

New Potato Leafhopper Control Strategies



Rufus Isaacs, John Wise, Steve Van Timmeren,
and Chris VanderVoort

Dept. of Entomology, Michigan State University, E. Lansing, Michigan



Michigan Grape and
Wine Industry Council



National Grape
Cooperative



Viticulture Consortium-East



Potato leafhopper

Carried into Michigan on spring storms

Adults feed and lay eggs in leaves

Prefer young shoots

Preference for some vines

Wine>hybrid>labrusca

Cayuga white, Pinot gris, Chardonnay
are highly sensitive

**Cause stunted growth, yellowing,
cupping**

PLH Management

- Regular scouting in spring
- Check under leaves throughout farm
- PLH adults move sideways
- After rain storms, populations can increase quickly
- Thresholds not well developed for specific varieties
- Recent studies showed symptoms on Pinot gris leaves with 1 nymph/leaf
- True long-term economic impact needs more study

Foliar broad-spectrum insecticides

Imidan 70WP (organophosphate)

Sevin 80S/XLR (carbamate)

Danitol 2.4EC, Capture 2EC, Baythroid XL (pyrethroids)

Systemic Insecticides

- Applied as soil or foliar sprays
- After application, absorbed into the vine
- Move inside the vine
 - Within treated foliage: locally systemic movement
 - From the roots to the foliage: systemic movement
- Can move to new foliage (soil application)
- Most effective on insects sucking or eating foliage
- Lower potential for breakdown and wash-off
- Long residual activity
- Low risk to workers, natural enemies
- Soil applications harmful to nematodes, soil insects?



Foliar systemic insecticides

Imidacloprid. Bayer.

Provado Pro Foliar insecticide registered for control of leafhoppers, Japanese beetle, rosechafer, mealybug. Apply at 1 oz/acre. 0 day PHI.

Dinotefuran. Valent.

Venom 70 SG Registered for control of grape insects. Foliar sprays for leafhoppers, grape berry moth, and multicolored asian ladybeetles at 1-3 oz/acre. Up to 6 oz/acre/season and 1 day PHI.

Acetamiprid. Cerexagri.

Assail 30SG. Registered for control of leafhopper, rosechafer, Japanese beetle, phylloxera. 7 day PHI.

Thiamethoxam. Syngenta. (Not registered)

Actara 25WG Foliar formulation has activity on leafhoppers, beetles.

Clothianidin. Arysta. (Not registered)

Clutch 50WG Foliar formulation.

Soil-applied systemic insecticides

All neonicotinoid insecticide class

Imidacloprid. Bayer.

Admire Pro 4.6F Soil insecticide (systemic protectant) for control of scale, mealybug, and phylloxera. Apply at 7-14 oz/acre to moist soil and irrigate with 0.5-1.0 inch water (rain is OK) within 24 h, or chemigate. 30 day PHI.

Dinotefuran. Valent.

Venom 70 SG (soil). Application rates for mealybug, leafhoppers, and thrips are at 5-6 oz/acre. One application max. and 28 day PHI.

Thiamethoxam. Syngenta. (Not registered)

Platinum 2SC Soil formulation active on leafhoppers, beetles.

Clothianidin. Arysta. (Not registered)

Belay 16WSG Soil formulation.

