

Section VII.
Insecticide Residues

METHOMYL AND HONEY BEES

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Bee bioassay tests were conducted using a standard bioassay method. Results follow.

Methomyl 2% dust (1.0 lb ai/acre) resulted in 98% mortality of bees with one-day residues, and methomyl 90 WP 1% mortality.

Methomyl 90 WP (0.5 lb ai/acre) 8 hour residues were non-hazardous to bees; 1.0 rate 8 hour residues were low hazard. Elvanol 52-22, a water-soluble plastic at 0.25% and 0.5% provided no safening effect to bees.

Methomyl 25% WP and 90% SP (0.5 lb ai/acre) did not differ in their hazard to bees. Eight hour residues of 90 SP (0.5 lb ai/acre) were non-hazardous to bees; the 1.0 lb ai/acre was moderately hazardous.

Methomyl 90 WP (0.5 lb ai/acre) directly applied to bees gave 100% mortality. The 0.5 lb ai/acre gave the following bee mortality sequence: leafcutting bees > alkali bees > honey bees > bumble bees.

Methomyl 1.8 LS (0.25, 0.5, and 1.0 lb ai/acre) 8 hour residues were non-hazardous to bees.

Repeated applications of methomyl 1.8 LS (0.45 lb ai/acre) at 5-day intervals caused increasing mortalities with successive treatments. Percent mortality for each application follow: 19, 28, 41, 63.

Adding fundal 97 SP (0.24 lb ai/acre), to methomyl 1.8 LS (0.225 lb ai/acre) increased 2 hour residue mortality from 28% to 100%.

The sticker Adhere at 4 oz per acre added to methomyl 90 WP at 0.9 lb ai/acre reduced 8 hour residue mortalities from 39% to 16%. Adding the sticker Plyac at 4 oz per acre did not reduce bee mortality.

Methomyl 90 WP 0.9 lb ai/acre residues were held either at 18 C in the dark, 20 C in the dark, or 10 C - 35 C in the sunlight. Honey bees suffered more mortality from residues in the sunlight.

Methomyl was applied 4 times by plane at 0.45 lb ai/acre to pollen shedding corn. Methomyl caused no abnormal or perhaps a low kill for one day after each application. Bees collecting corn pollen were reduced by 30%. There were no reductions in bee populations or brood in the test colonies.

Methomyl (0.9 lb ai/acre) was applied by ground in the evening to a 0.25 acre of blooming red raspberries. As soon as bees began foraging raspberry blooms the next day, they showed behavior changes. They removed nectar, backed away and soon were shying away from treated blooms. Foraging bees

were counted during mid-afternoon of the first day and on days 2, 4, and 6. Methomyl showed a strong repellent action for 2 days and a lesser repellency the third day, increasing to normal activity by the 6th day.

Methomyl (0.9 lb ai/acre) was applied at 8:30 pm on 16 April to a 0.08 acre plot of blooming blueberries. The same kind of condition response was observed. Honey bees probed around the flowers, and then flew off to untreated portions of the field.

The RT 25 for methomyl at 0.45 lb is 2 h and at 0.9 lb, 6 h. Materials with an RT 25 of 8 h or less are useful in terms of bee safety, if applied judiciously, i.e. if applied during the late evening or night.