

IDAHO BEE KILL INVESTIGATIONS

January, 1979

Dan W. Bench
RPAR Coordinator
Region VIII
February, 1979

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80290

March 13, 1981

Mr. Paul Vassalotti
South Dakota State University
Brookings, S.D. 57707

Dear Mr. Vassalotti,

Enclosed is a copy of the IDAHO BEE KILL INVESTIGATIONS, January 1979 by Dan W. Bench, RPAR Coordinator EPA Region VIII. This is an unpublished report. At this time, very few of the samples collected during the investigation have been analyzed for methyl parathion and none have been analyzed for the microcapsules. The analytic results are on the last two pages.

Further analyses for methyl parathion and microcapsules are in process. When I receive the results I intend to write a summary and publish the report.

Sincerely,

Dan W. Bench
U.S. EPA Toxic Substances Branch

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References

Letters: Lehner, Yolanda to Charles Brokopp
September 28, 1978
Kellog, Wilson to Pesticide Dealers and Applicators
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Johansen, Carl to Arthur Losey w/attachments
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Pesticide Damage Investigation Report, Marilyn Butler,
Idaho State Department of Agriculture, October, 1978

Untitled Bee Kill Investigation Report, Idaho State
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PENNCAP-M INSECTICIDE AND BEES: FACT AND FALLACY:
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INTRODUCTION

During the period January 9-13, 1979, I traveled to Twin Falls and Lewiston, Idaho to sample brood chambers from honeybee colonies that were suspected to have died from pesticide poisoning. The brood chambers sampled belonged to Frank Zagata, and Bill Lemmons who reside near Buhl in Twin Falls County, and Orie Mundell and Gene Pontius who reside in Lewiston in Nez Perce County. The bee yards involved were located in the respective counties. The sample log summary in the Appendix lists the total numbers of samples taken.

Since this was an out-of-region trip, my activities were coordinated with Robert Poss, Pesticide Branch Chief, Region X; Bill Freutel, EPA Idaho State Coordinator; and Rod Awe, Supervisor, Pesticide Enforcement, Idaho State Department of Agriculture. I was fortunate in having the very capable assistance of Marilyn Butler, a State pesticide enforcement inspector during my work in Twin Falls County. Contacts were limited to beekeepers and Agricultural Stabilization and Conservation Service (ASCS) representatives.

The beekeepers had stored the brood chambers they suspected to have been contaminated by pesticides separately from those they intended to start new colonies in during the spring of 1979. The brood chambers that could have come from any of several known bee yards were identified as "other 1, 2, 3 ...". Those known to have come from a particular bee yard were designated by its name.

Pollen samples were taken in accordance with a method developed in conjunction with the USDA SEA honeybee research laboratory in Laramie, Wyoming. Honey samples were taken when sufficient honey was found in the brood chambers. Duplicate samples were obtained whenever possible.

The brood chambers sampled were in full depth hive bodies. With the exception of CR 124314, I took all of the samples and when they were not in my immediate presence, they remained in a cooler locked in the car. The only exceptions to this were during the times they were checked in as baggage with the airlines. They were delivered to the EPA Technical Investigations Branch Laboratory at the Denver Federal Center upon my return to Region VIII.

Frank Zagata (Buhl Honey Apiaries)

Frank Zagata claimed to have had about 400 colonies damaged in June 1978 due to an application of Penncap-M to nearby white pea fields. The suspect contaminated brood chambers were stored in a warehouse in Buhl and in a shed behind the Zagata residence. Seventeen brood chambers from the "home" bee yard were placed in the shed after the colonies died last June. Sixteen "other" brood chambers from colonies that died during the summer were delivered to the shed from the warehouse just prior to my arrival. The reason for this was that the shed was heated whereas the

warehouse was not so that unsealed honey extraction in the warehouse would have been difficult. The brood chambers designated "other" came from the Konechny, Sonners, Johnston, Severa, Ponds, or Peterson bee yards. Pollen samples (CR 124304) were taken by spatula. Unsealed honey samples (CR 124307) were also taken by spatula since most of the honey was crystallized and could not be pressed from the combs using a spoon.

Three uncontaminated pollen samples (CR 124305) were taken from a brood chamber that had housed a queenless colony and came from the Upper Robinson, Lower Robinson, or Hazen bee yards. Six "home" and seventeen "other" brood chambers were sampled.

A sample of raw unfiltered honey for human consumption (CR 124309) was taken from a coffee can in the Zagata kitchen. Affidavits describing the raw unfiltered honey and describing a visit by Pennwalt officials to investigate the bee kill are attached.

Bill Lemmons (B & B Aparies)

Bill Lemmons claimed to have had about 430 colonies damaged in June 1978 due to an application of PennCap-M to nearby white pea fields. The brood chambers were stored in a warehouse in Buhl belonging to Mr. Lemmons' father. Twenty brood chambers designated "other" were brought to the warehouse belonging to Bill Lemmons just prior to my arrival. The original site was unheated. Six of these brood chambers were sampled. Pollen samples (CR 124308) were taken by spatula. The combs were devoid of honey. The samples come from the Kaster, Stiegemier, Chisholm, or Lunte bee yards.

Mr. Lemmons reported that he attempted to save the damaged colonies by feeding sugar water. The surviving bees consumed their honey stores along with the sugar water during this process. It is likely that much of the contaminated pollen was also removed during this process. The colonies gradually died out during summer. The 20 brood chambers brought to the warehouse for sampling were from among the first to die out so that the likelihood of finding pesticides in these samples is greatest.

Murdock

One brood chamber belonging to Bill Murdock was stored in the shed behind the Zagata residence. Pollen samples (CR 124306) were taken by spatula. The location of the colony was reported to have been 209 Bracken Street S., Twin Falls, ID, prior to its demise last June. The brood chamber was devoid of honey.

Mundell

Orie Mundell claimed that more than 1000 of his colonies were a total loss due to PennCap-M applications in the Lewiston area in May and June of 1976. The brood chambers were stored in an unheated section of the

honey house behind the Mundell residence in Lewiston. Mr. Mundell informed me that the approximately 400 hive bodies I observed there represented about 1/3 of the total destroyed in May and June of 1976. The other 2/3 had been "rendered" and sold for wax. I examined and rejected for sampling purposes a number of brood chambers because they contained insufficient pollen or because the pollen was overlaid by fungus. Three "other" brood chambers were sampled. They came from any of twenty-two known bee yards in Nez Perce County (see Appendix). Pollen samples (CR 124310) were taken by spatula. Wax with unsealed honey (CR 124312) was cut from combs in areas where pollen cells were not present.

Samples of raw unfiltered honey for human consumption (CR 124313) were taken from three glass containers in the Mundell kitchen (1978 harvest). A single honey bear filled with crystallized honey (CR 124313) was obtained from the cellar (1976 harvest).

Attached is an affidavit regarding the intended spraying of a rape-seed field near Lewiston just prior to the bee kill and an affidavit alleging that "two sets of books" were maintained by applicators in the area at the time.

Pontius

Gene Pontius claimed that 620 of his colonies were a total loss due to PennCap-M applications in the Lewiston area in May and June of 1976. Five brood chambers were delivered to the Mundell honey house on January 12, 1979 by Gene Pontius. Pollen samples (CR 124311) were taken by spatula from three of the brood chambers designated "other". The brood chambers were devoid of honey. They came from any of three known bee yards in Nez Perce County. (See Appendix)

DISCUSSION

Twin Falls County

See "Pesticide Damage Investigation Report", Marilyn Butler, Idaho State Department of Agriculture, October, 1978. Also see letter: Lehner, Yolanda to Charles Brokopp, September 28, 1978.

Nez Perce County

In addition to sampling the brood chambers belonging to Mundell and Pontius from colonies that died during May and June of 1976, I attempted to determine the source and identity of the pesticide involved. Sample analysis conducted by the EPA indicated methyl parathion.*

A 300 acre rapeseed field was in bloom on the plain just above the Lewiston valley in sections 29 and 30 T36N R4W. This is the rapeseed field referred to in the Mundell affidavit of January 12, 1979 and may be

* Exhibit # VII, Untitled Bee Kill Investigation Report, Idaho State Department of Agriculture, 1976.

the field mentioned on page 2 of PennCap-M Insecticide and Bees: Fact and Fallacy. In this connection, see letters of January 31, 1970 by Hugh W. Homan and February 8, 1979 and by Carl Johansen stating that rapeseed pollen was not identified in the pollen samples taken from dead bees and combs sampled following the bee kills.

Carl Johansen states in the above letter that wild mustards were grown extensively in waste areas, wheat fields, and pea field edges in the vicinity of the bee kills during May of 1976. In addition, he states that the pollen samples providing positive analysis for methyl parathion were the wild mustards.

It should be noted that the "Summary of the Lewiston Bee Kill" attached to the letter of June 17, 1976 from Wilson Kellogg, Director, Idaho State Department of Agriculture mentioned previously unreported applications of PennCap-M in the area of the bee kill.

APPENDIX

Sample Log Summary

<u>CR Number</u>	<u>Beekeeper</u>	<u>Numer of Samples</u>	<u>Item</u>	<u>Date of Suspect Contamination</u>
CR 124304	Zagata	21	Pollen	78
CR 124305	Zagata	3	Pollen, uncontaminated	78
CR 124306	Murdock	1	Pollen	78
CR 124307	Zagata	13	Unsealed honey	78
CR 124308	Lemmons	6	Pollen	78
CR 124309	Zagata	1	Raw Honey for Human Consumption	78
CR 124310	Mundell	3	Pollen	76
CR 124311	Pontius	3	Pollen	76
CR 124312	Mundell	1	Honey and wax	76
CR 124313	Mundell	4	Raw Honey for Human Consumption	76, 78
CR 124314	Zagata	1	Pollen Top Super	78

Samples were delivered to the EPA Technical Investigations Branch Laboratory at the Denver Federal Center on January 16, 1979.

Samples were duplicated when possible. Duplicates y and g have yellow and green labels respectively.

Sample Log

CR 124304

Subs	home 1-5, other 1-16	Duplicate y and g
Owner	Frank Zagata	
Date Taken	January 9 and 10, 1979	
Amount	x greater than 3 g	
Containers	100 ml glass jars	
Item	Pollen, suspect contaminated	
Sampling method	3 frames/hive body 10 cells/side	

Notes:

Brood chambers labeled "home" are from the home bee yard. Those labeled "other" are from Konechny, Sonners, Johnston, Severa, Ponds, or Peterson bee yards.

CR 124305

Subs	other 1-3	Duplicate y & g
Owner	Frank Zagata	
Date Taken	January 10, 1979	
Amount	x greater than 3 g	
Containers	100 ml glass jars	
Item	Pollen, uncontaminated	
Sampling method	3 frames/hive body, 10 cell/side	

Notes:

Brood chamber from queenless colony. Colony from Upper Robinson, Lower Robinson, or Hazen bee yards

CR 124306

Subs	other 1	Duplicate y & g
Owner	Bill Murdock	
Date Taken	January 10, 1979	
Amount	x greater than 3 g	
Containers	100 ml glass jars	
Item	Pollen, suspect contaminated	
Sampling method	3 frames/hive body, 10 cells/side	

Notes:

Colony located at 209 Bracken Street, S., Twin Falls, Idaho

(Sample bottles may be labeled CR 12306)

CR 124307

Subs	home 1-5, other 1-16	Duplicate y & g
Owner	Frank Zagata	
Date Taken	January 10, 1979	
Amount	x greater than 20 cc	
Containers	100 ml glass jars	
Item	Honey unsealed, suspect contaminated	
Sampling method	Honey taken from individual cells by spatula	

Notes:

Brood chambers labeled "home" are from the home yard. Those labeled "other" are from Konechny, Sonners, Johnston, Severa, Ponds, or Peterson bee yards.

Samples missing for lack of honey in brood chambers:

other

3 y g
4 g
5 y g
8 y g
9 y g
10 y g
12 y g
14 y g

CR 124308

Subs	other 1-6	Duplicate y and g
Owner	Bill Lemmons	
Date Taken	January 10, 1979	
Amount	x greater than 3 g	
Containers	100 ml glass jars	
Item	Pollen, suspect contaminated	
Sampling method	3 frames/hive body, 10 cells/side	

Notes:

From the Kaster, Stiegemier, Chisholm or Lunte bee yards.

CR 124309

Subs	Duplicate y and g
Owner	Frank Zagata
Date Taken	January 11, 1979
Amount	1 cup
Containers	4 oz glass jars
Item	Honey, suspect contaminated
Sampling method	

Notes:

Honey for human consumption taken from Zagata residence. From bee yards in Twin Falls County.

CR 124310

Subs	other 1-3	Duplicate y and g
Owner	Orie E. Mundell	
Date Taken	January 12, 1979	
Amount	x greater than 3 g	
Containers	100 ml glass jars	
Item	Pollen, suspect contaminated	
Sampling methods	3 frames/hive body, 10 cells/side	

Notes:

From Nez Perce County, 1976. Bee yards listed in Appendix.

CR 124311

Subs	other 1-3	Duplicate y and g
Owner	Gene N. Pontius	
Date Taken	January 12, 1979	
Amount	x greater than 3 g	
Container	100 ml glass jars	
Item	Pollen, suspect contaminated	
Sampling Method	3 frames/hive body, 10 cells/side	

Notes:

From Nez Perce County, 1976. Bee yards listed in Appendix.

CR 124312

Subs	other 2	Duplicate y and g
Owner	Orie E. Mundell	
Date Taken	January 13, 1979	
Amount	3 cups honey and wax	
Containers	1 1/2 quart jars	
Item	Honey and Wax, suspect contaminated	
Sampling method	Cut from foundation with clean hive tool	

Notes:

No pollen cells in sample. From Nez Perce County, 1976. Bee yards listed in Appendix.

CR 124313

Subs	1-3, plus honey bear
Owner	Orie E. Mundell
Date Taken	January 13, 1979
Amount	1 cup each plus one full honey bear
Container	4 oz glass jars and one plastic honey bear
Item	Honey, suspect contaminated
Sampling method	

Notes:

Honey for human consumption taken from Mundell residence. From bee yards in Nez Perce County, subs 1-3 from 1978 harvest. Honey bear from 1976 harvest. Honey was extracted, heated to 115 degrees, and strained through cheese cloth. This is raw unfiltered honey.

CR 124314

Subs	None
Owner	Frank Zagata
Date Taken	January 11, 1979
Amount	1/3 cup
Container	4 oz plastic jar
Item	Pollen, suspect contaminated
Sampling method	

Notes:

Taken last summer by Frank Zagata, random samples from shallow production super.

Sample Method

PHONE SUMMARY

NAME: Dan Bench
US E.P.A.
Region VIII
Denver, Colorado

DATE: 10/26/78

PHONE: FTS 327-3928

SUMMARY

In a phone conversation with Mr. Bench concerning the recommended procedure for obtaining samples from bee colonies allegedly damaged by Penncap M, I received the following:

- 1/ An EPA inspector in the appropriate EPA Region should be utilized, and he/she should follow the normal chain of procedures for an enforcement case.
- 2/ In particular, the inspector should:
 - a/ Obtain an US Geol. Survey 7 1/2 minute quadrant map and plot out where the beeyards are (with the beekeepers help).
 - b/ Sample at least one quarter (1/4) of the beeyards (for example, if there are 20 beeyards, sample at least 5 of them). Also, attempt to sample those yards adjacent to the area which has been sprayed. (To determine the area sprayed the inspector should talk with local/regional applicators and attempt to obtain an affidavit (or see the records, if possible) from the applicator.
 - c/ In each beeyard sample at least 2 of the damaged hives.
 - d/ In each hive there are usually 2 "deep boxes" or "brood chambers" at the bottom portion of the hive. The inspector should sample the top one of the "deep boxes" (or the one if only one is present). Note that the inspector should be sampling the "brood chamber(s)" which is (are) usually in the "deep boxes", but if it isn't then the beekeeper should locate the "brood chamber(s)" for the inspector.
 - e/ Obtain fresh pollen (it has a "mealy" look to it) from these "brood chambers".

- i/ To obtain the pollen use a pocket knife (or other suitable object) and remove the top 1/8" to 1/4" of pollen from each of 10 cells on each side of 3 frames. The frames near the center of the hive body should be sampled. Thus, 60 cells/colony (or hive) will be sampled.
- g/ The pollen from each hive should be treated as one composite sample.
- h/ At this point there is no need to sample honey or wax. (However, in order to sample honey, the inspector should obtain honey again from the brood chamber(s), and only unsealed honey should be sampled. The inspector should use the back of a spoon and press it back into the comb letting the honey run out into a suitable receptacle.)
- h/ The inspector should maintain the integrity of his/her samples and not allow unauthorized officials (such as the beekeeper) from handling the samples once they have been collected.
- i/ Example:
 - i/ 20 beeyards containing 600 hives (colonies) were damaged.
 - ii/ Sample $1/4(20) = 5$ beeyards.
 - iii/ Sample 2 colonies/beeyard or 10 colonies
 - iv/ In each colony sample 3 frames or 30 frames total.
 - v/ On each frame sample 10 cells for pollen on each side of the frame or 20 cells/frame or 60 cells/colony or 600 cells/10 colonies total.
 - vi/ When finished, should have 10 separate pollen samples.

Note: Analysis of the samples must include identification/quantification of methyl parathion and capsules present. To determine the presence/absence of capsules one should use the methodology of Blackmer and Reynolds, 1971 and/or Rhodes, et. al., unpublished manuscript, 1978. One of the pieces of equipment needed is a fluorescent spectrophotometer.

The above information was obtained from Mr. Bench, EPA Region VIII, who is experienced with this type of sampling. Further, he has talked with various USDA

Honey Bee Laboratory researchers for their comments/
recommendations. (Also, the beekeeper's assistance
in the above procedure is intended.)

Norman Cook, Biologist
EEB, HED

Affidavits

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER

AFFIDAVIT

STATE

Idaho

COUNTY

Turn Falls

CITY

Buhl

Before me, an employee of the United States Environmental Protection Agency, pursuant to the authority under 43 Statutes-at-Large 803 (7 U.S.C. 2217), Reorganization Plan No. 3 of 1970 (5 U.S.C. at Reorganization Plan No. 3 of 1970), Section 22(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. - 1361.), as amended, and Environmental Protection Agency Order No. 1255.3, Appendix N 1, as read together, personally appeared

Grace Zagata in the city, county and state aforesaid, who deposes under oath or affirmation and says:

These samples of house fly
larvae are identified, taken in Turn
Falls, Idaho. We use this house
larvae and also give some as bait
for bees.

The following are house fly
larvae identified by collection
no. 124309

I hereby swear/affirm that the foregoing statement is true to the best of my knowledge.

SIGNATURE

Grace Zagata

TITLE

FIRM'S NAME AND ADDRESS (Include Zip Code)

Subscribed and sworn to before me at (City and State) Buhl Idaho

this 10th day of Jan, 19 79.

Designated pursuant to law to administer oaths, affidavits, and affirmations, Authorization No. 122

Dan W. Bensch

SIGNATURE OF EPA EMPLOYEE

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER

AFFIDAVIT

STATE

Idaho

COUNTY

Blaine Falls

CITY

Blaine

Before me, an employee of the United States Environmental Protection Agency, pursuant to the authority under 43 Statutes-at-Large 803 (7 U.S.C. 2217), Reorganization Plan No. 3 of 1970 (5 U.S.C. at Reorganization Plan No. 3 of 1970), Section 22(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. - 1361.), as amended, and Environmental Protection Agency Order No. 12553, Appendix N 1, as read together, personally appeared

Frank and Grece Zagata in the city, county and state aforesaid, who deposes under oath or affirmation and says:

On June 27, 1978, I, [Signature],
L. E. Gordon and Dick Smith, of [Signature]
Corporation, Fresno, California and [Signature]
La Croix of Melbourn, British Columbia, Canada,
were here to look at a residential property
for [Signature]. They looked at the [Signature] and
the home place and they looked at one
other suspect yard. They also looked at
another yard of trees that had no [Signature],
for [Signature].

I hereby swear/affirm that the foregoing statement is true to the best of my knowledge.

Frank Zagata Grece Zagata [Signature]
SIGNATURE TITLE

FIRM'S NAME AND ADDRESS (Include Zip Code)

Bill Honeyaporia
Subscribed and sworn to before me at (City and State) Blaine, Idaho

this 10th day of January, 1977.

Designated pursuant to law to administer oaths, affidavits, and affirmations, Authorization No. 124

[Signature]

SIGNATURE OF EPA EMPLOYEE

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER

AFFIDAVIT

STATE

Idaho

COUNTY

Nez Perce

CITY

Heppner

Before me, an employee of the United States Environmental Protection Agency, pursuant to the authority under 43 Statutes-at-Large 803 (7 U.S.C. 2217). Reorganization Plan No. 3 of 1970 (5 U.S.C. at Reorganization Plan No. 3 of 1970). Section 22(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. - 136t.), as amended, and Environmental Protection Agency Order No. 1255.3, Appendix N-1, as read together, personally appeared

Eric E. Wandell in the city, county and state aforesaid, who deposes under oath or affirmation and says:

Page 1/3

On or about 22 July 1976 Don Vannoy, Inspector, and Wilson Kellogg, Director of the Idaho Department of Agriculture visited me at my residence to discuss the bee bills in late May 1976 in Nez Perce County.

During the conversation I mentioned that I spoke with Buford Rodgers on 21 July 1976 over the telephone. I had read the investigation report written by Don Vannoy sent to me by Mr Kellogg on 12/21/76. I recalled that I had seen an aerial application to Mr Rodgers' property in early May and had not seen it mentioned in the report. I asked Mr Rodgers during the above telephone conversation whether or not he had done any spraying in early May.

I hereby swear/affirm that the foregoing statement is true to the best of my knowledge.

SIGNATURE

TITLE

FIRM'S NAME AND ADDRESS (Include Zip Code)

Subscribed and sworn to before me at (City and State) _____

this _____ day of _____, 19____.

Designated pursuant to law to administer oaths, affidavits, and affirmations, Authorization No. _____

SIGNATURE OF EPA EMPLOYEE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AFFIDAVIT		SAMPLE NUMBER
STATE <u>Idaho</u>	COUNTY <u>Nez Perce</u>	CITY <u>Lewiston</u>

Before me, an employee of the United States Environmental Protection Agency, pursuant to the authority under 43 Statutes-at-Large 803 (7 U.S.C. 2217), Reorganization Plan No. 3 of 1970 (5 U.S.C. at Reorganization Plan No. 3 of 1970), Section 22(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. - 1361), as amended, and Environmental Protection Agency Order No. 1255-3, Appendix N - 1, as read together, personally appeared Eric E. Mundell in the city, county and state aforesaid, who deposes under oath or affirmation and says:

Page 2/3

He answered "yes, we sprayed 140 acres of alfalfa with Penncoep-M." He wasn't sure of the date and said he would call Don Schumacher to verify the date. He called back shortly and said the date was 4 May 1976. The alfalfa field we were speaking of is located in Sec. 35 T 36N R 4W.

I asked Mr. Kellogg why the 140 acres of alfalfa ~~that mentioned~~ that was sprayed with Penncoep-M wasn't in the report. Don Vanning turned to Mr. Kellogg and said "that was in Mr. Schumacher's other set of books." Mr. Kellogg ~~answered~~ answered "that's right." I said to Mr. Kellogg "you mean to

I hereby swear/affirm that the foregoing statement is true to the best of my knowledge.

SIGNATURE _____	TITLE _____
FIRM'S NAME AND ADDRESS (Include Zip Code) _____	

Subscribed and sworn to before me at (City and State) _____

this _____ day of _____, 19____.

Designated pursuant to law to administer oaths, affidavits, and affirmations, Authorization No. _____

 SIGNATURE OF EPA EMPLOYEE

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER

AFFIDAVIT

STATE

Idaho

COUNTY

Blaine Perce

CITY

Newton

Before me, an employee of the United States Environmental Protection Agency, pursuant to the authority under 43 Statutes-at-Large 803 (7 U.S.C. 2217), Reorganization Plan No. 3 of 1970 (5 U.S.C. at Reorganization Plan No. 3 of 1970), Section 22(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. - 136t.), as amended, and Environmental Protection Agency Order No. 1255.3, Appendix N 1, as read together, personally appeared

Cris E. Mundell in the city, county and state aforesaid, who deposes under oath or affirmation and says:

Page 3/3

tell me they (meaning Schumacher Ag Air) keeps two sets of boots? "Mr Kelley answered

~~"that's right"~~ "that's right."

Those present at this time were:

Eva Mundell

John Thayer

Mike Miltenberger

Dave Schuster

Don Vannoy

Wilson Kellogg

I hereby swear/affirm that the foregoing statement is true to the best of my knowledge.

Cris E. Mundell

SIGNATURE

Bea Keeper

TITLE

FIRM'S NAME AND ADDRESS (Include Zip Code)

Subscribed and sworn to before me at (City and State) Newton

this 12th day of January, 19 79.

Designated pursuant to law to administer oaths, affidavits, and affirmations, Authorization No. 122

Don W. Bernal

SIGNATURE OF EPA EMPLOYEE

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER

AFFIDAVIT

STATE

Idaho

COUNTY

Nez Perce

CITY

Heursten

Before me, an employee of the United States Environmental Protection Agency, pursuant to the authority under 43 Statutes-at-Large 803 (7 U.S.C. 2217), Reorganization Plan No. 3 of 1970 (5 U.S.C. at Reorganization Plan No. 3 of 1970), Section 22(a) of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. - 1361.), as amended, and Environmental Protection Agency Order No. 1255.3, Appendix N 1, as read together, personally appeared

Eric E. Mundell in the city, county and state aforesaid, who deposes under oath or affirmation and says:

On or about 12 May 1976 Tom Wagner Jr contacted me by telephone to advise me that he intended to spray Penncap-M on his rape field the next day. The 300 acre rape field is located in sections ^{39N 9E 0M} ~~29 and 32~~ of T36N, R4W. The purpose of the call was to warn me to move the set of bees in an adjacent canyon.

The next morning I moved the set of 36 colonies to the town of Lapwai, about six miles east

Note: 35N 9E
a 4000 ft.
at 35 and 32
T 35N R4W
PWB
31 Feb 1979

I hereby swear/affirm that the foregoing statement is true to the best of my knowledge.

Eric E. Mundell
SIGNATURE

Bee Keeper
TITLE

FIRM'S NAME AND ADDRESS (Include Zip Code)

Subscribed and sworn to before me at (City and State) Heursten, Idaho

this 12 day of January, 19 79.

Designated pursuant to law to administer oaths, affidavits, and affirmations, Authorization No. 122

Dan W. Denel

SIGNATURE OF EPA EMPLOYEE

Correspondence

Filer, Idaho
Jan 22, 1979

RECEIVED

Mr. Dan Bench
Pesticides Branch
Environmental Protection Agency
1860 Lincoln Street
Denver, Colorado 80295

JAN 24 1979

Pesticides Program
EPA -- Region VIII

Dear Mr. Bench:

I am a farmer in the Magic Valley residing near Filer. My main crops are contract beans and peas for seed.

I tried to get in touch with you when you were in the Twin Falls area recently but evidently by the time the news was in the paper you had already left the area.

I am concerned with the Honeybee kill and the chemical PenCapM which you are investigating. I have been trying to get the farmers' side of the story known thru the local Times News since last September with no results.

PenCapM is a very effective chemical for spraying peas because it will kill both Aphid and Pea Weevil and it has a longer lasting effect, 14 days as compared to 1 or 2 days for most chemicals. The Magic Valley is one of the largest producers of seed crops in the world and in order for us to have good production and make a profit we must control the insects.

The Beekeepers organization have convinced the general public that the farmer, seed companies, Chemical companies and applicators are responsible for their bees. These bees are domesticated and the property of the beekeepers and they should be responsible for them just as I am for my livestock. Bees are known to travel 3 miles or more so for one hive their range would include 25 sections of land or up to 15,000 acres. The bees are in fact trespassing on our property and stealing the pollen. They know the times of year when we are spraying and should keep them contained at those times.

I realize all chemicals have their good and bad effect. But I feel you should weigh the facts on both sides before making a determination to ban them for all use.

If you are back in the area I would appreciate an opportunity to present my opinions in person.

Sincerely,



Dean Ruhter
Rt. #1
Filer, Idaho

83328

February 1, 1979

REF: 8AH-P

Dean Ruhter
Route #1
Filer, Idaho 83328

Dear Mr. Ruhter:

Thank you for your letter of 20 January 1979, regarding your concern about the honeybee kill and your observations of the usefulness of PennCap-M as an insecticide in the Magic Valley. Your letter will be appended to the investigation report.

The scope of my investigation in the Twin Falls area was limited to sampling broodchambers of honeybee colonies that died out to determine whether or not pesticides were involved.

Please be assured that if I have the opportunity to return to the Twin Falls area in the near future I will contact you.

Sincerely yours,

Dan W. Bench
RPAR Coordinator
Air and Hazardous Materials Division

8AH-P:Bench:fhd,2/1/79,3926

file:

January 19, 1979

REF: 8AH-P

Rod Awe, Supervisor
Pesticides Enforcement
Idaho Dept. of Agriculture
4696 Overland Road, Suite 570
Boise, Idaho 83705

Dear Mr. Awe:

This is to thank you for your cooperation and assistance during my brood chamber sampling the week of 8 January 1979. As you no doubt know, I obtained honey and pollen samples from Frank Zagata and pollen samples from Bill Lemmons and Bill Murdock, all of whom maintain their apiaries in Twin Falls County. I also obtained pollen and honey samples from Orle Mundell and pollen samples from Gene Pontius of Lewiston. These were all suspected Penncap-M bee kills; those in Twin Falls County were in the summer of 1978 and those in Nez Perce County in 1976. I obtained affidavits from several of the beekeepers. I also spent some time one evening talking with Charlie Miller in Twin Falls.

I would like to request copies of the Idaho Department of Agriculture investigation reports into the suspected Penncap-M bee kills: Zagata ('78), Lemmons ('78), Murdock ('78), Pontius ('76), and Mundell ('76). The reports will be helpful to me in my attempts to reconstruct the best possible picture of what transpired at those times. I will send you copies of our laboratory results when I receive them.

I was pleased with the cooperation I received from Mrs. Marilyn Butler and found her suggestions regarding our sampling techniques valuable. I will look forward to working with your personnel in the future.

Sincerely yours,

Dan W. Bench
Pesticide Accident Investigation Officer
Air and Hazardous Materials Division

cc: Norm Cook (EPA HQ)
Bill Freutel (EPA Reg. X)
bcc: Marilyn Butler (Idaho Dept. of Agri.)
Howard Rhodes (SEA-USDA Bee Lab)

8AH-P:BENCH:mumbo:1/19/79
file: USE 2.0 (WY or CO)

COOPERATIVE EXTENSION SERVICE



University of Idaho

College of Agriculture

In Cooperation with the

U.S. Department of Agriculture

Moscow, Idaho 83843

(208) 885-6595

January 31, 1979

Mr. Dan Bench
US - EPA - A-H-P
1860 Lincoln
Denver, CO 80295

Dear Dan:

I was called to look at a possible bee kill in Lewiston, Idaho, and went to look May 20, 1976. I only visited Orie Mundell and he showed me two apiaries, one across from the Potlatch Mill and the other a mile west of Spaulding, plus a few colonies he had at his plant in North Lewiston. The bees were obviously dead or dying and the new bees that were emerging were dying as they emerged.

I did collect dead pollen collectors and pollen from the frames in the first two locations. I collected pollen from available blossoming plants including rape, mustard, fiddleneck and some others. I examined the pollen from the frames and dead bees and found no rape pollen on about 10 different slides. The pollen was primarily mustard. Ten samples is a very small sampling and I am sure if I examined more I would have found some rape pollen, which was in full bloom at the time. The mustard that was blooming was a winter annual weed; it was not growing in the pea fields because the pea fields are worked in the spring, but growing in waste areas.

If you need more information please let me know.

Sincerely,

Hugh W. Homan
Extension Entomologist

HWH:dl

cc: Rod Awe

Bee Yards In Nez Perce County

ORIE Mundell
639-28TH ST N
LEWISTON - Idaho. 83501

YARDS Bee's where killed 1976
Pencap - m

PORT DISTRICT	North Lewiston
ORIE Mundell	N&S. Highway
Sam Dilligan	Old W.W.P. Dam
Gary Palmer	Linsey Creek
POTATCH FOREST	East Lewiston
ORIE MUNDALL	RESIDENTS. N. Lew
Earl Tweedy	Lew - ORCHARDS
Jack Rugg	Hatwai
Earl Sampson	Coyote Gulch
Smith farm	Spalding
Jewett	Spalding Park
Sampson Bros.	S. Spalding Park
Pete McCormick	Lapwai
Bill White	Lapwai
Gary Coffland	Tom Bealle
Meacham Land & Cattle Co	Tom Bealle
Martin farm	Tom Bealle
J.B. Wilson farm	Tom Bealle
McGlaughlin	Garden Gulch

ORIE Mundell

Heckner land & livestock Co	Upper Garden Gulch
Wendell Kress	Myrtle Beach
Todd farm	Webb Creek

Gene W. Pontius

<u>Name</u>	<u>Location</u>
Horsepasture #3	23rd & Bryden, Lewiston Orchards
Home #1	2011 Alder, Lewiston Orchards
Rock Pit	Old Lapawi Road, Lewiston Orchards

References

UNITED STATES DEPARTMENT OF AGRICULTURE
SCIENCE AND EDUCATION ADMINISTRATION

FEDERAL RESEARCH
WESTERN REGION
HONEY BEE POLLINATION RESEARCH UNIT
Bee Research Laboratory
2000 East Allen Road
Tucson, Arizona 85719

September 28, 1978

Dr. Charles Brokopp, Project Director
Epidemiologic Studies Program
Department of Health and Welfare, State of Idaho
2373 Old Penitentiary Road
Boise, ID 83720

Dear Dr. Brokopp:

I'd like to summarize our results for you. The samples you sent us gave these data:

432a Zagata's honey bees 0.1 ppm (wet wt. thorax) or 4.86 ng/thorax

432b } Zagata's honeycomb

432c - not analyzed

432d Zagata's honey - no detectable MeP

433 Zagata's pollen from hives - no detectable MeP -
contains identifiable pea pollen

442 Lemmon's honey bees - no detectable MeP

Our limits of detection were about 0.006 ppm in the thoraces and about 1 ppb in the honey.

We ran cholinesterase levels on whole head homogenates from the same bees we used for the GC determinations. Zagata's bees (#432a) gave an average value of 21.02 μ M acetylthiocholine hydrolyzed/min/head. Lemmon's bees had an average of 59.09 μ M/min/head, and our controls had 60.69 μ M/min/head.

