

Determining the Effectiveness of the Federal Order/Interim Rule on *Phytophthora ramorum* Dissemination in Nurseries¹

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Abstract

When we examine the nursery survey data over the past 3 years, we find that in the western states, the number of *Phytophthora ramorum*-infested nurseries found via nursery inspections or surveys has dropped by more than 50 percent from 2004 to 2006, from 110 nurseries to 50, respectively. The percent of nurseries found to be infested compared to the number of nurseries inspected was at 1 to 2 percent. There were three main factors that were responsible for, or influenced, the decline from 2004 to 2006:

1. The sudden oak death Federal Order which was signed in 2004 and implemented in January 2005.
2. Grower trainings which were conducted beginning in January through March, 2004, sponsored by the California Oak Mortality Task Force (COMTF) and
3. Critical nursery research that was being identified and conducted.

In order to continue the trend, the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA APHIS), National Plant Board (NPB) and the nursery industry are working together on advanced training for growers, additional inspections of high-risk plants and piloting a voluntary best management practices (BMPs) program in the three western states in 2007. Thus as the regulations are pulled back, the BMPs may serve as a stepping stone to a clean stock-like program for all interstate shippers of nursery stock in the United States.

Key words: *Phytophthora ramorum*, sudden oak death.

When I was asked to give a talk at the Sudden Oak Death Third Science Symposium, I looked back at my previous talks and noted that I have spoken at length on the challenges that the industry and regulators face when working with a newly introduced pest. In reviewing the past 5 years, I would like to focus on how effective the majority of the regulations have been at minimizing the dissemination of the pathogen on nursery stock shipped interstate.

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The introduction of the Interim Rule led to the annual nursery inspections with a focus on *Phytophthora ramorum*-like symptoms and buy-in restrictions on nurseries that shipped host and associated host plants (HAP) interstate. Interstate shippers of HAP, if purchasing plants from other vendors, were required to purchase the product from nurseries that also possessed a USDA sudden oak death (SOD) Compliance Agreement or appropriate phytosanitary certification.

However, prior to the introduction of the Federal Order in January of 2005, buy-in pathways from Europe and British Columbia were not monitored in nurseries from other parts of the country. The front door was guarded in that nurseries in the rest of the U.S. put restrictions on product coming from the western states, but they failed to block the back door which was open to trade from potentially infected countries. My feeling is that the same situation existed for nurseries in the west coast prior to the establishment of the federal Emergency Order.

I feel that finds in nurseries from 2003 to 2006 are reflective of unrestricted trade in the late 90s and early 2000 between potentially infested states and between potentially infested countries. The pathogen entered the trade on the west coast, whether via nursery stock or the native environment, the inoculum built up in nurseries and it was not until 2003 to 2004 that the first noticeable finds occurred in nurseries shipping interstate.

Secondly, in addition to the Interim Rule, growers were made aware of the symptoms of the disease on ornamental plants, where the disease was found in nature, and, through grower trainings, were engaged in a broader scale discussion and review of BMPs for the prevention of the introduction of *P. ramorum* into a nursery operation.

Lastly, the nursery industry had identified needed research which would enable policies to be based on sound science (this continues to be work in progress).

We discussed the factors that influenced or contributed to the trend from 2004 to 2006, but what additional factors can we implement that will continue to influence this trend going forward? Let's analyze the data and determine what has been effective in reducing the occurrence of the pathogen in nursery trade. In quarantined counties, it has been suggested that the monthly inspections of interstate shippers of HAP has prevented potentially infected material from being shipped out of state. Conducting the inspections during the time of year when the disease is most prevalent (during the transition period from fall to winter and from winter to spring) has been shown to be far more successful at finding the disease on ornamental crops than inspections during off times.

The data also indicates that approximately 90 percent of the time, if there is an infection, a high risk (HR) plant, camellias and rhododendrons, is the ornamental plant found infected or associated with another infected plant.

So with that in mind, APHIS, the NPB and nursery industry discussed and identified that additional inspections are needed of HR plants that are shipped interstate and, if funding is available, for medium risk genera, such as *Pieris*, *Viburnum*, and *Kalmia*. Additionally, monthly inspections of HR plants by trained nursery personnel were proposed. COMTF, along with The California Department of Forestry (CDFA), The United States Department of Agriculture-Forest Service (USDA-FS) and the nursery industry in California will conduct trainings for growers up and down the state, similar to the trainings offered in 2004. Oregon is also formulating a training plan.