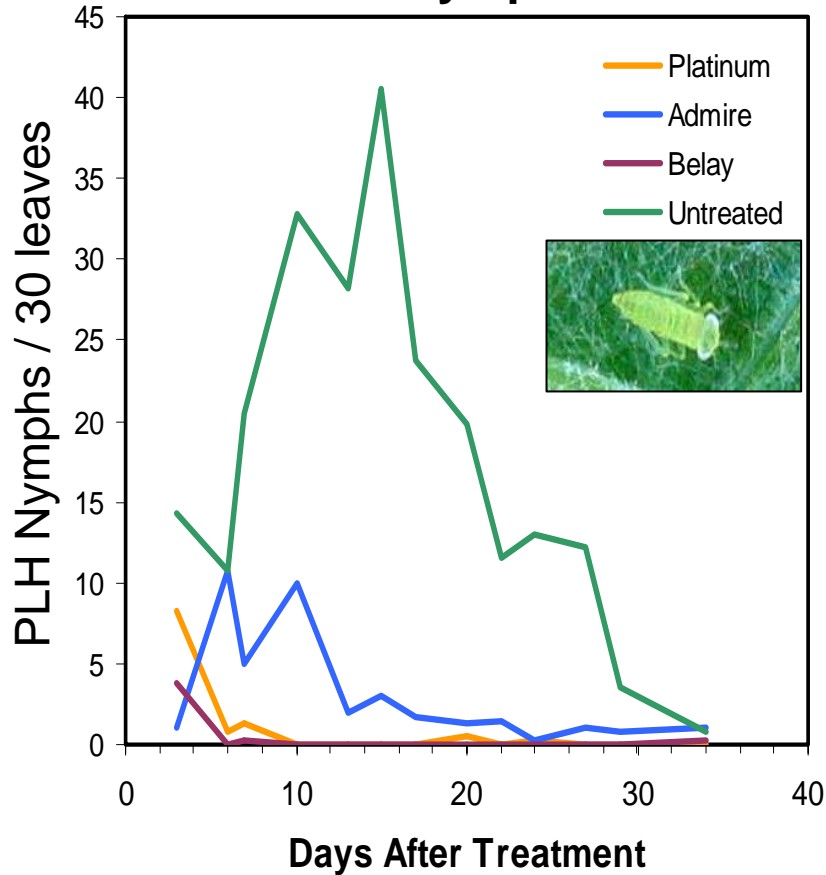
Control of potato leafhopper, 2006



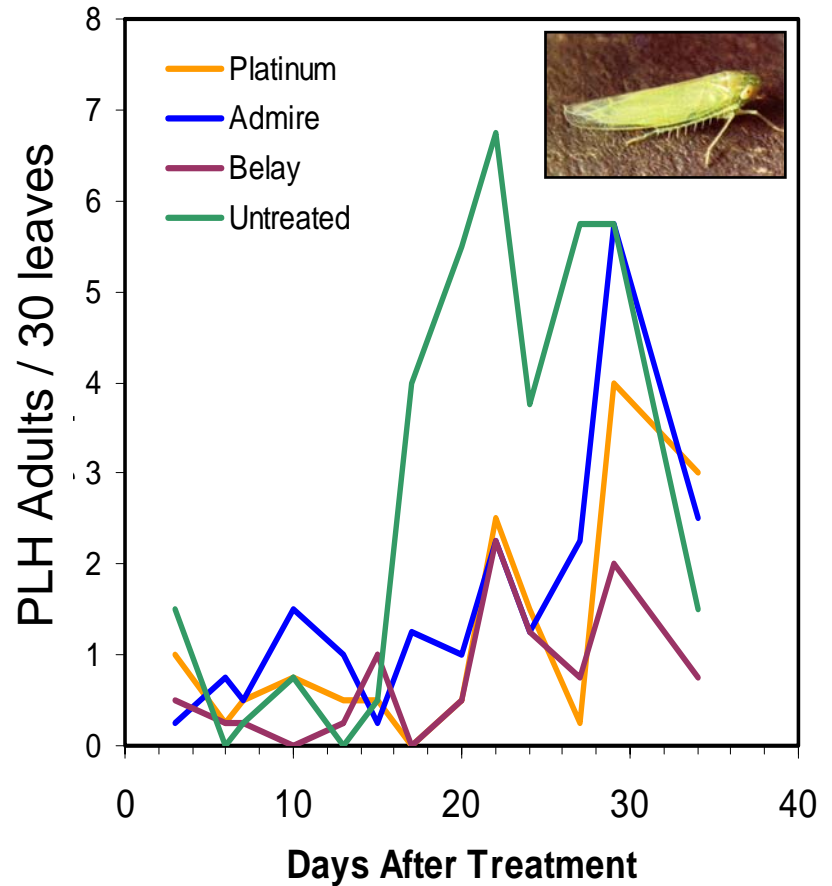
- Chemigation of hybrid vines with insecticides
- June 6 application (8-10 inch shoots)
 - Admire (16oz), Platinum (16 oz), Belay (20 oz)
 - Also applied Venom to Concord vineyard
- Measured PLH per leaf every 3 days
- Also sampled for Japanese beetle and berry moth
- Analysis of leaves for insecticide concentration at 1, 7, 14, 30 days later
- Soil samples for nematodes, soil insects

