



Oregon
Department
of Agriculture

2007 Plant Health Section Annual Report Commodity Inspection Division

The Plant Health Section provides official field inspections and laboratory testing for Oregon's seed, nursery, and Christmas tree industries. For other commodities, such as potatoes and wheat, we conduct surveys to establish pest-free status for specific counties or the state. These inspections, surveys, and testing are required for shipment to interstate and international markets. The section's pathologists also provide commodity groups and trade negotiation officials with official statements to facilitate the opening of new markets for Oregon's agricultural commodities.

The Plant Health Section has responsibility for several state quarantines, control area orders, and other regulations for plant pathogens. These administrative rules are designed to prevent exotic pathogens from being introduced or becoming established in the state and to provide quarantine pest-free production areas for Oregon growers.

In cooperation with USDA, the Plant Health Section conducts statewide surveys for exotic pathogens. These surveys are federally funded and help provide crucial data to keep interstate and international markets open to Oregon's agricultural products.

We are also active in helping to shape national policy on important pathogens such as *Phytophthora ramorum*. Staff scientists are regularly consulted by PPQ, and provide crucial input to national plant disease control efforts. Staff expertise is maintained and enhanced with a research program that develops and publishes new diagnostic protocols for regulated and emerging plant pathogens.

- In 2007, *P. ramorum* was detected in three nurseries. Quick responses by the Plant Health Section and Nursery & Christmas Tree Inspection Program (Plant Division) allowed for the eradication of *P. ramorum* from these sites. Eradication efforts in Curry County continue.
- The number of grass seed lots sent in for testing rose 18% from last year from 4,169 to 4,980 seed lots. The total number of samples tested for blueberry viruses of regulatory concern more than doubled during that same time from 10,545 samples (2006) to 22,695 samples (2007).
- In 2007, we began surveying commercial and seed potato fields for pale potato cyst nematode, a federally regulated parasite recently discovered in Idaho. Almost 1,300 soil samples were collected and tested; all were negative for PCN.
- The Plant Health Section completed its survey of nurseries in the Virus Ornamental and Fruit Tree Certification Program for apple chlorotic leaf spot virus (ACLSV) this year. This survey was started in 2004 to help nurseries identify and remove asymptomatic ACLSV-infected plants from their certified blocks of *Malus* and *Pyrus* rootstock.

With this consistently high workload, the staff managed to sustain the high level of competence expected of our Section, maintaining a low laboratory test error rate of 0.18%. It is a privilege to serve with such an exceptional and dedicated group. Thank you for all your hard work.

Nancy K. Osterbauer, Ph.D.
Plant Health Program Supervisor

Field Inspection and Certification Programs

Allium White Rot Inspection

In 2007, ODA staff inspected a total of 49 garlic (*Allium sativum*) fields (1,745 acres) in six counties for the presence of white rot caused by *Sclerotium cepivorum*. The inspection is a 100 percent visual inspection designed to find single strikes, or plants infected with white rot, in the field. White rot was found in four fields in 2007: three garlic fields in Jefferson County and one field in Crook County (Table 1).

Table 1. Allium white rot inspection results for 2007.

| Number of | County | | | | | |
|------------------|--------|-----------|---------|--------|---------|----------|
| | Crook | Jefferson | Klamath | Morrow | Sherman | Umatilla |
| Fields inspected | 8 | 21 | 2 | 14 | 3 | 1 |
| Acres inspected | 371 | 485.8 | 18.9 | 769.8 | 86.5 | 13 |
| Fields infected | 1 | 3 | 0 | 0 | 0 | 0 |

Mint Verticillium Wilt Inspection

The ODA offers a mint (*Mentha* spp.) rootstock field inspection service to detect Verticillium wilt (*Verticillium dahliae*) in established control areas. Under the provisions of the control area order, any fields confirmed as infected with *V. dahliae* cannot be used as a rootstock source. In 2007, the ODA staff inspected three fields (31 acres) in Klamath County and nine fields (230 acres) in Union County. Verticillium wilt was detected in seven fields in Union county.

Potato Late Blight Inspection

In 2007, the ODA staff conducted field surveys for late blight (*Phytophthora infestans*) of potato (*Solanum tuberosum*) for the export of fresh potatoes to Taiwan. A total of 94 fields (6,432.7 acres) from four counties were inspected (Table 2). The most common variety inspected was Russet Norkotah. No potato late blight was found in these fields.