From these results, I would say that Zagata's bees were killed by methyl parathion and that Lemmon's bees died from some other cause.

Frank Zagata sent us samples from his area. These were pollen samples taken from hives, and they provided these figures:


Brakett yard	0.58 ppm
Zagata home yard	5.34 ppm
Sonner yard	0.10 ppm
Konency yard	0.03 ppm
Johnson yard	0.64 ppm
Peterson yard	0.73 ppm
Severa yard	1.73 ppm
Pond yard	0.09 ppm

Julie Yoder sent us some bees from Lemmon's Apiary and from Zagata that she collected. Both groups of bees had inhibited ChE levels (9-18 $\mu\text{M}/\text{min}/\text{head}$). This could have been due to decay because the dry ice was long gone when those samples arrived here. There was no detectable MeP in the bees from Lemmon's Apiary and only a possible trace (<0.002 ppm) in the bees from Zagata's yard. Julie said she collected these bees as they were dying. I have no idea what was killing them. Mr. Zagata had mentioned that he thought Imidan was being used in that area also, so perhaps it was the cause. We didn't test for Imidan.

All the pollen samples that we looked at contained pea pollen that matched that from the blossoms you sent us. It is impossible to tell varieties or even species apart, so all we can say is that all the pollen samples contained some Pisum sp. pollen. This includes the samples sent us by Julie which had no measureable MeP as well as all the contaminated samples from Mr. Zagata.

We wondered if you'd like to write all this up with us for some sort of joint report to one of the bee journals. Please call if this letter is not clear enough, and please tell Julie I wish her well.

Sincerely,



Yolanda Lehner
Biological Lab Technician

cc:

Mr. and Mrs. Frank Zagata

STATE OF

DEPARTMENT OF AGRICULTURE

REGULATIONS

6

B

TO: All Aerial Applicators and Pesticide Dealers in the Counties of Latah, Lewis, Clearwater and Nez Perce.

FROM: Wilson Kellogg, Director

SUBJECT: Restricted Use of Methyl Parathion (Microencapsulated)

Effective this date no aerial application of microencapsulated methyl parathion will be made within two miles of any canyon breaks or the perimeter of the Clearwater-Snake River drainage within the boundaries of the following Counties: Latah, Lewis, Clearwater, and Nez Perce.

Investigation by this office and lab reports show that subject methyl parathion by aerial spray has destroyed hundreds of bee hives and bees in the above counties. Therefore, to protect the welfare of the beekeepers in said counties, this emergency restriction is issued.

This restriction is issued pursuant to Section 67-5203 Idaho Code and shall be in effect for a period of 120 days from date hereof unless sooner rescinded.


Wilson Kellogg
Director

WK:po

Prepared By:
Alfred E. Miller
Supervisor, Pesticide Enforcement
Idaho Department of Agriculture

SUMMARY OF LEWISTON BEE KILL

On the evening of May 17, 1976 our area investigator in Lewiston, Don Vannoy, was notified by Dwight Kilgore and R.W. Wade of a substantial bee kill.

The following day Vannoy initiated his investigation to determine the extent of the kill. He first noted that many beekeepers in the Lewiston Orchards area were affected. Records of the aerial applicators were inspected and it was found that the insecticide Imidan had been used on many fields in the area of the kill. Vannoy also noted that this product was used by growers too. The records listed only one other new product used in the area and this was encapsulated methyl parathion on one 95 acre field of peas.

Dr. Carl Johansen of Washington State University and Mr. Hugh Homan, extension entomologist, were contacted and it was the consensus of opinion of these individuals including Vannoy, that the bees were probably visiting sprayed fields. Since the application records indicated that Imidan was widely used, it was the most likely pesticide to have caused the kill. It seemed remote that one 95 acre field of encapsulated methyl parathion could have caused bee kills in such a large area. Hugh Homan examined pollen from dead bees and stated that it consisted mainly of weed pollen.

Based on the above facts, we recommended to the director to place a temporary restriction on Imidan usage in Northern Idaho counties. At this time, samples of dead bees were sent to the Oregon Department of Agriculture laboratory in Salem. Additional samples were also drawn by Vannoy and these samples were split and sent to the following laboratories: Morse Laboratory, Stauffer's Laboratory, the Environmental Protection Agency's laboratory in Seattle and the Washington Department of Agriculture laboratory in Yakima. All samples that were analyzed showed various residue levels of methyl parathion. No traces of Imidan were found while one sample showed a trace of

ethyl parathion. The Imidan restriction was lifted upon receipt of the laboratory analysis.

It was at this time that Super Kat Flying Service informed us that they had overlooked 400+ acres of peas that were sprayed with encapsulated methyl parathion that had been applied in the area of the kill. Vannoy also noted that a grower had applied the same product to 200 acres of peas in the Mission Ridge area and Schumaker Air Service had overlooked 160 acres of alfalfa which was not detected until the latter part of June.

Vannoy checked with a local orchardist who stated that he had used Carbaryl some three to four weeks prior to the kill but had not used any pesticides during the first two weeks of May.

The Oregon lab also was instructed to analyze for Carbaryl residues because beekeepers indicated that colonies that had been damaged ten days prior were still dying.

Surrounding states were contacted to see if there had been other incidences concerning bee kills of this type. Only California had one instance where bees traveled from an almond orchard to a field that had been sprayed with encapsulated methyl parathion. These bees continued to die two to three weeks after contacting the pesticide. John Hillis of the California Department of Food and Agriculture stated that research was being conducted concerning the bee hazards of encapsulated methyl parathion.

All dealers who sold both liquid methyl parathion and encapsulated methyl parathion were audited by Vannoy and Bill Freutel of the Environmental Protection Agency who was called in to help Vannoy with the investigations. All distribution records checked out with the applicator records. However, there could have been liquid methyl parathion applied that was carry over material from previous years.

On the basis of the information that had been compiled so far, we had evidence that implicated methyl parathion as the possible cause of the bee kill. However, no lab could differentiate between the liquid material and

and the encapsulated product in the analysis of the dead bees. Past experience has shown that liquid methyl parathion is highly toxic to bees but has never caused a bee kill of this type. Also, many widely used agricultural pesticides are also highly toxic to honey bees.

Vannoy took pea samples from fields sprayed with Methoxychlor to determine if these applications were spiked with methyl or ethyl parathion. However, negative results were obtained from these samples.

Bee colonies that sustained damage were plotted on a map as well as all ethyl parathion, liquid methyl parathion and encapsulated methyl parathion applications in order to define the scope of the problem. Weather conditions were obtained from the 10th through the 16th of May which indicated that wind currents were swirling at that time.

On June 9, 1976, Orie Mundell contacted Vannoy and stated that bee colonies in the Culdesac area were dying. Vannoy inspected damaged bee yards and took samples that were sent to the Oregon Department of Agriculture's laboratory. Again, Vannoy inspected the records of all aerial applicators to obtain copies of records containing any insecticide spraying during the first two weeks of June. A map was plotted with damaged bee yards and sprayed fields. Encapsulated methyl parathion was the primary suspect pesticide and the map plotting verified this theory. Director Kellogg was advised of the findings and was advised to restrict encapsulated methyl parathion which he did later that afternoon. The restriction was to last 120 days and would restrict the aerial application of encapsulated methyl parathion within two miles of breaks areas of the Snake and Clearwater drainage systems in Latah, Nezperce, Clearwater and Lewis counties.

→ Pennwalt, the manufacturer of encapsulated methyl parathion had a representative collect two racks from Orie Mundell's damaged colonies. These

racks were analyzed and it was found that the pollen contained high residues of methyl parathion. Whereas the wax had a lesser amount and the honey contained no detectible residues of methyl parathion.

The research that was conducted in California did not yield any data that would provide insight into the bee hazards when using encapsulated methyl parathion.

Pennwalt did indicate that they have submitted label restrictions to the Environmental Protection Agency that would help avoid or reduce bee kills with their product.

In conclusion, the data that has been generated by our department may be considered strong circumstantial evidence that encapsulated methyl parathion was responsible for our bee kill. The fact that methyl parathion was found in the bee samples merely means that methyl parathion was present and does not necessarily prove that it killed the bees. Although with our other information, it would certainly seem to be a strong suspect.

Other instances of severe bee losses have occurred in California, Washington and Arizona where encapsulated methyl parathion was implicated. However, further study will be required in order to conclusively evaluate the toxic effects of encapsulated methyl parathion on bees in these cases.

AEM/bb

WASHINGTON STATE UNIVERSITY

PULLMAN, WASHINGTON 99164

DEPARTMENT OF ENTOMOLOGY

February 8, 1979

Arthur Losey, Assistant Director
Grain and Chemical Division
Department of Agriculture
General Administration Building
Olympia, WA 98501

Dear Art:

Here is my statement concerning modification of Penncap-M regulations to protect bees (to be presented at the hearing in Wenatchee on February 15, 1979):

There are three major factors involved in these considerations: (1) the importance of bee-pollinated crops in Washington agriculture, (2) the lack of summer pasture for honey bees in Washington, and (3) the conflict of interests of insecticide manufacturers, distributors, fieldmen and applicators with reduction of bee poisoning problems.

In midwestern states such as Iowa, with a predominance of wind-pollinated crops and in western states such as Wyoming, where cattle ranching is the major agricultural industry, support for protection of bees is minimal. However, Washington with an annual farm value of bee-pollinated crops of \$400 million has attempted to reduce poisoning problems through Washington State Department of Agriculture regulations for about 30 years. It also is not surprising that California has the most stringent Penncap-M regulations currently in force in certain counties with high value agricultural crops.

Since there are about 100 thousand acres of bearing apple trees in Washington, colonies of honey bees are being moved into Washington from adjacent states during tree fruit bloom each spring. Although both out-of-state and some Washington colonies are removed after fruit bloom is over, there simply is a dearth of pollen and nectar plants for summer maintenance of the 66 thousand Washington colonies used in pollination service.

We are committed to educational programs to teach growers, applicators, fieldmen and beekeepers how to reduce bee poisoning. If these programs reached and affected the actions of everyone involved, we wouldn't need regulations. However, persons who derive part or all of their income from pesticide use are particularly hard to affect. Knowledgeable beekeepers readily admit that our modern agricultural system could not exist without effective pesticides. On the other hand, too much overuse and misuse of insecticides occurs. A number of persons have estimated that only about 50% of the insecticides applied in the United States are actually justified. I know of cases in the state of Washington where only about 30% was justified. Penncap-M is extremely hazardous to bees and cannot be misused to the slightest degree without causing damage. We need the best regulations we can devise to stop the killing.

Let's dispel some of the myths that have been perpetrated concerning Pennacap-M and bee poisoning:

- (1) That Pennacap-M is just another bee killer and not a special hazard. Nothing could be farther from the truth. Pennacap-M is the most destructive bee poisoning insecticide ever developed. The unique characteristic which makes this insecticide more hazardous than even Sevin dust is its great propensity for adherence to the body of a foraging bee. Add to this the fact that Pennacap-M contamination in pollen stored in beehive frames lasts from one season to the next with little or no reduction in strength and you have an extremely serious problem. For example, in one test we got the following data (when considered as replicates, no significant difference with length of storage between 9-day and 10.2 months):

<u>9 days</u>	<u>3.5 mo.</u>	<u>7.3 mo.</u>	<u>10.2 mo.</u>
0.53 ppm	0.11 ppm	0.34 ppm	0.27 ppm

The best comparison we can make of Sevin dust and Pennacap-M is as follows:

Material	lb ai/acre	Age in Months	
		ppm in stored pollen	% mortality, honey bee bioassay
Sevin dust	2.0	0.6 (8)	33 (8)
Pennacap-M	0.5	1.17 (7.3)	94 (10)

The data for Pennacap-M are taken from an experimental plot in which only 20 acres of a 70-acre field were treated. Roy Barker, USDA entomologist, Tucson; Michael Burgett, OSU entomologist, Corvallis and I have obtained various kinds of data indicating the special affinity of the microcapsules to adhere to bees and my most recent studies show that both capsule size and electrostatic charge are involved.

- (2) That the most serious bee kills near Lewiston, Idaho in May 1976 were caused by an illegal application to rapeseed. Actually, there was no rapeseed field in the Lewiston Valley. Hugh Homan, Extension Entomologist, U of I, Moscow checked blooms in the area and determined that the pollen on the dead bees was mustard and not rape. There had been a considerable amount of moisture during the spring and pea field edges, waste areas

and many wheat fields were yellow with black mustard or wild mustard blooms during May. The pollen samples providing a positive analysis for methyl parathion were mustard. I am appending electron micrograph pictures of black mustard, wild mustard and rape pollen to show the differentiation. Note that rape pollen is almost elliptical, pointed on the ends and 37.8 μ long. The mustards are oval and 31.6-32.6 μ long with a roughened surface from the pore structures which are about 2 times the size of those on the rape pollen. Chemical analyses conducted by 2 chemists of pollen from contaminated frames showed 12.7-15 ppm methyl parathion after 10 months storage. Penncap-M was the only formulation of methyl parathion recommended and used because of proven effectiveness against the pea leaf weevil. Therefore, all evidence indicates that pea fields surrounding Orie Mundell's apiaries were treated with Penncap-M. Orie suffered the greatest losses in the Lewiston area in 1976.

- (3) That corn is only foraged by honey bees about every four or five years and that sweet corn is much more attractive than field corn. Glen L. Stanley, State Apiarist in Iowa confirmed that corn is a major pollen source year after year, starting about the first of August. This is exactly the situation in Washington, honey bees start collecting corn pollen about August 1 every year. Honey bees will continue to collect pollen on field corn if it tassels before the sweet corn in an area and vice versa, there is no discernible difference in attractiveness between the two types of corn.
- (4) That I had to apply Penncap-M three times on rapeseed near Troy, Idaho in 1976 in order to obtain an effect on the bees. Actually, it became windy and rainy soon after each of the first two applications. The Penncap-M did not control the cabbage seedpod weevil on the crop and caused minimal kills of honey bees. Individual rape blooms remain open for 3-5 days. Therefore, the applications at 4-5 day intervals had little or no carryover effect on the bees. Furthermore, one of the most severely damaged colonies was the one placed next to the plot three days after the last application.

Washington beekeepers have asked that purchasers of microencapsulated insecticides be required to sign a register that certifies they will comply with the regulations. The vendor would be required to furnish the purchaser a copy of the regulations. He would also provide the purchaser with a statement about the critical nature of the bee poisoning problem. I would modify this proposal to only apply to microencapsulated formulations of insecticides known to be toxic to bees and for crop pest control uses with a potential hazard to bees. I firmly believe this proposal is essential for the protection of pollinating insects. Too often, severe bee losses occur when someone simply is unaware of the potential problem. This regulation would insure that anyone who purchased a microencapsulated insecticide hazardous to bees would know about the extreme danger involved for bees.

Arthur Losey
February 8, 1979
Page four

Washington beekeepers have asked that Pennacap-M be tagged with a red dye. Again, this is essential to solving the bee poisoning problems caused by Pennacap-M. In the past, record of use of an insecticide coupled with a positive chemical analysis for the material in dead bees or bee-collected pollen was considered sufficient evidence to establish the bee poisoning agent. Now, Pennwalt Corporation insists that a positive chemical analysis for methyl parathion does not prove Pennacap-M was the culprit. Under these circumstances, we need an effective marker that will aid us in determining the presence of the microcapsules. Pesticide manufacturers are required by law to provide suitable analytical methods for detection of their products before they can be registered for use. A better way to handle this question concerning Pennacap-M would be to simply revoke registration of the product until Pennwalt Corporation supplies an effective analytical method for the microcapsules.

Washington beekeepers have asked that exempted northcentral orchard areas and Palouse white-blooming pea areas be removed from the current Pennacap-M regulations. This mainly is concerned with the lack of summer pasture for the bees needed for orchard pollination. By the time you add the necessary 4-mile buffer zone around any exempted area, you have removed sizable amounts of potential bee forage. A single circle with a 4-mile radius encloses over 30 thousand acres.

Counter to this proposition, the orchardists claim they need Pennacap-M during second cover to control the San Jose scale. I checked this with extension entomologist Arthur H. Retan, Cooperative Extension Service, Pullman and research entomologist Stanley C. Hoyt, Tree Fruit Research Center, Wenatchee. They told me: (1) there is no special area problem with San Jose scale. Heavily infested orchards are found intermingled with lightly infested ones in both northcentral and Yakima areas. (2) San Jose scale has been a major cause of apple cullage in recent years. (3) The main reason for the San Jose scale problem is the lack of application of an effective delayed dormant treatment.

The orchardist has at least three options:

- (1) He can apply an effective organophosphate compound plus superior oil delayed dormant spray to control San Jose scale.
- (2) He can remove blooms in the cover crop by mowing, beating or treating.
- (3) He can use insecticides other than Pennacap-M in the second cover for San Jose scale control.

Washington beekeepers have asked that Pennacap-M not be used within six miles of any village or town. I would amend this to four miles, a more realistic distance for serious bee poisoning hazards. This regulation is needed because hobbyist and sideline beekeepers are being wiped out by Pennacap-M sprays in eastern Washington. There are thousands of hobbyist beekeepers in western Washington and in villages and towns of eastern Washington. When we first were contacted

Arthur Losey
February 8, 1979
Page five

by Palouse hobbyists in 1976 concerning the Penncap-M problem, they had determined that they numbered more than 15. Palouse is a small farming village 15 miles north of Pullman. Since that time, a number of these hobbyists with 2-12 colonies have been put out of the bee business by Penncap-M. Actually, a more realistic approach to this problem might be that taken in our tri-state insect control recommendations for 1979. We will only recommend use of Penncap-M on peas for control of the pea leaf weevil. It would not be applied if blooming weeds are present and would only be used in the spring before May 15.

We are only making two other specific recommendations for Penncap-M use in 1979. (1) for San Jose scale and codling moth on apples during second cover, if no significant amount of weed blooms are present in the cover crop and (2) for spring grain aphids such as the oat birdcherry aphid before May 15 and for fall grain aphids such as the greenbug after October 15, if no hazardous amounts of weed blooms are present. Growers are being warned against further non-essential uses of the product because of the extreme hazard to bees.

Some people have suggested that we should develop the thousands of acres in power line right-of-ways and encourage new oil seed crops such as rape and sunflower to remedy the bee poisoning problem by providing more forage. We conducted a sizable investigation of "bee forage preserves" in the 1960s. We found that there was no acceptable bee forage plant which would compete well enough with noxious weeds to be of help. More recently, we found that bee forage plants growing above 3500' elevation were not effective enough to maintain honey bee colonies.

I firmly believe that the best long-term approach to reduction of bee poisoning problems for the orchardist is establishment of solid grass cover crops. USDA agronomist John L. Schwendiman and WSU horticulturist Max E. Patterson at Pullman found that hard fescue was a very desirable and effective cover crop for orchards. Hard fescue is better than bluegrasses and other grasses from the standpoint of moisture management. Robert E. Fye, USDA, Yakima recently showed that crested wheatgrass and smooth brome grass on ditch banks and in orchards reduced the prevalence of catfacing insects. A good, competitive grass sod cover in orchards would reduce sucking bugs and virus disease-transmitting leafhoppers. Legumes are not only attractive to the sucking bug pests, but also disrupt nitrogen management, especially in pear orchards. One of the main concerns of the horticulturists is protection from freeze injury. Washington orchards with bare ground this winter are going to have some serious freezing damage to the roots of the trees. Bertha armyworms and other cutworms are attracted into orchards to lay their eggs on broadleaf weeds such as lambsquarters and Canada thistle. Therefore, establishment of grass sod cover crops in orchards would not only decrease bee poisoning problems, it would decrease damage from sucking bugs and climbing cutworms and provide important cultural dividends as well.

Sincerely,


C. A. Johansen
Professor

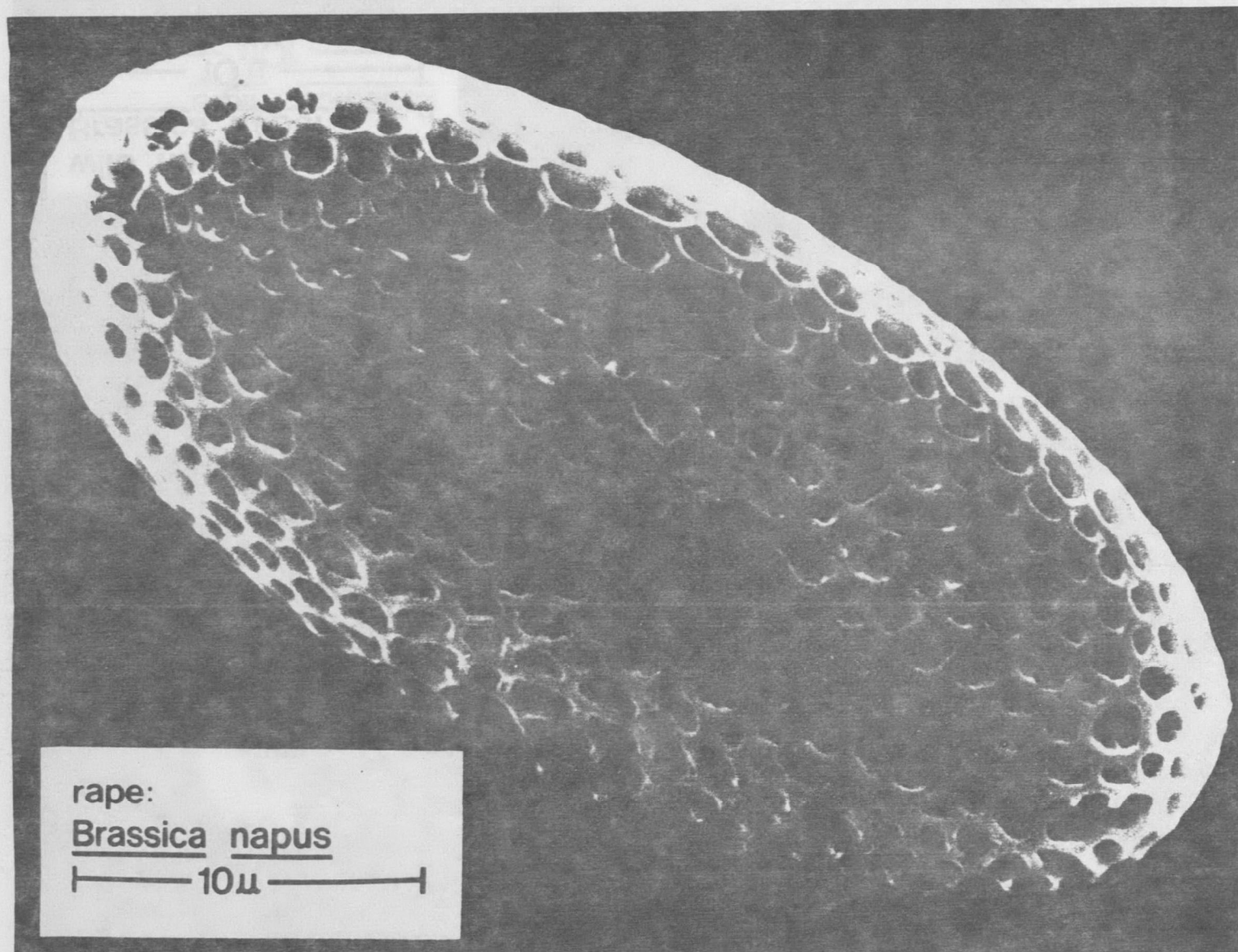
CAJ:dg
(continued)

Arthur Losey
February 8, 1979
Page six

cc: Norman Cook
Philip H. Gray, Jr.
Dan W. Bench
William T. Wilson
Elwood Sires
Allen W. Vaughan
E. C. Martin
E. Laurence Atkins
Mike Dover

Enclosures:

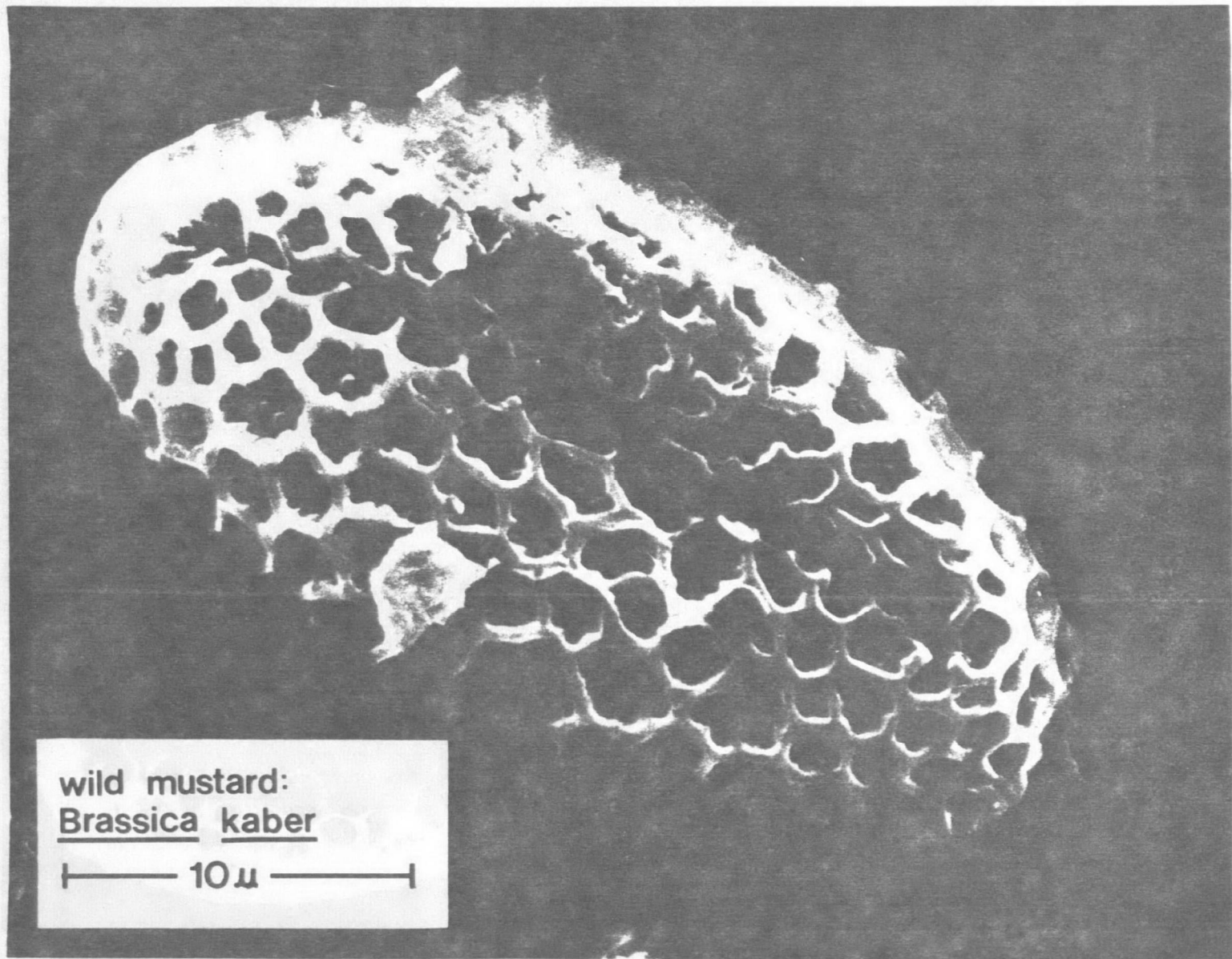
1. Electron micrographs of pollen grains.
2. Reprints of articles on Sevin dust and Pennacap-M poisoning.
3. Reprint of article on bee forage preserves.
4. Copy of Pennacap-M bee poisoning survey.



rape:

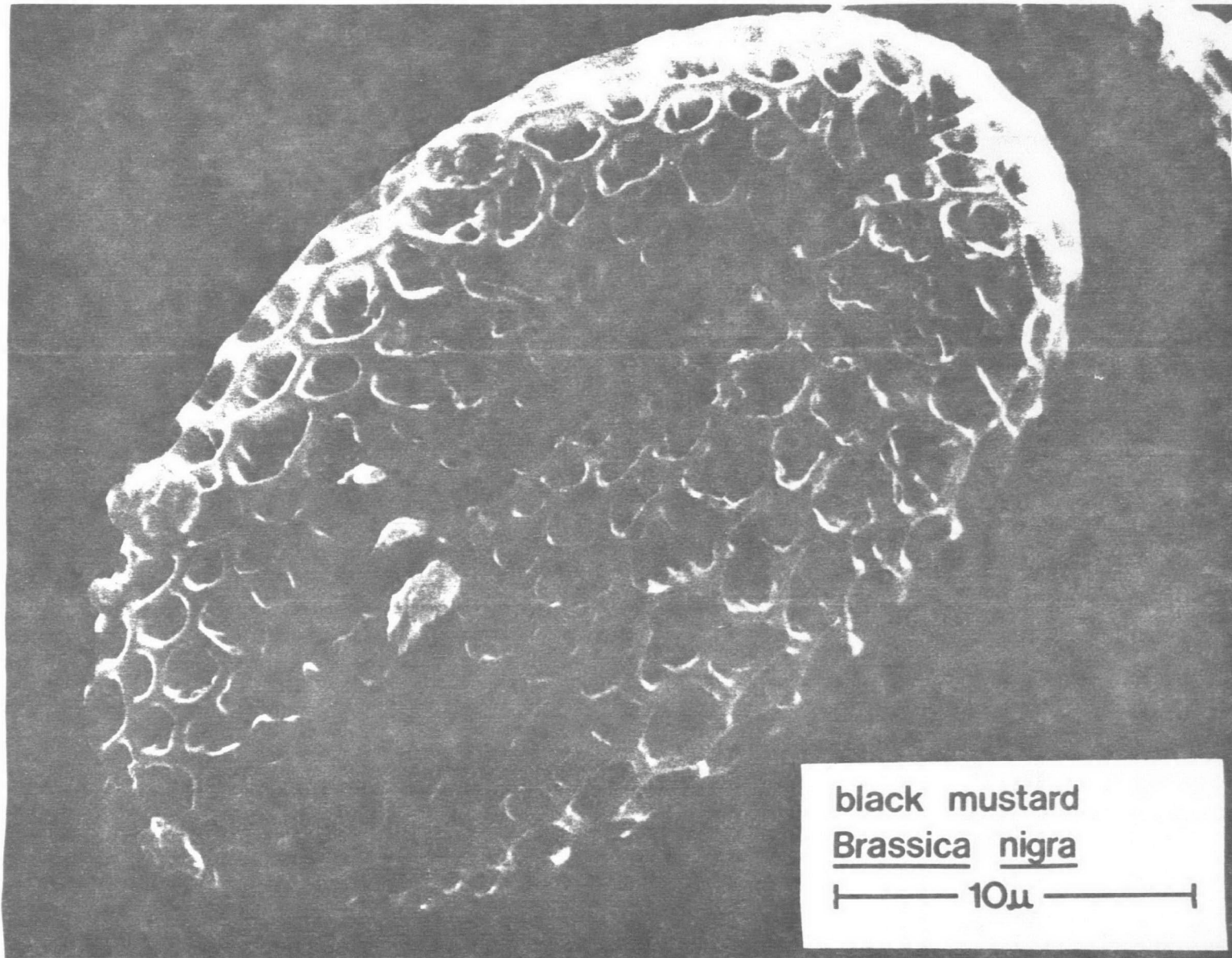
Brassica napus

— 10μ —



wild mustard:
Brassica kaber

— 10 μ —



black mustard
Brassica nigra

— 10 μ —

Toxicity of Carbaryl-Contaminated Pollen Collected by Honey Bees^{1,2}

CARL A. JOHANSEN AND F. CLARKE BROWN³

Severe losses of honey bees, *Apis mellifera* L., caused by carbaryl poisoning first occurred in Washington from use of sprays on apples, pears, and peaches in the spring of 1959 (Johansen 1959). However, the more critical problem of extensive colony destruction from carbaryl dust formulations started about Aug. 1, 1960, in the Yakima Valley (Johansen and Shipman 1961). We quickly found that carbaryl dust applied to sweet corn for control of the corn earworm, *Heliothis zea* Boddie, was being carried back to the colonies by honey bee foragers. The contaminated pollen was fed to the brood and killed larvae and newly emerged adults. Badly damaged apiaries typically contained about 25% of the colonies killed outright, 50% queenless, and 25% with obviously abnormal queen activity. None contained a sufficient quantity of bees to survive the following winter. Beekeepers also began reporting dwindling and ultimate death of colonies utilizing contaminated corn pollen for brood development the following spring.

Positive analyses for carbaryl were obtained from 3 corn pollen samples (removed from beehive frames) and 2 dead bee samples taken from honey bee colonies in 1960. These samples were collected from 3 apiaries in the Yakima Valley which had been severely damaged by carbaryl poisoning during August and September. Duplicate pollen samples were diluted to 20% by volume with sugar syrup and fed to worker honey bees in laboratory bioassay tests. Bee mortalities in these tests were as high as 43% after 72-hr confinement on the pollen-syrup diets (check mortality was 2%). However, contaminated pollen samples held in the beehive frames until April 1961 did not kill bees in bioassays conducted after the 7- to 8-month storage period. During several subsequent seasons, attempts were made to obtain additional bee collected corn pollen samples. However, the bees were so quickly decimated by the insecticide that adequate samples for analysis were not obtained.

Moffett et al. (1970) found that pollen artificially contaminated with 5% carbaryl dust retained a toxic hazard to honey bees for more than 10 weeks.

During February and March 1971, several beehive

Table 1.—Analysis of pollen stored in beehive frames for 8 months and its effect in caged honey bees when fed in sugar syrup.

Source of pollen	Type of pollen	Carbaryl (ppm)	72-hr % mortality of honey bees
Control colony	non-corn	—	7
Poisoned colony	non-corn	0	8
Poisoned colony	corn	0.6	36
Poisoned colony	corn	— ^a	38
Poisoned colony	corn	—	39
Control colony	corn	0	5

^a Sample too small to analyze chemically.

frames suspected to contain carbaryl-contaminated pollen were obtained from colonies in the Yakima Valley and the Columbia Basin. Dale Antles, Chemist, Washington State Department of Agriculture, obtained a positive analysis for carbaryl from 1 sample, using the method of Butler and McDonough (1970). Microscopic examination showed that all but one of the suspect pollens were from corn. Subsequent bioassays were conducted by feeding honey bee workers on pollen samples diluted to 20% by volume with sugar syrup. Inasmuch as these tests were conducted in late April, the pollens had been stored in the beehive frames for about 8 months. Table 1 presents the results of these studies. This represents the 1st successful bioassay for carbaryl in pollen stores during the spring following applications made to corn the previous August.