Effect of soil-applied insecticides on PLH

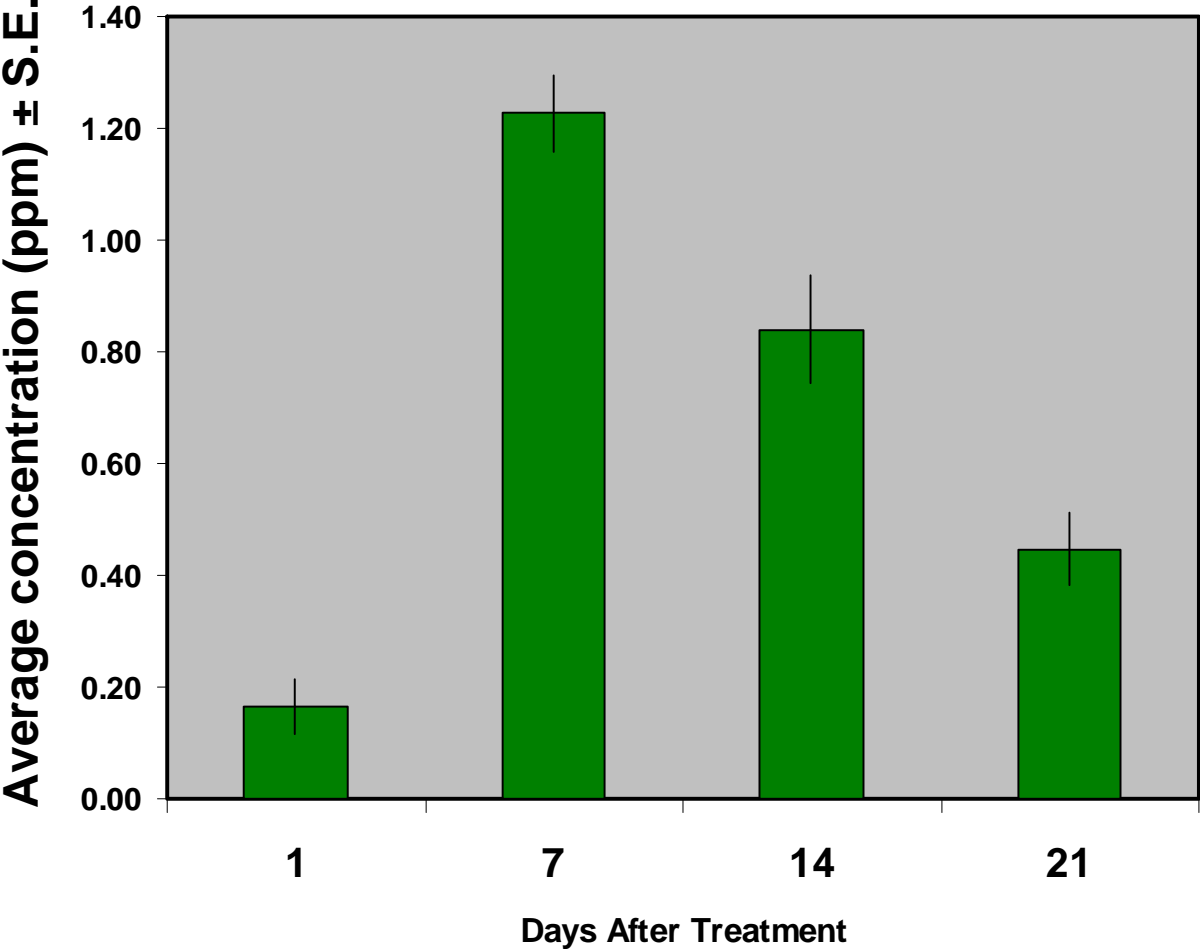
PLH Nymphs



Adult PLH

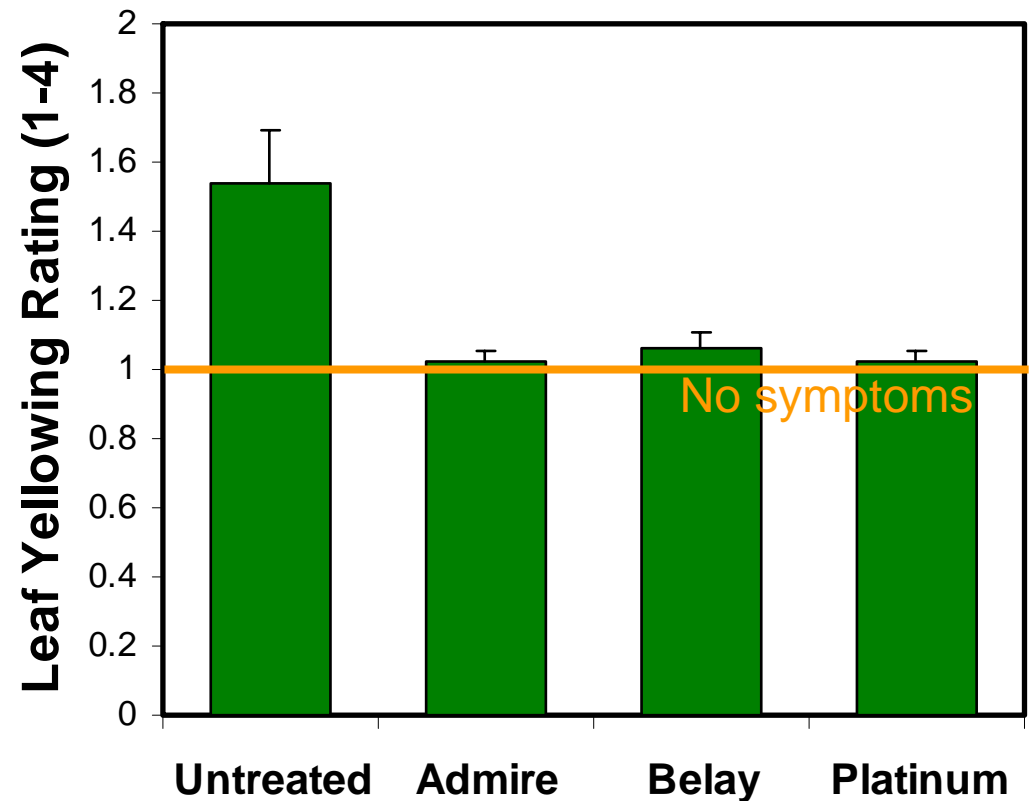


Concentration of Admire (ppm of imidacloprid) in grape leaves



Effects on vine symptoms

- 1 = no symptoms
2 = medium symptoms
3 = severe symptoms
- Control of PLH reduced yellowing of leaves
- Frost during 2006 on these young vines made it difficult to measure effects on growth