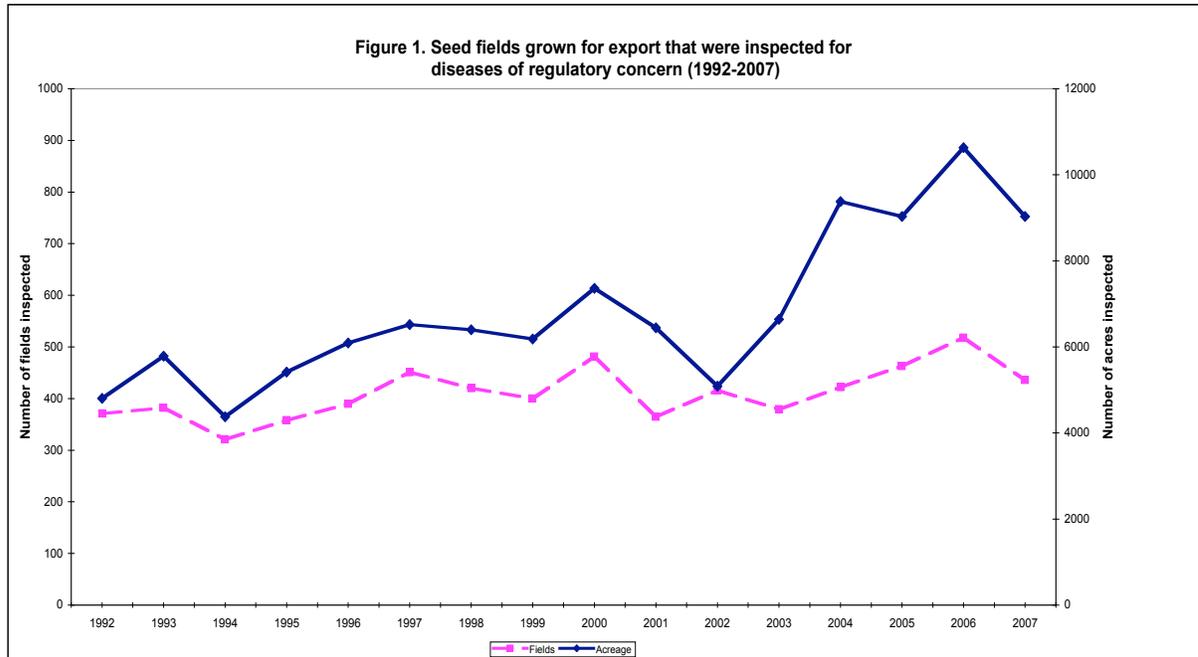
Table 2. Potato late blight inspection results for 2007.

| County | No. fields inspected | No. acres inspected | Results |
|------------|----------------------|---------------------|-----------------------------|
| Klamath | 31 | 1,442.8 | No potato late blight found |
| Morrow | 17 | 1,070 | No potato late blight found |
| Umatilla | 43 | 3,765.9 | No potato late blight found |
| Washington | 3 | 154 | No potato late blight found |

Seed Crop Field Disease Inspections

In 2007, the ODA staff inspected 422 seed crop fields (9,034 acres) for the presence of seed-borne or seed-associated pathogens of concern, down slightly from 2006 (Figure 1).

Inspectors surveyed for the presence of more than 100 different pathogens on 31 different host crops. The majority of fields (73%) were free from diseases of concern. Of the 118 fields found with at least one disease of concern, the most common diseases observed were *Xanthomonas campestris* pv. *carotae* (bacterial leaf blight of carrot), *Botrytis* sp. (scape blight of onion), *Sclerotinia sclerotiorum* (stem rot of cabbage), and *Ustilago maydis* (common smut of corn)(Table 3).



Official Survey Programs

Bean Disease Survey

In 2007, seven states in the USDA Animal and Plant Health Inspection Service Plant Protection and Quarantine (PPQ) Western Region (Colorado, Idaho, Iowa, Nebraska, North Dakota, Oregon, and Wyoming) conducted a survey of beans (*Phaseolus vulgaris*) for six pathogens of international quarantine significance: bean common mosaic (Bean Common Mosaic Virus, BCMV), anthracnose (*Colletotrichum lindemuthianum*), bacterial wilt (*Curtobacterium flaccumfaciens* pv. *flaccumfaciens*), halo blight (*Pseudomonas savastanoi* pv. *phaseolicola*), bacterial brown spot (*Pseudomonas syringae* pv. *syringae*), and common bacterial blight (*Xanthomonas axonopodis* pv. *phaseoli*). All participating states agreed to survey 15 to 25 fields for the target diseases twice during the growing the season. Surveys were to be performed along transects in each field and suspicious samples sent to a National Plant Diagnostic Network laboratory for official confirmation.