REFERENCES CITED

- Butler, L., and L. McDonough. 1970. Specific GLC method for determining residues of carbaryl by electron capture after derivative formation. *J. Ass. Offic. Anal. Chem.* 53: 495-8.
- Johansen, C. 1959. The bee-poisoning hazard. *Proc. Wash. State Hort. Ass.* 55: 12-4.
- Johansen, C., and H. J. Shipman. 1961. Current bee-poisoning problem and pollination service. *Ibid.* 57: 151-2.
- Moffett, J. O., R. H. Macdonald, and M. D. Levin. 1970. Toxicity of carbaryl-contaminated pollen to adult honey bees. *J. Econ. Entomol.* 63: 475-6.

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Bee Poisoning Characteristics of Microencapsulated Methyl Parathion¹

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INTRODUCTION

WE FIRST STARTED testing the new microencapsulated formulation of methyl parathion (Penncap M[®]) in 1971. Previously, a number of formulation additives had reduced the hazard of certain insecticides to bees (Johansen and Kleinschmidt, 1972). Certain water soluble plastic materials apparently provided a "locking in" effect which lowered their contact toxicity. We hoped that microencapsulation might also reduce bee poisoning. However, our first trials showed the microencapsulated formulation presented a much longer residual hazard than the standard emulsifiable concentrate (liquid) formulation.

Bee Poisoning Incidents, 1976

DURING MAY 1976, severe poisoning problems began occurring in the Lewiston, Idaho and adjacent Clarkston, Washington areas (Overton, 1977). Bee poisoning in the field was quickly associated with pollen contamination because of the killing of newly-emerged workers, breaking of brood cycles, supersede of queens and ultimate dwindling of the colonies (Johansen, 1978).

Honeybee colonies elsewhere in the Palouse Region began showing poisoning symptoms, but the most severe losses of the summer were associated with the use of Penncap M in orchards in the Yakima and Okanogan areas of Washington during July. We obtained pollen samples from colonies at Lewiston, ID and Palouse, Oroville, and Yakima, WA. Some of these samples were analyzed by R. E. Carlson, Residue Analysis Section, Pennwalt Corp., Tacoma. Duplicate samples from some locations were also analyzed by Clint Duncan, a chemist at Central Washington University, Ellensburg.

We conducted bioassays with worker honeybees by feeding four cages of 60 bees each with a 50:50 mixture of pollen and sugar syrup. The first Lewiston sample contained a minimal amount of

methyl parathion and caused no greater kill than the untreated checks. The second Lewiston sample was not tested because we had no personal control over its collection. The Yakima sample contained 0.2 ppm methyl parathion and caused 32 and 51% mortality after 24 and 48 hours, respectively. Barker (1978) analyzed frame pollen from the second Lewiston source 19 months after the Penncap-M was applied and detected methyl parathion. Sonnet et al. (1978) obtained frames from the same apiary and found contaminated pollen still caused bee mortality when placed in colonies 13.5-14.5 months after the original spray application.

Sample location and age	ppm methyl parathion		bee mortality
	Carlson	Duncan	
Lewiston-1 (9 mo.)	0.07	0	0
Lewiston-2 (10 mo.)	15.0	12.7	---
Yakima (8 mo.)	0.2	0.2	32-51%

Pesticides Branch, Washington State Dept. of Agriculture chemists analyzed eight samples of dead bees, six of which were associated with orchards and all of which contained methyl parathion at 0.08-3.98 ppm. Three additional samples contained both methyl parathion and parathion and therefore, were not the result of Penncap-M applications.

Microcapsule Studies

We examined various pollen samples with a light microscope. What appeared to be microcapsules were light colored and shiny. A series of scanning electron microscope studies were used to establish the presence of the capsules. We verified that the capsules were 30-50 μ in size, about the average diameter for many pollen grains. However, some pollens proved almost impossible to separate from the microcapsules (Fig. 1).

Next we conducted a simple cage test of adherence of the capsule material to honeybees. Filter papers were dusted with 35 mg each of either the capsule wall

material screened to 30-50 μ size (provided by Pennwalt Corp.) or a standard bentonite dust diluent. Each treatment and a check were replicated four times. Sixty worker bees were placed in each cage, held for one hour at 70°F and then placed in a freezer. Microscopic examination showed that the bees exposed to bentonite were essentially clean, as were the untreated checks. Bees exposed to the capsule wall material were quite dusty (Fig. 2).

Burgett and Fisher (1977) conducted field studies with Penncap-M containing a red dye (supplied by Pennwalt Corp.).

Although the spray was only applied to 0.1 of a one-acre plot in one study and to 0.4 of one acre plot in another, they found the tagged capsules in: 86% of pollen pellets from foragers, 74% of midguts of dead bee samples and 93% of pollen loads of dead bees. This is additional evidence of a strong tendency for the microcapsules to adhere to bees.

Stoner et al. (1978) showed that bees do not discriminate between pollen and Penncap M capsules and readily collect contaminated pollen. Barker et al. (1978) found that dyed capsules collected on the legs of bees walking on a screen 30 mm above a dried spray deposit.

1977 Investigations

A comparison of methyl parathion EC (emulsifiable concentrate, the standard liquid formulation) and methyl parathion ME (microencapsulated or Penncap-M) was conducted on 0.01-acre plots of alfalfa at Pullman, WA during July and August when the average maximum temperature was 85°F. Treatments were

applied with a hand sprayer, using 25 psi and applying 25 gal/acre. Residual test exposures were replicated four times by caging 50-100 worker honeybees with each of four foliage samples per treatment and time interval. Test bees were obtained by removing frames from the top super of a hive and placing them in a carbon dioxide anesthetizing chamber. Disposable cages were prepared from 15 cm plastic petri dishes with 2-inch screen inserts to provide room for flight. Alfalfa samples were cut into 2-inch lengths and placed in the cages. Bees were fed 50% sugar syrup and held at 75-78°F. for 48-hr mortality counts.

Results are presented in table 1. Note that methyl parathion ME continued to kill bees 5-9 times as long as methyl parathion EC. Atkins (1976) found Penncap-M was highly toxic to bees for more than four days; while methyl parathion EC only caused a low kill the first day in alfalfa plots.

Field studies were conducted in the Troy, ID area during the last half of May. Cold, windy rainy weather forced us to re-apply May 20, 25, and 29. Average maximum temperatures for the first five days following each application were as follows: 63, 58, and 69°F.

Each treatment was made by airplane on 20 acres of rapeseed which provided good test conditions: (1) minimal competition with other bee forage plants, (2) no other methyl parathion applications in the area, (3) good honeybee foraging on the open rape flowers for both nectar and pollen. One week before the first

Fig. 2. Worker honeybee with capsule wall material [plastic] adhering to all parts of her body. Focus is best and powder shows up best in hairs near base of wing and portions of middle and hind legs.

Fig. 3. Honeybee hive with Todd dead bee trap on entrance and false bottom

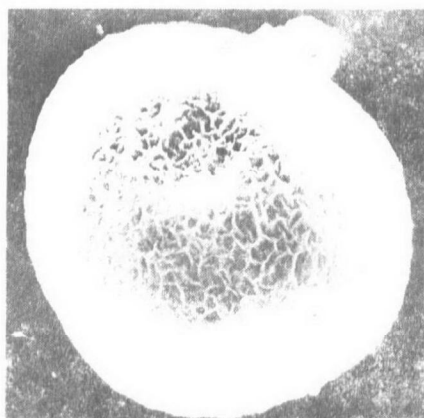
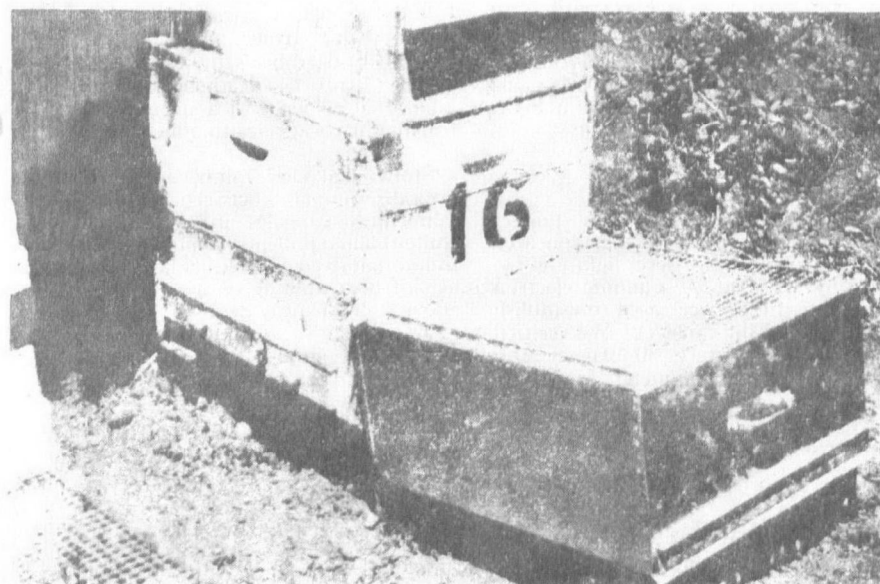
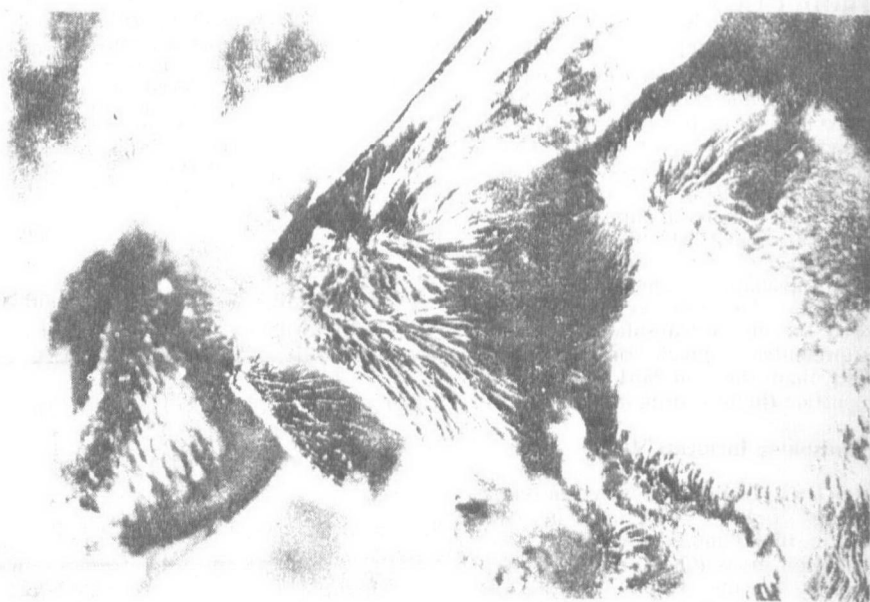


Fig. 1. Scanning electron microscope picture of Penncap-M capsule.



pollen and internal dieoff trap underneath

application, we placed one colony next to each plot and an untreated check field. Each hive was fitted with a Todd dead bee trap (Atkins et al., 1970) and a false bottom pollen and internal dieoff trap (Nye, 1959; Johansen, 1960) (Fig. 3). We planned to add a colony at each of the three locations one day after treating and every other day after that to provide for adequate pollen samples. One and 3-day colonies were placed next to the treated plots after the third application. Five-day colonies were not placed because the growers involved were planning to apply parathion for control of heavy cabbage seedpod weevil infestations (table 2). We removed the treatment colonies to Pullman on the evening of the fifth day.

Pennwalt Corp. provided a specially prepared red dye formulation of Penncap-

M which was used in the first applications. They also provided a sticker (No. 8) which we hoped would decrease pickup of insecticide onto foraging bees. It increased the kill following the first two applications, probably because of better adherence to the plants during inclement weather, but apparently reduced the long-term detrimental effects on the colonies (table 3). However, this treatment gave little or no control of the cabbage seedpod weevil. Colony 1B, which was exposed to all three applications, gradually declined till the queen stopped laying 28 days after the third application (table 3).

We believe the samples from colonies 1C, 1D, 3D, and 3E only reflect the effects of the third application because (1) individual blooms do not last more than the 4-5 day intervals involved and (2) inclement weather obviously helped remove the insecticide residues of the first two applications, especially in plot No. 3 where Penncap-M was applied alone and hardly caused abnormal bee kills (table 2).

Initial kills were severe following the third application on plot No. 1 (with sticker). However, colonies 1C and 1D recovered nicely during the rest of the season. In contrast, colonies 3D and 3E sustained heavy internal reductions of newly-emerged bees starting the fourth or fifth day after application. This culminated in irreversibly broken brood cycles after 12 and 19 days (tables 2 and 3).

Colony 3C was in place during both the second and third applications and was severely weakened, but it recovered during the rest of the season. Foragers from this colony, placed at the east side of the rapeseed field, started working the earliest blooms on the sloping west half of the field and simply never worked as strongly in the adjacent treated plot area. This fact is also reflected in lower chemical analyses and bioassays than for colony 3E. Colony 3D did not have enough rape pollen stored in the frames to provide a good analysis (table 4).

We were successful in discerning red-dyed microcapsules in pollen samples obtained five days after the first applications from colonies 1A and 3A. A considerable amount of searching under the microscope was required with these minimal samples.

Pollen samples for chemical analysis were taken from the frames by selecting cells in different areas at random. If it is assumed that the samples removed at each time period are essentially replicates, the average of the four analysis for 1C is 0.31 ppm and of the three analysis for 3E is 1.17 ppm. This indicates little or no loss of methyl parathion from the stored pollen during the 7-10 month periods (table 4). We also obtained 63 and 94% mortalities of bees in bioassays of pollen samples from colonies 3C and 3E after 10 months storage at room temperature (70°F).

Conclusions

The uniquely hazardous bee poisoning characteristics of PennCap-M are as follows:

(1) PennCap-M causes a delayed action break in honeybee brood cycles about two weeks after the applications are made. Only carbaryl (Sevin) dust formulations have previously been observed to cause this effect and carbaryl dust formulations are no longer used in commercial agriculture in the United States.

(2) PennCap-M toxicity to bees is retained in stored pollen in beehive frames from one season to the next. Only carbaryl dust formulations and certain outmoded arsenical insecticides have previously been proven to have this characteristic (Johansen and Brown, 1972).

(3) PennCap-M microcapsules have a special affinity to adhere to the hairs of

TABLE 1. EFFECT OF INSECTICIDE TREATMENTS ON ALFALFA TO HONEY BEES

PULLMAN, WASHINGTON, 1977

Materials	lb/acre	8th	48-Hr. % mortality at bees			
			Caged with treated foliage, 1 Day	1 Day	3 Days	5 Days
PennCap-M 2 lb/gal F	0.5	100	100	100	100	100
PennCap-M 2 lb/gal F	1.0	100	100	100	100	100
Methyl parathion 4 lb/gal EC	0.5	100	65	17	6	8
Methyl parathion 4 lb/gal EC	1.0	100	99	20	6	6
Untreated check	--	6	5	4	5	7

TABLE 2. EFFECT OF MICROENCAPSULATED METHYL PARATHION APPLIED TO

RAPESEED ON HONEY BEES, TROY, IDAHO, 1977

Treatment	Appl.	Colony No.	No. dead bees collected per day after application							
			1	2	3	4	5	6	7	8
PennCap-M plus sticker #8 2 lb ai/gal 0.5 lb/acre	1st	1A	165	992	696	480	311	---	---	---
		1B	---	---	---	627	960	---	---	---
		1C	---	---	---	---	---	---	---	---
		1D	---	---	---	---	---	---	---	---
	2nd	1B	981	895	860	1611 ¹	---	---	---	---
		1C	4431	1298	539	557 ¹	447	215	91	111
		1D	---	1177	543	580 ¹	363	333	51	93
		1E	---	---	---	232	554 ¹	136	52	47
	3rd	1A	---	---	---	---	---	---	---	---
		1B	---	---	---	---	---	---	---	---
		1C	---	---	---	---	---	---	---	---
		1D	---	---	---	---	---	---	---	---
Untreated	1st	2A	73	38	56	154 ²	23	---	---	---
		2B	---	---	---	571 ²	53	---	---	---
		2C	---	---	---	---	---	---	---	---
		2D	---	---	---	---	---	---	---	---
	2nd	2A	38	56	14	71	---	---	---	---
		2B	145	68	111	63	---	---	---	---
		2C	---	---	---	---	---	---	---	---
		2D	---	---	---	---	---	---	---	---
	3rd	2A	50	19	36	50	17	59	1705 ²	216
		2B	95	255	128	20	58	76	571 ²	144
		2C	---	---	---	---	---	---	---	---
		2D	---	---	---	---	---	---	---	---
PennCap-M 2 lb ai/gal 0.5 lb/acre	1st	3A	51	98	22	156	129	---	---	---
		3B	---	---	---	155	120	---	---	---
		3C	---	---	---	---	---	---	---	---
		3D	---	---	---	---	---	---	---	---
	2nd	3C	93	57	109	133	---	---	---	---
		3D	---	---	---	---	---	---	---	---
		3E	---	---	---	---	---	---	---	---
		3F	---	---	---	---	---	---	---	---
	3rd	3C	1775	296	260	85	532 ¹	268	112	97
		3D	---	---	---	---	---	---	---	---
		3E	---	---	---	---	---	---	---	---
		3F	---	---	---	---	---	---	---	---

1. About half of each dead bee sample for the first several days died inside the hive and contained some newly emerged bees; by the fourth or fifth day, those dying externally represented 85-94% mortality (mostly new) per sample.
2. Mortality in the check colonies occurred after a threshold application to the check plot on May 23 and a parathion application to plot #1 on June 4.

TABLE 3. EFFECT OF MICROENCAPSULATED METHYL PARATHION APPLIED TO

RAPESEED ON HONEY BEES, TROY, IDAHO, 1977

Treatment	Appl.	Colony No.	Pollen collection, days after application ¹					Colony condition up to 30 days after application
			1	2	3	4	5	
PennCap-M plus sticker #8 2 lb ai/gal 0.5 lb/acre	1st	1A	---	---	---	S	M	Strong, healthy brood
		1B	---	---	---	S	L	Strong, healthy brood
		1C	---	---	---	---	---	---
		1D	---	---	---	---	---	---
	2nd	1B	S	S	S	L	---	Moderate, healthy brood
		1C	H	S	S	N	N	Weak, brood cycle broken at 28 days
		1D	---	S	M	S	S	Weak, brood cycle not broken
		1E	---	---	---	S	L	Weak, brood cycle not broken
	3rd	2A	---	---	---	S	N	Strong, healthy brood
		2B	---	---	---	S	L	Strong, healthy brood
Untreated check	1st	2A	---	---	---	S	N	Strong, healthy brood
		2B	---	---	---	S	L	Strong, healthy brood
		2C	---	---	---	---	---	---
		2D	---	---	---	---	---	---
	2nd	2A	N	S	S	L	---	Strong, healthy brood
		2B	N	S	M	L	---	Strong, healthy brood
		2C	---	---	---	---	---	---
		2D	---	---	---	---	---	---
	3rd	2A	L	L	L	S	---	Strong, swarmed at 7 days
		2B	L	L	L	N	---	Strong, swarmed at 7 days
		2C	---	---	---	---	---	---
		2D	---	---	---	---	---	---
PennCap-M 2 lb ai/gal 0.5 lb/acre	1st	3A	---	---	---	S	M	Strong, healthy brood
		3B	---	---	---	N	N	Queen apparently lost during moving
		3C	---	---	---	---	---	---
		3D	---	---	---	---	---	---
	2nd	3C	N	N	N	S	---	Strong, healthy brood
		3D	---	---	---	---	---	---
		3E	---	---	---	---	---	---
		3F	---	---	---	---	---	---
	3rd	3C	S	S	S	S	S	Weak, brood cycle not broken
		3D	---	---	---	S	S	Weak, brood cycle broken at 17 days
		3E	---	---	---	N	S	Weak, brood cycle broken at 19 days
		3F	---	---	---	---	---	---

1. N = nil, S = small, M = moderate, L = large.

foraging bees. We have long known that dust formulations of insecticides are more hazardous to bees than liquid formulations because of greater pickup. Several kinds of data indicate that the plastic microcapsules possess a stronger tendency for pickup than standard powder formulations. Capsule size, which approximates that of most pollens bees are adapted to carry and electrostatic charge may be involved. The importance of these attributes in the bee poisoning effects of Pennacap-M remains to be determined.

References Cited

- Atkins, F. L., D. Kellum and K. J. Neuman. 1976. Effect of Pesticides on Apiculture. Ann. Rep. Proj. No. 1499. 536-67.
- Atkins, F. L., J. E. Todd and J. D. Anderson. 1970. Honeybee field research aided by Todd dead bee hive entrance trap. Calif. Agr. 24 (10): 12-3.
- Barker, R. J., 1978. Personal communication.
- Burgett, M. and G. Fisher. 1977. The contamination of foraging honeybees and pollen with Pennacap M. Am. Bee J. 117:626-7.
- Johansen, C. A. 1960. Bee repellent combined with dieldrin or Sevin in bee poisoning tests on alfalfa. J. Econ. Ent. 53:1010-2.
- Johansen, C. A. 1978. What is bee poisoning? Clean. Bee Culture 106:213-5.
- Johansen, C. A. and F. C. Brown. 1972. Toxicity of carbaryl-contaminated pollen collected by honeybees. Env. Ent. 1:385-6.
- Johansen, C. A. and M. G. Kleinschmidt. 1972. Insecticide formulations and their toxicity to honeybees. J. Apic. Res. 11:59-62.
- Nye, W. P. 1959. A modified pollen trap for honeybee hives. J. Econ. Ent. 52:1024-5.
- Overton, W. C. 1977. Are microencapsulated pesticides here to stay? Am. Bee J. 117:624-25.
- Sonnet, P. F., H. A. Rhodes, F. J. Wilkinson and W. T. Wilson. 1978. Honeybee exposure to Pennacap M and residues of methyl parathion in stored pollen. Prog. Rep. Honeybee Pesticides/Diseases Lab., USDA, Laramie, Wyoming.
- Stoner, A., P. F. Sonnet, W. T. Wilson and H. A. Rhodes. 1978. Pennacap M collection by honeybees. Am. Bee J. 118:154-5.

Table 4. Analyses of Pollen Stored in Beehive Frames, Microencapsulated Methyl Parathion Plots, Troy, Idaho, 1977

Colony	Exposure	ppm methyl parathion				bee mortality 10 mo.
		9 days	3.5 mo.	7.3 mo.	10.2 mo.	
1A	1 st appl.	0.05	---	---	---	---
1C	1 day after 3 ^d appl.	0.53	0.11	0.34	0.27 ²	---
1D	3 days after 3 ^d appl.	0.03				---
2A	no direct treatment	0.02 ¹	---	---	---	---
2B	no direct treatment	0.01 ¹	---	---	---	---
3B	1 st appl.	0.02	---	---	---	---
3C	2 nd and 3 ^d appl.	0.70	0.65	---	---	63%
3D	1 day after 3 ^d appl.	0.01	---	---	---	---
3E	3 days after 3 ^d appl.	1.03	1.30	1.17 ³	---	94%

¹Contaminated by foraging in treated plot one-half mile away.

²Pollen trap samples from colonies 1A, 1C and 1D ranged from 0.11-2.33 ppm, with 1C being the highest.

³Pollen trap samples from colonies 3A, 3C, 3D and 3E ranged from 0.01-6.63 ppm, with 3D being the highest.

Bee Forage Preserves

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Introduction

WASHINGTON beekeepers have long recognized lack of suitable bee pasture as one of the major factors causing their bee poisoning problems. Modern agricultural practices of large-scale land use and cultivation, removal of fence rows and strips of wild land, and widespread and indiscriminate use of weed-killing sprays have drastically reduced the available bee forage plants. In Washington, commercial beekeepers have become largely dependent upon cultivated fields for honey-bee colony maintenance. Now they are in the seemingly never-ending vicious circle of pasturing bees on commercial crops and sustaining increasing bee poisoning losses from the use of insecticides in agricultural pest-control programs.

With the advent of Sevin insecticide use on corn for corn earworm control in 1960 and the catastrophic bee poisoning losses suffered every subsequent season, we decided to investigate the development of bee forage preserves. Under the prevailing situation, we were interested in experimenting on any and all possible methods of reducing the problem.

Discussions with groups of interested persons—corn producers, corn processors, orchardists, legume seed growers, beekeepers, chemical company representatives, chemical applicators, and government officials—produced the idea

of seeding bee plants in the wasteway areas of the Columbia Basin Irrigation Project in eastern Washington. These wasteways contain thousands of acres of land which are subirrigated from the drainage water. Bureau of Reclamation plans are for these lands to remain uncultivated in the foreseeable future. Therefore, such wasteways offered the greatest potential for development of safe and effective bee pastures.

Experimental Plantings

On March 21, 1962, representatives of seven state and federal agencies met in the Winchester Wasteway and established 32 kinds of plants, shrubs, and trees in a 3-acre plot (Figs. 1 and 2). Twenty-one items were planted in individual rows, while 11 of the most potentially desirable legumes were drilled in larger plots. Bureau of Reclamation personnel made sizable seedlings of eight selected legumes in adjacent areas of the Wasteway the following December. In 1963, 1964 and 1965 additional plantings were made in the same general area, as well as in the Puyallup area of western Washington.

Eight legumes (varieties of vetch, trefoil, alfalfa, sweetclover, milkvetch, and clover) made excellent stands by fall in the original Wasteway planting. During 1963, honey-bee colonies placed near the plot foraged mainly on the sweet clovers, while bumble bees and leafcutting bees (*Osmia*) visited the



Figure 3. Old mat of growth of Madison vetch which was torn up by rodents and birds during first winter after seeding.

other plants. By the winter of 1964-65, the heavy "mats" of growth formed by vetch, alfalfas, and clovers were being severely torn up by rodents and birds (Fig. 3). White sweet clover dominated the areas originally seeded to both white and yellow varieties and

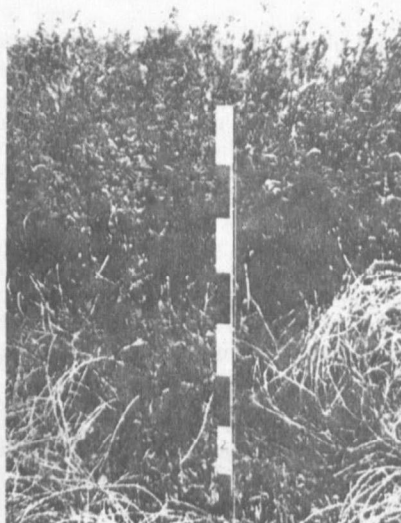


Figure 4. White sweet clover formed this excellent 6-foot growth by mid-June of the year after seeding; it competed very successfully with Canada thistles and other noxious weeds.

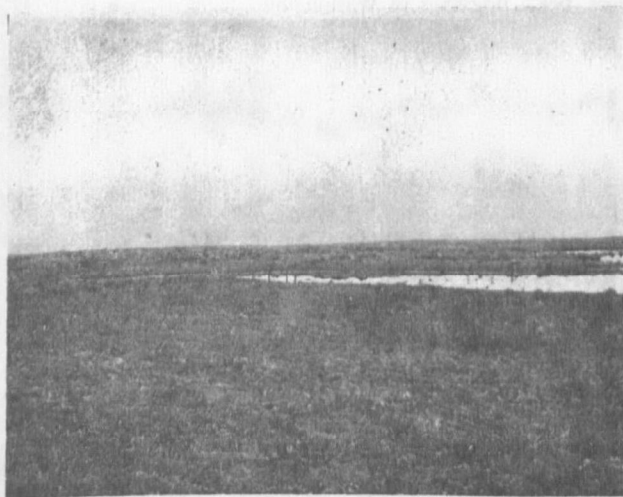


Figure 1. Winchester Wasteway bee forage plot area 1 month after planting; note sandy soil; dark area to the right indicates sub-irrigation from standing water.



Figure 2. Winchester Wasteway plot area 2 months after planting; irrigation equipment was used to help maintain seedlings through the May drought of 1962.

formed a tall luxuriant growth (Fig. 4). White sweetclover reseeded itself every other year and continued to provide an abundance of blooms in the alternate years.

Canada thistle was the most serious weed to move into the plot area. It encroached progressively into the alfalfa, clover, and trefoil plots. White sweetclover and Cicer milkvetch (*Astragalus cicer*) successfully competed with the thistles (Fig. 5). However, milkvetch proved to be of no value as a bee forage plant—honey bees visit it very rarely.

Black locust quickly emerged as the best tree in the plot. Even though this species was considerably smaller than the pink locusts when originally planted, it became the dominant tree within a few years. Black locust also seeded itself and formed a thick grove of various-sized trees.

Several wild plants not seeded by us did develop in the experimental area. *Psoralea*, a legume which is cited by F. C. Pellett as a nectar plant in some regions, had few small blooms which were never observed to be foraged by honey bees. An evening primrose, *Oenothera*, which became quite widespread in the plot, also was not foraged by honey bees. Fireweed, *Epilobium angustifolium*, spread into the area, but did not become abundant enough to compete with thistles or form an important bee forage source.

Current Activity

During early 1968, we became interested in seeding a sizable area of wet lands of the Winchester Wasteway to demonstrate the potential of this program. White sweetclover was obviously our first choice bee forage legume. However, the Bureau of Reclamation and legume seed production interests quickly vetoed our suggestion of seed-

ing this plant. Water from the Winchester wasteway is impounded by O'Sullivan Dam for re-use in the lower reaches of the irrigation project. Alfalfa seed growers are justified in fearing contamination of their fields with sweet clover, since it can only be eliminated by costly roguing of the plants during the growing season. The Bureau also raised a number of valid technical objections to the spread of sweet clover in the irrigation system which they maintain.

Therefore, we were forced to utilize second-choice plants—birdsfoot trefoil and black locust. Seeds were purchased by the Northwest Cannery and Freezers Association or donated by the Soil Conservation Service. Seeding of a sizable amount of shorelines was done by the Washington State Department of Game. A brief survey in late summer showed that these legumes had made little or no establishment in competition with the grasses and other plants already present. Furthermore, the birdsfoot trefoil plot in the 1962 experimental planting became completely overrun by Canada thistles during the 1968 season (Fig. 6). Since the Bureau of Reclamation is committed to a control program for noxious weeds in the Wasteways, it would only be a matter of time before trefoil plantings would be eradicated by herbicide treatments.

Conclusions

Washington beekeepers have always pointed out a number of practical problems of the bee forage projects as follows:

- (1) If land is good enough for bee forage production, it is probably already cultivated.
- (2) It is not economically feasible for beekeepers to raise their own forage.
- (3) Effective bee forage areas would probably require at least 1 acre per

honey bee colony just for maintenance status.

(4) A succession of kinds of plants providing both pollen and nectar throughout a major portion of the season would be required for colony maintenance.

We thought we had the answers to (1) and (2) above, in the wasteway areas of the Columbia Basin Project. However, by the same token, if we cannot make the idea work in these wasteways, where can we possibly hope to be successful on a meaningful scale in the State of Washington?

To add to this discouraging assessment, the "legume seed preserves," which were established by Washington State Department of Agriculture zonal regulations of insecticide use on corn, are currently being reduced as effective sanctuaries for honey bees. With increasing pressure for acreage of processing sweet corn, growers are beginning to raise this crop in the zones restricted from the use of Sevin. Malathion dust, although a mediocre substitute for corn earworm control, can be disastrous to honey bees.

We have literally investigated all suggestions for the relief of the Sevin bee poisoning problem since 1960. It appears that our original prediction, that new control chemicals would eventually provide the answer to this problem, is about to come true. Gardona, Galecron, and Thiodan have emerged as insecticides showing considerable promise for corn earworm control combined with relatively low hazards to honey bees. Lannate spray also fits this category, even though it is quite toxic to bees. It has a short enough residual action to be definitely preferred to Sevin. Obviously, we should stop wasting time and money on investigating Bee Forage Preserves as an answer to bee poisoning problems in Washington. ●



Figure 5. Cicer milkvetch formed this dark drill-width of growth along the edges of waterways 2 years after being seeded by Bureau of Reclamation personnel.



Figure 6. Birdsfoot trefoil formed this luxuriant growth by early summer of the season after seeding, but became completely overrun by Canada thistles 5 years later.

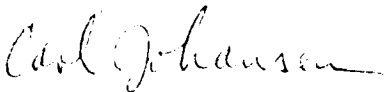
WASHINGTON STATE UNIVERSITY

PULLMAN, WASHINGTON 99164

DEPARTMENT OF ENTOMOLOGY

MEMORANDUM

TO: Extension Entomologists, State Apiarists and others concerned with
bee poisoning problems

FROM: Carl Johansen 

DATE: January 26, 1979

SUBJECT: Bee poisoning survey

As many of you know, I sent out 53 questionnaires to extension entomologists of all states and territories concerning bee poisoning problems with micro-encapsulated (ME) methyl parathion (Penncap-M). I received about 30 replies and have prepared a tabulation of the results. The material is supplemented with records from state apiarists, bee researchers and beekeepers.

In many cases, the first listing for a state is that obtained from the extension entomologist. All cases are associated with reported methyl parathion ME applications at the appropriate time and place. Note that many records have been further validated by chemical analyses and/or capsule analyses. Methyl parathion ME is essentially the only material currently used in commercial agriculture which has been proven to remain toxic to bees in stored pollen in beehive frames from one season to the next. Therefore, we consider the "stored contaminated pollen-following spring honey bee colony collapse syndrome" to be another excellent means of identifying the chemical.

