

**AGRICULTURAL RESEARCH FOUNDATION
INTERIM REPORT 12/23/16
FUNDING CYCLE 2016 – 2018**

TITLE: Evaluating newer, “softer” and biological aphid control products on Christmas trees

RESEARCH LEADER: Chal Landgren

COOPERATORS: Judy Kowalski, Pacific Northwest Christmas Tree Growers Association, Kirk Co., Drakes Crossing, Stone Mountain

SUMMARY: First year screening trials on grand fir were completed (result summary below). The second-year trials will focus on products that appeared to both control aphids and be cost effective for users. Based on these criteria, likely test products include- Sivanto, W-E 440, M-Pede and Grandevo.

OBJECTIVES: Field evaluation of a number of softer and biological insecticides (see Table 1) to determine:

1. Are the products effective in controlling aphids?
2. Is one application per season sufficient for control?
3. Do product applications damage natural predator populations or the trees?
4. If effective, how long will pest control last after initial application?

PROCEDURES: The products included in the first-year field trial are listed in Table 1. The first-year trials will be used as a screening trial for the second-year tests. To briefly summarize procedures the process was:

- Investigate aphid control products listed as “softer” on beneficial insects. These tend to various oils, salts, bacteria and some new products not currently registered or tested on Christmas trees.
- Locate a test site with significant aphid damage and consistent populations across the field.
- Apply the test products at labeled rates and compare to the standard protocol- Lorsban Insecticide.
- Evaluate results on both aphid control and beneficial insect population dynamics over a 5-week period (each tree evaluated every two weeks)

SIGNIFICANT ACCOMPLISHMENTS TO DATE:

The first-year screening has been completed and below is a summary of results:

Site Selection: Test location was at a Kirk Co. grand fir field in Oregon City with an ongoing aphid infestation.



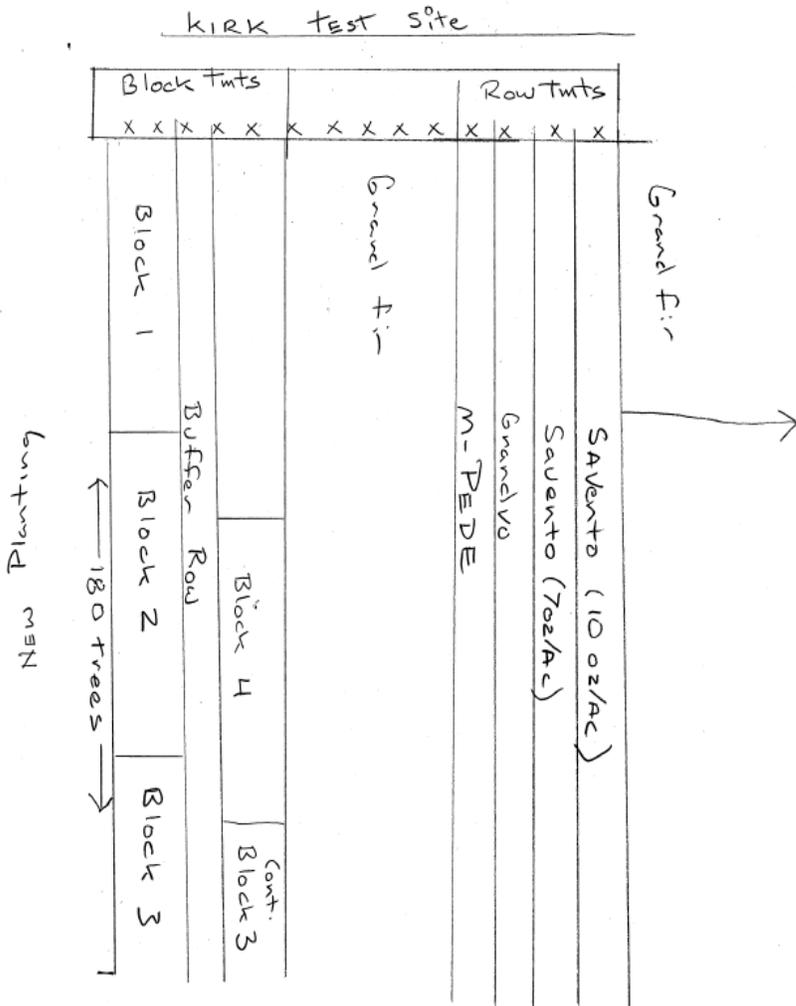
Tree's evaluated averaged 5 ft. tall with high weed pressure throughout the plot, namely Queen Anne's Lace and false dandelion.

Test Description: The trial Included treatments in blocks/ reps and row treatments of selected products. In the Block Treatments, 11 reps (products) of 10 trees each were randomly assigned to each block. The four blocks were utilized each consisting of 110 trees. Treatments were mixed in 3 gallon batches and applied to each block/rep. Excess product was sprayed on trees outside the treatment area.

The row treatments were more "operational" and set up to spray one uninterrupted tree row (180 trees) with 4 gallons of solution. Four products were tested in this manner (Sivanto™ at 2 concentrations, Grandvo PTO™ and M-Pede™). Effort was made to spray all sides of each tree top to bottom.

Trees appearing stunted or sickly were not treated or included in trial.

The test site layout appears to the left. The majority of trees before treatments showed signs of significant aphid populations with heavy amounts of honeydew and Sooty Mold at the time of spraying.



The test site at the time of spraying appears above.

Tested products and rates are listed in Table 1 .

Results: A brief summary of first-year efforts suggests that on this site in 2016, beneficial insects provided the majority of the aphid control. The site was extremely “weedy” this was apparently excellent habitat for beneficial insects.

Based on the retail costs of products and our observed first year control results, some of the promising products that we hope to include in the second-year trial include: W-E 440, Sivanto, M-Pede and Grandevo.

ADDITIONAL FUNDING RECEIVED DURING PROJECT TERM: Bayer CropScience provided an additional \$1500 for testing of their product- Sivanto.

FUTURE FUNDING POSSIBILITIES: Bayer may be interested in a second-year trail, if registration is promising.

Table 1. Treatment details:

Replication	Product	Chemical	Rate/ac.
1	UTC/R-11	Surfactant	0.25%
2	Sivanto	Flupyradifurone	7 fl oz.
3	Sivanto	Flupyradifurone	10 fl oz.
4	Lorsban-4E	Chlorpyrifos	32 fl oz.
5	BotaniGard	Beauveria Bassiana	3 qts
6	Grandevo	Chromobacterium	3 lbs.
7	M-Pede	Potassium salts	2 % v/v
8	Endeavor	Pymetrozine	10 oz.
9	Mainspring	Cyantraniliprole	8 oz.
10	Aza-Direct	Azadirachtin	32 fl oz.
11	WE-440	Phyto-Oil	2.5 Oz per gal