

RAPID COMMUNICATION

NATIONAL HONEY BEE MITE SURVEY (1)
INVENTAIRE NATIONAL
DES ACARIENS DE L'ABEILLE DOMESTIQUE
NATIONALE BESTANDSAUFNAHME DER MILBEN
DER HONIGBIENE

H. SHIMANUKI*, D. A. KNOX*, M. DELFINADO-BAKER** and P. J. LIMA***

* *U.S. Department of Agriculture, Agricultural Research Service,
Plant Protection Institute, Bioenvironmental Bee Laboratory, Beltsville, MD 20705.*

** *Department of Entomology, University of Maryland, College Park, MD 20742*
(Present address : *U.S. Department of Agriculture, ARS, Bioenvironmental Bee Laboratory, Beltsville,
MD 20705.*)

*** *U.S. Department of Agriculture, Animal and Plant Health Inspection Service,
Plant Protection and Quarantine, National Program Planning Staff,
Biological Assessment Support Staff, Hyattsville, MD 20782.*

SUMMARY

A National Honey Bee Mite Survey of apiaries in the United States and Canada was conducted by the U.S. Department of Agriculture. A minimum of 100 adult bees was requested from each apiary that was to be surveyed. These samples were sent to the Bioenvironmental Bee Laboratory in Beltsville, Maryland, for examination. Upon receipt, 50 bees from each sample were examined for *Varroa jacobsoni*. Then a transverse section of each thorax was cut and cleared in a 5% KOH solution for 24 hours at 37 °C before examining the tracheae for *Acarapis woodi*.

No *Acarapis woodi* or *Varroa jacobsoni* was found in any sample from over 4,400 apiaries surveyed in 1980-1982.

INTRODUCTION

The U.S. Honeybee Act of 1922 as amended prohibits the importation of all life stages of the honey bees and harmful germplasm except from countries that the

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Secretary of Agriculture has determined are free from harmful diseases and parasites. When first enacted the Honeybee Act was designed to protect this country from the mite, *Acarapis woodi*. The presence of *A. woodi* in Mexico (WILSON and NUNAMAKER, 1982) and the unconfirmed report of the Asiatic mite *V. jacobsoni* in Maryland (DE JONG *et al.*, 1981) stimulated the honey bee industry of this country to request a survey by the United States Department of Agriculture. Two agencies, the Animal and Plant Health Inspection Service and the Agricultural Research Service, responded by conducting a joint National Honey Bee Mite Survey. The Survey was made to verify the mite-free status of the United States and thus maintain our favorable position in foreign markets for package bees and queens.

MATERIALS AND METHODS

Each of the 50 states, territories and possessions were requested to submit a minimum of 50 samples of adult bees. Some states, such as those that border on Mexico, states where package bees and queens are produced, states where migratory beekeeping is practiced, and those having more than 100,000 colonies, were asked to submit additional bee samples.

The Animal and Plant Health Inspection Service provided the survey participants with pre-labeled sample containers. Each state representative was instructed to add 70 % alcohol to the containers and collect pooled samples from apiaries across the state representing hobby, sideline and commercial beekeeping as well as samples from various strategic points. All samples were to be collected between August 1981 and September 30, 1982. A minimum of 100 adult bees was requested from each apiary. It was suggested that the samples include foraging as well as moribund bees that were found crawling near the hive entrance. The bees were killed in an insect killing jar or by direct immersion into the alcohol. Each state representative was asked to maintain a record of the state number, beekeeper name and apiary site.

The samples were then sent to the Agricultural Research Service's Bioenvironmental Bee Laboratory (BBL) in Beltsville, MD, where each incoming sample was assigned a BBL number. The BBL and state numbers, date the samples were received and examined, and the results were all stored in a computer to facilitate issuance of monthly reports to all states that submitted samples. Fifty bees from each sample were first examined visually for *Varroa jacobsoni* and then a transverse section of each thorax was cut with a scalpel. The sections were cleared by a 5 % KOH solution for 24 hours at 37 °C. The trachea in each section was first examined with a dissecting microscope, and any with darkened areas were examined more closely with a compound microscope.

RESULTS AND DISCUSSION

The Survey was officially ended on September 30, 1982. We requested 8,300 samples from 56 jurisdictions, and received 4,357 samples from 45 jurisdictions and two Canadian provinces (Table 1). Also, prior to this formal survey, 131 honey bee samples primarily from western Canada and California were examined for Acarine mites (Table 2).

TABL. 1. *Results of national bee mite survey*

<i>State</i>	<i>Samples allotted</i>	<i>Samples received and examined</i>
Alabama	100	10
Arizona	100	89
Arkansas	50	35
California	1,000	197
Colorado	50	69
Connecticut	50	5
Florida	700	389
Georgia	400	347
Hawaii	100	35
Idaho	200	45
Illinois	50	50
Iowa	50	48
Kansas	50	20
Louisiana	50	30
Maine	50	6
Maryland	100	100
Massachusetts	50	35
Michigan	200	56
Minnesota	300	132
Mississippi	100	92
Missouri	250	80
Montana	200	169
Nebraska	250	267
Nevada	100	71
New Hampshire	50	24
New Mexico	100	37
New York	250	106
North Carolina	350	148
North Dakota	400	419
Nova Scotia	—	13
Ohio	50	50
Oklahoma	50	15
Oregon	100	90
Pennsylvania	50	11
Puerto Rico	50	39
Rhode Island	50	19
Saskatchewan	—	3
South Carolina	100	3
South Dakota	400	98
Tennessee	300	52
Texas	400	23
Utah	50	28
Vermont	50	13
Virginia	50	32
Washington	200	74
West Virginia	50	42
Wisconsin	100	41
TOTALS :	7,750	4,357

TABL. 2. — *Acarine survey summary september 1980 through January 1981*

Location	Apiaries Sampled	Date
<i>Canada :</i>		
Alberta	45	Sept. 1980
British Columbia	14	Aug.-Sept. 1980
<i>United States :</i>		
California	64	Sept.-Oct. 1980
Hawaii	4	Jan. 1981
Texas	4	Dec. 1980

No Acarine mites were found in these samples.

No parasitic bee mites were found in any of the bee samples submitted to our laboratory. Based on these results, the United States of America is still free of the parasitic bee mites, *Acarapis woodi* and *Varroa jacobsoni*.

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REFERENCES CITED

- DE JONG David, Dewey M. CARON, H. SHIMANUKI and I. Barton SMITH Jr., 1981. — Resolution of the *Varroa jacobsoni* problem in Maryland. *Bull. Entomol. Soc. of America*, **27**, 267-270.
- WILSON William T. and Richard NUNAMAKER, 1982. — The infestation of honey bees in Mexico with *Acarapis woodi*. *Amer. Bee J.*, **122**, 503-505, 508.