CJ:rb

BEE LOSSES CAUSED BY THE APPLICATION OF MICROENCAPSULATED
METHYL PARATHION ON BLOOMING CROPS OR WEEDS

<u>State</u>	<u>Year</u>	<u>Remarks</u>
Arizona	1975	1500 <u>1(5)/</u> colonies severely damaged from use on alfalfa with small number weed blooms in fields for blue alfalfa aphid.
Arkansas	1978	No problems on cotton or alfalfa to date.
California	1976	8 - 10,000 <u>1(?)</u> / colonies damaged or lost from use on alfalfa with blooming weeds for alfalfa weevil.
	1977	1 - 2,000 <u>1(?)</u> / colonies damaged or lost, use of Penncap-M restricted.
	1978	< 1,000 <u>1(?)</u> / colonies damaged or lost.
Colorado	1978	No losses reported yet, but concern over potentially hazardous use on corn near tasseling for western bean cutworm.
	1978	Unconfirmed report of loss in Boulder County.
Connecticut	1978	No problems to date.
Delaware	1978	No problems to date.
District of Columbia	1978	No use of Penncap-M.
Hawaii	1978	No reports to date.
Idaho	1976	2,300 <u>1(12)/</u> colonies severely damaged from use on peas with blooming wild mustard for pea leaf weevil.
	1977	260 colonies severely damaged from use on blooming Austrian winter peas.
	1978	3 - 500 <u>1(7)/</u> colonies damaged or destroyed from use on peas for pea leaf weevil, unusual foraging of bees on white-blooming peas caused by lack of other pollen sources in area.
	1978	280 colonies severely damaged from use on blooming Austrian winter peas.
Illinois	1978	No documented kill from use on alfalfa and corn, Penncap-M was applied <u>before</u> tasseling on corn.
Iowa	1976	One colony lost from treatment for alfalfa weevil.
	1977	No kills reported.
	1978	40 <u>1(1)/</u> colonies heavily damaged or destroyed from use on corn for European corn borer. (50 colonies severely damaged from use on corn which was shedding pollen and while blooming smartweed and wild sunflowers in field, reported by beekeeper).
	1978	50 colonies lightly damaged from use on corn 1.5 miles away, reported by same beekeeper.
	1978	A number of colonies lost by State Apiarist.

Kansas	1978	State Apiarist claimed Kansas beekeepers lost bees in Nebraska and Arizona, but couldn't estimate losses for state.
Louisiana	1978	No confirmed cases to date from use on apples.
Maryland	1978	No reported cases to date.
Massachusetts	1977	One case reportedly involved use on sweet corn during pollen shed.
Minnesota	1977	500 colonies lost or damaged from use on sunflowers.
	1978	No reported losses with reduction in use.
Mississippi	1978	No problem as yet, but minimal use in state.
Missouri	1978	No confirmed kills to date, but concerned about use.
Montana	1978	Alfalfa leafcutting bees killed after moving into seed field one week after spray applied.
Nebraska	1978	No confirmed kills from use on alfalfa weevil, grasshoppers, and aphids to date.
Nevada	1976	One unconfirmed case involved use on alfalfa for aphids.
	1978	No further reports with discontinued use.
New Jersey	1978	No reported kills from use on sweet corn for corn earworm and European corn borer or on apples.
New Mexico	1978	No known cases in state.
New York	1976	153 colonies severely damaged from use on sweet corn while it was tasseling.
	1978	72 ¹⁽⁵⁾ / colonies severely damaged or destroyed in apple orchards while white clover blooms in cover crop.
North Dakota	1978	Not enough use yet, to know if problems might develop.
Oklahoma	1978	No reports to date.
Oregon	1977	Three kills reported, details unknown.
	1978	30 colonies damaged from use on peas with wild cucumbers blooming in field.
Pennsylvania	1977	Less than 100 colonies destroyed from use on alfalfa with blooming weeds for alfalfa weevil.
	1978	Most alfalfa harvested before alfalfa weevil became a problem, concern with potential problems on alfalfa, apples and sweet corn.
Puerto Rico	1978	Product not yet used in Puerto Rico.
South Carolina	1978	Only recommended on peaches for non-cut-facing insects, no documented losses to date.

South Dakota	1978	No problems to date with uses against grasshoppers on corn, alfalfa and pastures, greenbug on small grains, or first brood European corn borer.
	1978	Unconfirmed report of kill from use on roadsides for grasshoppers.
Texas	1978	134 colonies damaged or destroyed from use on seed corn.
Vermont	1978	Only use on apples and no reported cases to date.
Washington	1975	500 ^{3/} colonies damaged or destroyed from wild mustard bloom in alfalfa for alfalfa weevil.
	1976	1399 ^{1(9)2(5)3/} colonies damaged or destroyed from weed bloom in orchard cover crops (white clover, vetch).
	1976	700 ^{3/} colonies contaminated from Canada thistle bloom in wheat; dwindled early spring 1977.
	1976	39 ^{1(1)2(1)3/} colonies damaged or destroyed from use on rapeseed in bloom and peas with blooming weeds in field.
	1977	37 colonies damaged or destroyed from weed bloom in orchard cover crops (sweetclover, alfalfa, white clover).
	1977	14 ^{3/} colonies damaged or destroyed from use on peas with blooming weeds in field.
	1978	202 colonies damaged or destroyed from weed bloom in orchard cover crops (yellow sweetclover, alfalfa).
	1978	5 ^{3/} colonies damaged or destroyed from use on peas with blooming weeds in field.
West Virginia	1977	50 colonies severely damaged, 250-300 moderately damaged from use on alfalfa with dry land cress in bloom for alfalfa weevil control.
	1978	No further losses reported.
Wyoming	1978	53 ^{1(2)/} colonies destroyed, 111 severely damaged, 80 moderately damaged, and 21 with minimal damage from use on alfalfa in partial bloom at 0.6 to 2.7 miles distance.

^{1/} Positive chemical analysis for methyl parathion, number in parentheses indicates number of apiaries sampled.

^{2/} Positive capsule analysis, number in parentheses indicates number of apiaries sampled.

^{3/} Typical stored contaminated pollen - following spring honey bee colony collapse syndrome.

STATE OF IDAHO
DEPARTMENT OF AGRICULTURE
PLANT INDUSTRY DIVISION
P. O. BOX 790
BOISE, IDAHO 83701

Pesticide Damage Investigation Report

OWNER Frank Zagata, B. W. Lemmons, Charles Miller Zagata: 543-4076
Lemmons: 543-6941
PHONE Miller: 733-1470
MAILING ADDRESS Zagata: Route 1, Box F-26, Buhl, ID 83316
~~Lemmons: Route 1, Box 10, Buhl, ID 83316~~
Miller: 842 Sparks St., P.O. Box 740, Twin Falls, ID 83301

ALLEGED DAMAGE

Type Bee kill Amount See Report
(Crop, animals, etc.)
Date damage occurred (or first noticed) See Report
Pesticide involved See Report E.P.A. Reg.No. _____
Manufacturer's Name _____
Sample taken: Yes X No. If yes, state sampling procedure in your narrative.
Location of damaged property See Report

Operator _____ Company See Report
Mailing Address _____
Phone _____ Lic.No. _____

Violation suspected: Yes No. If yes, explain in your narrative.

Additional Information

1. If humans are involved, obtain written statement from attending physician.
2. If animals are involved, obtain written statement from attending veterinarian.
3. Attach photographs of damaged property.
4. Attach copy of applicator's records.
5. Attach claimant pesticide damage report.
6. Attach narrative of your investigation which includes list of persons who inspected damaged property before and after damage occurred.
7. Indicate direction and distance when drift is involved.

Inspector Harold M. Zutter Date 10-29-78

Original - Department
Duplicate - Inspector

REPORT ON ALLEGED BEE LOSSES
IN BUHL - TWIN FALLS AREA IN 1978

The term "bee" in this report refers to the honey bee only.

I. ALLEGED BEE LOSSES

6-19-78 Initial reports to Boise office of bee losses in the Buhl area.

Telephone calls to Frank Zagata and B & B Apiary (Lemmons):

Lemmons said two of his yards were affected, colonies totaling about 100; Zagata's son indicated they had suffered bee losses but were still in the process of assessing the amount.

Frank Zagata

Summary: Frank Zagata reported damage to bee colonies in 11 yards located in a large area ranging from southwest of Buhl to east of Filer. Colonies allegedly damaged totaled 641-646 and are itemized in the 7-3-78 conversation with Zagata. (See map of Zagata yards for locations)

Damage to 2 additional yards with an unknown number of colonies was not mentioned by Zagata but was reported by Marvin Taylor, T & F Aerial (described later in this report).

6-20-78 and 6-22-78 Conversation with Frank Zagata and inspection of colonies

Zagata said

he had suffered substantial bee losses at several yards in the Buhl-Filer area;

he felt the loss was caused by insecticide use on peas;

he had been told that Penncap M was used on some pea fields in the area;

he was hearing from various sources that Penncap M had a long term damaging effect on bee colonies and he was concerned about the future of his bee business.

We discussed foraging habits of bees. Zagata said that, contrary to popular belief, bees do forage on pea blossoms at a stage when the bloom opens to reveal pollen. He said he had suffered minor bee losses in the past two

or three years. caused in his opinion by insecticide use on peas. The losses he was noticing this year were much more severe than in previous years.

On 6-22 Zagata showed me bee colonies in his home yard and in other yards in the area south of Buhl. Following are yards, colonies/yard, location and symptoms I observed as Zagata opened colonies and inspected frames.

Home yard (approx. 70 colonies) 4 mi. S, $1\frac{1}{4}$ mi. W of SW corner, Buhl

1 colony was still fairly active, all others appeared to have less than normal activity

most of capped brood appeared dead

dead bees were visible in front of most colonies

several queen breeder colonies did not appear to be affected.

Fairview Grange yard (approx. 60 colonies) 4 mi. S, $1\frac{1}{2}$ mi. W of SW corner of Buhl

no inspection; Zagata said he had not looked at this yard yet.

Severa yard (approx. 60 colonies) 5 mi. S, $1\frac{1}{2}$ mi. W of SW corner, Buhl

colonies appeared to be less affected than at Home yard

much of the capped brood larva appeared dead

queen was actively laying in some colonies

all colonies appeared to be affected in varying degrees

dead bees were visible in front of most colonies.

Konechny yard (approx. 58 colonies) 5 mi. S, 1 mi. W, $\frac{1}{2}$ mi. S of SW corner of Buhl

some dead brood, some brood hatching

general condition about the same as at Severa yard

dead bees visible in front of most colonies.

Sonners yard 4 mi. S, $1\frac{1}{2}$ mi. E of SE corner of Buhl

no inspection; Zagata said damage was not as severe here as at other yards.

Lone Tree yard (approx. 40 colonies) 6 mi. S, $3\frac{1}{4}$ mi. E of SE corner, Buhl

no damage at this yard except for 1 or 2 colonies

bee activity around colonies was markedly improved and in sharp contrast to colony activity around other yards

capped brood appeared alive.

New queen cells were being formed in a few colonies we looked at in the affected yards.

Additional yards reportedly suffering bee losses but not inspected:

Johnston yard, 3 mi. S, 1-3/4 mi. E of SE corner of Buhl

Devisser (Ponds) yard, 2 mi. S, 1 mi. E of Filer

Peterson yard, 2 mi. E, 1/2 mi. N of Filer

Yards not suffering any known damage but located in vicinity of pea fields:

Chrismor, McClain and Mathews yards, all E or NE of Buhl.

Zagata said two ASCS bee inspectors had examined some of his yards on 6-16. On the same day a Reeders Spraying fieldman and an Asgrow fieldman also looked at some of his colonies. An ASCS inspector was scheduled to re-examine the alleged losses on 6-23.

According to Zagata, samples of dead bees had been collected by Department of Health and Welfare, and more sampling was scheduled by that agency.

7-3-78 Conversation with Zagata

Zagata reported that the Harmon yard (1 1/2 mi. S of SE corner of Buhl) had suffered a severe bee kill; some colonies were completely wiped out, according to him.

Zagata had tabulated damaged colonies as follows:

Home yard	38 + 60 + 9 colonies	
Severa	55	
Konechny	55 - 60	
Sonners	38	
Johnston	64	
Devisser (Ponds)	57	
Peterson	65	
Harmon	44 *	
Hicks	47 **	
Cedar Draw	54	(3 mi. N, 1 1/2 mi. W of Filer)
Blick	55	(3/4 mi. N of Castleford; symptoms here not the same as at other yards)

* Part of the Harmon yard had been moved to Roseworth

** Some colonies from the Hicks yard, originally located 2 mi. N, 4 1/4 mi. E of SE corner, Buhl, were moved to the Zagata home yard. It is not clear whether damage occurred before or after they were moved.

According to Zagata, undamaged yards included:

Rector yard (W of Zagata home), Watts and Mathews yards (E and NE of Buhl)

According to Zagata, except for the Blick yard, symptoms in the other damaged colonies were all similar and were unlike any bee damage symptoms he had seen before. Zagata was convinced that the insecticide Penncap M was responsible for his bee losses. He had been told it was used on peas in the Magic Valley area for the first time this spring.

8-1-78 Conversation with Zagata

Zagata called to say

pollen from 8 yards had been submitted to Dr. Roy Barker's lab for plant source analysis;

results indicated the pollen was from peas;

the yards from which the pollen was taken were Home (2 yards), Sonners, Konechny, Johnston, Peterson, Severa and Devisser (Ponds);

pollen from the Hicks, Cedar Draw and Harmon yards had been sent to Boise; no results had come back on these yards.

Lemmons (B & B Apiary)

Summary: B & B Apiary reported bee losses in 6 yards (no report on number of colonies) located south of Buhl and north of Filer. Bee losses were also reported in colonies located on Bell Rapids, however, it is not clear whether this alleged damage was sustained in the colonies before or after they were moved to Bell Rapids. (See map for yard locations)

6-29-78 Conversation with Bill and Benny Lemmons

Bee loss had been noticed at 4 yards:

Kaster yard (approx. 66 colonies) 6 mi. S of SE corner, Buhl
Stiegemeier yard (approx. 50-60 colonies) $\frac{1}{2}$ mi. E of Kaster yard
Blass yard (approx. 126 colonies) 5 mi. N, $\frac{1}{2}$ mi. E of Filer
Thler yard 4 mi. N, $\frac{1}{2}$ mi. E of Filer

According to Lemmons

Bee loss at the Kaster yard was first noticed the evening of 6-16-78. Part of this yard was subsequently moved to Bell Rapids for onion

pollination on the Griggs and Thain farms. Kaster reported to Lemmons that he had seen a plane spraying peas near the Kaster farm on the morning of 6-16;

on Saturday, 6-17, Lemmons went to the Stiegemier yard and discovered a bee kill there;

on 6-20 ASCS inspected the affected colonies;

on 6-22 when Lemmons checked the Kaster colonies that had been moved to Bell Rapids he discovered that bees were still dying;

bee loss at the Blass yard was discovered on 6-15; many bees were dead and some were still dying;

part of the Blass yard was moved to Bell Rapids on 6-16 (some colonies at Thains farm had not previously suffered damage; some colonies were moved in from the Blass yard and had suffered prior damage);

potato spraying near Thains was done on 6-20 and onion spraying at Thains was done about 6-11 (Note: applicator's records for onion spraying for John Thain are included with this report):

both previously damaged and previously undamaged colonies at Thains were now showing bee loss;

a sample of bees had been taken from one Bell Rapids colony that was originally at the Blass yard and was submitted for pesticide analysis;

many of the Bell Rapids colonies showed symptoms of weak queens; Lemmons doubted these colonies were strong enough to start new queen cells;

on 6-15-78 bee loss at the Ihler yard was noticed; dead larva were found on top of the hives and piles of dead bees in front of the hives had a slick appearance.

Lemmons said that bees forage on pea blossoms during the early stage of bloom, particularly if no other pollen source is available to them.

6-29-78 Inspection of Blass yard (remaining colonies) with Lemmons

Colonies were opened by Lemmons and frames were inspected. There did not appear to be a large field force but there was good activity inside the hives - newly hatched bees were visible (still house bees) as was capped brood. Dead bees in front of hives had been there some time; there did not appear to be recently dead bees in the piles.

Lemmons said 70 colonies from this yard were taken to Bell Rapids. All the colonies at the Blass yard on 6-15 had been there since April.

7-10-78 Conversation with Lemmons

Lemmons said the colonies on Bell Rapids were not regenerating; Health and Welfare had recently taken a sample from these colonies.

Lemmons said the Kaster and Stiegemeier yards appeared to be rebuilding colony populations.

The following Buhl area yards showed no bee losses:

Davis yard 1 mi. S, $\frac{1}{4}$ mi. W of SE corner of Buhl
Chisholm yard 2 mi. S, $\frac{1}{4}$ mi. E of "
Lunte yard (Latta) 2 mi. S, $\frac{1}{2}$ mi. E of SE corner of Buhl
Thomas yard 4 mi. W, 2 mi. N, $\frac{3}{4}$ mi. W of Buhl
Unnamed yard located 3 mi. W, 1 mi. N, $\frac{1}{4}$ mi. E of Buhl

7-20-78 Conversation with Lemmons

Lemmons had discovered bee losses at 2 additional yards, the Lunte yard and the Chisholm yard. These losses were reported to ASCS approximately 7-14.

Lemmons said

some of the colonies remaining at the Blass yard were not regenerating and were showing symptoms unlike previous years insecticide effects

the colonies appeared improved at times, at other times appeared worse;

the same situation was evident in the colonies remaining in the Kaster yard;

no reports were back concerning the sample taken by Health & Welfare;

samples of pollen were being sent to Roy Barker.

Charles Miller

A conversation with Miller on 7-5-78 revealed he had not suffered substantial bee losses. Minor loss had occurred in 2 yards but Miller did not feel this posed any problem for him. Miller indicated locations of his bee yards (See map). The yards with minor damage were:

2 miles SE of Twin Falls airport

NW of Twin Falls near Snake River Canyon; this yard was reportedly moved on 7-3.

7-18-78 Telephone conversation with Miller

Miller called to report that his yard south of the Twin Falls airport had suffered a minor bee kill; he thought the damage was related to Penncap use. He said he moved the entire yard to McMasters Flat to minimize losses. He did not report the alleged damage to ASCS.

Additionally, he said that 3 yards south of Kimberly suffered bee losses first noticed on 7-15-78. According to Miller these 3 yards showed no damage on 7-1-78. The 3 yards were located:

approx. 3/4 mi. E of Strickers Tavern

approx. 1 mi. N of Strickers Tavern

west of the old Stricker store.

Miller said he did not think bee loss in these 3 yards was caused by Penncap use. He apparently had reported these 3 yard losses to ASCS.

Marvin Taylor, T & F Aerial Report on Zagata Bee Kill

6-30-78 Marvin Taylor of T & F Aerial informed me of an apparent bee kill in 2 of Frank Zagata's yards located on Jon Wells' property north of Castleford.

Investigation of this incident revealed

T & F Aerial applied Metasystox-R and Dylox to Wells' seed alfalfa and clover which was in light bloom

application was made on 6-29-78, starting at approximately 6 a.m. and was completed by 8 a.m.

application was made according to label directions

the bee loss apparently occurred because of unusually warm early morning temperatures that resulted in bees actively foraging earlier than usual

Wells and Taylor were jointly assuming responsibility for the loss to Zagata.

This incident was reported and investigated to distinguish this particular bee loss from the other losses being reported.

II. INSECTICIDE APPLICATION

During and immediately prior to the period of June, 1978 when bee losses were first reported, primarily only two crops, alfalfa and peas, were being sprayed with insecticide in the area west of Twin Falls. The bulk of spraying on alfalfa hay was apparently over, with most fields either cut or nearly ready to cut. Some insecticide applications were made on alfalfa stubble after the first cutting was taken off. A few fields of alfalfa seed, not a major crop, were sprayed with insecticide during the time period that bee losses were reported.

The insecticides used most commonly in early - mid June included Imidan, dimethoate, Metasystox-R, Dylox, Penncap M, and in lesser quantities Systox, malathion, methyl parathion, and possibly some Furadan. All these insecticides except Penncap M were used in previous seasons.

Since unusually large bee losses were reported in 1978 with concurrent damage symptoms unfamiliar to the bee keepers, attention was focused on use of Penncap M by commercial applicators. Of primary consideration was commercial aerial application because ground application is not normally a means of applying insecticides to blooming crops in this area. A few farmers do prefer this method, however, and although no private or commercial ground application of insecticides to peas or alfalfa was substantiated, this cannot be excluded as a possible cause of reported bee losses.

Two aerial firms, Reeders Spraying and Ken-Spray applied Penncap M to pea fields in the large area west from Twin Falls to Castleford. Marvin Taylor of T & F Aerial apparently applied Penncap M to alfalfa stubble on his own property but said he did not use the product on peas. These three companies plus Clements Crop Protection (one plane leased from and used jointly with Ken-Spray) applied some or all of the other insecticides mentioned above to peas and alfalfa. Applications to pea fields were made at various times during daylight hours. The Clements Crop Protection plane may have applied Penncap M to pea fields, but according to applicators records, not in the general area where bee losses were reported. Applicators records show that Thomas Helicopters and Gem State Helicopters did not apply insecticides to crops in the area west of Twin Falls during the time period being considered. No other aerial firms are known to work in the Twin Falls - Castleford area during this time of year.

During the first part of June, 1978, weather in southern Idaho was unseasonably windy and unsettled. Apparently because of this factor almost all of the pea fields that needed insecticide application were sprayed on 3 days: June 13, 16, and 17, with small numbers of fields being sprayed on other days from June 13 to approximately June 22.

Applicators records show that some methyl parathion in a non-encapsulated form was applied to fields in the Castleford area. These fields are within reported bee foraging range of some of the yards where bee losses were reported.

Applicators records show that the onion fields on Bell Rapids were sprayed with Dithane and Diazinon.

The few pea fields which I saw shortly after Penncap M application were almost totally devoid of blooming weeds both in the field and along field edges.

At the time of year that peas were being sprayed, with a good portion of alfalfa cut and no other major crops in bloom, very little bloom was available on which bees could forage except for some weeds which were blooming along fence rows and ditchbanks.

Recommendations for use of specific insecticides on pea fields were made either by fieldmen from contracting seed companies or by fieldmen from the aerial application firms. All those who reportedly made recommendations for insecticide use were licensed as Pest Control Consultants by the State of Idaho.

The pea fields sprayed were apparently all the white variety. Insecticide was applied for weevil and/or aphid control at various stages of bloom and non-bloom, however, fieldmen familiar with pea crops stated that an effective application should be timed to precede the visible onset of pod development.

At least two people associated with the agricultural and chemical application industries suggested that since a disease had been reported among bee colonies in southern Idaho in 1977, part of the alleged 1978 damage might also be related to disease, rather than pesticide exposure.

III. GENERAL CONSIDERATIONS

Because of the large number of colonies reportedly damaged, thorough inspection of bee losses was not accomplished, except possibly by ASCS and the individual beekeepers. The total numbers of allegedly affected colonies mentioned in this report is based primarily on judgement of the beekeepers.

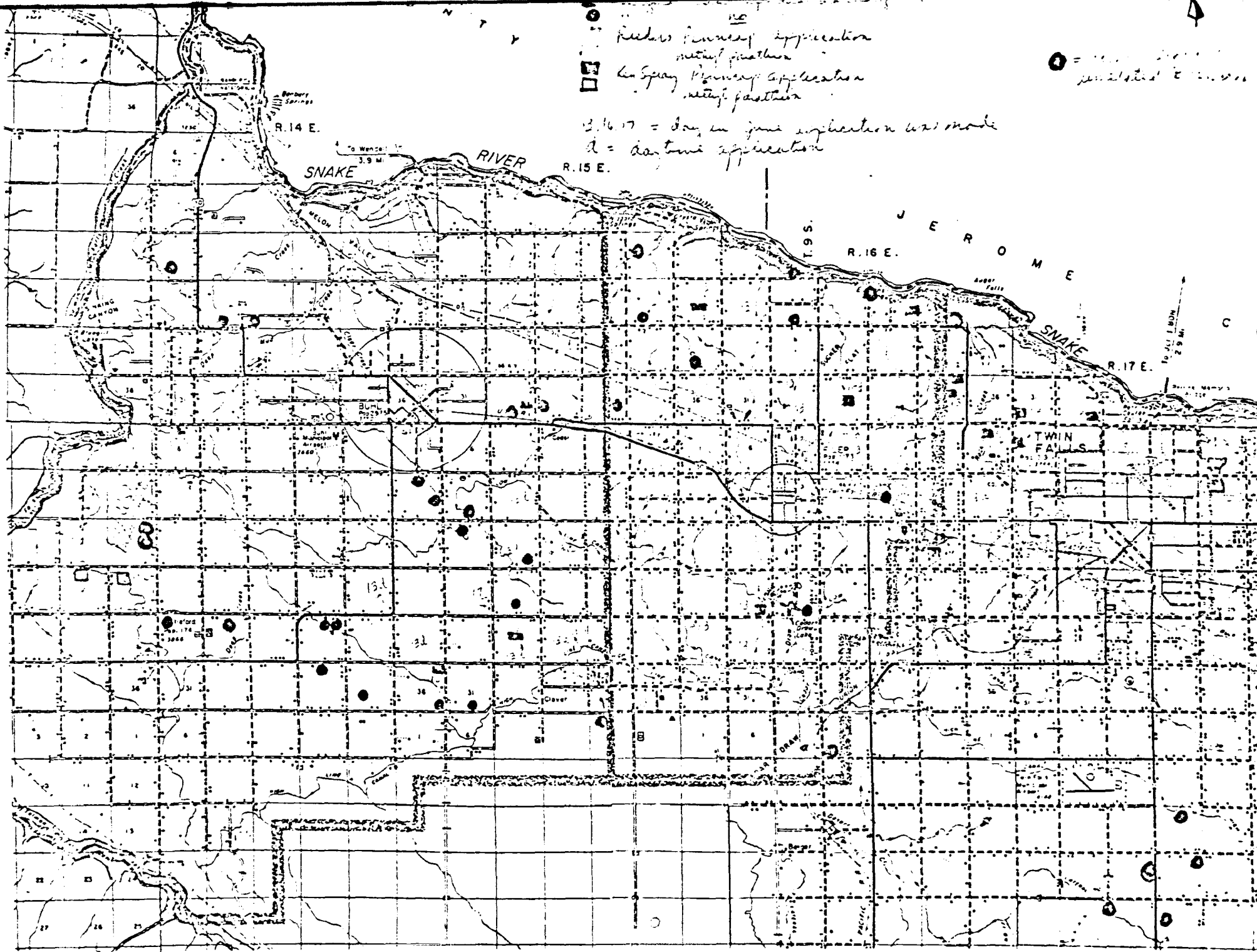
No impartial person who is recognized as being knowledgeable about honey bees was available in this part of the state. Therefore, the suggestion that bee disease may have contributed to some of the alleged loss was not investigated.

It appears likely that insecticide application to pea fields may have contributed to a large percentage of the alleged bee losses. Possibly a very significant factor was the necessity for applicators to spray almost all of the fields within a few days and during a time period when preferred and easily found pollen sources were not available to the bees.

16
 Reelers Primary Application
 with pastures
 17
 Air Spray Primary Application
 with pastures

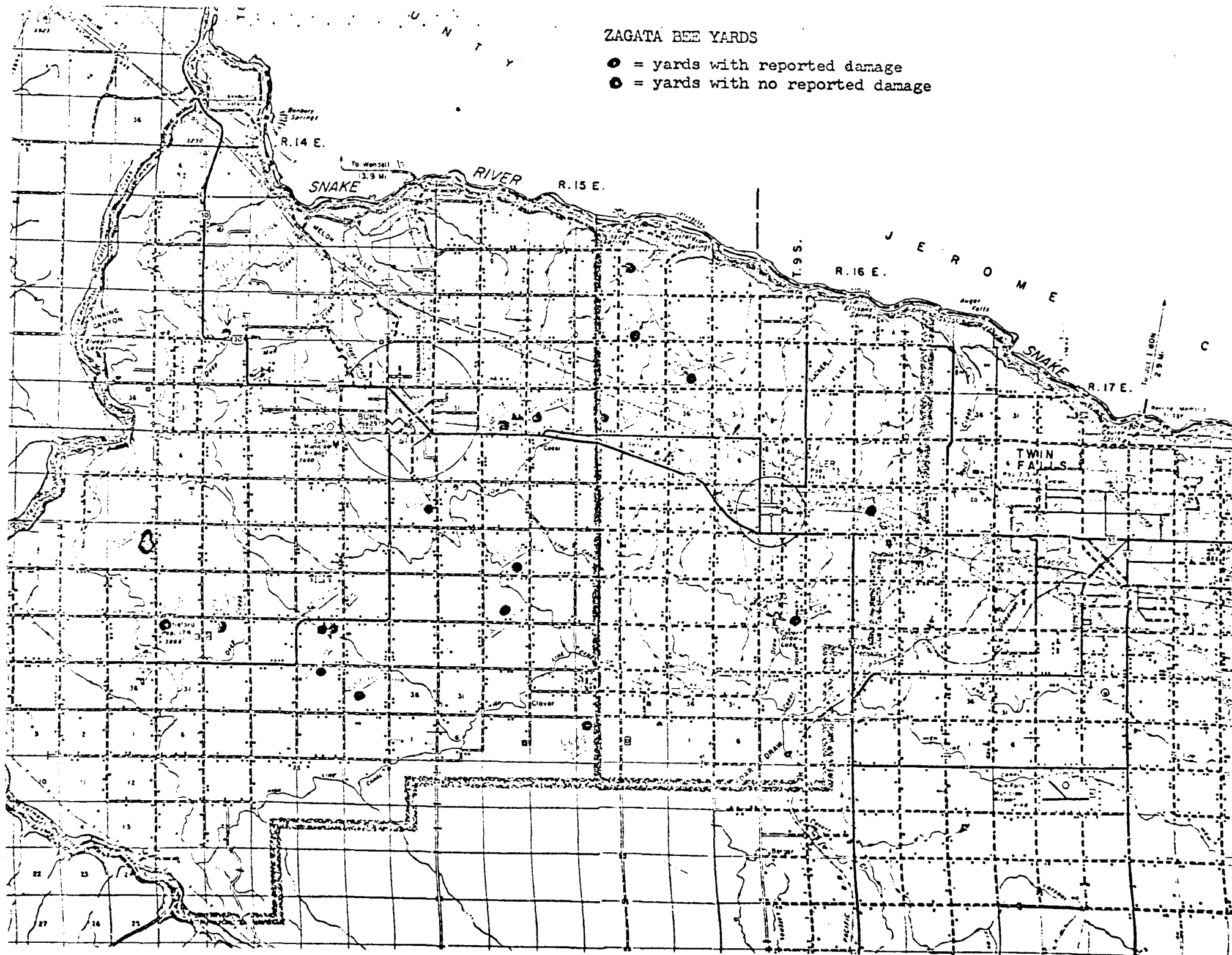
1 = ...
 ...

2.16.17 = day in zone application was made
 2 = daytime application



ZAGATA BEE YARDS

- = yards with reported damage
- = yards with no reported damage

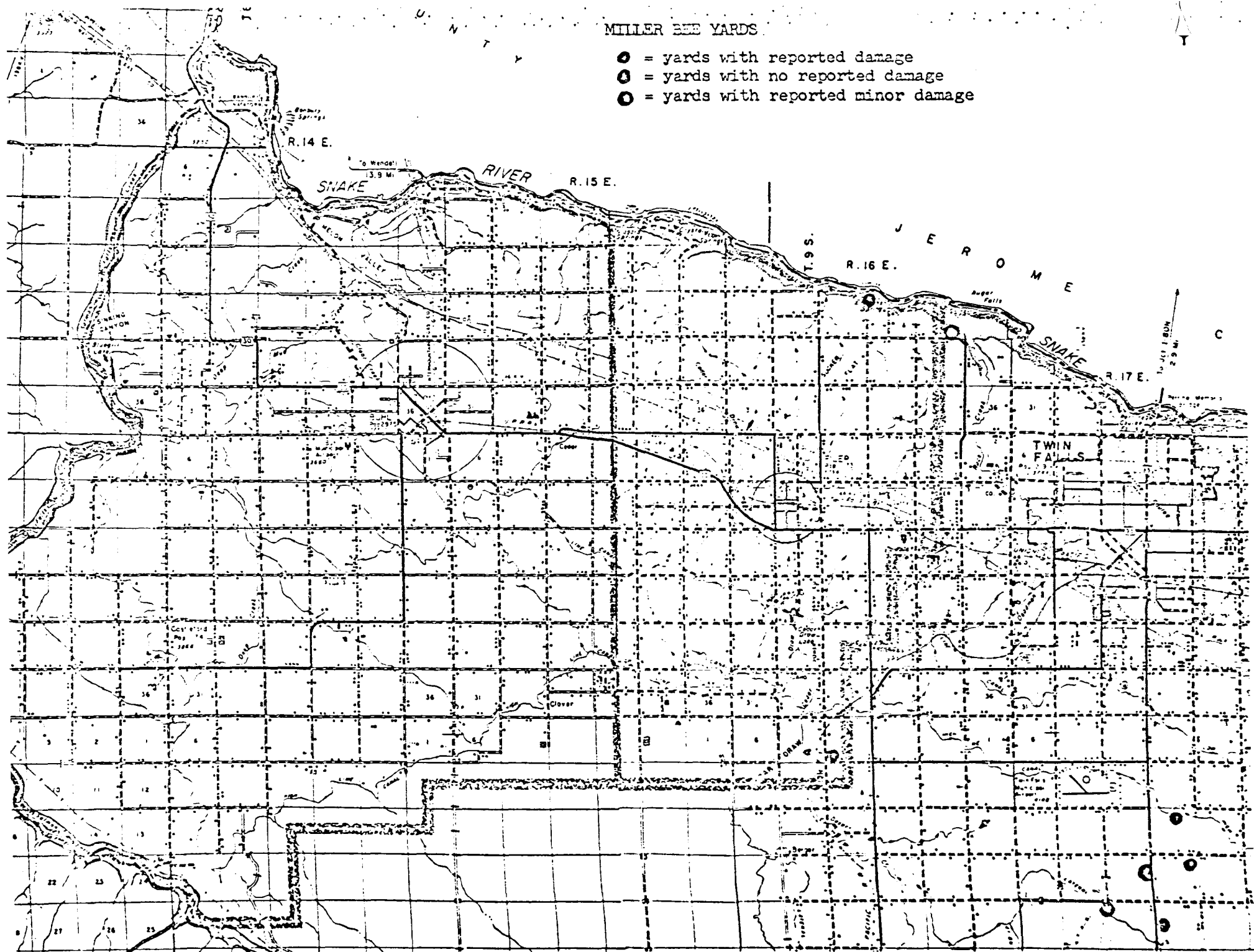


-
- = yards with reported damage
 ○ = yards with no reported damage
- The map displays a section of the Snake River in Idaho. Key locations include Buhl, Jerome, and Twin Falls. The Snake River flows from the top left towards the right. A grid system is overlaid on the map, with labels for Townships (T. 14 N., T. 15 N., T. 16 N.) and Ranges (R. 14 E., R. 15 E., R. 16 E., R. 17 E.). Specific landmarks such as Bonanza Springs, To Wendell (3.9 Mi.), and To All Buhl (2.9 Mi.) are noted. The map also shows various smaller towns and geographical features like valleys and canals.

