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June 11, 1984

Alfalfa Leafcutting Bee Newsletter: Volume I No. 2

INCUBATION AND PLACEMENT OF LOOSE CELLS

Once in trays inside the incubator, the temperature for loose cells can be brought to 80-85°F and humidity levels to 50-80%. Temperatures above 85° tend to increase mortality. Below 80° increased incubation length contributes to less vigorous bees being placed in the field. Cells stored at 35-40°F can slowly be brought to incubation temperatures over a three to four day period. If cells are to be dipped immediately prior to incubation, a day for drying prior to their placement should be accounted for.

Cells should be placed in incubating trays one to two inches deep to prevent bees emerging from bottom cells from chewing into other cells containing live larvae. Racks should be placed to enable air movement around the trays and fans should be placed to eliminate hot spots in the room. Incubation should be carried out in darkness, except for parasite trap lights, since light increases energy output of the bees that may be needed later for feeding in the field.

Cells may be incubated 14 days with no screens on the trays or until the first signs of adult bee emergence. This allows better air movement in the trays and a better parasite kill, if chalcid types are present.

On day four of incubation, vapona strips (no pest strips) may be placed at the rate of 1 per 1,000 cubic feet. (~~These strips are generally not necessary if infestation levels of parasites are 3% or less.~~) Disregard & use at any level! At this same time, one or more "grow lights" or black lights, should be placed on the floor in centrally located positions to enable maximum visibility to emerging parasites. The lights should be suspended over soapy water pans or fly paper to "trap" the pests.

If used, vapona strips should be removed on day 14 and the room thoroughly ventilated for at least eight hours. After removal of the vapona, screens should be placed on the trays since male emergence begins on day 14 or 15. The wasp parasites generally begin emergence on the 9th day and this will continue until the 18th day. After male bee emergence and one or two days into female emergence (day 22 or 23, when 70% of cells with bee larvae have emerged), bees should be placed in the field, weather permitting, if there is adequate bloom available. If necessary, bees may be held in darkness at no less than 60°F for up to one week with no significant mortality occuring.

Placing the bees in the field is probably the most critical point of the annual cycle. Unscreened trays should be placed in shelters at night or early morning before temperatures reach 65-70°F. If temperatures are higher and bees are placed during the day, extreme losses due to drift may occur. Wind is also an important factor to consider during placement. Placement of bees during or immediately prior to wind or cold conditions will result in drift and mortality that cannot be compensated for.

Nesting material should be located in the domicile so as not to be exposed to direct sunlight and the shelter should face east or slightly southeast. Since bees generally work alfalfa farther to the east than the west, western shelters should be placed closer to the western side of the

crop than the eastern shelters to the eastern edge. If bees drift, this should be compensated for by placing extra nesting materials in the appropriate shelters. If trays are placed next to the shelter roof, enough room should be allowed for air circulation to prevent overheating of emerging bees. Trays placed too far from the roof may result in poor emergence. Cells must not be exposed to direct sunlight until all adults bees have emerged.

Contents of trays should be discarded as soon as bees have emerged. If chalkbrood is present, the materials should be burned. This prevents bees from nesting in empty cacoons and also kills insect pests that may be present.

If possible, place domiciles in a different location each year to prevent the buildup of dead larvae and chalkbrood inoculum in the nesting area. If the domicile is fixed in the same position year after year, spray ten feet of ground around it liberally with chlorine solution.

Do not place chalkbrood free bees in the same domicile as bees with incidence of chalkbrood. If possible, "clean" bees should be kept isolated by at least ¼ mile from chalkbrood contaminated stock.

Coordinate pesticide applications. Consider bee proximity and activity for all pesticide applications. Bees do not have to be sprayed directly to suffer ill effects. Avoid: (1) spray drift; (2) pesticide applications when temperatures are low; (3) potential insecticide residues during seed set; (4) moving bees into fields too soon after application of pesticides; and (5) killing or damaging the neighbor's bees--they may be working in your fields (from Kish, 1981).

Kish, L. P. et.al, 1981. Chalkbrood - A Serious Disease in the Alfalfa Leafcutting Bee and What We Can Do About It

DISINFECTION FEASIBILITY STUDIES

On May 31 and June 1, 1984, disinfection treatments were made at the Paul Jones Ranch near Forsyth. One treatment was via fumigation in the back of a dairy truck owned by Art Shaw. The truck chamber had dimensions of 10 x 11.25 x 6.5 feet or 732 cubic feet. Ideal test conditions that we attempted to achieve were:

1. Exposure time - 24 hours
2. Ethylene oxide concentration - 450 mg/litre
3. Temperature - 70°F
4. Relative humidity - 20-40%

These specifications were derived mainly from previous lab studies conducted at the University of Oregon at Corvalis and from temperature-humidity conditions at which ethylene oxide (fumigant) is chemically active.

The fumigant material used consisted of 12% ethylene oxide (active ingredient) and 88% dichlorodifluoromethane (carrier gas). At 3:40 P.M. on May 31, eleven pounds of material was introduced into the truck chamber giving and assumed concentration of 649 mg/l. After the introduction of the fumigant, the temperature in the chamber was 74°F. The temperature dropped to 62°F by 9:30 P.M. and by 9:30 A.M., the morning of June 1, had dropped to 54°F. The temperature then gradually rose to roughly 60°F by 3:40 P.M. on the afternoon of June 1, at which time the treatment terminated via the opening of doors to the truck chamber. Ideal test conditions, therefore, were not met since the chamber temperature fell below 70°F for at least 18 hours. To compensate for this, an additional fifteen pounds of material was added to the fumigation chamber at 9:30 P.M., thereby increasing the existing concentration by an additional 885 mg/l for the remaining 18 hour period. Another factor which did not meet ideal conditions was relative humidity since a hygrometer used indicated 45-60% and it rained the afternoon of May 31. Materials fumigated were 29 boxes of polystyrene

laminates with 2,700 holes per box and 25 boxes of wood laminates with 1,210 holes per box.

Enough wood laminates were sprayed with an iodine solution to fill roughly five 1ft x 4ft boxes. This was done by individually spraying both surfaces of each laminate with a hand sprayer. Material used was a 7% solution of tincture of iodine which was diluted down to .7% with tap water. We intend to spray more wood laminates in the near future. Placement of bees that fill these nesting materials in the field will be monitored and results will be determined from X-ray analysis of the extracted loose cells at the end of the season.

In closing, we wish to thank Paul Jones and Art Shaw for their help and support, without which these treatments could not have been made.

MISCELLANEOUS

A correction to the 1984 alfalfa leafcutting bee director (which all beekeepers should have received by now) is as follows:

Brandon Leafcutter Bees Mike Dolinski 8811 29th Avenue Edmonton, Alberta CANADA T6K 2X5	CHANGE TO:	Sonja Korsan and Lynn Ziegler RR 1 Gibbons, Alberta CANADA T0A 1N0

A Final Note: It should be emphasized that we do not recommend dipping loose cells in iodine solutions. This practice has not been tested experimentally or otherwise, and effects on developing larvae are not known.

For further information contact:

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