticides designated for "restricted" use is required by the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 as amended by Congress in 1972. The Act requires that the entire program be fully operative by October 1976.

Many States are now developing certification programs following standards proposed by the Environmental Protection Agency (EPA).

The following questions and answers give a brief overview of the certification program. For details, consult the amended FIFRA and official regulations.

WHAT IS THE PURPOSE OF CERTIFYING PESTICIDE APPLICATORS? Certification programs are designed to ensure that users have the competence to handle restricted-use pesticides without causing danger to themselves, the public, or the environment. The certification programs will also allow continued use of certain products that might otherwise have to be withdrawn from the market because of potential danger to people - or the environment - if these chemicals were to be used by the general public.

WILL EVERYONE WHO USES ANY PESTICIDE HAVE TO BE CERTIFIED? No. Pesticides will be classified for "general" or "restricted" use. Those classfied for "general" use may be applied by the general public without further restrictions other than those specified on the label. Persons using these products do not need the special competence required for the use of restricted pesticides.

WHAT ARE RESTRICTED-USE PESTICIDES? Pesticide products classified for restricted use will be those that require controls in addition to label instructions, because they may have unreasonable adverse effects on the environment or cause injury to the applicator, even when applied in accordance

(continued on page 8)

WORLD SUGAR SUPPLY SHORT

World sugar production was at an all-time high during 1973-74 but world sugar consumption is increasing at a rate of two to three per cent a year. The stock of sugar carried over from 1972-1973 was very small by normal standards. The supply situation is expected to remain tight.

Several beekeepers have complained that the price of sugar for feeding bees has increased recently. The figure released by the USDA show an increase from 6.9 cents in 1964 to 10.37 cents in 1973. During the same time retail sugar rose from 12.81 cents to 15.11 cents per pound. The 15.11 cents is a preliminary figure and may actually prove to be higher.

BEES ON THE WANE

by Rafael Bermudez

The world's supply of bees is declining and it could affect man's food supply, according to a government bee expert.

It isn't that man is running out of the busy insects, but there may not be enough of them around to pollinate properly.

"Man is at a point right now that anything that gets in his way ought to be sprayed and killed. It's an attitude that has to change," said Dr. John Harbo research leader of the Agriculture Department's bee breeding and stock center laboratory in Baton Rouge.

He said the worldwide shortage of bees has not reached a critical stage despite assaults on the insect from herbicides and insecticides and intrusions of civilization into their habitats.

"This isn't something sudden. It's been happening for years." Harbo said. "We're not going to run out of bees. I don't think there's anything to worry about."

What does worry some scientists is the effect a continued decline in bees could have on the world food situation. The cross pollination of flowers and plants that bees accidently carry on as they gather food is essential for successful growth of many fruits and other crops.

For example, the seed of alfalfa, a main source of food for cattle has to be pollinated in order to grow.

"The reasons for the shortage! I think you could start with the fact that bees depend on wild plants for growth. They get their food from natural flowers," Harbo said.

"As our population keeps growing we lose some of the waste grounds where these wild flowers grow."

He said some of the flowers from which bees draw food are a nuisance to farmers and are mowed or sprayed. And pesticides used to kill harmful insects often kill bees as well.

Harbo said he had no statistics on the rate of decline of the bee population, but had noticed sharp increases in the price bee growers pay for queen bees and worker bees.

The price of a queen bee is up to $5.50, about double what it was a few years ago. And the wholesale price of a pound of honey has jumped from 12 cents three years ago to 47 cents this fall.

Harbo said some of the research conducted at his laboratory involved breeding techniques and the behavior and habits of certain types of bees. Much of the research is aimed at improving methods of raising honey bees.

"There are certain environmental factors which make a bee more likely to sting. Some bees are meaner than others just like people. We're trying to learn the aggressive nature of stinging bees," Harbo said. "If you had an ideal bee, you'd have one that produces a lot of honey and that doesn't sting much."

Many farmers who grow crops that need pollination hire a beekeeper who brings in hives to do the job. But the number of man-tended bee colonies used to pollinate crops has dropped by 11 per cent, according to one report. The report estimated a new decrease of almost 200 billion bees in the world.

"I think whatever good could come of this is if it brings home to people that all insects aren't bad. Most insects are harmless," Harbo said.

BEEKEEPER FIGHTS IMPORTATION BAN

An Avon Park beekeeper has filed a suit in federal court challenging the constitutionality of a Florida law that he says prevents him from bringing his bees south for the winter.

Stanley Trescott, a migratory beekeeper, filed the suit Thursday against State Agriculture Commissioner Doyle Conner. Trescott asked for a three-judge hearing on his challenge.

"If we don't get some favorable Supreme Court action, it will hurt the entire U. S. food supply." Trescott said in an interview.

He said migratory beekeepers are being hurt by Florida and Texas, states that ban the importation of bees.

Trescott said he had more than 800 bees in New York that would die if he couldn't bring them to Florida for the winter. He said he sends his bees north in the summer to pollinate fruit trees.

The actions of Florida in closing down its borders to many beekeepers by requiring them to move their bees in short time periods will eventually hurt the U.S. Food supply and drive already high prices up even further, he contended.

"Beekeeping is the keystone to agriculture," he said, adding that beekeepers are contemplating similar suits in Texas challenging that state's laws.

Bees are a vital source of pollination for plants such as clover that take nitrogren out of the air and put it into the soil, he said.

"You cut down on bees, you cut down on the amount of nitrogen in the soil and then cut down on food crops," he said.

and that doesn't sting

grow crops that need
er who brings in hives to
ıber of man-tended bee
crops has dropped by 11
one report. The report
of almost 200 billion bees

ɔd could come of this is if
hat all insects aren't bad.
" Harbo said.