① = yards with no reported damage

MILLER BEE YARDS

- = yards with reported damage
- = yards with no reported damage
- ◐ = yards with reported minor damage



Untitled Bee Kill Investigation Report
Idaho State Department of Agriculture 1976

INTRODUCTION

I first became aware of the bee kill the evening of May 17, 1976, when I was contacted by Dwight Kilgore, and R. W. Wade concerning their bee kill. I notified Elmer Russell, Administrator of the Division of Plant Industries of the Idaho Department of Agriculture. I was authorized to conduct an investigation of the bee kill starting May 18.

DAY BY DAY ACCOUNT

The following is a daily breakdown of what I did each day concerning the bee kill investigation. Any work which was unrelated to the bee investigation is excluded from this report.

MAY 17

I first became aware of the bee kill the evening of May 17, 1976, when I was contacted by Dwight Kilgore who resides at 3225 8th Street East, Lewiston, phone 743-8873, and R. W. Wade of 120 N. Garden Court, Lewiston, phone 743-8065, concerning their bee damage.

MAY 18

Loren Kambitsch: I first visited with Loren Kambitsch, the Nez Perce County Extension agent to discuss the bee kill situation with him.

ASCS Meeting: I then attended an ASCS meeting in order to talk with some of the beekeepers. Since there were fee beekeepers in attendance at this meeting, another meeting was set for 1:00 p.m. that afternoon for the beekeepers to attend. Ross Mothershead of the Lewiston ASCS office contacted many of the local beekeepers and notified them of the planned meeting.

Dwight Kilgore: In the meantime, I observed the two locations of bee colonies owned by Dwight H. Kilgore. Two colonies of bees were located at his home at 3225 8th Street East, Lewiston, phone 743-8873, and the other location that I observed was at the Fish

and Game grounds at 16th Avenue and Warner Avenue, Lewiston.

In front of each of the four colonies were piles of worker bees. It looked as though they had returned to the hive to die and were then removed by the surviving worker bees.

A one pint sample of dead bees was gathered from in front of the colonies at each of the two locations, however, only the sample from the 16th and Warner Avenue yard was submitted to the Oregon State lab for pesticide analysis.

I wrote up a pesticide damage investigation report and Dwight Kilgore filled out the claimant pesticide damage report. Pictures of the colonies were taken at each of the two yards.

R. W. Wade: I then observed the bee colonies of Mr. R. W. Wade located at his home at 120 N. Garden Court, Lewiston, phone 743-8065. Of the 47 hives at his yard, 13 of the hives had a mound of worker bees bodies in front. Apparently, the worker force of the unaffected colonies had not been foraging at the same location as the colonies of the affected bees. The drones and queen bee of the one hive that we opened were still alive.

A sample was obtained and pictures were taken of the affected colonies. I filed a pesticide damage investigation report and Mr. Wade was given a claimant report to fill out and submit to the Boise office.

Schumachers Ag Air: Next I went to Schumachers Ag Air of Lewiston to look at their applicator records in order to obtain a rough estimation of the amount and type of pesticides which had

been applied in the last week or so prior to the bee kill in the adjacent areas of the kill.

Meeting with beekeepers: At one o'clock that afternoon I attended the meeting held at the ASCS office. Six or more beekeepers who had experienced bee damage were in attendance. I made arrangements with several of them to investigate their yards in order that a damage claim could be filed.

Malcolm Anderson: After the meeting was adjourned I went with Malcolm Anderson to his home at 1324 Cedar Avenue, Lewiston, phone 743-9365, to observe the two hives at this location.

Worker bees were piled in front of the two colonies. Upon opening one of the hives it could be seen that some of the young brood and a few drones were dying. A one pint sample of bees was taken. I also took pictures of the damaged colonies.

In addition to the two colonies which I observed, Mr. Anderson also has an additional 146 colonies which he said were severely damaged on the lower end of Potlatch Creek near Arrow Junction. (See exhibit I)

Robert Diehl: Next that afternoon I met with Robert C. Diehl of 1322 Cedar, Lewiston, phone 743-8733. Mr. Diehl has only the one colony. Upon observation I noted that there was almost no activity at this hive, yet there were very few bee bodies in front of the hive, in contrast to the colonies that I had observed previously (and the ones that I later observed).

No samples were taken from this colony. The damage claim forms

were filled out.

MAY 19

Don Kunze: On the second day of the bee kill investigation I met with Dwight Kilgore again. He took me to one damaged colony belonging to Mr. Don Kunze at his home at 715 Airway, Lewiston, phone 743-7004 and also to the other damaged colony at 1827 Burrell Avenue, Lewiston.

At both colonies bees were lying in a pile in front of the hives. One sample was taken from the colony at 715 Airway Avenue and pictures were taken.

Don Kunze was out of town, however, Mrs. Kunze was home. I wrote up a pesticide damage investigation report and left a claimant pesticide damage report with Mrs. Kunze to be filled out and submitted to the Boise office.

Wes Cannon: I then met with Wes Cannon of 3809 11th Street, Lewiston, phone 743-7969. I went with him to observe his two hives which were located at 1035 Ripon Avenue, Lewiston.

Again bees were piled up in front of the colonies as if the remaining bees had removed them from the hives. We could only find a couple of dead drones. A quart sample was obtained from the mound of dead bees in front of the two hives and I took pictures of the colonies and damage claim forms were filed.

SuperKat: On the afternoon of the 19th, I went to SuperKat, Inc. of Lewiston to obtain applicator records of the period of the

10th through 16th. And to map the fields which had been sprayed with insecticides.

On this visit I was only shown records of one 95-acre job of pencap in the bee-kill area which was applied on the 13th of May. (On a later inspection on the 27th, however, records of a 450-acre job of pencap also applied on the 13th of May were made available to me.)

Between the 10th and 16th no methyl parathion was applied in the area of concern. Two applications of marlate were made and one application of Imidan also was applied.

(See exhibit II)

Schumachers Ag Air: I then went to Schumachers Ag Air to obtain a more complete record of their insecticide applications during the period of the 10th through the 16th. Four applications were made of ethyl parathion. Three of these applications were on rape and were 12 to 16 air miles from the bee kills in the Lewiston Orchards. The remainder of Schumachers work in the period of the 10th through the 16th in the area in question were seven Imidan jobs on peas and two Marlate applications. No Pencap or methyl parathion was applied by Schumachers Ag Air in this time period in the bee kill area. (See exhibit III)

MAY 20

Orie Mundell: On Thursday, the 20th of May, Hugh Homan, the University of Idaho Extension Entomologist, and I met with Orie E. Mundell of 639 28th Street North, Lewiston, phone 743-1914,

to inspect his damaged colonies at two locations - the Deligan location near the Stables Club on Highway 12, and the Jewett location near the Spaulding Mill on Highway 95. I obtained a one-quart sample of dead bees from these two locations.

Hugh Homan obtained samples of bees and pollen from various flowering weeds and rape in order to match the pollen taken from the bees' bodies with the pollen sampled from the flowering plants. (See exhibit IV)

The colonies at these two locations exhibited little bee activity and workers were lying in mounds in front of the hives. Hugh Homan and I then drove around the Tammany area so that he could collect weed and rape pollen for matching purposes with the pollen found on the bees that he had sampled. Hugh also obtained small samples of bees from the samples that I had taken on the two previous days.

Hugh and I observed that there were quite a number of flowering weeds surrounding the pea fields. At this time we only knew of the one 95-acre field of Pencap which had been applied (see page 5 of this report). Bearing in mind that bees normally fly only a couple of miles to forage, it seemed logical to us that Imidan, which was flown on a number of fields of peas in the area during the time period in question and which was the chemical used extensively by farmers with ground rigs was probably the insecticide which had caused the bee kill. We reasoned that the weeds which were flowering in and around the fields of peas applied with Imidan were

likely causing the kill.

The two jobs of ethyl parathion had been applied in the immediate bee kill area and two east of the area on Magpie grade. However, parathion symptoms on bees are normally different than those being shown by the bees in this kill. Parathion normally kills bees in the field rather than upon return at the hives.

Three Marlate jobs had been flown on in the area, however, Marlate toxicity to bees is less than that of Imidan. Farmers do not apply Marlate by ground rigs due to the agitation problems encountered.

On the afternoon of the 20th, I purchased dry ice from University of Idaho Chemistry Store. (Dry ice can only be obtained on a special order basis in Lewiston and then it only comes on one day of each week.)

The 6 samples that I had obtained between the 18th and the 20th were then sent to the Oregon State Lab in Salem for pesticide residue analysis.

MAY 21

Howells Flying Service: On Friday, I obtained the applicator records of Howell's Flying Service of Genesee.

(See exhibit V)

Friday afternoon a temporary ban was placed on the commercial use of Imidan pending the results of the laboratory analysis.

(See exhibit VI)

MAY 22

Orie Mundell: Saturday Harry Groger, a representative of the Stauffer Chemical Company, Orie Mundell and I observed the same two yards that Mr. Mundell and I had on May 20. The Sam Deligan (Stables location) and the Jewett location (near the Spaulding Mill). In addition, we also visited the Jack Rugg (Tiki Club location on Highway 12), the Smith location (Highway 12), the McLoughlin location (on U.S. 95 between Lapwai and Sweetwater), and the Whitman location (on the old Webb Creek Road).

(See exhibit I)

Mr. Groger and I split the bee samples that we obtained from each location. He numbered his samples to correspond with mine for any future reference. Our sample #1 was obtained from the Stables location (land owner - Sam Deligan) and the Tiki Club location (land owner - Jack Rugg.) . Sample #2 was taken from the Spaulding location (land owner - Smith). Sample #3 was obtained from the Spaulding Mill location (land owner - Jewett). Sample #4 was collected from the Garden Gulch location (land owner - McLoughlin). Sample #5 was taken at the Webb Cut-Off Road (land owner - Whitman).

Orie Mundell had checked the Whitman yard on the 20th of May. At that time he could see no damage at this location. On the 22nd however, we observed that several of the hives were beginning to show damage.

I noticed that there was even less bee activity Saturday than there had been two days previously on the two yards which I had observed on both days. There was also more evidence of dying brood.

MAY 24

Monday, I again obtained dry ice from the University of Idaho. I divided the five samples of bees which I had obtained on Saturday and air-freighted five samples to the EPA lab in Seattle and five to the Washington State lab in Yakima.

(See exhibit VII)

(Harry Groger flew down with his five samples to Stauffer Chemical Lab in Richmond, California. The Stauffer Lab then divided their samples and sent one-half to the Morse Lab in Sacramento, California.)

MAY 25

Tuesday I went to the Harlon Flying Service in Craigmont. Jerry Harlong said that absolutely no work other than fertilizer applications were done in the Sweetwater-Lapwai, Cottonwood Creek or Lewiston-Tammany area this spring.

Craigmont Flying Service: I also stopped at the Craigmont Flying Service. Between the period of May 10 through the 17th, nine jobs of Imidan were applied in the area but no applications of Pencap or parathion were made.

(See exhibit VIII)

Colley Flying Service: At Nez Perce I visited with Jack

Colley of the Colley Flying Service. No work had been done by them any further west than the Reubens area.

Observation: By this time it was beginning to appear that Imidan was not responsible for the bee kill, since the bees in the affected hives were still dying. The toxic effects of Imidan normally would be expected to last only 3 to 4 days, and yet Imidan had been banned since Friday the 21st. The results of the lab analysis had, however, not yet been obtained from the Oregon State Lab, the EPA Lab or the Morse Lab.

MAY 26

Wednesday a report was received from the Morse Laboratory that the samples of frozen bees delivered to them by the Stauffer Chemical Company were analyzed and from 0.193 ppm to 1.13 ppm of methyl parathion were detected. No Imidan residues in any of the five bee samples were detected.

(See exhibit IX)

The temporary ban on Imidan was therefore released by Al Miller, Pesticide Registrar on the basis of the laboratory analysis. (See exhibit X)

Mark Means, Inc.: Bill Freutel, EPA Consumer Safety Officer and I met with Roger Allison of the Mark Means, Inc. at Lewiston. Bill made copies of all methyl parathion and Pencap records of sales to commercial applicators.

Schumacher's Ag Air: Bill Freutel and I then went to Schuma-

cher's Ag Air. The Pencap on hand was inventoried and records of all Pencap and parathion applications were obtained.

(See exhibit XI)

Meeting with Wilson Kellogg: Bill Freutel and I then met with Wilson Kellogg, Director of the Idaho Department of Agriculture. Also Bob Quigley, 1804 14th Avenue, Lewiston, phone 743-6348, Mike Richardson of 423 Park Avenue, Lewiston, phone 743-7536, Gene Pontius, 2011 Alder Avenue, Lewiston, phone 743-2394, and Orie Mundell were in attendance.

Orie Mundell: Bill Freutel, Gene Pontius, Orie Mundell and I then observed the bee yards at the Sam Deligan location and at the Jack Rugg location, which belong to Mr. Mundell. I noted that there were even fewer bees alive on the 26th than on my last inspection of the 22nd of May. More than 50% of the bees which were alive were drones and the brood were dying either prior or shortly after emergence. Pictures were taken.

The reason that many of the drones lived could be attributed to their habits of staying at the hive and not traveling for their food. The young brood, however, may have died from indirect factors. As Gene Pontius pointed out, the temperature in the hive must stay at a certain constant level. With the worker force being so greatly diminished in number it is possible that there was no longer enough population in the hive to keep it warm enough for the young brood at night.

After observing the two yards of Mr. Mundell's, Bill Freutel, Wilson Kellogg and I then met to discuss the bee kill situation.

MAY '27

Star Motor Freight: Thursday, Bill Freutel and I inventoried all Pencap on hand and copied records of all incoming and outgoing shipments of the Star Motor Freight Co. of Lewiston.

(See exhibit XII)

Weather Bureau: Next, Bill and I went to the Weather Bureau at the Lewiston Airport Weather Station. Copies of the weather data from the period of May 10 through the 16th were obtained.

(See exhibit XIII)

Superkat, Inc.: We then inspected the applicator records of Superkat, Inc. An additional application record of a Pencap job on 450 acres on McCormick Ridge was shown to us (which had been shown to me on my previous inspection on May 19.) Bill and I, therefore, went through all of their records and copied down all Imidan, Marlate, Pencap and Methyl Parathion jobs that had been done all season on all applications flown from the Lewiston airport.

(See exhibit XIV)

We also inventoried all Pencap and Methyl Parathion that was on hand and obtained copies of their records of both of the two insecticides. By subtracting the amount applied from the amount received, the inventory on hand of both the Pencap and Methyl Parathion came out as it should.

Harry Groger: That evening Bill Freutel and I met with Harry Groger of the Stauffer Chemical Company upon his request.

MAY 28

Homer McNeill: Friday I met with Homer McNeill, representative of the Agchem Division of the Pennwalt Corporation, P. O. Box 21, Wenatchee, Washington, phone 663-4707, upon his request.

Superkat, Inc.: Bill Freutel returned to Superkat at Lewiston to finish his investigation. (I did not accompany Bill on his investigations Friday since I had to go out of town on a matter unrelated to the bee kill investigation.)

Berger & plate, Inc.: Bill then inventoried the methyl parathion and Pencap in stock at Berger & Plate, Inc. of Nez Perce. Records of the amount of the two insecticides received and sold also were obtained.

Superkat, Inc. - Nez Perce: Bill also inventoried the Pencap and Methyl Parathion of Superkat, Inc. of Nez Perce and obtained copies of their records of the purchase and application of the two chemicals.

MAY 29:

Lapwai: On Saturday I sampled the pea foliage of a 900-acre field of spring peas directly east of Lapwai. (See exhibit I) According to the applicator records of Superkat, Inc. this field was sprayed with Marlato on the 9, 10, and 12th of May. This sample was taken as an enforcement sample to ascertain whether or not Pencap or Methyl Parathion had been also applied to this field.

I also talked with Larry Boyer, Lapwai, phone 843-2551, to check out a lead that he had applied Pencap by ground. Mr. Boyer said that he had applied 200 acres of Pencap by ground on the upper end of Mission Creek.

(See exhibit XVI)

JUNE 1

ASCS Office: On Tuesday, I went to the Agricultural Stabilization & Conservation Service at Lewiston to plot on a map the locations of some damaged yards which I had not inspected and therefore had no record of.

(See exhibit I)

Webb Ridge: I then attempted to obtain another pea foliage enforcement sample from an additional field of peas on the Webb Ridge Road which was sprayed with Marlate on the 16th of May according to the records of Superkat, Inc. I found that this field however, could only be reached by traveling quite a distance on a muddy road. I, therefore, was unable to obtain this sample.

Twin City Foods, Inc.: At Twin City Foods, Inc., a pea processing plant at Lewiston, I obtained records of all insecticides that were applied to the fields which they had contracted with growers. Superkat, Inc. did the insecticide applications for Twin City Foods. I compared the application records of Twin City Foods with those of Superkat, Inc.

(See exhibit XVII)

I also copied their inventory records of Pencap and Methyl Parathion which had been received and applied.

Gene Pontius and Donald Jones: I met with Gene Pontius and Donald Jones of 1120 4th, Lewiston, phone 758-6807, in order to plot the locations of their damaged yards.

(See exhibit I)

JUNE 2

Howell Flying Service: At the Howell Flying Service of Genesee I plotted all Pencap applications on a map which were done south of coordinate 48N which intersects the town of Genesee.

(See exhibit I)

I also inventoried all the Pencap which was on hand and obtained usage records of the Pencap purchased and applied.

(See exhibit XVIII)

University of Idaho: I purchased dry ice from the chemistry store in the Physical Science Building.

I then air-freighted the samples of pea foliage obtained Saturday to the Oregon State Lab at Salem in order to have them analyzed for Methyl Parathion.

(See exhibit XIX)

JUNE 3

Bill Freutel: Thursday, I met with Bill Freutell at Lewiston. Bill and I charted weather data obtained from the Lewiston Weather Station on the 27th.

We also worked on the map to finish plotting Methyl Parathion and Pencap applications and bee yard locations.

(See exhibit I)

JUNE 4

Bill Freutel organized and studied data that had been compiled in the bee kill investigation.

We also met with Bob Scott, a representative of the Velsicol Chemical Corporation of E. 8622 Maringo, Spokane, Washington, phone 926-2295.

Friday afternoon, I was notified by Al Cornwell of the Oregon State Laboratory that the frozen pea foliage samples which I had air-freighted to them contained no methyl parathion residue.

(See exhibit XIX)

JUNE 8

Tuesday I visited with Richard Schaffer of 1351 Ripon Avenue concerning the insecticide that he used on his 10 acre orchard (upon a lead that he had used parathion in the past.) Mr. Schaffer said that the only chemical applied this spring was Sevin to thin apples on May 29. Mr. Schaffer also mentioned that five colonies belonging to Gene Arnone, 1019 29th Street, phone 743-2293, were kept in the orchard throughout the month of May and were apparently unharmed. The 10-acre Schaffer orchard is the largest orchard in the Lewiston Orchards, the next largest belonging to W. H. "Chick" White of 1629 Ripon and is about five acres.

JUNE 9

Bob Dickeson: Wednesday I met with Bob Dickeson, P. O. Box 671, Lewiston, phone 743-3342. Mr. Dickeson had notified me several days prior that he desired to file a damage claim on his two colonies which were damaged on the 15th of May at 1014 Bryden in Lewiston. Upon inspection, little activity was noticed from one of the hives, the other hive however, did not seem to have been damaged as severely.

Orie Mundell (2nd bee kill): Orie Mundell notified me that he had noticed six more yards which were beginning to show damage the day before. I met with Mr. Mundell that morning and we observed six yards, all of which were from two to six miles west of Culdesac. None of these yards had been damaged in the initial bee kill period of the 15th and 16th of May according to Mr. Mundell. The worker bees were coming back to the hives and dying. We could observe the surviving workers carry the dead or dying bees out of the hive. Individual samples were taken at the Kauffman, Louis Paris (Rock Creek), and Wolfe Chicken Farm locations.

On that afternoon, I went to Schumachers Ag Air and Superkat, Inc. applicators. Applicator records of all insecticides applied within 7 to 8 miles of the second bee kill area were obtained and the job locations were plotted on a map.

(See exhibit XX) (See Exhibit XXI)

JUNE 10

Thursday morning dry ice was purchased from the University of Idaho. The three samples obtained on the previous day were

air-freighted to the Oregon State Laboratory for pesticide residue analysis.

JUNE 14

Monday, Al Miller and I met with Orie Mundell, Gene Pontius, Mike Miltenberger and Woodrow Blakely. We learned from them that in addition to the additional newly damaged bee yards of Mr. Mundells, Mr. Pontius, Mr. Miltenberger and Mr. Blakely also were experiencing more yards being damaged. These yards are located mainly at higher elevations around the Gifford area. This additional damage occurred in the period of the 8th of June through the 10th of June. It was the opinion of the above beekeepers that a restriction should be placed on the future usage of Pencap.

JUNE 15

Tuesday, Al Miller and I interviewed the following people concerning their reports of planes dumping pesticides in the

Lewiston area: Carol Van Brunt, 731 Bryden, Lewiston, 743-0492
R. M. Quigley, 1804 14th Ave., Lewiston
Pat Richardson, 2026 Alder, Lewiston, 746-3938

We did not find Mike Richardson of 423 Park Avenue, Lewiston, 743-7536 and Mrs. Spencer Overhaul of 114 N. Garden Court, Lewiston, 743-8176, at home.

We stopped at the W. C. White orchard at 1629 Ripon to ask him what insecticides were used this spring on his orchard. We visited with Mrs. W. C. White, however Mr. White was not at home. We did not see any used parathion or Pencap containers among the

other pesticide containers.

Tuesday evening, Orie Mundell reported that three additional yards were damaged during the day. Near the bottom of the Culdesac-Reubens grade. Orie reported that Jerry Matteson also had two hives damaged near Culdesac.

DAMAGED BEE YARDS
OF
FIRST KILL OF MAY 15-16, 1976

ORIE MUNDELL C.

1. 39N, 4E
2. 37N, 4E
3. 38N, 4E
4. 39N, 2E
5. 40N, 4E
6. 40N, 5E
7. 40N, 7E
8. 41N, 10E
9. 41N, 12E
10. 43N, 16E
11. 40N, 12E
12. 39N, 12E
13. 39N, 12E
14. 39N, 12E
15. 41N, 15E
16. 38N, 14E
17. 40N, 15E
18. 38N, 13E
19. 38N, 14E
20. 38N, 16E
21. 36N, 13E
22. 34N, 12E
23. 32N, 11E
24. 35N, 8E

GENE PONTIUS C.

1. 42N, 23E
2. 44N, 16E
3. 44N, 17E
4. 39N, 19E
5. 39N, 19E
6. 45N, 19E
7. 30N, 17E
8. 44N, 22E
9. 35N, 6E
10. 35N, 7E
11. 37N, 11E

ARNONE & WOODLAND C.

1. 35N, 4E
2. 34N, 5E
3. 35N, 6E
4. 40N, 6E
5. 37N, 7E
6. 34N, 8E

C. WOODROW BLAKELY

1. 36N, 4E
2. 36N, 4E
3. 35N, 5E
4. 32N, 6E
5. 30N, 14E
6. 27N, 16E

C. DONALD JONES

1. 34N, 12E

C. VERNON PRATER

1. 35N, 5E

R. M. WADE

1. 31N, 15E
2. 37N, 3E

MALCOLM ANDERSON

1. 46N, 15E
2. 45N, 15E
3. 47N, 16E
4. 35N, 5E

C. BOB DICKESON

1. 36N, 3E

C. WES CANNON

1. 35N, 5E

C. DWIGHT KILGORE

1. 36N, 4E
2. 36N, 4E

C. DON KUNZE

1. 36N, 3E

EXHIBITS

#

I	map (first bee kill)
II	Superkat, Inc. (applications)
III	Schumacher's (applications)
IV	Hugh Homan's report
V	Howell Flying Service (app)
VI	Letter restricting Imidan
VII	EPA Bee Analysis
VIII	Harlon, Colley, Craigmont (app)
IX	Stauffer Chemical analysis
X	Letter lifting Imidan rest.
XI	Schumacher's Inventory
XII	Star Motor Inventory
XIII	Weather Bureau reports
XIV	Superkat, Inc. (all applications)
XV	Superkat, Inc. Inventory
XVI	Larry Boyer application
XVII	Twin City application
XVIII	Howell Flying Inventory
XIX	Oregon State Lab Analysis
XX	map (second bee kill)
XXI	Schumacher & Superkat (app. during second bee kill period)

SUPERKAT, INC. (Lewiston)

*Before or during bee kill of May 15-16, 1976

<u>LOCATION</u>	<u>INSECTICIDE</u>	<u>DATE</u>	<u>ACRES</u>	<u>CROP</u>	<u>GROWER</u>	<u>INVOICE</u>
1. 30N,14E	PENCAP	5-13	450	peas	LARRY BOYER	2230
2. 43N,16E	PENCAP	5-13	95	peas	LARRY BOYER	2244
3. 50N,11E	PENCAP	5-16	87	peas	ANDY ZENNER	2230
4. 38N,14E	MARLATE	5-9,10,12	900	peas	LARRY BOYER	2230
5. 31N,11E	MARLATE	5-16	100	peas	TWIN CITY	2249
6. 32N,8E	MARLATE	4-14	55	peas	GALEN BUCHANAN	2107
"	M. PARATHION	5-22	110	"	"	"
7. 36N,8E	M. PARATHION	5-19	300	peas	DICK WAGNER & TWIN	3104
	+ PENCAP	5-20	300	"	"	"
8. 34N,8E	M. PARATHION (Respray of #6)	5-22	110	peas	BUCHANAN-MOUNCE	3789
9. 39N,10E	M. PARATHION	5-22	165	peas	TOM WAGNER & TWIN	3787
10. 35N,8E	PENCAP	5-22	70	peas	TWIN CITY	3788
11. 34N,8E	PENCAP	5-22	50&110	peas	McINTOSH	3784
12. 36N,7E	M. PARATHION	5-18	300	peas	McINTOSH-TWIN	
	"	5-22,5-25	STRIPS	peas		
13. 36N,7E	M. PARATHION +PENCAP (Near Road)	5-20	300	peas	DICK WAGNER & TWIN (Poor Farm)	

EXHIBIT #III

SCHUMACHERS AG AIR

*Before or during bee kill of May 15-16, 1976

<u>LOCATION</u>	<u>INSECTICIDE</u>	<u>DATE</u>	<u>ACRES</u>	<u>CROP</u>	<u>GROWER</u>
41N, 3E	Ethyl Parathion	5-17	70	peas	Jones Normel
40N, 9E	Ethyl Parathion	5-15	300	rape	Tom Wagner
43N, 18E	Ethyl Parathion	5-12	85	rape	Wayne Martin
42N, 19E	Ehtyl Parathion	5-15	95	rape	Lloyd Butler

The remainder of Schumachers work in the time period of May 10-17
was:

7-Imidan applications on peas

2-Marlate " " "

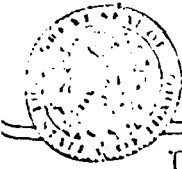
0-Pencap "

0-Methyl Parathion

HOWELL FLYING SERVICE

<u>LOCATION</u>	<u>INSECTICIDE</u>	<u>DATE</u>	<u>ACRES</u>	<u>CROP</u>	<u>GROWER</u>	<u>INVOICE</u>
48N,10E	PENCAP	5-6	58	peas	Don Ahren	1813
45N,14E	PENCAP	5-6	43	peas	Phil Herman	1814
42N,7E	PENCAP	5-4	130	peas	Thor Gilje	1806
41N,8E	PENCAP	5-4	120	peas	Clarence Gilje	1807
40N,9E	PENCAP	5-9	191	peas	Stanton Becker	1844

The above are all insecticide applications made by Howell Flying Service south of the 48N map coordinate.) From first of season through May 21.



STATE OF IDAHO

DEPARTMENT OF AGRICULTURE

4696 OVERLAND ROAD
P. O. BOX 796
BOISE, IDAHO 83721

TO: ALL AERIAL AND GROUND APPLICATORS AND PESTICIDE DEALERS IN
NORTHERN IDAHO

FROM: WILSON KELLOGG, DIRECTOR, IDAHO DEPARTMENT OF AGRICULTURE

DATE: May 21, 1976

SUBJECT: IMIDAN

All Imidan applications are prohibited by order of the Director of the Idaho Department of Agriculture until further notice. Imidan is under investigation due to the excessive bee losses occurring in northern Idaho.

Any applicator who applies Imidan to any crop in northern Idaho after May 21, 1976, will be subject to the penalty provisions of the pesticide use and application law.

WK:pa

A handwritten signature in cursive script that reads "Wilson Kellogg".

EPA BEE ANALYSIS

1.	.39	Methyl Parathion		
2.	.17	Methyl Parathion		
3.	.48	Methyl Parathion01 ethyl
4.	.50	Methyl Parathion		0 Imidal
5.	.11	Methyl Parathion		
6.	.27	Methyl Parathion		

EXHIBIT #VIII

HARLON FLYING SERVICE

Work Done Before Bee Kill of May 15-16, 1976

In Area in Question:

None

COLLEY FLYING SERVICE

Work Done Before Bee Kill of May 15-16, 1976

In Area in Question:

1 Imidan application in the Gifford-Reubens area on Beuford Webb prior to bee kill of May 15.

CRAIGMONT AIR SERVICE

Work Done Before Bee Kill of May 15-16, 1976

.In Area in Question:

1 Imidan application 2 miles east of Coyote grade on edge of rim. On Oaberg's prior to May 15 bee kill.



STATE OF IDAHO

DEPARTMENT OF AGRICULTURE

4696 OVERLAND RD

P. O. BOX 799

BOISE, IDAHO 83725

Ph. 324-3240

TO: ALL AERIAL AND GROUND APPLICATORS AND PESTICIDE DEALERS
IN NORTHERN IDAHO

FROM: Alfred E. Miller, Supervisor, Pesticide Enforcement

DATE: May 26, 1976

SUBJECT: IMIDAN RESTRICTION

The temporary restriction in Northern Idaho on Imidan usage is lifted effective May 26, 1976.

If you have any questions concerning this matter, please contact me.

Alfred E. Miller

EQUAL OPPORTUNITY EMPLOYER

EXHIBIT XI

SCHUMACHERS AG AIR
 *Before or during bee kill of May 15-16,76

LOCATION	INSECTICIDE	DATE	ACRES	CROP	GROWER
188	Ethyl Parathion	5-17	70	peas	Jones Normel
189	Ethyl Parathion	5-15	300	rape	Tom Wagner
190	Ethyl Parathion	5-12	85	rape	Wayne Martin
191	Ethyl Parathion	5-15	95	rape	Lloyd Butler

The remainder of Schumachers work in the time period of May 10-17 was:

-1-100 applications on peas

2-Marlate " " "

3-Pencap "

4-Methyl Parathion

PENCAP
MANUFACTURER * DISTRIBUTOR * DEALER

MANUFACTURER: Pennwalt Corporation

DISTRIBUTORS: Van Waters and Rogers Inc.

Wilbur Ellis, Inc.

DEALERS: Berger and Plate - Nezperce
Brocke and Sons - Kendrick
Empire Farm Chemical - Moscow
Genesee
Lewiston Grain Growers - Lewiston
Lapwai
Craigmont
Ferdinand
Reubens
Lenore
Mark Means - Lewiston
Craigmont
McGregor - Genesee
Grangeville
Nezperce Rochdale - Nezperce
Greer

RECORD AND INVENTORY CHECK FROM VAN WATERS & ROGERS (DISTRIBUTOR)
THROUGH THE DEALERS AND APPLICATORS:

1. Van Waters and Rogers to Star Motor Freight in Lewiston:
April 8, 1976 - 60 - 5 galcans = 300 ga's. Invoice #10636
2. Star Motor Freight (Lewiston):
On Hand - 15 - 5 gal. = 80 gals.

