

I. Pome Fruits

a. Chemical control with Bt

1. *Pandemis pyrusana* Kearfott on apple leaves

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BIOASSAY, FIELD-AGED RESIDUES OF BACILLUS THURINGIENSIS (Bt) AGAINST LEAFROLLERS, 1992. Using a leaf-disk bioassay, different Bt products were evaluated for their effect on PLR larvae. Bt products were applied to Red Delicious apple trees at their recommended field rates as shown in Table 1 using a handgun sprayer at 300 psi to the point of drip, simulating a dilute spray of approximately 400 gallons per acre. Treated apple leaves were collected 1, 3, 5, 7 and 9 days post-treatment. Two punches (2.3 cm diameter) were taken from each of 20 leaves per treatment on each date. Four punches were placed in a petri dish (Falcon 1006, 50x9 mm). Five one- to two-day-old leafroller larvae were placed on the leaf disks and the petri dish lid was put in place. Ten dishes were used for each Bt product and rate (50 larvae per treatment). Dishes were placed inside a food storage container with a wet paper towel to maintain a high humidity and kept at 75°F (±2°F) constant temperature and 16:8 photoperiod. Dishes were examined after 96 and 144 hours to determine larval survival. Data were corrected for untreated mortality using Abbot's formula.

Percent larval mortality caused by all products declined through the fifth day when results became variable (Table 1). Javelin gave the highest larval mortality at 1 and 3 days post-treatment, followed by Dipel, then MVP. MVP at the 3-quart rate gave higher larval mortality at 1 and 3 days post-treatment compared to the 2-quart rate. The pattern of declining larval mortality for MVP was similar to that of the other Bt products even though the initial level of mortality was much less. The short residual life of all Bt products indicates that repeat applications at 7-day intervals during the period when the pest's susceptible stage is present would be required to achieve acceptable commercial control.

Table 1. Corrected percent mortality of PLR larvae exposed to field-aged residues of Bt products using a leaf-disk bioassay method.

Product	Rate form. /acre	Corrected percent larval mortality - 96 hours ¹ (days after treatment)				
		1	3	5	7	9
Dipel 2X	1 pound	51.1b	39.1a	31.8b	16.2ab	42.5b
Javelin	1 pound	80.0c	50.0a	29.5b	32.4b	22.5ab
MVP	2 quarts	11.1a	26.1a	9.1ab	5.4ab	35.0b
MVP	3 quarts	37.8b	32.6a	25.0ab	0.0a	0.0a
Product	Rate form. /acre	Corrected percent larval mortality - 144 hours ¹ (days after treatment)				
		1	3	5	7	9
Dipel 2X	1 pound	57.1b	41.3a	37.5b	17.2a	45.9b
Javelin	1 pound	90.5c	52.2a	30.0ab	24.1a	32.4ab
MVP	2 quarts	14.2b	32.6a	7.5ab	3.4a	35.1ab
MVP	3 quarts	40.5a	43.5a	32.5ab	0.0a	5.4ab

¹ Means in the same column and days after treatment with the same letter not significantly different (p=0.05, Student-Newman-Keuls).