

# Trunk Injection for Pest Control in Pears

## *2017 Annual Accomplishment Report*

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**Objectives:** The objective of this trial was to determine the effectiveness trunk injection technology for tree fruit insect pest management, by 1) testing the effectiveness of trunk injection for controlling pear psylla (PP) *Cacopsylla pyricola* (Forster) in pears, and 2) Characterizing the seasonal distribution of insecticide residues in pear leaves and fruit following trunk injections.

### **Activities, Accomplishments, and Impacts:**

Mature 'Bartlett' pear trees at the Trevor Nichols Research Center in Fennville, MI (Pear 3 Block) were sprayed with an FMC 1029 airblast sprayer at the rate of 100 gpa. One-tree plots were arranged in a RCB design with 4 replications. Tree spacing was 18 × 20 ft, with at least one buffer row separating all plots. Regular maintenance foliar applications of Annihilate, Battalion, FireLine, Glyphosate, Manzate, Penncozeb, Sobran, and Vanguard were applied across the block. In addition, Glyphosate and Parrot were banded below the trees for weed control. Test materials were applied on May 23 7-14 days after petal fall, and at threshold (23 June). Injection treatments occurred on May 22 (7-14 days after petal fall). Injections were made using an Arborjet Quick-jet system into four equally spaced plugs around the trunk about one foot from the ground, treatment doses equivalent to foliar per acre rates on a per tree basis. PP and egg evaluations were made on 31 May, 12 June, 19 June, 28 June, 14 July, and 21 July. A two-minute count per plot for PP nymphs occurred on 7 August. A two-minute count per plot for sooty mold occurred on 17 August.

Psylla egg and nymph evaluations were made by counting the number of eggs and nymphs per 50 leaves. Leaves were picked and brought into the lab for evaluation. The samples were inspected under a stereo microscope and the number of PP eggs and nymphs were recorded. A timed field count to evaluate PP nymphs occurred by counting the number of nymphs per plot for two minutes. Data are presented as the number of nymphs counted per plot for two minutes. A timed count to evaluate sooty mold occurred by counting the number of leaves with sooty mold present for two minutes. Data are presented as the number of leaves with sooty mold present per plot after two minutes. Transformed treatment means were analyzed using ANOVA and means separation by Tukey's HSD at  $P = 0.05$ .

All treatments significantly reduced PP nymphs and eggs in one or more of the leaf evaluation dates (Tables 2, 3). In general, injections of abamectin and azadirachtin outperformed the foliar treatments of the same compounds, although not necessarily with statistical differences. All treatments significantly reduced the incidence of sooty mold in the two-minute count on 17 Aug (Table 3).

Residue samples are being processed and submitted to the MSU Pesticide Analytical Lab for analysis, and incorporation into seasonal residue profile graphs. These data and the performance results will be used for grower presentations and a poster for GL Expo in 2018.

**Table 1.**

Treatment/ Formulation	Rate Product Acre	Appl. Timing
1 Untreated Check		
8 Azasol (2017 injection)		A
9 Agri-Mek (2017 injection)		A
10 Azasol (2016 inj. 11-May 2016)		
11 Agri-Mek (2015 inj.20-May 2015)		
7 Agri-Mek	4.1 fl oz/a	AB
Superspread 7000	0.25 % v/v	AB
12 Azasol	35 oz/a	AB

**Legend.**

Appl. Code	Appl. Target	Appl. Date
A	Petal Fall + 7 or 14 days	23-May
B	Threshold (1 nymph per 3 leaves)	23-Jun

**Table 2.**

Treatment/ Formulation	Rate Product Acre	Appl. Timing	# Psylla Eggs per 50 Leaves					
			May 31	June 12	June 19	June 28	July 14	July 21
1 Untreated Check			22.3 a	326.5 a	225.8 a	126.5 a	14.5 ab	8.5 a
8 Azasol (2017 injection)		A	5.5 b	116.5 ab	96 ab	132.3 a	9 ab	2 a
9 Agri-Mek (2017 injection)		A	3.8 b	22.5 b	9 b	13 b	2.8 b	1.5 a
10 Azasol (2016 injection)			0.5 b	133.3 ab	69.5 b	37 ab	5.3 ab	9.5 a
11 Agri-Mek (2015 injection)			8.5 ab	179 ab	65.8 b	51 ab	4.3 ab	9.8 a
7 Agri-Mek	4.1 fl oz/a	AB	6.8 ab	148 ab	75.3 b	74 ab	3.5 ab	2.5 a
Superspread 7000	0.25 % v/v	AB						
12 Azasol	35 oz/a	AB	5.8 b	94.8 b	107.8 ab	80.8 ab	11.5 ab	6 a

Means followed by same letter do not significantly differ ( $P=0.05$ , Tukey's HSD)

ANOVA performed on square-root transformed data; data presented are actual counts

**Table 3**

Treatment/ Formulation	Rate Product Acre	Appl. Timing	# Psylla Nymphs per 50 Leaves						2 min count Sooty Mold
			May 31	June 12	June 19	June 28	July 14	July 21	Aug 17
1 Untreated Check			13.5 a	50.8 ab	155.3 a	72 a	5.3 a	0.5 a	71.5 a
8 Azasol (2017 injection)		A	1.8 b	28.8 ab	25.3 b	27.8 ab	1.8 a	1.8 a	8.5 b
9 Agri-Mek (2017 injection)		A	2.8 b	8.8 b	14.8 b	6.3 b	3.5 a	0.3 a	15.8 b
10 Azasol (2016 injection)			4 ab	18.8 ab	24.3 b	15.5 b	1.5 a	2.5 a	27.5 b
11 Agri-Mek (2015 injection)			3 b	56.5 a	44.5 b	36.5 ab	3.5 a	3 a	14 b
7 Agri-Mek	4.1 fl oz/a	AB	5 ab	29.8 ab	31.3 b	22 b	0.8 a	0.8 a	10.3 b
Superspread 7000	0.25 % v/v	AB							
12 Azasol	35 oz/a	AB	6.8 ab	29.8 ab	44.3 b	27 ab	6 a	1.8 a	14 b

Means followed by same letter do not significantly differ ( $P=0.05$ , Tukey's HSD)

ANOVA performed on square-root transformed data; data presented are actual counts