

## **Final Report**

**TITLE:** Developing Methods for Use of Own-rooted *Vitis vinifera* Vines in Michigan Vineyards

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### **OBJECTIVES:**

- (1) To determine the ability to culture varieties of the species *Vitis vinifera* on a long term basis with a combination of own-rooted vines and the use of the insecticide spirotetramat.
- (2) To develop and provide growers with effective vine establishment and vine management systems for own-rooted vines of the *Vitis vinifera* species under Michigan growing conditions.

**RESULTS AND DISCUSSION:** The overall goal of this project was to develop methods of establishing own-rooted *Vitis vinifera* grapevines from cuttings as rapidly as possible, to then treat those vines in various ways with the insecticide spirotetramat and then to evaluate the long term performance of those vines under Michigan growing conditions. Spirotetramat (tradename Movento) is registered for the control of Phylloxera and nematodes of grapevines. Can this chemical strategy for control of Phylloxera replace the need for a Phylloxera-resistant rootstock when growing grape varieties of the species *Vitis vinifera* on Phylloxera-infested soils?

Several factors were considered when attempting to grow own-rooted vines of the *Vitis vinifera* species under Michigan growing conditions. These include:

- (1) Planting Stock - Options : (a) place cuttings directly into a vineyard situation, (b) propagate cuttings in a nursery and plant next year, (3) purchase own-rooted vines from a commercial nursery, or (d) use varitions of layering to create new, own-rooted vines in an existing vineyard.
- (2) Movento applications : (a) none, (b) 1/year, (c) 2/year and (d) 1/3 years.
- (3) Handling of Cuttings – Options: (a) direct plant in vineyard, (b) intiate modest growth before planting in vineyard, (c) initiate significant growth in a greenhouse before planting into a vineyard.

- (4) Planting of cuttings – Options:(a)directly into vineyard soil, (b) into a cylinder of soil mix in an augured hole in the vineyard.
- (5) Cutting management during the growing season - Options: (a) mulching, (b) ground applied fertilizer, (c) herbicide control of weeds around cuttings, (d) foliar fertilizer , (e) disease and insect control, (f) deer browsing control, and (g) methods of overwintering.

Winter injury has been devastating the many Michigan wine grape vineyards the past two years. To state the obvious, this injury is most devastating to very cold tender varieties like Merlot and Sauvignon blanc. A very significant factor in managing these vines prior to a winter-injury episode and renovating these vines after such an episode is the existence of a graft union 2-3 inches above the soil surface. Few growers are equipped to avoid damage to vines in the area of the graft union by soil hilling or mulching techniques. Injury down to the graft union prevents rebuilding of the vine from trunk renewal canes. Were it possible to grow own-rooted vines of these cold tender varieties, it might be easier to place healthy canes close to the ground in the fall in hopes that snow cover would provide protection against winter low temperatures. A lack of graft union would make it feasible to renew vines from shoots that originate either at ground level or even below ground level. In 2016 we used the technologies learned in 2015 to establish small plantings of the cold tender varieties Merlot and Sauvignon blanc. Treatment 1 will be conventional grafted vines. Other treatments will be own-rooted vines as follows: Treatment 2 – No special vine management for winter protection; Treatment 3 – Place canes near the ground in fall in anticipation of having winter protection from snow cover; Treatment 4 – same as Treatment 3 but with the addition of straw mulching.

**TIME PERIOD OF STUDY** - This project began in 2013 This grant funded work from 1/1/16 to 12/31/16.

**METHODS** – Outlined above.

**COMMUNICATION ACTIVITIES** The following activities were held in 2016 and portions or all of these meetings contained information developed in this project.

Zabadal T. April 27, 2016. The Use of Movento to Control Phylloxeration on Own-rooted *Vitis vinifera* grapevines. Fruit Hill Growers Annual Meeting. Paw Paw, MI

Zabadal, T. and J. Schoonmaker. Planting own-rooted *vinifera* – four years later. July 27, 2016. 27th Annual MSU Viticulture Field Day. Benton Harbor, MI

**IMPACT-** This project has developed vine propagating techniques that several commercial wine grape growers are now evaluating. It is too early to know if the insecticide spirotetramat is capable of supporting sustainable production on own-rooted *Vitis vinifera* grapevines in Michigan. However, the early results are encouraging and impressive. It has been possible to develop full vine size of a *Vitis vinifera* vineyard (Gruner Veltliner variety in just two years from the time of planting of dormant cuttings Figure 1.)



Figure 1. A Gruner Veltliner vineyard in Southwest Michigan. Vines were planted as dormant cuttings in June, 2013.

**BUDGET NARRATIVE** - This project utilized the resources of this grant as originally proposed .

The Bayer Crop Sciences corporation contributed approximately \$1500 worth of the insecticide Movento for use in this project.

**ABSTRACT** - Wine grape varieties of the species *Vitis vinifera* are recognized worldwide for producing the very highest wine quality. Recently, the chemical control of root Phylloxera has provided an alternative to grafting for controlling this pest on *V. vinifera* vines. This project evaluated that option along with methods for the rapid establishment of own-rooted *V. vinifera* grapevines. Results to date have indicated as little as a two-year period for establishment of productive own-rooted *Vitis vinifera* vines. The greatest advantage of this technology may occur when very cold tender *Vitis vinifera* varieties are planted in Michigan. In 2016 own-rooted cuttings of the varieties Merlot and Sauvignon blanc were planted and treated with spirotetramat. Further evaluation is needed to determine if this technology can provide sustainable *Vitis vinifera* productivity.