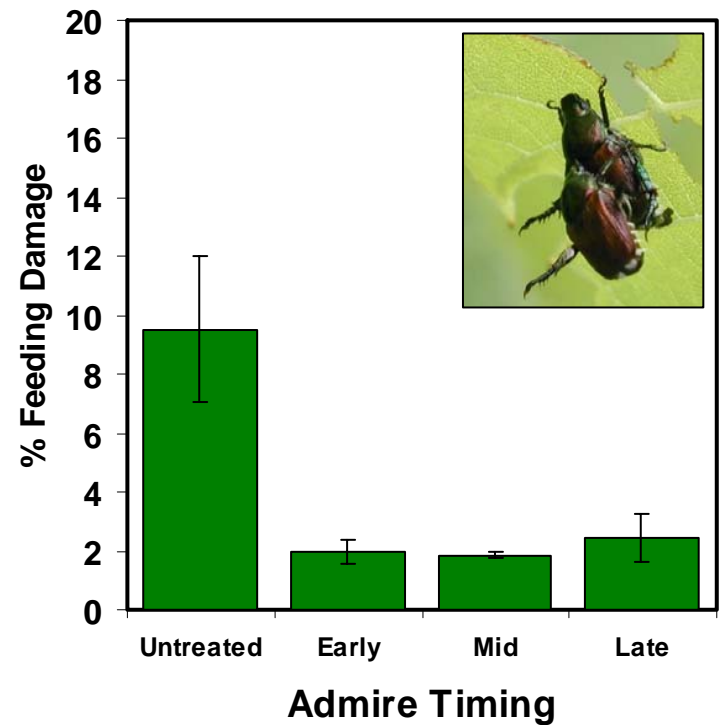
Variable effects on other insect pests

Grape berry moth



No reduction in cluster infestation

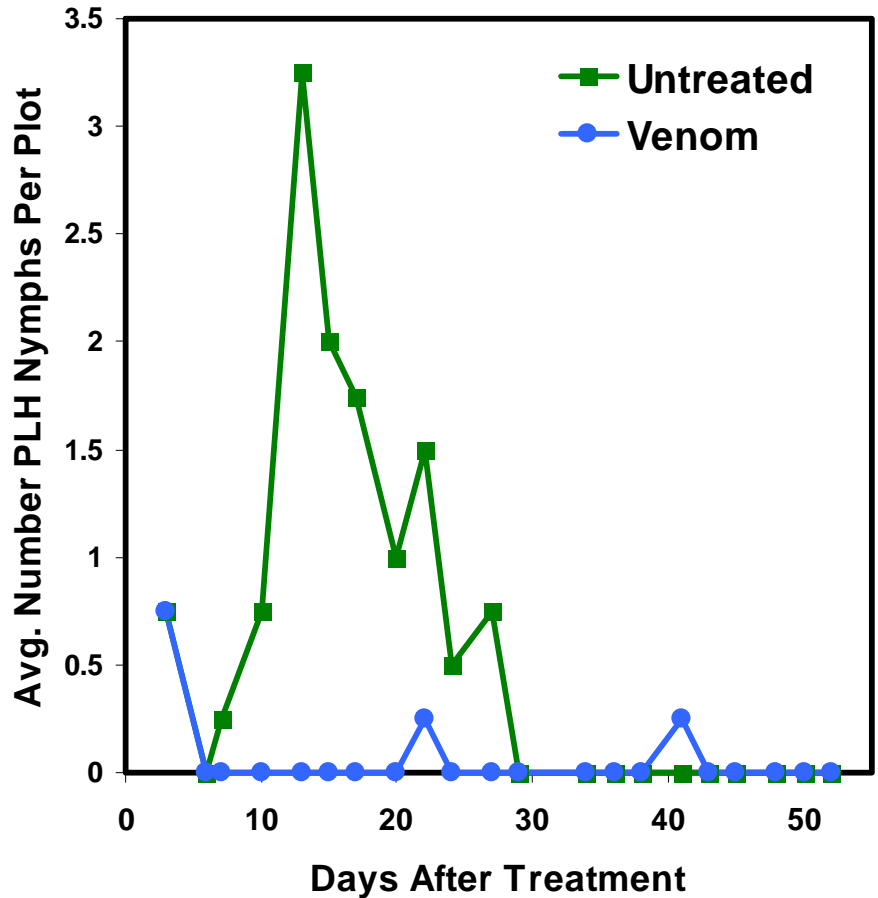
Japanese beetle



Soil-applied Venom for insect control

In a separate trial, Venom insecticide provided long-term vine protection against PLH