Four processing bean fields (73 acres) in Marion County and 15 seed fields (382.3 acres) in Grant and Malheur counties were selected and inspected for the target diseases (Table 4).

Twice from June to July, the bean fields were visually inspected by following a W-shaped transect through each field. BCMV was identified in one field in Malheur County. All the other fields were free of the six target diseases. The data was entered into the National Agricultural Pest Information System (NAPIS) database.

Table 3. Seed crop field disease inspection results by crop and county for 2007.

| Crop | County | No. fields inspected | Acreage inspected | Pathogens of concern Detected (No. of fields) |
|---|-----------|----------------------|-------------------|--|
| Alfalfa (<i>Medicago sativa</i>) | Malheur | 2 | 10 | |
| | Umatilla | 7 | 233.7 | Alfalfa mosaic virus (3), <i>Cirsium arvense</i> (2) |
| Garlic (<i>Allium sativum</i>) | Crook | 7 | 354 | <i>Sclerotium cepivorum</i> (1) |
| | Jefferson | 16 | 452.8 | <i>S. cepivorum</i> (3) |
| | Marion | 3 | 65 | |
| | Morrow | 7 | 498 | |
| Leek (<i>A. porrum</i>) | Deschutes | 1 | 0.5 | |
| | Marion | 8 | 23.35 | |
| Onion (<i>A. cepa</i>) | Clackamas | 1 | 1.3 | |
| | Deschutes | 1 | 3 | |
| | Jefferson | 5 | 25.11 | <i>S. cepivorum</i> (3), <i>Botrytis</i> sp. (2) |
| | Linn | 1 | 5 | <i>S. cepivorum</i> (1) |
| | Malheur | 8 | 52.85 | |
| | Marion | 16 | 101 | <i>Botrytis</i> sp. (14) |
| | Sherman | 2 | 12 | <i>Botrytis</i> sp. (2) |
| Bean (<i>Phaseolus vulgaris</i>) | Grant | 1 | 50 | |
| | Malheur | 25 | 472.3 | Bean common mosaic virus (1) |
| | Umatilla | 1 | 4 | |
| Swiss chard (<i>Beta vulgaris</i>) | Marion | 4 | 33 | |
| | Polk | 1 | 5 | |
| | Yamhill | 1 | 5 | |
| Sugarbeet (<i>B. vulgaris</i> var. <i>saccharifera</i>) | Marion | 3 | 64.04 | |
| Buckwheat (<i>Fagopyron esculentum</i>) | Linn | 1 | 25 | <i>Peronospora ducometi</i> (1) |
| Carrot (<i>Daucus carota</i>) | Crook | 5 | 87.5 | |
| | Deschutes | 2 | 39.3 | |
| | Jefferson | 99 | 2207.5 | <i>Xanthomonas hortorum</i> pv. <i>carotae</i> (42), <i>Alternaria radicina</i> (6), <i>Erwinia carotovora</i> pv. <i>carotovora</i> (1) |
| | Malheur | 3 | 12.53 | |
| | Marion | 1 | 1.5 | |
| | Sherman | 1 | 8 | |
| | Wheeler | 1 | 20 | |
| Chicory (<i>Cichorium</i> sp.) | Marion | 4 | 13.5 | |
| Coriander (<i>Coriandrum sativum</i>) | Jefferson | 4 | 239 | |
| | Lane | 4 | 86 | |
| Corn (<i>Zea mays</i>) | Malheur | 31 | 547.09 | <i>Ustilago maydis</i> (28) |
| Arugula (<i>Eruca sativa</i>) | Lane | 3 | 37.5 | |
| Kohlrabi (<i>Brassica oleracea</i>) | Lane | 1 | 10 | |
| Cabbage (<i>B. oleracea</i>) | Clackmas | 1 | 1 | <i>Sclerotinia sclerotiorum</i> (1) |
| | Columbia | 1 | 8 | |