Shipments:

4-14 to Berger and Plate - Nezperce	5-5 gals = 25 gals	60323 Inv.
4-19 to Berger and Plate - Nezperce	18-5 gals = 90 gals	60525 Inv.
4-22 to Berger and Plate - Nezperce	5-5 gals = 25 gals	60527 Inv.
4-29 to V.W.R. - Portland	2-5 gals = 10 gals	60530 Inv.
5-10 to Berger and Plate - Nezperce	14-5 gals = 70 gals	60534 Inv.
TOTAL	220 gals	
Total to Berger and Plate =		210 gals

3. Berger and Plate - Nezperce
(V.W.R. to Berger and Plate in Nezperce)

BERGER & PLATE	AMOUNT	GALLONS
On Hane (carry-over)	4-5 gal cans	20
From Wilbur Ellis	4-5 gal cans	20
From V.W.R.	42-5 gal cans	<u>210</u>
	TOTAL	250
To Colley Flying	48-5 gal cans	<u>-240</u>
Inventory which should be on hand		10
Inventory which was on hand		20

27 May 1976

Mr. Don Vannoy
State Department of Agriculture
83rd Avenue
Lewiston, ID 83501

Dear Don:

The following is a list of our sales of Pencap M in
Northern Idaho:

<u>DATE</u>	<u>INVOICE NO.</u>	<u>CUSTOMER</u>	<u>DESTINATION</u>	<u>QUANTITY</u>	<u>TOTAL (gal)</u>
4/12/76	032891	Union Whse & Sply	Grangeville	20 x 5	100
4/12/76	032903	Nez Perce Rochdale	Nez Perce	12 x 5	60
4/19/76	032972	Geo. F. Brocke & Son	Kendrick	10 x 5	50
4/30/76	033132	Pure Gro	Moscow	100 x 5	500
5/3/76	033164	Empire Farm Chem	Moscow	20 x 5	100
5/7/76	040129	Pure Gro	Moscow	70 x 5	350
5/10/76	040174	Empire Farm Chem	Moscow	20 x 5	100
5/14/76	040268	Pure Gro	Moscow	60 x 5	300
5/14/76	040270	McGregor Co.	Genesee	25 x 5	125
5/17/76	040298	Empire Farm Chem	Moscow	40 x 5	200
5/17/76	040300	McGregor Co.	Genesee	60 x 5	300
5/18/76	040331	Pure Gro	Moscow	80 x 5	400
5/22/76	040384	Pure Gro	Moscow	85 x 5	425
5/22/76	040390	Geo.G. Brock & Son	Kendrick	80 x 5	400
5/21/76	040391	Lewiston Grain Grow.	Craigmont	40 x 5	200
4/19/76	032972	Geo.G. Brock & Son	Kendrick	15 x 30	450
5/7/76	040129	Pure Gro	Moscow	5 x 30	150
4/17/76	033026	Nez Perce Rochdale	Nez Perce	10 x 5	50
4/22/76	033059	Mark Means Co.	Craigmont	4 x 5	20
4/24/76	033060	Nez Perce Rochdale	Nez Perce	7 x 5	35
4/26/76	033061	Mark Means Co.	Craigmont	8 x 5	40
5/5/76	040159	Nez Perce Rochdale	Nez Perce	24 x 5	120
5/8/76	040191	Lewiston Grain Grow.	Craigmont	4 x 5	20
5/10/76	040193	Berger & Plate	Nez Perce	4 x 5	20
5/12/76	040286	Lewiston Grain Grow.	Craigmont	20 x 5	100
5/13/76	040287	Mark Means Co.	Craigmont	12 x 5	60

Sincerely yours,

John R. Gaiser

EXHIBIT #XIII

	TIME																							
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Temp. F°				56	55	57	62	66	70	72	76	76	72	73	73	59	52	51	50					
Wind Knots			03	07	06	08	09	11	12	10	08	04	09	05	08	09	07	05	08	09				
Speed MPH			4	8	7	9	11	13	14	12	9	5	11	6	9	11	8	6	9	11				
Wind Dir. Degrees from North				100 E	130 SE	110 SE	80 S	80 E	100 E	100 E	60 NE	10 N	230 SW	110 E	20 N	20 N	300 N-W	270 W	150 SE					
Humidity %				72	72	62	52	44	48	41	41	46	48	48	82	94	94	94						
Precipitation 0.00 inch				-	-	-	-	-	-	-	-	-	-	-	0.18	-	-	--	-	-	0.42			

5/11/76

TIME

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Temp. F°				48	47	47	49	54	56	56	60	60	63	62	65	65	65	64	61					
Wind Knots			07	07	06	04	06	14	08	09	13	11	12	11	12	14	16	08	10					
Speed MPH			3	3	7	5	7	17	9	10	15	13	14	13	14	16	13	9	12					
Wind Dir. Degrees from North			280 W	220 S-W	190 S	130 S-E	330 N-W	250 S-W	260 W	290 W	300 N-E	300 N-W	300 N-W	300 N-W	300 N-W	300 N-W	300 N-W	270 W	270 W					
Humidity %			66	72	72	62	48	48	48	32	32	32	32	30	28	24	30	28						
Precipitation 0.00 inch			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

5/12/76

TIME

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Temp. F°				43	44	46	48	53	57	61	65	67	72	75	76	76	78	75	69					
Wind Knots			06	06	07	07	10	11	09	11	08	06	08	07	08	05	00	04	06					
Speed MPH			7	7	8	8	12	13	10	13	9	7	9	8	9	6	0	5	7					
Wind Dir. Degrees from North			110 E	130 SE	120 SE	120 SE	90 E	60 NE	100 E	70 NE	30 E	30 E	110 E	120 SE	50 NE	40 NE	0 N	120 SE	120 SE					
Humidity %			84	78	72	66	64	50	38	44	44	42	48	48	30	26	34	46						
Precipitation 0.00 inch			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						

5/15/76

TIME

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Temp. F°				43	43	45	50	52	53	61	64	63	71	72	73	74	74	73	69					
Wind Knots			05	04	04	06	07	05	03	04	06	05	06	08	10	08	10	10	08					
Speed MPH			6	5	5	7	8	6	4	5	7	6	7	9	11	9	11	11	9					
Wind Dir. Degrees from North			130 SE	130 SE	120 SE	60 NE	70 NE	300 NW	140 SE	40 NE	10 N	30 N	90 E	100 E	40 NE	40 NE	50 NE	40 NE	90 E					
Humidity %			76	76	70	68	64	52	40	46	36	30	22	24	22	22	24	32						
Precipitation 0.00 inch			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

5/16/76

TIME

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Temp. F°				48	48	52	57	63	66	71	75	80	84	87	87	87	85	81	80					
Wind Knots			07	06	06	06	06	09	08	08	06	06	03	12	13	12	08	09	03					
Speed MPH			8	7	7	7	7	10	9	9	7	7	3	14	15	14	9	10	9					
Wind Dir. Degrees from North			150 SE	170 S	150 SE	140 SE	90 E	100 E	80 E	100 E	40 NE	80 E	80 E	160 S	160 S	170 S	160 S	110 E	90 E					
Humidity %			66	72	58	52	46	40	34	34	18	18	10	12	12	16	24	22						
Precipitation 0.00 inch			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						

SUPERKAT, INC. (Lewiston)
(All Insecticide Applied up to 5-27-76)

<u>WORK ORDER</u>	<u>DATE</u>	<u>TOWN</u>	<u>OWNER</u>	<u>ACRES</u>	<u>INSECTICIDE</u>	<u>CROP</u>
1. 2231	5-8	Genesee		90	Pencap	peas
2. 2244	5-13	Lapwai	Boyer	95	Pencap	peas
3. 2245	5-13	Mission Creek	Boyer	450	Pencap	peas
4. 2235	5-9	Lapwai	Boyer	900	Marlate 2#/acre	peas
5. 2110	4-18	SP-21	Blewett	33	Imidan 2#/acre	peas
6. 2104	4-10	4P-42	Boyer	650	Imidan	peas
7. 2105	4-13	5P-115	Blewett	65	Imidan	peas
8. 2140	5-3	6P-115	Breeden	120	Imidan	peas
9. 2148	5-6	-	Boyer	420	Marlate 2#/acre	peas
10. 2147	5-6	9P-42	Boyer	650	Marlate 3#/acre Pencap 1 quart	peas
11. 2212	5-17	Genesee	-	70	Imidan	peas
12. 2167	5-1	Genesee	Dennler	185	Imidan 2#/acre	peas
13. 2206	5-12	Genesee	Dennler	38	Imidan 2#/acre	peas
14. 2215	5-19	Genesee	Dennler	45	Imidan 2#/acre	peas
15. 2168	5-1	Genesee	Evans	55	Imidan 2#/acre	peas
16. 2204	5-9	Genesee	Evans	72	Marlate 3#/acre	peas
17. 3779	5-20	Genesee	Evans	38	Pencap 1 Quart	peas
18. 2198	5-17	Southwick	Lohman	55	Imidan 2#/acre	peas
19. 2182	5-13	6R-143	Miller	18	Marlate 2#/acre	Alfalfa
20. 2192	5-17	Southwick	Newman	80	Imidan 2#/acre	peas
21. 2246	5-14	Southwick	Newman	10	Imidan 2#/acre	peas
22. 2211	5-15	Genesee	Reisenauer	100	Imidan 2#/acre	peas
23. 2176	5-12	CC1-10T- 111	Schulthesis	80	Marlate 3#/acre	peas
24. 2243	5-13	CC1-14T- 142	Hood/Swan	40	Marlate 3#/acre	peas

ENT.

<u>WORK ORDER</u>	<u>DATE</u>	<u>TOWN</u>	<u>OWNER</u>	<u>ACRES</u>	<u>INSECTICIDE</u>	<u>CROP</u>
25. 2239	5-12	Dot20-44	Brown	130	Marlate 3#/acre	peas
26. 2240	5-12	Dot10T/107	Sodorte	20	Marlate 3#/acre	peas
27. 2249	5-15	-	Hood/Swan	100	Marlate 3#/acre	peas
28. 2250	5-15	CC1/10T 143	Brown/Home	130		
29. 2143	5-6	CC1/107 115	McKay	150	Marlate 3#/acre	peas
30. 2248	5-15	CC1/8T 97	Hood/Hawley	85	Marlate 3#/acre	peas
31. 2142	5-6	CC1/14T 142	Hood/Scout	30	Marlate 3#/acre	peas
32. 2141	5-6	CC1/14T 142	Hood/Swan	120	Marlate 3#/acre	peas
33. 2149	5-8	CC1/24T 105	Hood/Scout	100	Marlate 3#/acre	peas
34. 2201	5-5	CC1/10T 11	Schulthesis	105	Marlate 3#/acre	peas
35. 2124	5-5	CC1/24T 105	Hood	40	Marlate 3#/acre	peas
36. 2125	5-5	CC1/24T 105	Hood	40	Marlate	peas
37. 2123	5-5	CC1/10T 11	Schulthesis	220	Marlate 3#/acre	peas
38. 2122	5-5	Dot/6P 133	Blackman	75	Marlate 3#/acre	peas
39. 2178	5-3	Dot/3V80	Becker	90	Marlate 3#/acre	peas
40. 2195	5-18	Dot/6P 159	Howard	300	Parathion-Methyl	peas
41. 2194	5-18	CC1/10T 107	Sadorff	50	Marlate 3#/acre	peas
42. 2190	5-16	Dot/6P-96	-	100	Marlate 3#/acre	peas
43. 3794	5-24	Dot/6P 159	Scout	100	Pencap	
45. 3789	5-22	Dot/6P 137	Buchanan	110	Parathion-Methyl	peas
46. 3787	5-22	Dot/3V 74	Wagner	165	Parathion-Methyl	
47. 3788	5-22	Dot/6P 159	McIntosh	70	Pencap 2 Pints	
48. 3785	5-21	Dot/6P 96	Scout	60	Marlate 3#/acre	

CONT.

<u>WORK ORDER</u>	<u>DATE</u>	<u>TOWN</u>	<u>OWNER</u>	<u>ACRES</u>	<u>INSECTICIDE</u>	<u>CROP</u>
49. 3783	5-22	Dot/6P 159	Howard	10	Pencap 1 Pint	
50. 3784	5-22	Dot/6P 159	McIntosh	160	Pencap 2 Pints	peas
51. 3104	5-20	Dot/6P 159	Wagner	300	Pencap 1 Quart/300 acres Marlate #2/25 acres Parathion-Methyl 1 pt/300	
52. 3795	5-24	Dot/6P 159	Wagner	7	Parathion-Methyl 1 pt.	peas
53. 3793	5-24	Dot/5V 74	Wagner	250	Parathion-Methyl 1 pt.	peas
54. 3792	5-24	Dot/6P 133	Blackman	75	Parathion-Methyl 1 pt.	peas
55. 3791	5-24	Dot/6P 133	Elliot	115	Parathion-Methyl 1 pt.	peas
56. 3797	5-24	Dot/6P 159	Howard	3	Parathion-Methyl	peas
57. 3790	5-24	Dot/3D 75	Taylor	135	Parathion-Methyl	peas
59. 2107	4-14	-	McCann- Buchanan	55	Marlate 3#/acre	
60. -	5-18	-	McIntosh	300	Methyl Parathion	

SUPERKAT, INC. (Lewiston)
PENCAP

PENCAP RECEIVED

From McGregor (Uniontown) May 8, 1976	25 g.
" Pure Gro (Moscow) May 6, 1976	200 g.
" McGregor (Genesee) May 16, 1976	25 g.
" Pure Gro (Moscow) May 17, 1976	<u>250 g.</u>
TOTAL GALLONS RECEIVED	500 g.

PENCAP APPLIED: (Up to May 27)

Kenny Anderson, May 8, Genesee	23.5 g.
Larry Boyer, May 6, Culdesac	54.0 g.
Larry Boyer, May 13, Culdesac	144.0 g.
Andy Zenner, May 16, Genesee	25.0 g.
Twin City, May 22, Tammany	42.5 g.
May 22, "	2.5 g.
May 20, "	71.0 g.
May 24, "	25.0 g.
 Don Linehan, May 19, Genesee	 33.0 g.
Sanford Evans, May 20, Genesee	<u>10.0 g.</u>
TOTAL	430.5 g. applied

PENCAP INVENTORY AS OF MAY 27, 1976

16-5 gallon cans or 80 gallons.

(No Pencap was carried from the previous year)

The amount of pencap on hand was within 10.5 gallons of what should be on hand. (500 g. - 430 g. = 69.5 g.)

EPA REGISTRATION AND BATCH NUMBERS OF PENCAP IN STORAGE 5-27-76

EPA 4581-292
EST 4581-TX-1
EGC 2CGG - 33 (9 - 5 gallons)
EGC OGDG - 34 (7 - 5 gallons)
 (16 - 5 gallons or 80 gallons)

SUPERKAT, INC. (Lewiston)
METHYL PARATHION

Methyl Parathion on hand:

147 - 5 gallons = 735 gallons

Pure Gro - Methyl 4E EPA 1202 - 124 AA

EST 148-CA-1

180226 A

180226 B

EXHIBIT #XVI

LARRY BOYER PENCAP GROUND APPLICATION

<u>LOC. LOCATION</u>	<u>INSECTICIDE</u>	<u>DATE</u>	<u>ACRES</u>	<u>CROP</u>	<u>GROWER</u>
1. 31N,16E	PENCAP	-	200	B.peas	Larry Boyer

TWIN CITY INC.
PENCAP

250 gallons of Pencap was purchased from Pure Gro Inc. of Moscow.

710 gallons of Methyl Parathion 4# was purchased from Pure Gro Inc. of Moscow.

*All of the above Pencap and Methyl Parathion was delivered to Superkat Inc. of Lewiston to be applied on processing pea fields which growers have contracted with Twin City.

HOWELL FLYING SERVICE (Genesee)
Pencap

TOTAL PENCAP APPLIED UP TO JUNE 2, 1976:

Empire Farm Chemical, Genesee - Supplier

Thor Gilje	37.5g	x 4 = acres
John Baldus	19.0g	
P. Herman	10.0g	
"	25.0g	
John Baldus	17.25g	
Howard Blume	10.0g	
Don Herman	37.0g	
Haxton Farms	7.25g	
"	30.0g	

Pure GroInc., Genesee - Supplier

Clarence Gilje	30 g.
Dan Ahern	15 g.
Zenner	35 g.
Stanton Becker	25 g.
Beckers	47.75 g.
Walt Erickson	12.5 g.
Fred Commick	5 g.
Jay Nelson	20 g.
M. Stout	7.25 g.
Dan Ahern	14.25 g.
Zenners	66.0 g.
Ray Qualey	18.75 g.
Art Borgen	17.5 g.
M. Holben	10 g.
Morken Ranch	33 g.
Zenner Ranch	42.5 g.
Jay Nelson	15 g.
Mel Moser	10 g.
Kent Bromeling	20 g.
Zenner Ranch	37.25 g.
Stanton Becker	22.5 g.
Morken Ranch	3 g.
Richard Neyens	6 g.
M. Moser	20 g.
M. Holben	13 g.
Morken Ranch	16 g.
D. Greenwell	34 g.
Ed Buelenberg	10 g.

HOWELL, Cont.

McGregor, Inc., Genesee - Supplier

Morken	23.5 g.
Albert Nye	20 g.
Fred Morcheck	35 g.
Ray Eser	13.5 g.
Anderson and Rossebo	5 g.
Andy Anderson	5.g.

PENCAP INVENTOY JUNE 2, 1976

Pencap:

EPA 4581-292	
EST 4581-TX-1	
EGC - 26c6 - 33	4-5 g. cans
EGC - 07EG - 50	1-5 g. cans
EGC - 03EG - 47	4-5 g. cans
EGC - 0906 - 37	4-5 g. cans
EGC - 17CG - 29	1-5 g. cans
No Batch #	<u>1-5</u> g. cans
Total	15-5 g. cans = 75 gallons

PENCAP INVENTORY OF JUNE 2, 1976 RECEIVED FROM:

McGregor - 28 gallons
PureGro - 40.25 gallons
Empire Farm Chemicals - 7.5 gallons
TOTAL = 75.75 gallons

(No Methyl Parathion was applied)



LABORATORY ANALYSIS REPORT

Idaho Department of Agriculture Date June 1, 1976
Division of Plant Industries
4696 Overland Road, P.O. Box 790
Boise, Idaho 83701

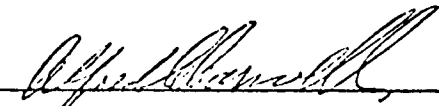
Laboratory No. _____ Date Analysis Completed June 1, 1976
Your Sample Of Bees Received On May 25, 1976
Manufactured By _____
Sampled At _____
Sampled By Don Vannoy

Results: Analyzed for Pesticide Residues

Sample No.	Source	Methyl Parathion	Analytical Results Imidan*	Sevin
8882	Malcom Anderson	0.66 ppm	0.00 ppm	None
8883	Wes Cannon	0.80 "	0.00 "	detected
8884	Dwight Kilgar	0.39 "	0.00 "	in
8885	Don Kunze	0.18 "	0.00 "	Composite
8886	Orie Mundell	0.17 "	0.00 "	Sample
8887	R. W. Wadr	0.23 "	0.00 "	

* less than 0.01 ppm.

DISTRIBUTION	✓	DATE
RUSSELL		6/3
AWE		
MILLER	✓	
STOFFER		
PLANT SERVICES		


Alfred Cornwell, Official Chemist

SCHUMACHER AG ATR

RECORDS FROM MAY 31 - JUNE 16, 1976
OF ALL WORK DONE WITHIN 7-8 MILES
(2nd bee kill May 8 and 9)

<u>SECTION</u>	<u>INSECTICIDE</u>	<u>DATE</u>	<u>ACRES</u>	<u>CROP</u>	<u>GROWER</u>	<u>INV.</u>
40N,18E	Pencap	6-2	100	peas	Richard Grant	1851
37N,17E	E.Parathion	6-7	190	peas	Herndon-Jones Normel	1896
37N,17E	E.Parathion	6-7	100	peas	"	1895
37N,17E	E.Parathion	6-7	240	peas	"	1897
39N,15E	Pencap	6-8	56	peas	Marvin Kinzer	1887
28N,9E	E.Parathion	6-9	96	peas	Buchanan	1898
41N,16E	Imidan	6-9	20	peas	John Meacham	1850
41N,16E	Imidan	6-9	120	peas	Bill and John Hechtner	1893
41N,16E	Imidan	6-9	107	peas	"	1848
41N,16E	M.Parathion	6-6	360	peas	Meacham (John Ridge)	1884
39N,10E	E. Parathion	5-31	120	peas	Dick Wagner (Jones Normel)	1829
34N,11E	E.Parathion	5-31	64	peas	T. L. Todd-Jones Normel	1828
34N,11E	E.Parathion	5-31	73	peas	"	1830
39N,11E	Imidan	6-2	100	peas	Tom Wagner	1833
30N,7E	Pencap	6-7	120	peas	McIntosh and Sons	1890
39N,16E	Parathion M	6-6	350	peas	Bud Meacham	1885
40N,20E	Imidan	6-6	65	peas	Pierce Blewett	1886
37N,17E	Parathion E	6-2	120	peas	Don Herndon(Jones Normel)	1852
34N,11E	Parathion E	6-4	30	peas	T. L. Todd	1870
34N,11E	E.Parathion	6-4	30	peas	"	1869

(All Parathion applied on Jones-Normel peas is 8# Ethyl)

many	E.Parathion #8	6-11	6	peas	Jones Normel-Herndon	1920
many	E.Parathion #8	6-11	14	peas	"	1922
"	"	6-11	20	peas	Jones-Normel-Buchanan	1919
"	"	6-11	20	peas	Jones-Normel-Herndon	1921
39N,26E	Pencap	6-10	115	peas	Carl Riggers	1903
ifford	E.Parathion #4	6-11	100	peas	Richard Grant	1911

SUPERKAT, INC. (Lewiston)
 WORK RECORD FROM MAY 31 - JUNE 16, 1976
 of all work done
 (2nd bee kill May 8 & 9)

<u>LOCATION</u>	<u>INSECTICIDE</u>	<u>DATE</u>	<u>ACRES</u>	<u>CROP</u>	<u>GROWER</u>	<u>INV.</u>
S-1 38N,14E	M.Parathion	6-8,9	240	peas	Larry Boyer	3855
S-2 39N,12E	M.Parathion	6-2	12	peas	McIntosh(Taylor)Twin C.	3833
S-3 40N,14E	M.Parathion	6-5	100	peas	Larry Boyer	3841
43N,16E						
S-4 34N,10E	M.Parathion	6-5	120	peas	Harold Breedon	3839
	M.Parathion	6-6	60	peas	Hood/TwinC./Pulman	3849
	"	6-8	100	peas	Hood/Swann/Twin C./Pulman	3852
	"	6-8	130	peas	Hood/Twin-Pulman	3854
	"	6-8	190	peas	Hood/Twin-Pulman	3853
	"	6-9	65	peas	Schulthesis Bros	3858
	"	6-12	100	peas	Hood/Twin	3866
	"	6-12	160	peas	Hood/Twin	3862
S-5 29N,15E	"	6-15	450	peas	Larry Boyer	3871
	"	6-3	200	peas	Hood/Twin	3838
	"	6-2	110	peas	Hood/Twin	3835
	"	6-2	60	peas	"	3836
S-6 36N,8E	"	6-1	6	peas	McIntosh/Twin	3829
	"	6-2	175	peas	Schulthesis/Twin	3837
	"	6-2	270	peas	Becker(Coyote)	3834

SUPERKAT, INC. (Nez Perce)
Pencap June 1 - 16

½SE Nez Perce	Larry Riggers Pencap 1 quart	130 acres W.O. 3251	peas	June 6
4m. E Craigmont	Pete Zenner Pencap 1 quart	175 acres W.O. 3413	peas	June 6
4m. SE Craigmont	Jerry Riggers Pencap 1 quart	20 acres W.O. 3438	peas	June
4m. E Craigmont	Joe Zenner Pencap 1 quart	415 acres W.O. 3271	peas	June 9

HARLON FLYING
Pencap applied June 1 thru June 16

E Craigmont	Wayne Zenner Pencap 1 quart	20 acres	peas	June 5
H-1 35N,27E	Stanley Hill Pencap 1 quart	119 acres	peas	June 5
H-2 32N,26E (Reubens)	Eldridge Gill Pencap 2 quarts	22 acres	peas	June 6

CRAIGMONT AIR SERVICE
Pencap applied between June 1 - 16

C-1 35N,15E	Buck Bozarch	June 4	100 acres	Culdesac
C-2 33N,20E	Vern Dickinson	June 15	55 acres	Culdesac

Colley Flying Service

5/29	Emil Braun	78 acres	1 quart Pencap	(Russel Ridge)
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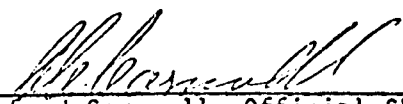


LABORATORY ANALYSIS REPORT

State of Idaho _____ Date June 7, 1976
Plant Industry Division _____
418 3rd Ave. _____
Lewiston, ID 83501 _____ (Don Vannoy)
Laboratory No. 9396-9397 Date Analysis Completed June 4, 1976
Your Sample Of Pea plants Received On June 4, 1976
Manufactured By _____
Sampled At _____
Sampled By _____
Results:

<u>Sample #</u>		<u>Analysis</u> <u>Methyl Parathion</u>
9396	#1 North End	None*
9397	#2	None*

*less than 0.01 ppm.



Alfred Cornwell, Official Chemist

AC:er

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Pesticide Residue Levels in Idaho Bee Samples

DATE: June 8, 1976

FROM: Robert H. Rieck, Chemist *R.H.R.*

RECEIVED

TO: Don Donaldson, Chief
Enforcement Section, Pesticides Branch

JUN 10 1976

Pesticides Branch

Five bee samples from the Lewiston, Idaho area were analyzed for pesticide residues. It was suggested they be analyzed for Imidan, methyl parathion, methoxychlor and carbaryl (sevin). The results are listed below:

<u>Lab no.</u>	<u>Station no.</u>	<u>Imidan</u>	<u>Methyl Parathion</u>	<u>Methoxychlor</u>	<u>Sevin</u>
22600	1	< 0.10ppm	0.39ppm	< 0.02ppm	< 1.ppm
22601	2	< 0.10	0.17	< 0.02	< 1.
22602	3	< 0.10	0.48	< 0.02	< 1.
22603	4	< 0.10	0.50	< 0.02	< 1.
22604	5	< 0.10	0.27	< 0.02	< 1.
22604	5	< 0.10	0.11	< 0.02	< 1.

PENNCAP-M[®] INSECTICIDE AND BEES: FACT AND FALLACY

Dr. James R. Lowell, Jr.
Manager, Technical Department
Agchem Division, Pennwalt Corporation

February 6, 1978

PENNCAP-M is a flowable microencapsulated formulation of methyl parathion, which has found wide commercial acceptance on agricultural crops since its first commercial registration in 1974. The product is manufactured by Pennwalt Corporation, using a patented process which encases tiny droplets of the active ingredient in a thin shell of cross-linked nylon type polymer. The encapsulation process reduces the oral toxicity of the active ingredient to mammalian species by a factor of at least six, compared to an EC formulation on an active ingredient basis. Dermal toxicity to mammals is reduced by a factor of at least twelve. PENNCAP-M is not required to bear the skull and crossbones insignia on the EPA-registered label.

Since the very first commercial registration the label use directions have carried a statement that PENNCAP-M is highly toxic to bees, because the active ingredient of PENNCAP-M is methyl parathion. In addition, for those crops where application to the blooming crop represented a particular hazard to honeybees, a statement was also included recommending against application to the crop in bloom.

Although PENNCAP-M received widespread testing under experimental use permits during 1973, 1974 and 1975, and commercial usage during 1974 and 1975, no reports of bee losses were received until early 1976. During 1976 and 1977, Pennwalt Corporation and various state regulatory agencies analyzed bees from bee kills in which PENNCAP-M was suspected as a possible cause. In a number of these, methyl parathion was found in the dead bee samples. However, there is no certain method available to determine whether the causative agent was PENNCAP-M or other formulations of methyl parathion used in the area. During early 1976, a number of bee kills involving a formulation of methyl parathion (according to bee analyses) were reported in California alfalfa growing areas. One factor common to most of the bee kills was a heavy concentration of blooming weeds in the alfalfa fields and around the field edges. The bee kills occurred during a period of drought in California, when the honeybees were foraging on any available pollen source. In order to prevent further occurrence of bee losses due to application of PENNCAP-M, the PENNCAP-M label was amended in September, 1976 to include a statement cautioning against application of the product to blooming weeds on which an economically significant number of bees is actively foraging.

In late spring, 1976, a rather sizeable bee kill occurred in Lewiston, Idaho. Over 2,000 bee hives in the Lewiston Orchards area were killed or severely damaged, apparently by a nearby

pesticide application. After early reports that no pea fields sprayed with PENNCAP-M were located in the area of the major bee kill, we requested the Idaho Department of Agriculture to sample rapeseed fields located nearby. We were informed by an Idaho official that they had no authority to sample the rape field (an inaccurate statement, we believe). Our own investigation of the bee kills in the Lewiston area confirmed what the Idaho Department of Agriculture bee kill maps indicated; no PENNCAP-M applications were found in applicator records for pea fields within eight miles of the largest bee kills. However, the blooming rape fields mentioned above were located only one-half to one mile away from the largest bee kills. Although these fields were apparently treated for seedpod weevil with some insecticide, the fields were not analyzed for insecticide residues. Rape is a known favored pollen source for honeybees. One aerial applicator sprayed peas downwind from and adjacent to bee hives in another area. After his application, he observed no losses to the nearby bee hives.

Most of the bee kills investigated during 1976 occurred in four areas. In the state of Washington, the bee losses were due to spraying blooming weeds in apple orchards. In Lewiston, Idaho, if PENNCAP-M was involved in the bee losses, it must have been sprayed on a crop not on the label. In California, the bee losses were due to spraying blooming weeds in alfalfa, and in New York, blooming weeds in fruit orchards.

As noted above, EPA registered in September, 1976, an amended PENNCAP-M label with more detailed restrictions against application of PENNCAP-M where a hazard to bees may exist. Any use of PENNCAP-M which may result in the bee losses is inconsistent with the labeling. The product may not be applied to either blooming crops or weeds on which significant numbers of bees are actively foraging.

During latter 1976, Pennwalt Corporation undertook a major effort to educate Pennwalt salesmen, and in turn Pennwalt customers, to the potential hazards of misuse of PENNCAP-M. Perhaps because of these efforts, there were few reports of bee kills in 1977. Some kills were reported in the Central Valley of California (Kern County). A representative of the Agriculture Commissioner stated that "whatever was used in the area killed bees." In that case, the alfalfa fields which were sprayed were close to almonds being pollinated by honeybees.

Since the reports of bee losses in early 1976, Pennwalt researchers have endeavored to establish clearly the conditions under which bee kills may occur. In tests on many crops at our Warminster (Pennsylvania) Research Station under the direction of Mr. Gary Curl, Station Manager, we were able to produce only minor bee losses, and these only by spraying directly blooming sunflowers, even though the bee hives were immediately adjacent to the treated fields.

Pennwalt Corporation has both funded and cooperated in academic research on the nature, mechanism, and means of prevention of bee losses due to pesticides. Mr. Larry Atkins, Apiculture Specialist at the University of California at Riverside found that PENNCAP-M remained toxic to honeybees for approximately four to six days, compared to methyl parathion EC, which remained toxic for one day or less.¹ Dr. Carl Johansen, Professor of Entomology, Washington State University at Pullman, found that PENNCAP-M had a two to three-fold increase in residual action compared to methyl parathion EC.² Dr. Michael Burgett, Assistant Professor of Entomology, Oregon State University, found that bees pick up pollen contaminated with PENNCAP-M, and confirmed results of other bee researchers that bees do not seek out PENNCAP-M capsules.³ In a published article, Dr. Burgett acknowledged that bee losses have occurred due to misapplication of PENNCAP-M. Using a special formulation of PENNCAP-M with a visual dye, furnished by Pennwalt Corporation, Dr. Burgett found that no PENNCAP-M capsules reached the honey stomach in bees deliberately subjected to blooms contaminated with PENNCAP-M. He postulated that a bee's proventricular valve rejects the capsules from the honey stomach. Consistent with Dr. Burgett's results, to date no methyl parathion has been found in honey from bee kills allegedly caused by PENNCAP-M.

On the subject of determining the cause for bee kills, it has been noted that bees analyzed in a number of bee kill investigations generally show pesticide levels of from 0.1 to a few ppm. The level detected depends largely on how long the bees have been dead, and how the sample was handled. At the present time, there is no certain method to distinguish between formulations of methyl parathion as a causative agent in bee losses.

On June 23, 1977, Dr. E. C. Martin of the USDA wrote a letter to all state apiculturists and extension entomologists regarding the supposed hazards of PENNCAP-M to bees. Dr. Martin's letter was prompted by rumors, not the facts, about bee kills mentioned

previously. After Dr. Martin's first letter was distributed, we had the opportunity to discuss the history of the PENNCAP-M bee problem with him, and pointed out a number of inaccuracies in the stories he had heard. Dr. Martin wrote a second letter, dated August 25, 1977, and noted that other materials, such as carbaryl and lead arsenate are also toxic to bees in stored pollen. In this second letter, Dr. Martin strongly recommended following the label use directions, and avoiding spraying blooms visited by bees. He stated that like other bee-toxic pesticides, PENNCAP-M is the "most recent pesticide causing unique problems with bees." He advised extension agents to make pesticide recommendations that will hopefully control insects "without excessive bee kill." Dr. Martin's latter remarks are parallel to our own conclusions; the key to avoiding bee kills is to read and follow the label. The PENNCAP-M label explicitly recommends against spraying blooms on which bees are foraging.

One area of recent concern about PENNCAP-M is sweet corn, a crop on which honeybees forage occasionally when other pollen sources are not available. Studies show, and corn growers confirm, that PENNCAP-M is one of the most effective controls of corn earworm and European corn borer on sweet corn. We believe that PENNCAP-M is the most effective and most economical means for controlling these insects in sweet corn. Recognizing the value of PENNCAP-M for this use, and at the same time considering the need to protect bees when they do forage in corn fields, we believe that the following program can provide effective, economical control of corn insects with a minimal adverse effect on bees. Under standard sweet corn spray schedules, an effective, moderately persistent insecticide is needed to protect corn from damaging insect populations. In general, bees forage in sweet corn only during periods when other, more favored pollen sources are scarce. When bees are not foraging in sweet corn, the grower should be able to obtain effective control by using a moderately persistent insecticide, such as PENNCAP-M, for control of corn earworm and European corn borer. On those occasions when bees are visiting the corn fields, the best alternative is a nonpersistent insecticide, such as methomyl, preferably applied at night or during periods of no foraging activity. Of course, if it is possible to move the bees to another location, the best solution, recourse to a nonpersistent insecticide is not necessary.

At a recent meeting under EPA auspices in Washington, D.C., representatives of the pesticide industry, the federal government agencies, and the bee keeping industry discussed the

problems of pesticide losses to bee keepers. An EPA representative commented that labeling similar to the PENNCAP-M label precautions is now under consideration by EPA for all pesticides in Bee Toxicity Category I (highly toxic to bees).

During the past several years, Pennwalt Corporation has emerged as a leader in the search for new knowledge of ways to avoid bee losses due to pesticide application. We have funded research by academic personnel and tested in our own facilities. We recognize the importance of bees as highly beneficial pollinators of a large portion of the crops grown in the United States. While we support more governmental support of research in this area, we strongly believe that the immediate and effective answer to the problem of bee kills is education of applicators and users of pesticides toxic to bees and use of effective pesticides in strict accordance with the product labeling and in a manner which does not expose honeybees to unreasonable hazards.

References

1. E.L. Atkins, D. Kellum, and K.J. Neuman, Project No. 1499, 1976 Annual Report.
2. C. Johansen, personal communication, 1977.
3. M. Burgett and G. Fisher, Amer. Bee J. 626 (1977).

Newspaper Articles
Twin Falls County
1978 - 1979

Beekeepers puzzled by dead, dying bees

By KEN HODGE
Times-News writer

BUHL — Honeybees are dying mysteriously in Magic Valley and local beekeepers suspect an encapsulated pesticide of poisoning their hives.

Several beekeepers in the Buhl and Twin Falls area report thousands of their bees have died in recent weeks and more are dying. Hives which should be raising young bees are barren of larvae.

One Twin Falls beekeeper blames his dead bees on microencapsulated methyl parathion, the same chemical blamed for killing thousands of hives of bees in north Idaho in 1976.

Methyl parathion was blamed for wiping out 3,000 hives of bees and partially affecting 3,000 others near Lewiston that year.

After some of his bees died suddenly this spring, Twin Falls beekeeper Charles Miller sent a mailgram to Idaho Director of Agriculture Wilson Kellogg asking why methyl parathion, sold under the brand name Pennncap-M, is being used near Idaho bee yards.

Kellogg, in a letter to Miller, said the Idaho Department of Agriculture successfully got a court order banning the chemical after the Lewiston disaster in 1976.

But that order has since been overturned by Pennwalt Corporation, manufacturer of Pennncap-M, and Kellogg said his department is now enjoined from discussing the particular pesticide with farmers.

"We have done about everything possible to assist the beekeepers in the long battle with new chemicals," but Kellogg added, "...our hands were tied by the court order regarding Pennncap-M."

