

## **Potential Economic Impacts of the Widespread Distribution of *Phytophthora ramorum* to Oregon's Nursery and Christmas Tree Industries: A Preliminary Economic Assessment of Failing to Eradicate *P. ramorum* from Oregon's Forestlands**

**Background.** *Phytophthora ramorum* is a recently discovered exotic plant pathogen capable of killing several species of economically valuable trees including red oak, live oak and tan oak and damaging many species of ornamental plants commonly sold in the nursery and Christmas tree trade. *P. ramorum* is a federally quarantined organism and is under active eradication in portions of Curry County, Oregon and under suppression or active management in California counties where it is found. Additionally, significant regulations have been placed on nurseries in CA, OR and WA to prevent the movement of the pathogen to non-infested areas of the country.

In Curry County, a task force comprised of the USFS, APHIS, BLM, ODA, ODF, OSU and local timber companies has been actively attempting eradication of this pathogen. The efforts have been ongoing since 2001 with good results. However, in the recent past, severe weather has allowed the disease to spread locally and experts believe the situation is at a tipping point. New strategies, focusing on increased monitoring and early mitigation will be required to prevent additional spread and may allow containment and eventual eradication of the pathogen. These new strategies will require significant additional funding above historical and current levels.

If *P. ramorum* in Curry County can not be more closely monitored and more quickly mitigated, experts believe the pathogen will continue to expand its distribution. They point to a scenario similar to the rapid dispersal of the pathogen observed in California from 1995 to 2005. Climate-host mapping shows that Western Oregon is essentially at the same risk as Northern California for the pathogen's establishment and spread (1). This preliminary analysis explores potential economic impacts to Oregon's nursery and Christmas tree industries if the pathogen becomes widely distributed in Western Oregon through a failure of the eradication program.

**Impacted Industries.** Oregon's nursery industry is the second largest in the nation in terms of the value of sales, behind only CA. The wholesale value of nursery stock sold in Oregon was \$966 million in 2006 (2). Oregon's Christmas tree production ranks first nationally and wholesale value was placed at \$125 million in 2006. Both of these industries would be severely impacted by the widespread distribution of *P. ramorum* in Western Oregon. These impacts are both direct and indirect as explained below.

**Direct Financial Impacts.** Many nursery and Christmas tree cultivars grown in Oregon could be exposed to the airborne inoculum of the pathogen if the pathogen was widely distributed in the environment. Susceptible species include *Rhododendron*, *Viburnum*, *Pieris*, *Kalmia*, *Syringa* (lilac), *Acer* (maple), *Salix* (willow), *Magnolia*, *Vaccinium* (huckleberry), *Abies* (fir), and *Pseudotsuga* (Douglas fir) to name a few. In fact well over 100 species and genera are known to be susceptible and the host list continues to grow (3).

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(1) Climate Host Mapping for *P. ramorum*, Causal Agent of Sudden Oak Death. USDA. APHIS. CPHST.

(2) Nursery Crops 2006 Summary. USDA. National Agricultural Statistical Service (NASS).

(3) APHIS List of Regulated Hosts and Plants Associated with *P. ramorum*. USDA APHIS. PPQ.

The USDA has developed and tested regulatory systems that closely monitor and certify nurseries that are found in areas where the pathogen is endemic and these systems could be employed in Oregon. These systems allow such nurseries to ship to their customers in other states, but it requires official monthly inspections among other regulatory procedures. Currently, because Oregon is largely free of the pathogen, only one annual inspection is required in Oregon nurseries. However, if the pathogen becomes widely distributed, we can expect that the number of inspections statewide will rise from about 1,500\* per year to 12,000 per year. We can expect that the current regulatory budget for certification would need to rise from \$800,000 to \$6.5 million per year.

Additionally, if the disease becomes endemic, nursery managers will likely use prophylactic spray programs specifically for *P. ramorum*. Currently, few nurseries have such programs; however, some nurseries have a general *Phytophthora* suppression program that focuses on summer sprays for warm-weather *Phytophthora* species. Because EPA labels restrict the use of the chemicals to uninfected plants only, they will need to be applied on a year round, prophylactic basis. Using current prices for the two most effective products (mefenoxam and dimethomorph) applied on a monthly rotational application and a \$30 per acre application cost, the total cost per acre for treatment for a year is \$3,960. If we assume that only 10% of the 94,250 acres in production in Oregon opt for this treatment, then the annual cost to the industry would be \$37.3 million. If the acreage is increased to 25% of the industry's total, then the cost becomes \$93.3 million per year.

Growers would incur other additional direct costs if they are required, as is likely, to implement best management practices (BMPs), or to participate in the pilot Grower Assisted Inspection Program (GAIP), the United States Nursery Certification program (USNCP) or other systems approaches to reduce risk from this pathogen. Federal regulations currently under consideration may compel higher risk nurseries, those that produce *Rhododendron* and similar genera, to adopt such systems approaches. More information will need to be gathered to estimate the fiscal impact of these programs.

**Indirect Financial Impacts.** Oregon's nursery industry enjoys a reputation of producing healthy, high quality, fast growing and cold hardy plants. The quality of Oregon's nursery products means they are in high demand nationally and internationally and as a result, Oregon ships 75% of its production to other states or other countries. The same is true of Oregon's Christmas trees and over 90% of that crop is shipped interstate or internationally.

The perception of customers is key to maintaining this reputation. Oregon has been praised nationally and internationally for our efforts to fight *P. ramorum* in Curry County and that fight has helped keep our growing areas free-from the pathogen. If the pathogen is allowed to spread to forest lands in the western part of the state, we will lose both the area free-from status and the reputation of providing healthy nursery stock. As a result, out-of-state customers will lose confidence in product health and will choose to buy product from other sources, including eastern US nurseries, and nurseries in Canada and The Netherlands.

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\* The ODA currently conducts three inspections at *Rhododendron* and *Camellia* nurseries per year and one at all other nurseries.

To estimate potential indirect costs through a loss of sales, we will look at three scenarios; a loss of 5% of sales, a loss of 15% of sales and a loss of 30% of sales. First we calculate the value of material shipped out of Oregon. That is 75% of nursery sales (\$630 million) and 90% of Christmas tree sales (\$112 million) for a total of \$742 million in 2006 (4). Next, we subtract out the value of plants that are largely unaffected by *P. ramorum*, including ornamental grasses, fruit and nut plants, palms, and commercial vegetable and strawberry transplants in Oregon (\$60 million). The remaining total of at-risk plant sales is \$682 million. The potential loss of sales can then be calculated at 5% (\$34.1 million), 15% (\$102.3 million) and 30% (\$204.6 million).

**Summary:** This preliminary review identifies and estimates costs to the nursery and Christmas tree industries in Oregon in the event that *P. ramorum* becomes widely established in Western Oregon as a result of the failure to eradicate the pathogen in Curry County. Direct financial impact estimates include both regulatory and disease management components and vary from approximately \$43.8 to \$156 million per year. The additional costs of other forms of disease management, such as BMPs or systems approaches are not included.

Indirect costs due to loss of sales from customer's perception of the product being associated with or exposed to *P. ramorum* range from \$34.1 to \$204 million per year. **Total losses to the Oregon nursery and Christmas tree industries from the components considered here range from low of \$77.9 million to a high of \$304 million per year.**

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(4) REGIONAL CONNECTIONS: Metropolitan Portland's Nursery Industry Cluster. PSU.

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