:R FIGHTS
'ION BAN

:eper has filed a suit in
the constitutionality of a
revents him from bringing
:er.
nigratory beekeeper, filed
ainst State Agriculture
ıer. Trescott asked for a
challenge.
e favorable Supreme Court
:ntire U. S. food supply."
:w.
ekeepers are being hurt by
hat ban the importation of

d more than 800 bees in
if he couldn't bring them
He said he sends his bees
ɔllinate fruit trees.
rida in closing down its
pers by requiring them to
:ime periods will eventually
ɔly and drive already high
: contended.
keystone to agriculture," he
eepers are contemplating
llenging that state's laws.
:ce of pollination for plants
ıitrogren out of the air and
d.
bees, you cut down on the
: soil and then cut down on

SPECIAL NOTICE . . . YOUR ATTENTION REQUESTED

INTERNATIONAL BEEKEEPING CONGRESS

GRENOBLE, FRANCE

SEPTEMBER 8 - 14, 1975

The Eastern Apicultural Society is making a survey to try to determine if there will be sufficient interest in attending the XXV International Congress in Grenoble in September 1975 to merit development of a special GROUP or CHARTER program for your consideration. May we ask that you review and return the following survey questions as soon as possible. Early reply is necessary so that ample time will be available in securing needed reservations in the ALPINE DISTRICT OF EUROPE.

Thanks for your help and attention.

. . . . . .

BEEKEEPING SURVIEY - XXV CONGRESS SEPT. '75

Name: _____ Address: _____ Zip: _____

Name of Beekeeping Organization _____

Telephone _____ Date _____

Number in Party _____

1. We (Do) (Do Not) have a serious interest in attending the Congress.

2. If a SPECIAL GROUP PROGRAM IS DEVELOPED, WE WOULD PREFER TO BE AWAY FROM HOME (Only for the Congress _____); (For the Congress plus one week TOUR IN THE ALPINE DISTRICT _____); (For the Congress plus two weeks TOURING IN THE ALPINE DISTRICT OF EUROPE _____).

3. WE (Have) (Have Not) attended other International meetings.

IN VIEW OF THE IMPORTANCE OF TIME, PLEASE RETURN THE ABOVE SURVEY ALONG WITH ANY COMMENTS YOU MAY WISH TO ADD DIRECTLY TO:

SANTILLI & ROLFES TRAVEL AGENTS INC.
2123 North Charles Street
Baltimore, Maryland 21218
Telephone 727-4464

Attn: Mr. Frank R. Santilli

Answers on Certification--

(continued from page 5)

with directions for use, warnings and cautions or when used in accordance with a widespread or commonly recognized practice. These compounds will generally be available only to certified applicators.

HOW CAN A PERSON BECOME A CERTIFIED APPLICATOR? States will certify applicators using tests based on Federal standards to determine that the applicator is competent to apply the materials without endangering the environment, himself, or the public. State standards must conform and be at least equal to those set by EPA. Details of the standards and tests will vary depending on the use involved. However, there will be two types of certified applicators.

WHAT ARE THE TWO TYPES? One is a private applicator (a farmer, rancher, etc.) who applies or supervises the application of restricted pesticides for the protection of agricultural commodities on property he or his employer owns or rents, or, as an exchange of services, on another private applicator's property.

The other type is the commercial applicator who applies or supervises the application of restricted pesticides for any purpose or on any property other than as provided by the definition of "private applicator." Each commercial applicator will be certified in one or more use categories and then may use pesticides for any purpose allowed by the label within the category or categories for which he is certified.

WHAT ARE THE CATEGORIES FOR COMMERCIAL APPLICATORS? The regulations establish ten categories based on occupation: (1) agricultural pest control; (2) forest pest control; (3) ornamental and turf pest control; (4) seed treatment; (5) aquatic pest control; (6) right-of-way pest control; (7) industrial, institutional, structural, and health-related pest control; (8) public health pest control; (9) regulatory pest control; and, (10) demonstration.

CAN STATES HAVE OTHER CATEGORIES OR SUBCATEGORIES? Yes, a State may designate such subcategories as it deems necessary within the ten major categories. With the EPA Administrator's approval, States may establish additional major categories to meet their needs. A State may also delete any category that is not needed in that State.

HOW WILL THE CERTIFICATION PROGRAM BE ADMINISTERED? Applicator certification is primarily a State responsibility. State authorities will develop plans based on Federal standards, and these plans must then be approved by EPA. Insofar as possible, EPA will assist States in organizing their certification plans, but the Agency does not plan to develop a Federal certification program.

WILL CERTIFICATION BE REQUIRED FOR EVERYONE WHO APPLIES A RESTRICTED PESTICIDE? No. Non-certified persons who are competent may apply restricted pesticides under the direct supervision of certified commercial or private applicators. Certified applicators supervising non-certified personnel must demonstrate knowledge of Federal and State supervisory requirements.

WHEN WILL CERTIFICATION REQUIREMENTS BECOME EFFECTIVE? State certification programs are now being formulated. States that plan to certify applicators must have approved programs in effect by October 1976.

WHERE CAN A PERSON GET ADDITIONAL INFORMATION ON CERTIFICATION? There are several sources. Contact your State or local pesticide regulatory officials for more details. They may be located in the State Department of Agriculture, State Department of Natural Resources, State Environmental Office, or similar agencies. Also, you may contact any of EPA's ten Regional Offices across the country, or write to the Environmental Protection Agency, Washington, D.C. 20460.

EAS JOURNAL
c/o J. C. Matthenius, Jr.
516 Victory Avenue
Phillipsburg, N. J. 08865

SECOND CLASS PRIVILEGE
PENDING AT
South Amboy, N. J. 08879