Although Miller says only one yard of his bees were hit by the mysterious killer, two Buhl beekeepers, Frank Zagata and Bill Lemmons, say 15 of their yards may have been affected by pesticides

Since each bee yard contains 50 to 60 hives, they estimate about 1,000 hives will be affected. They are not sure what caused the kill, but suspect Pennncap-M.

A few of Zagata's hives were destroyed when the pesticide was reportedly first sprayed on pea fields in the Filer and Buhl area in mid-June.

During ensuing weeks, many bee colonies have continued to lose bees, Zagata said.

A healthy hive, worth about \$50, usually contains a minimum of six pounds of bees, according to Zagata. About 3,500 dry bees are needed to make a pound.

Zagata and Lemmons say their big economic losses are in the young bees which would have been generated by the devastated hives.

A total of nearly 20 million bees may be affected by the outbreak of pesticide poisonings.

A hive which loses many of its workers will fail to make enough honey for the winter and the bees will starve to death when cold weather sets in.

"It will be a long time before we know what our losses are," Zagata says. "We got a pretty damn good dose of it. It's not ordinary stuff."

He says he has lost four hives outright and others are sadly short-handed for feeding and raising new young. Combs which should be full of white larvae remain empty and dwindling numbers of bees crawl across the bee boards.

Pennncap-M, the brand name of microencapsulated methyl parathion, is highly hazardous to bees, according to three University of California researchers who recently published their research findings in the American Bee Journal.

E.L. Atkins, D. Kellum, and K.W. Atkins, entomologists at the university, studied the effects of both liquid methyl parathion and Pennncap-M on bee colonies and determined the capsules, though safer for the user, are about 13 times more lethal

to nearby beehives.

A second writer, P.F. Thurber of Kirkland, Wash., explained Pennncap-M contains microscopic bits of porous plastic which are filled with pesticide and put in a carrier medium which keeps the deadly chemical inside the capsule. When the medium dries out, the insecticide slowly comes out of the plastic and becomes active.

The capsules are both good and bad.

They are good for farmers beset by bugs because of a "timed release" of the chemical which stops large hatches of insects in a single, long-lasting application.

For honeybees, however, the tiny capsules are exactly the same size as a grain of pollen. A foraging bee, covered with coarse fuzz, picks up encapsulated poison along with pollen when he crawls into a flower and unwittingly carries it back to the hive.

Worker bees store pollen in honeycomb cells as food for young bees and the deadly capsules can remain insidiously pigeonholed in the hive for months.

If the capsules end up in a cell with a larvae which feeds on pollen, the result is immediate death. Stored pollen, is also lethal to young bees when laced with the capsules.

That is why many of the larvae in area beehives are being found dead, according to local apiarists. And many bee boards have no larvae at all because the bees which ordinarily would nurture the young have died off.

Pennncap-M is registered with the Environmental Protection Agency for use on alfalfa, peas, beans and other crops. On peas, it is used to control the pea weevil, the pea aphid and the pea leaf weevil.

The label on the chemical, however, warns the applicator not to apply the spray near wildlife or adjacent to a body of water because "birds and other wildlife feeding in treated areas may be killed."



BUHL BEEKEEPER FRANK ZAGATA AND DEAD BEES IN FRONT OF HIVES
... encapsulated pesticide suspected of killing helpful insects

Jerome area beekeeper losing out this year

By LONNIE ROSENWALD
Times-News writer

JEROME — It's been a bad year for bees.

First, many of the hardworking honey-makers were poisoned this summer by pesticides which got into the pollen they collect.

Then their image was tarnished by "The Swarm," a disaster film about a murderous herd of killer bees.

Jerome beekeeper Ernie Hancock complains bees don't deserve the treatment they're getting. Hancock houses about three-quarters of a million honeybees in backyard bee colonies in Jerome County. He loves bees, and tries to prove it by allowing his Idaho mongrel bees to buzz around him without covering himself with nets or other special clothing.

"It's wasps and yellow jackets, not honeybees, that sting," he explained in defense of the fearsome insects. Stoically holding out a finger into which an angry bee is forging its stinger, the man who handles bees daily admitted, "Stinging always hurts."

Although beekeeping is only a sideline for Hancock, he was incensed three weeks ago when he began finding handfuls of dead bees lying in front of the three-story wooden hives where his bees live and store honey.

He said he figured out how they died by tracing a path from his hives to his neighbors' fields where encapsulated methyl parathion, a pesticide used on alfalfa, peas and beans, had been sprayed.

The encapsulated pesticide has been blamed for beekills throughout the Magic Valley this summer. Methyl parathion capsules are the same size as pollen grains — 20 to 40 microns. Bees can't distinguish between the capsules and pollen, so they carry the deadly nuggets back to their hives. If the bees don't die on the way home, the capsules contaminate their larvae, threatening the next generation of bees.

Methyl parathion was the villain in severe beekills in Lewiston in 1976, causing the Idaho Department of Agriculture to ban its use in the state. However, a successful protest by the Pennwalt company, manufacturer of

the pesticide, got the ban reversed on a technicality in an Idaho court last winter. With renewed use of the pesticide this summer there has been a reoccurrence of beekills.

Although the worst of the kills is over for this season, Hancock said some bees continue to die: "You find little traces of kill every time you go out."

After finding many of his bees had been killed this summer, Hancock tried to measure what effect the kill had on honey production. To do that he weighed one of his hives every day for a four-day period beginning right after a spray.

"They were making four pounds a day," Hancock said. "After they got sprayed, they actually lost a half a pound. Then after four days they gained two pounds."

Luckily the honey wasn't contaminated by the pesticides because organisms can't live in honey. But there will be hidden losses for Hancock from the beekill. He has fewer bees to collect and store honey for the winter, so his bees may starve to death during their hibernation.

It's not just the damage to his \$3,000 a year honey business that bothers Hancock — his beekeeping is part of a family tradition carried on in Jerome by Ernie, his father, uncle and cousin. He maintains his own hives, collects and filters the honey and even seals and labels the jars himself, all on spare evenings and weekends. His hives are in seven different locations in Jerome County. None escaped this summer's kill but some suffered greater losses than others.

According to Hancock pesticide use has upset the whole ecological balance of his back yard. Not only bees but also some of the birds that used to fly through are gone. He can't prove it, but he blames pesticides for killing the birds.

He says hobby beekeepers like himself suffer more from the pesticide problem than large commercial beekeepers who have moved their hives to safer locations like Fairfield, Mackay and Carey where there are fewer farmers spraying pesticides.

Bees have to be moved a long

distance from crop-sprayed fields because they fly as far as three miles to pollinate. In studies bees have traveled as far as nine miles to find a blade of grass.

"Just moving them around Magic Valley won't do any good," Hancock explained. "If I move my hives I'll move into a valley 60 or 100 miles away."

One hobby beekeeper in Twin Falls claimed the hives don't have to be transplanted that far away. He successfully avoided pesticides by moving his bees to Rock Creek.

Hancock says recent publicity about bee deaths from pesticides has had some effect on neighboring farmers who spray. They now spray later in the day hoping bees will have already returned home from the fields.

Not until 7 p.m. does the Hancock family hear the ominous drone of airplanes as they swoop down over nearby fields leaving a trail of white spray. Unfortunately the delay does little good because encapsulated pesticides (which are only one of many pesticides sprayed on crops) remain deadly for 17 months, according to a recent article by pesticide expert P.F. Thurber in the American Bee Journal.

Hancock doesn't blame farmers for the bee kills. He believes if growers use pesticides carefully they can save their crops from insects without relying on encapsulated methyl parathion.

Its chemical manufacturers and their fieldmen urge farmers to use more pesticides, Hancock said.

"Once they get these growers spraying, they just spray more and stronger chemicals," he complained.

He added that beekeepers are such a small economic group they can't force farmers to stop using encapsulated chemicals.

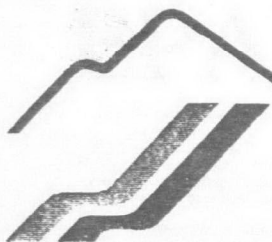
"I'm bucking some pretty tough people," the beekill victim acknowledged.

"I don't think beekeepers themselves can do anything and I don't expect anything from the Agriculture Department. If anybody does anything it'll be the EPA (Environmental Protection Agency)."



Bob DeLachmatt/Times-News

Ernie Hancock, Jerome beekeeper, and honey-makers killed by pesticides



Magic Valley

B

Twin Falls, Idaho

Monday, August 21, 1978

The Times-News

EPA studying bee-killing pesticide

By LONNIE ROSENWALD
Times-News writer

DENVER, COLO. — The Environmental Protection Agency has begun an official investigation of Penn-Cap-M that could result in further restrictions on use of the pesticide.

Penn-Cap-M, or encapsulated methyl parathion, is a widely used pesticide which is highly toxic to honeybees and has been identified as the culprit in recent beekills in many areas across the country, including the Magic Valley.

Dan Bench, an administrator at the Denver regional EPA office, told the Times-News "The agency is looking into putting Penn-Cap-M under R-Par (Rebuttable Presumption Against Registration) review," but Bench said the product was not under consideration to lose its registration.

"What might be considered is the cancellation of certain uses of this pesticide," Bench said.

R-Par classification means the EPA will restrict use of a substance unless it receives evidence of the substance's safety. Once classified, industry or users have a chance to offer a rebuttal to the restrictions. After hearing arguments from both sides, the EPA measures the evidence of hazards against benefits and makes a regulatory decision.

Bench said there are currently 50 substances under the P-Par classification but only one has fully completed the

review process.

Bench began an investigation of Penn-Cap-M after receiving complaints this week from several beekeepers in Riverton, Wyo. following extensive beekills there.

"I want some more information on the pesticide," he said.

Bench, the R-Par coordinator for Region VIII of the EPA, contacted Dr. Carl Johansen, a Washington State entomologist and bee poisoning expert, Friday to ask what he thought of placing Penn-Cap-M, a product manufactured by the Penwalt Company, on the EPA's R-Par list.

Johansen told Bench use of Penn-cap-M should be highly restricted because of its extreme toxicity to bees. He recommended allowing its use only to combat aphids on wheat in early spring, on apples 30 to 60 days past full bloom and against weavils on peas in early spring.

An R-Par classification "would force the issue," Johansen said.

Bench remarked about Johansen's advice, "He knows what he's talking about."

James Lowell, a spokesman for the Penwalt Company, which manufactures Penn-Cap-M, argued that the product is already "one of the most strictly labeled insecticides in the country." Restrictions listed on the label of the product which is used by farmers chiefly to combat aphids and weavils prohibit its use on blooming crops if bees are located nearby.

Bench said the EPA can't even consider an R-Par rating

unless it receives a request for restriction from the public or scientific community.

"We haven't had enough complaints to do anything about it yet," Bench said.

He said a recommendation from an organization of beekeepers, along with evidence of beekills caused by the use of Penn-Cap-M, would prompt him to ask federal EPA officials to give the substance an R-Par classification.

Jerome beekeeper Charles Hancock, one of the largest commercial beemen in Idaho, said the Association of Idaho Beekeepers will discuss what to do about the problem at its regular meeting this fall.

Beekills have been reported in the past three years in Arizona, California, Colorado, Idaho, Iowa, Oregon, Washington and Wyoming. Johansen said during the last week alone he received reports of kills in Texas, Wyoming, Iowa and Washington.

Studies including one done by U.S. Department of Agriculture scientists in Wyoming have found Penn-Cap-M responsible for many of the kills. The substance can be mistaken for pollen and transported by bees to their hives, where it is fatal to many bees.

The EPA is a newcomer to mounting concern about the effects of Penn-Cap-M on honeybee populations. Beekills, which resulted in a ban on use of Penn-Cap-M in Idaho between 1976 and 1977, have prompted studies of the pesticide's effect on bees by Penwalt and university

researchers in California and Washington.

Johansen, who is studying the Penn-Cap-M problem at Washington State University, said the state of Washington is considering tightening up regulations on its application. Iowa Agriculture Secretary Robert Louisberry Thursday expressed concern about use of Penn-Cap-M in his state.

Penwalt spokesman Dr. James Lowell said a company representative is currently in Riverton investigating the beekill reported there last week.

Meanwhile Lowell denied a claim by Dr. Bill Wilson of the Wyoming Department of Agriculture that the company is advising applicators in certain areas of the country not to use Penn-Cap-M because of poison danger.

Bill Freutel of the Idaho EPA office also said applicators in the Lewiston area did not use the pesticide this year because they feared lawsuits.

Lowell, Technical Manager of Penwalt, confirmed reports that the company is studying possible modifications of the product to make it safe for use in beekeeping areas. Penwalt has one fulltime researcher assigned to the task, and is experimenting with modifications of the product at its Washington and Pennsylvania locations.

Among ideas Penwalt researchers are studying is the addition of bee repellent and addition of a "sticker" to the product to make it adhere to plants.

But Lowell said the company is working on other alternatives and would not say what they are.

EPA investigates Magic Valley bee kills

By KEN HODGE
Times-News writer

BUHL — The Office of Pesticide Programs of the Environmental Protection Agency is investigating a rash of bee kills which hit Magic Valley last summer.

Dan Bench, a pesticide registration coordinator from the EPA's Denver office came to Buhl this week under instructions from Washington, D.C., to take pollen samples from bee colonies which may have been poisoned mysteriously last year.

He said samples he takes will be tested for chemical residues in an effort to determine whether or not pesticides were responsible for bee kills in Idaho.

Bench's examination of Magic Valley beehives was ordered after a Buhl beekeeper sent a letter of complaint to the EPA in Washington, D.C.

After taking samples in Magic Valley, Bench said he will go to north Idaho to examine hives where severe bee losses were presumed to have

been caused by pesticides in 1976.

Two Buhl beekeepers, one Twin Falls beekeeper and others on the North Side suffered bee losses which might have been caused by aerial applications of encapsulated methyl parathion, a deadly chemical used to control pea weevils.

The encapsulated pesticide, sold under the brand name of PennCap-M, may have caused bee deaths both in the field and in the hive since research has shown bees can carry tiny pesticide-laden capsules back to their

home colonies along with grains of pollen.

Once in the hive, the capsules may be sealed into pollen cells or fed to larvae, causing delayed casualties as much as 17 months later in the hive.

Richard Heuwinkel, director of operations at the EPA pesticide office in Washington, D.C., said if the EPA determines that pesticides have caused the Idaho kills, officials may take action against applicators and against further use of the pesticide involved.

January 12, 1979

Twin Falls Idaho

Times News, Twin Falls Idaho (January 1979)

EPA investigates dead Idaho bees

By KEN HODGE
Times-News writer

BUHL. — A Washington, D.C., office of the Environmental Protection Agency is investigating bee deaths in Idaho which may have been caused by pesticides.

The investigation is focused on large numbers of bees found dead in Magic Valley last summer and near Lewiston two years ago.

The EPA took a special interest in Idaho's bee kills when a Buhl beekeeper sent a letter to its Washington Pesticide Programs Office complaining about substantial bee losses he and other apiarists suffered last summer.

"Pesticides have been blamed for bee kills a good deal and we're, of course, interested," Richard Heuwinkel, director of the operations division of the EPA pesticide office, said Wednesday. "We want to check into a few of these things a little further."

Heuwinkel said when beekeepers blame a particular pesticide for bee deaths, they usually have no substantial evidence linking the chemical to the kills.

Heuwinkel said an EPA official has been assigned to inspect and sample Idaho beehives involved in massive bee deaths in an effort to gather background information and possible evidence.

If the investigation links a particular pesticide to bee deaths in Idaho, EPA officials could take action against an applicator or change the label on the pesticide to prevent accidental bee deaths in the future, Heuwinkel said.

"It would depend on the circumstances. If pesticide is the cause and it is the result of somebody misusing it, then we have an enforcement problem," Heuwinkel said. "If it is because the label is hard to follow, then maybe we need to change the label."

Dan Bench of Denver, an RPAR coordinator for the EPA, is looking for the cause of Buhl area bee deaths first noticed more than six months ago.

"I'm doing some residue studies," Bench said Tuesday as he picked small yellow pollen caps from honeycombs near Buhl. "We haven't proved anything. I'm just investigating."

Several beekeepers in the Buhl area noticed unusual numbers of dead bees outside their hives early last spring and suspected a form of encapsulated methyl parathion to be the culprit.

The highly toxic pesticide reportedly had been sprayed on pea fields to stop hatches of pea weevils.

Whatever the cause, bees continued to die over the entire season and many hives were substantially weakened as their populations dwindled.

Without a large population, a colony



Ken Hodge/Times-News

EPA official Dan Bench extracts pollen

of bees cannot produce honey or new young. And during cold weather, a weakened hive cannot generate enough heat to prevent the demise of the entire colony by freezing.

Deadly effects of last spring's mysterious poisoning are still being felt in bee colonies throughout the valley, according to one Buhl beekeeper.

"I don't know what the loss will be overall on this stuff," Bill Lemmons of Buhl said Tuesday. "We fed syrup to a lot of them and tried to keep them alive. A lot died out later on this fall. With this cold spell, some of the colonies are so small, I don't know how they will come out."

He said he had to bring in about 100 hives whose colonies were wiped out.

Lemmons and other beekeepers in the area suspect the cause of their dead bees to be microencapsulated

in the pollen samples was a stable form of the deadly chemical similar to that used in manufacturing PennCap-M. But Barker had no conclusive proof that the material came from that particular product.

PennCap-M is a pesticide product which contains methyl parathion in tiny capsules made of a dacron-like material. Inside the capsules, the product is not as dangerous to applicators as ordinary methyl parathion would be. Kept in a liquid carrier medium, the material is not harmful until the medium dries and allows the chemical to escape from the tiny capsules.

Since the capsules are small — about the size of a pollen grain — bees can pick them up in the hairs on their bodies and bring them back to the hive.

If the poison is released inside the hive, many bees can die. If capsules are stored in cells with other grains of pollen, they can act like a time bomb, killing bees as long as 17 months later, researchers have found.

Barker said finding tiny PennCap-M capsules in honeycombs is a difficult task.

Although some samples of pea pollen Barker tested contained methyl parathion, he said he could not find any tiny plastic capsules among the millions of pollen grains in his samples. He said concentrations of the capsules would be about one part per million.

He said concentrations of only 2 parts per million can affect honeybees. He has found concentrations as high as 50 ppm. in research he has done by dying the pesticide before application.

methyl parathion, sold in the area under the brand name of PennCap M, though they have no conclusive proof.

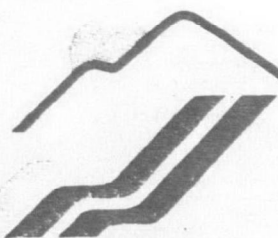
One Buhl beekeeper, who wished to remain anonymous, sent pollen samples to a U.S. Department of Agriculture bee research laboratory in Tucson after the widespread kills.

Roy Barker, an entomologist at the Carl Hayden Bee Research Laboratory in Tucson, said he found methyl parathion in some of the samples of pollen sent to him from Buhl.

"I'm not ready to write anything conclusive on what I've found," Barker explained Tuesday. "Some samples had it and some did not. The samples that had it were pea pollen."

Barker said finding pea pollen in beehives was unusual in itself. He said many bee experts believed heretofore that bees did not forage in pea fields.

He said the methyl parathion found



Filer farmer protests EPA parathion ban

TWIN FALLS — Bees may die when he uses it, but Filer farmer Dean Ruhter said he needs encapsulated methyl parathion to farm successfully.

Ruhter, who grows peas near Rock Creek, is starting his own private protest against an Environmental Protection Agency investigation of the pesticide which may result in a ban of the poison.

"I am sure that we killed the bees (when using methyl parathion), but I don't know whose fault it was," Ruhter explained. "I think the beekeeper has some responsibility."

Ruhter's protest follows a recent visit by EPA official Dan Bench to the Buhl and Castleford area. Bench sampled pollen from hives in which large numbers of bees died mysteriously last spring and summer.

Bench said he will test the samples to try to find out what killed the bees.

Local beekeepers said they suspect an encapsulated form of methyl parathion of killing the bees. Sold in Magic Valley under the brand name of PennCap-M, the chemical is a derivative of certain war-time nerve gases and acts on an insect's nervous system to cause death. The chemical

is also dangerous to human beings.

But danger or not, Ruhter said he would have a difficult time growing a good pea crop without it and plans to protest the investigation and possible ban of the chemical.

"It is one of the best chemicals for the price," Ruhter explained. "It will take care of both the pea weevil and aphids. Because of its residual (long-lasting action) it is valuable for long hatches."

Because of its encapsulated form, the methyl parathion in PennCap-M is released over a long period of time as its wet carrier medium gradually

dries out and allows the poison to escape and become active.

"It gives you a chance to go in before you maybe could with some other chemical and it will last longer," Ruhter said.

Ruhter said the chemical kills all insects in the field and if bees happen to be there, they will surely die, too.

But he claimed a beekeeper has a responsibility to protect his own bees if they are in the area.

"I am not too sure the bees are not trespassing on the property when they come onto a private individual's crop," Ruhter said. "And I think they

might be stealing the pollen from the property in the process."

Ruhter said part of the problem stems from the fact that bees can roam up to three miles from their hives on foraging jaunts.

"If you look at a map, you could put beehives outside all the towns in Twin Falls County, like Filer, Buhl, Castleford, and Twin Falls and cover the whole county," he said. "That's the reason it scares me what the beekeepers are doing."

He said a beekeeper who puts his bee yard in a corner of a field has no control over what fields the bees will

frequent in search of food.

"There are some alternatives (to banning methyl parathion)," Ruhter said. "The keeper knows that a farmer is going to spray at certain times of the year."

"They can move their bees at that time. They could find out where the majority of the peas or a certain crop is growing and they can maybe keep their bees out of that area."

Ruhter said he plans to write to his congressmen and appear on radio and television shows to publicize his protest campaign.

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Insecticide ban follows bee-kill

By HAL HOLLISTER
Lewiston Morning Tribune

The Idaho Department of Agriculture Friday ordered all commercial crop dusters in the state to halt immediately the use of the insecticide imidan, under threat of penalties imposed under the state's pesticide law.

The Lewiston Morning Tribune was unable to reach department officials for an explanation of the action, but the move clearly indicated that imidan is suspected of being the prime cause of the massive bee-kill that virtually wiped out the honeybee population in the Lewiston area this week.

News of the ban came from Donald J. Vannoy, plant industry investigator for the department at Lewiston.

Asked if the ban means that imidan killed the bees, Vannoy said, "It looks like it. It looks as though imidan sprayed to control the pea leaf weevil was at fault."

The ban came on the heels of a report by Dr. Hugh H. Homan, extension entomologist at the University of Idaho at Moscow, who had previously collected pollen from dead bees and from various flowering weeds in the Lewiston area.

Homan told the Tribune his investigation indicated that the insecticide drifted from an agricultural crop onto fields of weeds in flower, and that the bees picked up the insecticide there while seeking nectar.

"And that means the crop was probably peas," he said. "The only other crop then being sprayed is rape, and there is only one field of rape in the area, and it is five miles from town and could hardly have been a factor."

But Homan said the insecticide didn't originate at a single source. "It definitely wasn't caused by one spraying," he said. "The pollen the bees collected came from different sources, so it's impossible to put the blame on any one person, any one applicator. If the insecticide hadn't drifted, there would have been no problem. The bees were susceptible because of the timing. The weeds were in bloom this year at the very time the crop was sprayed."

The ban on the use of imidan coincided with the entrance of the Lewiston City Council into the field.

Acting on instructions the council issued at its agenda luncheon Friday, City Manager Armand E. Werle wrote letters urging the Department of Agriculture and the regional office of the federal Environmental Protection Agency at Seattle to take action.

In his letters, Werle pointed out an "unknown pesticide" has virtually wiped out the bee population of the area and threatens to contaminate the city's water supply and vegetables and fruit raised in backyard gardens. He ended with these words:

"The Lewiston City Council urges (both bodies) to take immediate action to determine the cause of this agricultural catastrophe. We hope that through your joint efforts corrective action can be taken immediately and this will be prevented in the future."

Dale L. Geaudreau, director of environmental health at the North Central District Health Department here, said he has collected samples of raw honey which will be sent to the Department of Health & Welfare at Boise for analysis to see whether the honey contains any of the pesticide. He said he expects to receive a report the latter part of next week or the following week.

Meanwhile the bees continued to die.

"There's practically nothing left in the 900 hives I've inspected," Orle Mundell of North Lewiston told the Tribune. "I could put all the adult bees I've found in one super. And the baby bees are still dropping off the comb."

Another heavy loser, Malcolm Anderson of Lewiston Orchards, concurred. "The bees are still dying," he said. "The field force (the working bees) are all gone, and so are the brood bees in many of the hives. All told, 147 of my hives were hit, many of them very hard."

In all, more than 2,000 colonies of bees were either destroyed or decimated by the effects of the insecticide.

Parathion blamed for bee

By HAL HOLLISTER
Lewiston Morning Tribune

The investigation of a mammoth bee-kill in the Lewiston area took a new turn Wednesday when an analysis of some of the dead bees showed that the wrong insecticide has been blamed for the slaughter.

As a result, the statewide ban on the application of imidan has been lifted, according to Al Miller, chief of the

pesticide division of the Idaho Department of Agriculture at Boise.

The new suspect, Miller said, is methyl parathion, a volatile chemical that is extremely toxic to both insects and mammals. Residues of methyl parathion were found in dead bees which were sent to a Sacramento, Calif., laboratory for analysis, he told the Lewiston Morning Tribune in a telephone interview. "We know it killed the bees," he said, "but we don't know

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how yet. Only one 90-acre field was sprayed with the chemical, and we have to find out how so many bees got killed over such a wide area, and why."

He said the obvious explanation — that all the bees contacted the insecticide in the same field — is not

kill; imidan ban revoked

plausible. "Some of the bees died 20 miles from that field, and bees don't fly that far," he explained. "We must find some other answer. We must search out all the clues and prevent this from happening again."

Miller said the ban on the use of imidan was lifted because all of the bees analyzed so far "showed negative results on imidan." He also said the use of methyl parathion has not been prohibited, however.

"It depends on whether the chemical was misused or the chemical itself is at fault," he said. "We're investigating both possibilities."

Miller was unable to fix the location of the field that was sprayed with methyl parathion, but Wilson Kellogg, director of the Idaho Department of Agriculture, told the Tribune that it is located on the south side of the Clearwater River two to three miles east of the U.S. Highway 95 bridge at Arrow. He said the field was sprayed sometime between May 10 and May 16.

Kellogg, who was at Lewiston on another matter, spent much of the day

conferring with Donald J. Vannoy, the department's plant industry investigator here, and William Freutel of Boise, pesticide coordinator for the federal Environmental Protective Agency in Idaho.

"We're trying to put things together," Kellogg said. "It's like trying to figure out a murder after it's committed. We'll check out everything in our power to do so and then figure out where we go and what caused this thing. It's too early to draw any conclusions, but we think we're on the right track."

Miller said five samplings of dead bees have been analyzed and another seven samplings remain to be analyzed to determine what killed them. "The EPA is analyzing still further samplings and five different laboratories are involved in the work. When all the results are in, we'll know whether all were killed by parathion and we'll have a good basis to work from."

Miller said investigators have been working as rapidly as possible under adverse conditions.

"There was a lot of conflicting evidence that made it extremely difficult to analyze and make decisions on," he said. "We've made progress, but there's still a lot to do."

The bee-kill, which first came to light May 17, has destroyed or heavily damaged more than 2,000 colonies of the insects in an area stretching from Lewiston to points as distant as Jacques Spur, Lenore and Juliaetta.

A Lewiston housewife suggested Wednesday that the substance that killed the bees might also have had an ill effect on hummingbirds in the Lewiston area.

"We have a hummingbird feeder and lots of flowering plants to attract the birds, and I used to see them around the place many times a day," she told the Tribune. "But I haven't seen a hummingbird for almost two weeks now, and I'll bet whatever got the bees got them, too."

The Tribune was unable to confirm Wednesday night that parathion or other pesticides might pose a danger to hummingbirds.

Enforcement of pesticide regulations said needed

An official of a chemical firm that manufactures pesticides told the Lewiston Morning Tribune Wednesday that the massive bee-kill that occurred here last month doesn't indicate a need for more or stronger regulations — but he implied it might suggest a need for stricter enforcement of regulations now on the books.

"We're probably the most-regulated industry in the world already," said Clay Shelton of Portland, manager of the product development division of the Stauffer Chemical Co. "The laws are there — enforcement of them is the question."

Shelton defended the manufacturers of pesticides, including his firm, which produces and markets Imidan, which for a time was suspected of killing the bees that died here.

"Imidan isn't new," Shelton said. "It's been around for many years and is used primarily to treat tree fruits — and tree fruits need pollination by bees."

Shelton noted that no pesticide is approved by the federal government until it has passed exhaustive tests and proved safe when applied as directed.

"If the instructions on the labels are followed, there's no problem," he said. "We (the chemical industry) spend millions testing out products, and we're responsible for any claims made on the labels of our products."

Shelton said his firm has sent dead bees taken from the hives of Orie Mundell of North Lewiston to laboratories in Oregon and Richmond, Calif., for analysis. "All the tests came up with the same results — no Imidan,"

he said.

"It's important to us that beekeepers be protected, but people must understand that the original pests are still there — the pea weevil and pea-leaf weevils. They're still there, and they must be contended with if the crops are to be saved."

Shelton, who has been at Lewiston to study the bee-kill for his firm, was accompanied by Hugh A. Scott, a Portland freelance writer. Scott pointed out that Imidan was used last year on about 75,000 acres of peas on the Palouse and Camas Prairie. No significant effects on bees were reported at that time, he noted.

Both he and Shelton pointed out that Imidan was developed as an alternative to DDT, which has been banned by the Environmental Protection Agency

Bee kill probe continues

By HAL HOLLISTER
Lewiston Morning Tribune

Two officials investigating a massive bee-kill in the Lewiston area earlier this month worked all day Thursday without arriving at any definite conclusions.

"We're tracking down manufacturers' records of all methyl parathion shipped into the state and used," William Freutel, pesticide coordinator for the federal Environmental Protection Agency at Boise, told the Lewiston Morning Tribune.

"We're also reviewing the records of applicators to determine when and where pesticides were applied in this area. We also went to the National Weather Service station (at Lewiston Airport) to obtain information about the weather over the eight-day period when the insecticide was applied.

"But we don't have any conclusions yet," Freutel said. "We're still waiting for lab reports from the EPA and from Oregon State University, where some of the dead bees were sent for analysis. We're getting down to good old detective work; that's what we're involved in."

Freutel said he and Donald J. Vannoy, plant industry investigator for the Idaho Department of Agriculture, have also talked with insecticide dealers here in an effort to obtain a clue to the cause of the bee-kill. "And the dealers have been very cooperative, as have the applicators," he said.

The investigation is slow and laborious, but it has been made easier because of studies already made by the state department of agriculture, he commented. "The state has done much of the work, so there'll be that

much less for me," he said. "They've made a real good investigation."

The huge bee-kill, which was first noted on May 15, has now destroyed or heavily damaged at least 2,500 bee colonies in an area stretching from Lewiston to Lenore to Juliaetta to Jacques Spur. And the toll may grow even greater.

Gene Pontius of Lewiston Orchards told the Tribune Thursday that the number of his hives that were hit by insecticide has now grown to 750. Orie Mundell of North Lewiston reported even heavier losses. He estimated that more than 1,200 of his bee colonies have been destroyed or heavily damaged.

Officials now believe that the primary cause of the massive bee-kill is methyl parathion, a highly volatile, extremely toxic insecticide used to control the pea leaf weevil in green pea crops.

Meanwhile, reports that hummingbirds and barnyard fowl may have suffered from the insecticide continued to emerge.

Eleanor Kunze of 715 Airway Ave. told the Lewiston Morning Tribune Thursday that five newly-hatched bantam chicks died at her home a short time after the bee-kill came to light.

"The first one was on Saturday," (May 15) she said. "The others died during the next two or three days. I don't know that an insecticide killed them, but they didn't seem to be diseased, and none of them had any punctures or other marks on them. I also had some chicks two weeks older than that, and none of them suffered any ill effects."

Fears that the parathion might have killed more than bees first were made public Wednesday when a Lewiston

housewife reported that hummingbirds which formerly frequented her garden hadn't appeared for two weeks.

An extension entomologist at the University of Idaho at Moscow told the Tribune Thursday that hummingbirds don't usually visit shallow field flowers, however. "Usually, they stick close to gardens, where the deep-throated flowers they favor grow," said Dr. Hugh H. Homan.

Gary "Sam" McNeill, a biologist at the Idaho Fish & Game Department office at Lewiston, said he didn't doubt that methyl parathion has the capability to kill small birds.

"I recall a study that reported that a field application of parathion killed 5-day-old pheasant chicks," he told the Tribune.

Bee probe intensifies

By HAL HOLLISTER
Lewiston Morning Tribune

Investigation of a bee-kill that virtually wiped out the honey producing industry in the Lewiston area last month is expected to shift into high gear again today with the return of a pesticide specialist for the federal Environmental Protection Agency.

William H. Freutel of Boise, EPA pesticide coordinator in Idaho, told the Lewiston Morning Tribune in a telephone interview Wednesday that he will arrive at Lewiston this morning to continue the investigation he began here last week.

The massive bee-kill, which resulted in the destruction or decimation of more than 2,500 colonies of bees in a 250-square mile area, has been blamed on an application of methyl parathion, an insecticide highly toxic to bees.

Freutel said the EPA is still tracking down the distribution of a particular product that uses methyl parathion.

"We know the chemical at fault, but we need to know the product," he told the Tribune. "We have the manufacturers' records of what they shipped to distributors. Now we'll go to the distributors and find who they sold to, which probably will be the applicators. We need to know that to determine the amount used in the area and see if this might be the only source (of the bee-kill)."

Freutel said he will meet again with beekeepers in the Lewiston area to fix on a map the location of hives that were affected by the insecticide. "We'll determine elevations of the hives to see if an air inversion could have been a factor. We're also looking at weather records for the period involved (in mid-

May), checking wind direction and velocity, temperatures and other relevant data. In addition to that, we'll be plotting all fields treated with the chemical during that time."

Freutel indicated that such laborious delving into the records is necessary because of the enigmatic nature of the huge bee-kill. Even though methyl parathion has been identified as the substance that killed most of the bees that have been analyzed thus far, records show that the only time the chemical was used during the period in question was on a 90-acre field about three miles east of Arrow — a point as far as 20 miles from some of the colonies that were destroyed or heavily damaged. Since bees seldom fly more than five miles, that application couldn't be the only explanation for the massive kill.