Insect pressure too low to measure effects on JB or GBM

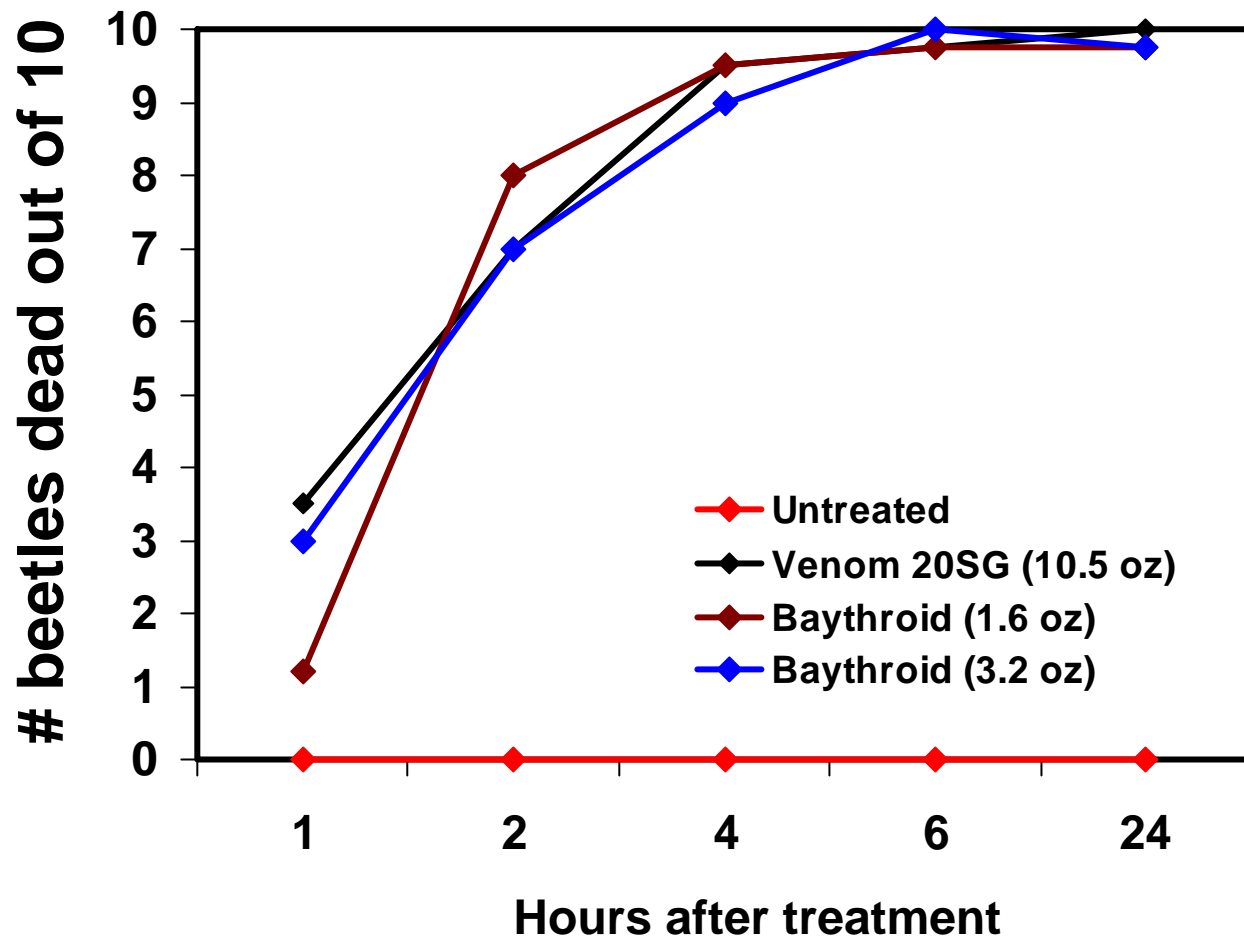


Multicolored Asian Ladybeetle, *Harmonia axyridis*

Potential contaminant of harvested fruit, tainting juice and wine



Control of Multicolored Asian Ladybeetle



Venom = 1 day PHI
Baythroid = 3 day PHI

PLH management with systemic insecticides

- Foliar contact insecticides are highly active on PLH but do not protect the active growing shoot
- Admire highly effective for PLH control when soil applied at first detection (need regular scouting).
- Venom also controlled PLH as a soil application
- Soil applications gave over 3 weeks residual activity.
- Some additional Japanese beetle control, and should provide rosechafer protection. No benefit found for GBM control.
- (Foliar-applied Venom is effective MALB control - 1 day PHI).
- 2007 projects will test banded spring application. Also plan to compare to foliar sprays of Sevin, Venom, Assail, etc.