With regards to recurrent or repeat nurseries... those that have been found to be infected a second or third year likely due to their soil or water being infested, these nurseries need the attention of researchers to identify an effective method of soil/water remediation. There will be several talks during this conference focusing on soil cleanup.

Finally, as we roll into 2007, we need to focus on risk mitigation measures to prevent the introduction of *P. ramorum*, as well as other pests and pathogens, into nursery operations. The BMPs or risk mitigation measures were designed by researchers, regulators, and industry for the sole purpose of assisting nursery growers in identifying areas of risk in their operations. Preliminary discussions have been occurring with regards to a pilot program of the BMPs in the western states. The objective would be to create a pilot program for 2007, learn what is and is not successful, so that by the time the Emergency Order sunsets, we will have a viable program in place, which could potentially be the BMPs. The BMPs could then be a stepping stone to a clean stock-like program in the future.

The criteria for the pilot program may be as follows:

- Be conducted in the western states; include small, medium and large facilities in both quarantined and regulated counties.
- The nursery participating in the pilot program would partner with the state or county agriculture department and determine the BMPs that are appropriate for a particular nursery based on a wide range of factors, including the physical location of the nursery - whether it is located in a quarantined or regulated county, geographical location – hilly terrain, streams on property, environmental factors, crops grown and type of nursery – in-ground, containerized, greenhouse. Auditing of the program could occur annually or whenever the nursery modified their operations.

How could auditing of voluntary BMPs be accomplished? First, the following criteria would need to be identified before the appropriate BMPs could be suggested. A number of nurseries have already gone through the process of identifying needed risk mitigation measures to prevent the introduction of pathogens into their operations. The BMP pilot program would be documenting what the nursery currently has in place, ensuring that the program contains all the components of the BMP program and auditing it.

Secondly, a customized workbook could be created for each pilot site. Currently draft standardized documentation sheets for each BMP are being created which identify how a practice is being addressed. If the BMP is deemed appropriate for the site, then the 'site specific nursery' check-off box would be marked. If the practice were not appropriate, the 'N/A' box would be checked. The draft BMP documentation sheets will be vetted to the industry and regulators. These would create the framework for the workbook.

So for example, if this recommended BMP were selected as appropriate for a nursery, "Avoid or minimize accumulation of standing surface water in containerized high-risk plant beds" then the following documentation of irrigation practices would be completed. The options to check off are:

- Sufficient drainage available to prevent standing water in high risk production areas.
- High risk plants are grown on benches which allow for drainage.
- Gravel or other highly permeable surface under HR plants allows for water drainage sufficient to prevent standing water.
- Slope of land drains water away from HR production areas.

Another example of a recommended BMP with documentation is:

"Avoid overhead irrigation of high-risk plants. Irrigate in a manner to avoid prolonged leaf wetness of 12 hours or more." The options are:

- Overhead irrigation is not used on HR plants.
- Timing of overhead irrigation is early enough to allow for leaf drying.
- Circulation fans are used.
- Plant spacing is adequate and allows for foliage to dry within 12 hours.
- Other methods are used to minimize leaf wetness (explain).

In addition, Tuesday night the California Oak Mortality Task Force nursery committee, which is open to everyone, will meet to review and update the most current nursery research needs list. This list will be the basis for research that will be conducted at the W501 mock nursery site in California. Talks are ongoing in Alameda County with regards to a 7.28 ha (18 acre) parcel, five of which we are interested in setting up as a mock nursery. Kathy Kosta and Nik Grünwald will be giving an update at the nursery committee meeting.

We hope to have a diagnostics firm working with the researchers at the mock nursery to design simple, fast, accurate, field diagnostics for the detection of *P. ramorum* infected plants.

So as we move into 2007 and beyond, we expect the positive trend in the reduction of infested nurseries to continue as we utilize the BMPs as a potential stepping stone towards a long-range goal of a 'clean stock-like program' for all interstate shippers of nursery stock in the U.S.