Meanwhile, Elmer Russell of Boise, administrator of plant industries for the Idaho Department of Agriculture, confirmed that the evidence against the suspected chemical continues to mount.

"Laboratories at the Oregon Department of Agriculture at Salem, the Washington State Laboratory at Yakima and the EPA laboratory all found essentially the same thing," Russell told the Tribune in a telephone interview. "That is, no imidan (the chemical first suspected) was found on the dead bees analyzed, but a substantial amount of methyl parathion was."

Despite the evidence that the chemical is responsible for the bee-kill, the use of methyl parathion in Idaho has not been prohibited, according to Wilson Kellogg, director of the department.

When asked by the Tribune why the use of methyl parathion hasn't been

prohibited as that of imidan was when it was the suspect, Kellogg replied:

"The fact is, the initial damage has been done and investigation is in process on the whole works (of insecticides). The question is whether they (the applicators) haven't used one chemical to spike another. The investigation of sales and applicators' records will make that clear, then we'll put the picture together. But it will take the whole week. You can't get all parts of a jigsaw puzzle in place at once."

Lewiston beekeepers, meanwhile, reported that their bees are still dying from the effects of the insecticide.

"At last count, 999 of my colonies were totally destroyed," said Orle Mundell of North Lewiston. "And of the remaining hives, 100 were severely damaged and I don't believe they'll survive the winter. I went through hive after hive and found them empty — not a bee in them. I've got about 550 hives that weren't hit. I started out this spring with 1,750 hives."

Woodrow W. Blakeley of Lewiston Orchards said his bees, too, are still dying. "If they continue to dwindle there won't be enough left to keep the brood warm, and the eggs won't hatch," he said. "I tried to escape by moving some hives to McCormick Ridge, and they got sprayed, too."

A small beekeeper, Roy Turnelson of 426 Lapwai Rd., said the destruction is continuing in his area. "I'm still packing out dead bees," he said. "I cleaned out all the dead ones a couple days ago, but I went out today and counted around a hundred more dead bees in each hive. It's too early to say whether those remaining can bring in enough honey to make it through the winter

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Bee-kill probe findings await laboratory check

By HAL HOLLISTER
Lewiston Morning Tribune

Investigation of a bee-kill that destroyed or heavily damaged upward of 2,000 colonies of honeybees in the Lewiston area earlier this month hit a lull Friday as investigators awaited reports from laboratories that are analyzing some of the dead bees.

William Freutel, pesticide coordinator for the U.S. Environmental Protection Agency in Idaho, ended a three-day investigation of the bee-kill here and returned to Boise. He is expected to return to Lewiston next Wednesday to continue the probe.

Donald J. Vannoy, plant industry investigator for the Idaho Department of Agriculture at Lewiston, could not be reached for comment Friday.

Before returning to Boise, Freutel told the Lewiston Morning Tribune that any major development in the investigation will have to await reports from laboratories at Oregon State University at Corvallis and the EPA laboratory at Seattle.

The most conclusive evidence produced to date is that at least some of the bees

were killed by methyl parathion, a volatile chemical that is highly toxic to bees. Use of the insecticide has not been banned, however, pending a Department of Agriculture determination of whether the chemical itself or the method of applying it was at fault.

Meanwhile, the toll of dead and dying bees continued to rise.

The heaviest loser — Orie Mundell of North Lewiston — told the Tribune that his casualties have climbed to 1,948 colonies. Of these, 990 colonies were destroyed, 100 were severely damaged and 58 received moderate damage, he reported.

"The trouble is, they're still dying," Mundell said. "The hives have already been inspected (to determine the amount of compensation that will be paid by the Agricultural Stabilization & Conservation Service), but bees in hives with both severe and moderate damage are still dying."

Another heavy loser, Malcolm Anderson of Lewiston Orchards, confirmed this. "Bees are still sickening, and dying around town here," he said. "Not a lot of them, but it's still happening. I had about 148 hives of bees

damaged. Only one was wiped out, and that was right in my backyard.

Anderson said he has no insurance that will cover his losses, and he doesn't believe any of the other beekeepers do. "I never heard of a company that would insure a bee-man against losses caused by pesticides," he said. "I don't think there's a company that would touch it."

The only compensation apiarists can expect to receive short of going to a court of law are payments provided by the ASCS. Those payments range downward from \$22 for each colony of bees that is destroyed.

That payment is made only after the loss is certified after an examination by a federal inspector. The beekeeper must pay the cost of the inspection.

Beekeepers here told the Tribune that the market price of a healthy swarm of bees in a two-tiered hive is \$70 per hive.

Picnic planned

The Tumelson clan of the Peck and Lewiston areas will gather for a covered-dish picnic at Spalding Park Sunday at noon.

Remember these 1976 stories?

Another year has passed and the Lewiston Morning Tribune takes a second look at some of the 1976 events that made news in the Lewis-Clark Empire. The topics were selected by editors of the newspaper, but no attempt was made to rank them in importance.

Vacant hives tell a story

Beekeeper Gene Pontius of Lewiston has a mountain of empty hives stacked in a warehouse that remind him of the worst bee kill in the history of the Lewiston area last spring.

More than 2,500 colonies of honey bees in about a 250 square mile area were wiped out or decimated by the pesticide encapsulated methyl parathion aerially sprayed on croplands. The massive kill of bees was first reported in mid-May in Lewiston Orchards, but two months later beekeepers from Lewiston up the Clearwater River Valley to Culesac, Kendrick, Peck and Gifford were still reporting dying bees.

The beekeepers only recourse was financial compensation from the Agricultural Stabilization & Conservation Service, which the apiarists said amounted to only a fraction of their losses. Orie Mundell of North Lewiston lost more than 1,000 colonies of bees and Pontius lost more than 500. Pontius said his honey production this year was cut to 40 per cent of normal. He also said he is afraid he will not be able to regenerate some of his colonies next spring in hives still contaminated with pesticide.

Investigators of the kill found that the bees in the Lewiston area were casualties of a newly-developed form of methyl parathion packaged in microscopic capsules to keep its potency longer. The bees apparently picked up the poison capsules on their legs along with pollen while foraging among flowering weeds growing around sprayed fields.

The bees then returned to their hives with the poison, which killed not only the worker bees, but brood stock in the hives.

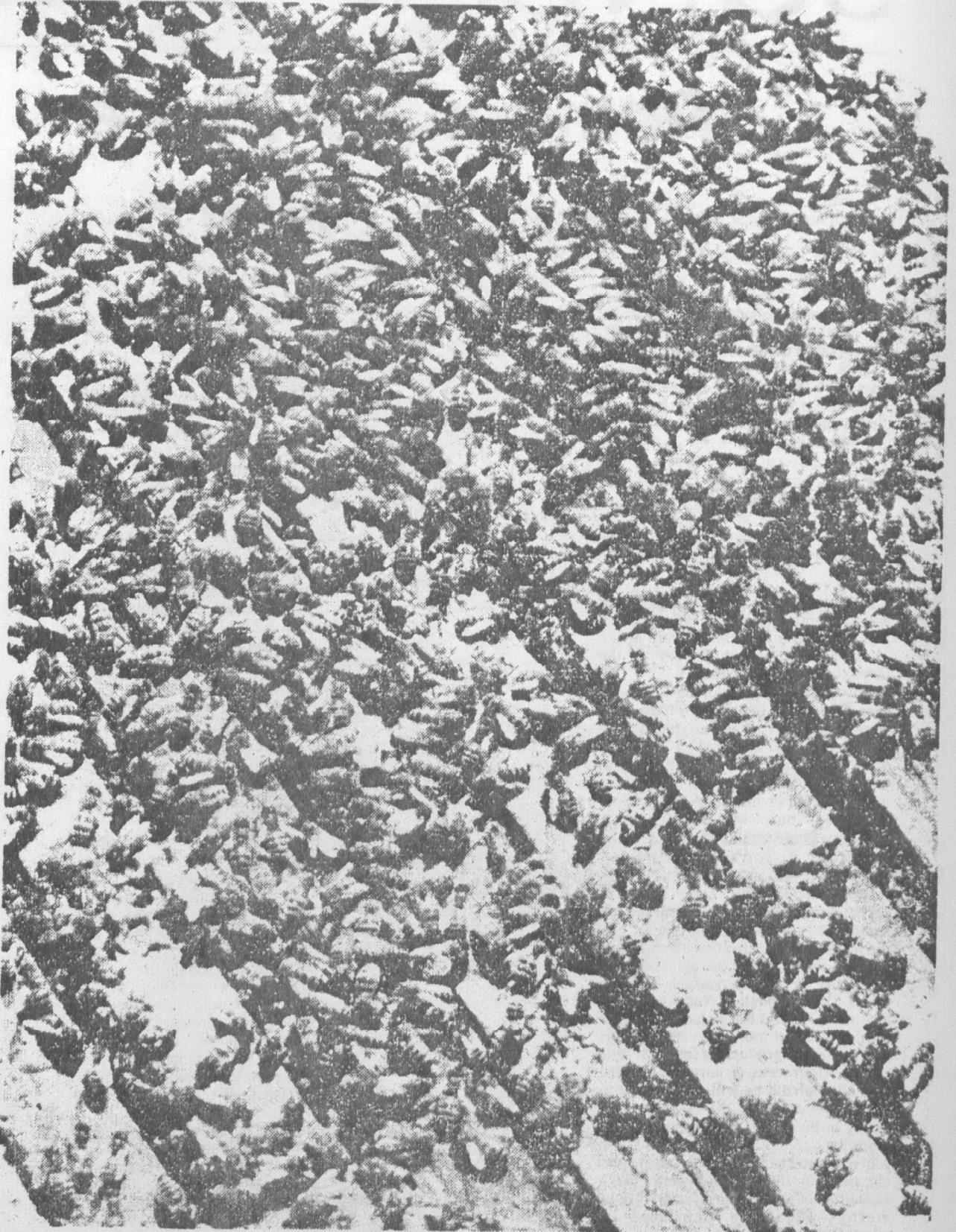
Although pesticides were suspect as the cause of the bee kill from the onset, the exact culprit and the way in which the bees were exposed to the poison eluded investigators for many weeks. The Idaho Department of Agriculture, which headed the investigation, at first mistakenly attributed the deaths to the insecticide imidan used to control the pea leaf weevil. The department halted the use of imidan in Idaho.

But laboratory analysis of some of the dead bees revealed about a week later that methyl parathion, another insecticide used to control the pea leaf weevil, was the bee killer. In mid-June, Wilson Kellogg of Boise, director of the state agriculture department, issued an order banning the use of the micro-encapsulated form of the pesticide in the Clearwater and Snake River drainages in Idaho.

Last fall, Kellogg began public hearings around the state to gather information that will be used to formulate new regulations governing applications of pesticides in Idaho. The hearings were mandated by passage of new pesticide laws during the last session of the Idaho Legislature.

The hearing at Lewiston Dec. 1 drew more than 100, including beekeepers, gardeners and grape growers effected by pesticides as well as crop dusters, farmers and pesticide distributors. At the hearing, Kellogg heralded greater cooperation between these groups under the new state pesticide laws.

The chances of another bee kill such as the one that crippled Lewiston area beekeepers last spring may be lessened this year. But the full impact of the area's worst bee kill in history may not be known until this year, either. — Diane Pettit.



Tribune/Barry Kough

Bees took it on the chin during 1976, the victims of an insecticide applied to crops. Tougher regulations on pesticide applications were likely as the year drew to a close.

June 11, 1977

Bee kill

Kellogg acted illegally in banning pesticide

By GARY S. SHARPE
Lewiston Morning Tribune

Idaho Department of Agriculture Director Wilson Kellogg of Boise acted illegally in temporarily banning the application of a pesticide that has killed untold thousands of bees in north central Idaho.

Kellogg failed to establish rules and regulations governing the issuance April 29 of an emergency order that banned the use of encapsulated methyl parathion for 120 days. That was the successful contention of the pesticide's manufacturer, Pennwalt Corp. of Philadelphia, in obtaining a restraining order last weekend.

Fourth District Judge Alfred C. Hagan approved the corporation's argument May 31 when he signed the firm's restraining order. The order struck down the temporary prohibition.

Kellogg could not be reached Friday for comment.

Encapsulated methyl parathion is used to kill pea leaf weevils and aphids that infest green pea and other north central Idaho crops. Thousands of bees were killed by the pesticide last summer when they

(Related picture on 9A)

carried pollen with tiny time-release capsules of methyl parathion from blooming crops and weeds to their hives.

The agriculture department sought to ban application of the pesticide, known as Penncap-M, on blossoming weeds and crops within a four-mile radius of bee yards.

"By far the bulk of the use and application . . . and sales of Penncap-M occur during the month of June," Pennwalt attorneys argued. "Unless (the agriculture department is) restrained . . . from enforcing said invalid emergency order (the firm's) sales of Penncap-M within the state of Idaho will be almost totally destroyed."

The agriculture department will be asked at a hearing at 3:30 p.m. June 30 in district court at Boise to show cause why it should not be prohibited from ever banning the use of Penncap-M.

Parathion

Bill would outlaw aerial application

By JAY SHELEDY
Lewiston Morning Tribune

BOISE — Aerial application of methyl parathion in the micro-capsule form — the culprit in the mass killing of north central Idaho bees last year — would be outlawed in the Lewiston area under legislation being prepared by the Idaho Department of Agriculture.

Department Director Wilson Kellogg is sharing these sweeping pesticide and herbicide regulation proposals with members of the House and Senate Agricultural Affairs committees for last-minute comment prior to drafting the bill.

The microscopic capsules of the deadly parathion were picked up by honey bees in the pollen of sprayed fields and taken back to hives. Millions of Lewiston area bees died and apiarists lost much of their honey crop.

The proposed controls would equal or exceed federal Environmental Protection Agency standards governing pesticide use on federal lands. But the proposed state regulations do not as yet specify penalties for those who violate the controls.

"These regulations are long overdue," said Rep. Lester Clemm, a Troy area farmer who regularly uses pesticides and who is a Democratic member of the House Agriculture Committee. "We have to get this pesticide thing under control."

The new restrictions would prohibit aerial spraying of the micro-capsules within a half mile of any canyon breaks of the Clearwater-Snake River drainage within the boundaries of Nez Perce, Latah, Clearwater and Lewis counties.

Further, no pesticide that is toxic to bees could be applied to any agricultural crop in bloom in the 10 northernmost counties from three hours after sunrise to three hours before sunset. The crop exception would be green peas which could be sprayed at any time. Austrian peas, however, would fall under restricted spraying.

Austrian peas generally are the first to bloom and because the acreage of this variety is considerably less than green peas there is a higher concentration of bees in Austrian peas fields. Bees are normally in their hives during the hours spraying is permitted.

Clemm and others feel, however, that the law should contain a clause requiring beekeepers to notify a farmer when hives are located within three miles of a crop. They would also like to require apiarists to place large warning flags next to the hives.

"Beekeepers normally move hives at night and catch spray planes off guard the next morning," said Clemm. "There should be some responsibility on the beekeeper."

North central Idaho grape growers and gardeners would also find additional protection in the omnibus legislation.

The aerial application of 2,4-D, MCPA and MCPB herbicides with a low volatile ester (producing droplets instead of spray) would be prohibited between May 15 and Oct. 15 at elevations above 2,000 feet in Latah, Nez Perce and Clearwater counties or within one mile of a susceptible crop or hazard area in any county.

And no spray pilot could apply high volatile ester formulations of 2,4-D — which has a tendency to vaporize and float under certain weather conditions — in those three counties, or within five miles of a susceptible crop or hazard area anywhere in the state.

This regulation is designed to protect grapes, tomatoes, garden products and other susceptible crops.

No pilot could spray any pesticide within one-half mile of any community or densely populated area unless the wind is away from the hazard area.

And no application could be sprayed if the

(Continued on page 17A)

Postius

8C Lewiston Morning Tribune

Sat April 9, 1977



A bee in clover could be a bee in danger, thanks to new agricultural sprays.

Culprit may not be known until June, Kellogg says

Tribune Staff Report

BOISE — Idaho Department of Agriculture Director Wilson Kellogg said Thursday he still isn't sure a suspected pesticide is the culprit in new honey bee kills in the Lewiston area and that it will be June before anyone is certain.

And that may be too late to avoid another disaster this year, Kellogg indicated to the Tribune.

Apiarists blamed a microencapsulated form of methyl parathion for the sudden and near total destruction last year of \$1 million worth of bees. And large numbers of bees have been dying once again.

Farm chemical dealers say no pesticide fatal to bees has been sprayed

this season, and apiarists are surmising hive frames contaminated last summer may be causing the most recent losses.

"The beekeepers didn't steam clean their frames as they were advised to do by the pesticide manufacturer," said Kellogg. "But the cost of cleaning is almost prohibitive. I am deeply concerned what in the devil has caused the deaths. I'm not too sure we have the real culprit pinned with microencapsulated methyl parathion."

He said the dead bees have been shipped to Washington State University for tests that won't be completed until June. "You're almost looking at an after-the-fact situation again this year."

Current pesticide regulations, drawn

up by the Department of Agriculture partly as a result of last year's bee kills, prohibit the aerial application of methyl parathion within a half mile of major river canyons and breaks in Nez Perce, Lewis and Latah counties.

Penwalt Manufacturing Co. of Fresno, Calif., placed a bee warning on the label of its methyl parathion containers in an attempt to eliminate a liability factor, said Kellogg. "It puts the money on the backs of the applicators — unless the bees are trespassing."

Kellogg said the attitude of ranchers and farmers toward beekeepers is deteriorating. "They don't want to sacrifice reasonable spraying of crops, so I guess they are discouraging beekeepers from being around."

Bees

Beekeepers still reeling from last year's disaster

By ROBERT C. GIBSON
Lewiston Morning Tribune

Half of Woodrow Blakeley's collection of 200 colonies of bees was destroyed last summer in a massive kill, blamed on pesticides, that swept through Lewiston and the Clearwater River valley.

Gene Pontius, a Lewiston Orchards apiarist, also was hit hard by the bee

kill. About 80 per cent of his bee colonies were contaminated and 50 per cent of his business was destroyed.

The beekeeping businesses of Blakeley and Pontius have taken different paths, however, as a result of the bee kill.

Blakeley considers himself lucky that the income from his bees only supplements his pay as a Lewiston fireman. He had 200 colonies of bees

last spring. Now he has about 100.

Blakeley said it will cost him at least \$5,500 to replace the bee colonies he lost in the kill. But he will not spend that money this spring because he is afraid that those bees, too, will be wiped out in another massive bee kill he expects this summer.

Already this spring bees that Lewiston area apiarists put in hives contaminated last summer have started to die in unusually large numbers.

Blakeley said he does not think he can afford to replenish his hives if he has to gamble on their welfare again this summer. As a result, he will tend only the 100 hives he has left.

But his income from honey also will be cut in half. Each colony can be expected to produce from 10 to 60 pounds of honey per year. At several dollars per pound for honey, the money Blakeley will not get this year adds up quickly.

LAST YEAR'S bee kill and the uncertainty of this year's crop has taken the enthusiasm out of Blakeley's operation.

Pontius, on the other hand, has no choice but to continue building a bigger and better bunch of bees. And he has been busy this spring trying to get his operation back up to its normal size. He figures he is still 300 colonies down from his high last year of 1,845 colonies.

Pontius has to build his business back quickly because he has contracts to pollinate Wenatchee orchards.

About 60 per cent of Pontius' bee business is pollination contracts. Only a small part of his income is from honey.

In an attempt to build his business back to the size he needs to pollinate orchards, Pontius has bought out two smaller apiaries. One business he bought out was irreparably damaged by the bee kill last spring. The other sold out for other reasons.

The bees already have been put to work this spring. Pontius took them to California to pollinate almond orchards for a couple of weeks.

Pontius said that, because of his contractual agreements, he has to rebuild his colonies this year, even if he has to gamble on another bee kill this summer.

Pontius said he considers himself lucky that part of his bees were in Wenatchee when the spraying season was on in Lewiston. None of those bees were killed.

It will cost Pontius more than \$30,000 to rebuild his operation to the size it was a year ago.

Blakeley and Pontius, like most beekeepers in Lewiston and the Clearwater River Valley, are bitter about the bee kill.

THEY THINK that an insecticide, encapsulated methyl parathion, was responsible for the massive kills that left a double fist full of dead bees at the foot of each hive almost hourly.

But they have not been able to put the blame on any particular aerial applicators or any particular farmer. And the aerial applicators and the pesticide manufacturing firms deny any wrongdoing.

Laboratory tests done at Washington State University and Idaho state laboratories show traces of methyl parathion in the bees that recently died. But until a finger can be pointed at a particular source of the chemical, no action can be taken by apiarists to recover damages.

The apiarists think that wind drift and improper application of the pesticide are to blame for the deaths. Bees ranged only a mile or two from the hives in the weeks before they died, they say. And no parathion was sprayed that close to their hives, they contend.



Dead bees, above and below, litter the ground and hives after the massive bee kill of 1976.



Bee-killing pesticide legal again

By DIANE PETTIT
Lewiston Morning Tribune

Some restrictions on the use of the pesticide that caused a massive bee kill in the Lewiston area last year have been lifted by order of the Fourth District Court at Boise.

"We got shot down in the courts," Wilson Kellogg, of Boise, director of the Idaho Department of Agriculture, confirmed for the Tribune by telephone. Kellogg had telephoned Lewiston beekeeper Gene Pontius earlier in the day to inform him and fellow area apiarists that encapsulated methyl parathion, the insecticide that decimated their hives last spring, could be used again this year.

"We're not saying everybody's going to use it," Kellogg told the Tribune. "But they can."

Fourth District Judge Alfred C. Hagan granted an alternative writ prohibition Tuesday which nullifies an emergency order issued April 29 by the state agriculture department. The order banned the use of encapsulated methyl parathion on blossoming crops and weeds and prohibited applications of the bee-killing pesticide within a four-mile radius of marked bee yards.

The court action was initiated by Pennwalt Corp., the makers of the encapsulated form of the chemical methyl parathion under the brand name Penncap-M. Pennwalt Corp. claimed that the emergency order was imposed without following proper procedures, such as holding public hearings, sources told the Tribune Saturday. The pesticide company also claimed violation of its constitutional rights.

The court action does not affect the new state pesticide regulations approved by the Idaho Legislature in March, Kellogg noted. The regulations include a ban on aerial application of encapsulated methyl parathion within a half-mile of the Snake and Clearwater River breaks. This restriction remains in effect, Kellogg said.

He said his department would have to go through the public hearing process in order to reinstate the statewide restrictions on encapsulated methyl parathion during the blooming period. The hearings would probably be scheduled for early next fall.

The timing of the current court action effectively prevents the restrictions from being imposed during the critical period this year, Kellogg noted. "The emergency order was only good for 120 days. You've got to give 20 days notice for a public hearing, then you have a minimum of 10 days to come up with a solution, then 20 days thereafter before it goes into effect. That puts us long past the 120 days of the regulation's effectiveness."

Pontius told the Tribune Saturday that he had spent the past three days moving his hives to escape the expected spraying. He already has lost bees by the hundreds at Lenore and in the Potlatch area from "whatever it is they're spraying now." He plans to move many of his 1,800 hives further north into timbered areas. "I'll let the bears eat them," he said.

Beekeeper Dwight Kilgore of Lewiston also reported

(Continued on page 13A)

Photographs
Twin Falls County
1978

Photographs
Nez Perce County
1976

Additional Information

Mr Dan Benck
Environmental Protection Agency
Pesticide Division.
Denver, Colo.

Oct 1978
Bull Idaho

Dear Sir,

We read in our local newspaper, The Times-News, that you are investigating the use of PennCap-M. We have been hard hit with PennCap-M this year. We didn't even know there was such a product before.

My husband and son run a bee business, and we won't know our complete loss for a while.

I work in the bees with my husband and we came home on June 13 and found our bees here at home dying. So he went scouting around to see if someone had sprayed anything. He found two farmers about a mile from us had sprayed white pear, that morning. So we checked around and found other yards had been hit also. Bees were still dying on June 16th, so my husband knew we had more than an ordinary bee kill. He called the field man for the pear company and the field man for the aerial applicator & told them to come see how they were killing his bees. They came but they didn't tell us what they had used.

The next day the planes were flying on pears yet at noon. So Frank went to the airport to protest. He found out then that PennCap M had been used and how potent it was.

We tried to get the Environmental man here involved - But he never called us - and he was told of the kill. Later we learned he didn't want to get involved. The Health and Welfare - pesticide kill division - of Boise came down & investigated & took bees to examine.

The local pesticide inspector investigated. Dr Ray Barker of Tucson Bee Research Laboratory called & gave us advice. He sent Pollen samples from eight yards to him.

The Pennwalt people, of which Dr. Lowell was one and 3 others came from Fresno. They refused to believe that their product was

responsible. on that Bees go in; white peas. also the State of Idaho - pesticide Division - was letting planes fly illegally all day on white peas. because they didn't think bees go into white peas:

But we have proof they do. We gave Dr Charles Brokopp of Health & Welfare of Boise, a sample of peas from this one field. He sent some of the blossoms to Tuscon. In the pollen samples we had sent to Tuscon, they isolated some pea pollen, and it matched the pea pollen in the blossoms. also the Pea Pollen tested 5.34 p.p.m of Methyl Parathion.

Besides killing bees & brood Pennacp also contaminates the combs especially where the pollen is put. It cost us the loss of honey on these yards, lots of extra work, equipment and productivity for years to come. As we are advised to meet these combs come down, in the main hive, and replace with new comb. or uncontaminated comb. This is impossible to do. to replace with different comb. As it takes a drawn out comb that is perfectly drawn, to make a good brood nest.

In any part of the country - the honey flows. aren't that fast to get new comb drawn out easily so will take several years to replace.

We had 8 yards tested, all were affirmative and then there was several yards we know had been hit with Pennacp M that weren't tested. They run from 50 to 79 ^{parts} to a yard.

What we would like to know is - why do they let such a product to be used in a valley like this where bees are in nearly every square mile or so. Some yards closer - some farther apart. But we know bees fly up to 3 miles to forage and there is no way it can be used safely.

Roy Barker, says there are plenty of things to use besides Pennac M that are safer, too.

Is it right for a big chemical company to take away the right of our making a living and to destroy our property. With all the Bee kills they have had - in as many states as they have. They can't help but know it is destructive to Bees and other wildlife.

We hope you can help stop this killing and destruction. If you need more information on this product you can call Roy Barker, at the Bee Research Laboratory at Tucson Arizona; also Dr Charles Brodus of Bee Health & Welfare Laboratory.

There were other beekeepers affected in the Valley - but don't know if they had their beehives tested.

The Idaho Beekeepers are having a Convention now 10 + 11th, and if it will help we will file a formal protest.

Not only were we hit with Pennac M - but nearly every word had killed when Green Giant sprayed corn with Sevinol - while pollen was on and beans were sprayed. All in all it hasn't been a profitable year. and a very trying one.

We have taken bees from good yards and given to some of the Pennac M hives but they don't seem to build up much. If they do they may not survive next summer, when poison pollen is uncovered to feed brood.

We thank you for anything you can do. or any help you can give.

By Grace Zagata

Sincerely
Mr & Mrs Frank Zagata
Rt 1 Box 120
Buhl Idaho 83316

COOPERATIVE EXTENSION SERVICE



University of Idaho

College of Agriculture

In Cooperation with the

U.S. Department of Agriculture

May 20, 1976

June 4, 1976

TO: County Agricultural Agents, Beekeepers

FROM: Hugh W. Homan

SUBJECT: Bee Poisoning Problem

A number of severe bee poisoning incidents have occurred during the past three weeks in various areas of the Pacific Northwest. These have been associated with pea leaf weevil control on peas in the Lewiston area of Idaho; with cabbage seedpod weevil control on rape seed in northern Idaho and adjacent Washington; on collards grown for seed near Marysville in western Washington; and with alfalfa weevil control on alfalfa-grass hay in the Kittitas Valley of Washington. Blooming weeds and mustards in fields or field edges are the source of the problem on peas and alfalfa hay.

Parathion, methyl parathion, and microencapsulated methyl parathion (PennCap-M) are the materials which have been implicated to date. The microencapsulated formulation may pose a special problem in contaminating the pollen collected by honey bees. At this time of year there is a dearth of good pollen plants and bees will often forage for several miles to find pollen to feed their brood. Kill of newly emerged adult bees, as well as brood, is definitely associated with pollen contamination.

* We strongly advise that parathion, methyl parathion, and microencapsulated methyl parathion NOT be applied to blooming crops, including blooming weeds in the fields. The preferred low-bee-hazard material for pea leaf weevil is methoxychlor although imidan is quite acceptable, for alfalfa weevil control, methoxychlor, and for cabbage seedpod weevil control, endosulfan (Thiodan).

Use all these materials strictly in accordance with label directions and/or official recommendations by the University of Idaho for the specific crop. Information on recommendations may be obtained from the University of Idaho Cooperative Extension Service.

Hugh W. Homan, Extension Entomologist

d1

Prepared by:

A. R. Gittins

Insecticide: Farmers vs. beekeepers

Associated Press

WENATCHEE — Washington beekeepers and farmers are feuding over whether the insecticide Penncap-M helps crops at the expense of bees.

The Washington Department of Agriculture will have to sort out the evidence before deciding if new restrictions, which is what the beekeepers want, will be imposed on the chemical.

Penncap-M is widely used to control bugs in apples, wheat and other crops. Beekeepers claim it harms bees.

However, many farmers say stiffer regulations would remove a needed insecticide from farm use.

More than 100 farmers and beekeepers swarmed to a hearing in Wenatchee last week to voice views on the beekeepers' proposals.

The proposals would require that Penncap-M be prohibited from use within six miles of any town and that cer-

tain orchard areas no longer be exempted from the regulations.

The proposals also would require all buyers of Penncap-M to sign a register certifying they will comply with conditions on applying the chemical; that those who sell the insecticide furnish buyers with a copy of the regulations governing its use; and that the insecticide be tagged with a red dye so it can be readily identified in case of bee losses.

Elwood Sires of Union Gap, president of the Washington State Beekeepers Association, said farmers need bees for pollination more than they need Penncap-M. Bee losses, he said, have been so high that farming is in danger of losing its state bee industry.

A state report says damage has declined since regulations on Penncap-M were revised in 1978 and beekeepers acknowledge they have no specific data to contradict that report.

Charles Boone of Yakima, a beekeeper and orchardist, urged that the chemical be banned from further use in the

state, saying orchardists have adequate alternative chemicals.

The Washington State Horticultural Association urged no changes be made. The group said two bee losses were reported from use of Penncap-M in 1978.

The group also argued that no reports of bee kills came from any orchard areas exempted from the Penncap-M regulations. Therefore, the group said, there is no reason to eliminate those exemptions. The group indicated applicators already are required to be licensed, making registration as proposed needless paperwork.

Penncap-M "is greatly needed throughout north central Washington," testified Wenatchee horticulturist Norm Gutzwiller, himself a beekeeper. "It is particularly needed in areas where other materials are not working properly, particularly for scale."

Wenatchee grower Stanton Chase said use of the material has not harmed the 300 hives he has in his orchard.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: February 26, 1979

SUBJECT: Report of Analysis of Honey and Pollen from Killed Honey Bee Colonies

FROM: K. T. Zee

Petition Method Validation Section, CBIB/BFSD *King & Zee*

TO:

J. M. Conlon (TS-769)

J. G. Touhey (TS-768)

C. Bushong (TS-769)

W. Waldrop (TS-770)

N. Cook (TS-769)

R. Schmitt (TS-769)

D. Bench, Pesticide Accident Investigation Officer

Air and Hazardous Materials Division, Denver, Colorado

D. Campt (TS-769)

THRU: Warren R. Bontoyan, Acting Chief, CBIB/BFSD *WFB*

Three honey and four pollen samples were received by CBIB with a transmittal memo dated January 19, 1979 from D. W. Bench, Pesticide Accident Investigation Officer, Denver, Colorado. All samples were from Twin Falls County, Idaho, where PennCap-M was used. Analysis for methyl parathion and capsule material was requested. Due to the lack of a suitable method, analysis for capsules was not performed by this laboratory.

All honey samples contained some solid materials (dead bees, I suspect). Sample identified as "CR 124317, other 1Y", has substantial amounts of the solids. Pollen samples appeared to be gummy.

Methodology - Methyl parathion:

Samples are extracted three times by 1:1 petroleum ether and methyl alcohol on a Waring blender. The extract is poured into a separatory funnel through a glass wool plug. Add 600 ml water to the solvent and mix cautiously. Drain and discard water. Rewash solvent layer with two 100 ml portions water, discarding water each time. Pass ether solution through a 2-inch anhydrous sodium sulfate column, and collect eluate in a Kuderna-Danish concentrator. Evaporate the solvent to ca 10 ml on a steam bath. Waxy samples were subjected to an Acetonitrile partitioning clean-up step per P.A.M. Vol. 1. Section 211.14.

Before analyzing the samples, we subjected the method for a recovery study. Honey from local shops was fortified with methyl parathion @ 0.1 ppm and 90% recoveries obtained. Unfortified honey and reagent blanks showed no sign of methyl parathion peak on gas chromatograms.

The samples were first analyzed on gas chromatograph equipped with a Ni⁶³ electron capture detector, then we re-analyzed the samples with a phosphorous specific flame photometric detector. The operating parameters are as follows:

Column: 6' x 3 mm I.D. 10% DC 20s on 80/100 mesh gas chrom Q

Oven - 200° C

Injector port - 250° C

Detectors - 250° C for Ni⁶³, 200° C for FPD

CR 124304 home 1Y pollen sample was confirmed qualitatively and semi-quantitatively by High Pressure Liquid Chromatography (HPLC).

Results

	PTM found	
	E.C. Detector	FPD Detector
CR 124307		
Honey home 1Y	< 0.01	---
Honey other 1Y	< 0.01	0.015
Honey other 2Y	< 0.01	---
CR 124304		
Pollen home 1Y	10.0	9.5
Pollen other 1Y	0.15	0.12
Pollen other 2Y	0.27	0.21
CR 124305		
Control pollen	< 0.03	-.01

Comments

1. Honey samples are relatively free of methyl parathion, but the pollen samples showed various amounts of methyl parathion.
2. A published method by Blackmer and Reynolds entitled "A Semiquantitative Method for the Detection of Microcapsule Residues Resulting from Micro encapsulated Pesticide Application." J. Agric. Food Chem., 25 : 559-61 which measures the liberated amines from the reacted Penncap-M polymer was considered impractical for these samples.

Copies: C. Hall (TS-767)
C. Mitchell (TS-769)
R. Lee (TS-768)
R. Storherr (TS-768)

Attachment: Gas Chromatograms