| | | | | |
|---|-----------------------------|------|---------|--|
| | Lane | 9 | 55.1 | <i>Alternaria brassicicola</i> (1), <i>Peronospora parasitica</i> (1), <i>S. sclerotiorum</i> (1) |
| | Linn | 5 | 39.6 | <i>Mycosphaerella brassicicola</i> (1), <i>P. parasitica</i> (2) |
| | Marion | 23 | 128.900 | <i>P. parasitica</i> (1) |
| | Yamhill | 2 | 30.3 | <i>Alternaria brassicicola</i> (1), <i>S. sclerotiorum</i> (1) |
| Pak Choi (<i>B. rapa</i>) | Marion | 2 | 5 | <i>Sclerotinia sclerotiorum</i> (1) |
| Mustard (<i>Brassica</i> sp.) | Deschutes | 1 | 20 | |
| Rutabaga (<i>Brassica</i> sp.) | Malheur | 1 | 10 | |
| Turnip (<i>B. rapa</i>) | Malheur | 1 | 60 | |
| Radish (<i>Raphanus sativus</i>) | Benton | 2 | 30 | |
| | Columbia | 1 | 12.5 | |
| | Jefferson | 3 | 23 | |
| | Malheur | 7 | 106 | |
| | Marion | 8 | 75 | |
| | Lane | 7 | 73 | |
| | Linn | 5 | 100 | |
| | Wasco | 1 | 27 | |
| | Union | 1 | 30 | |
| | Yamhill | 5 | 106 | |
| | Kale (<i>B. oleracea</i>) | Lane | 2 | 31 |
| Malheur | | 1 | 20 | |
| Cucumber (<i>Cucumis sativus</i>) | Marion | 3 | 3 | Cucumber mosaic virus (1) |
| Melon (<i>C. melo</i>) | Malheur | 2 | 2 | |
| Oat (<i>Avena sativa</i>) | Marion | 1 | 20 | |
| Parsley (<i>Petroselinum crispum</i>) | Jefferson | 1 | 18 | |
| Pea (<i>Pisum sativum</i>) | Jefferson | 1 | 22 | |
| | Lane | 3 | 20 | <i>Peronospora viciae</i> (1) |
| | Malheur | 6 | 171.5 | |
| | Marion | 1 | 22 | <i>P. viciae</i> (1) |
| | Umatilla | 1 | 45 | |
| | Union | 9 | 631.5 | |
| | Wallowa | 2 | 120 | |
| Rye (<i>Secale cereale</i>) | Linn | 1 | 20 | |
| Sorghum (<i>Sorghum bicolor</i>) | Morrow | 2 | 13 | |
| Spinach (<i>Spinacia oleracea</i>) | Lane | 6 | 103 | |
| | Marion | 4 | 65 | |
| | Yamhill | 3 | 50 | |
| Sunflower (<i>Helianthus annuus</i>) | Malheur | 1 | 6 | |
| | Union | 16 | 904 | |
| Tomato (<i>Lycopersicon esculentum</i>) | Josephine | 3 | 2.125 | |

Karnal Bunt Survey

Karnal bunt (*Tilletia indica*) is a fungal disease of wheat originally reported from India. After its discovery in Arizona wheat fields in 1996, a federal quarantine was adopted and a national survey strategy implemented to ensure US wheat export markets remained open. Oregon has participated in the national survey since its inception in 1996. In 2007, a total of 37 samples were collected from 12 counties and shipped to the national Karnal bunt testing laboratory in Olney, TX. Samples were collected from counties that produce commercial quantities of

wheat as dictated in PPQ's Karnal Bunt Strategic Plan: Overcoming Karnal Bunt as a Quarantine Pest While Preserving Export Markets FY2003-2007. No Karnal bunt spores were found in any wheat samples examined in 2007. Results were posted into NAPIS. This is the twelfth consecutive year Oregon has tested free of Karnal bunt.

Table 4. Bean disease survey results for 2007.

| Field ID. | County | Acres | Variety | 1 st inspection | | 2 nd inspection | | Disease found |
|------------|---------|-------|---------------|----------------------------|-------------------|----------------------------|-------------------|---------------|
| | | | | Date | % acres inspected | Date | % acres inspected | |
| P1 | Marion | 20 | 91G | 6/14 | 17% | 7/25 | 17% | None |
| Brooks | Marion | 18 | Italian Tapia | 6/14 | 13% | 7/25 | 13% | None |
| O2 | Marion | 15 | Italian Tapia | 6/14 | 20% | 7/27 | 20% | None |
| S3 | Marion | 20 | Redons | 7/6 | 21% | 7/30 | 21% | None |
| TB-01-2007 | Grant | 50 | Cal-Curly | 7/11 | 40% | 8/8 | 15% | None |
| SN-04-2007 | Malheur | 2.5 | Pink Panther | 7/11 | 40% | 7/23 | 15% | None |
| SN-09-2007 | Malheur | 68 | Thoroughbred | 7/10 | 40% | 7/25 | 15% | BCMV |
| SN-11-2007 | Malheur | 17 | Brio | 7/11 | 40% | 7/24 | 15% | None |
| SN-12-2007 | Malheur | 3 | Brio | 7/11 | 40% | 7/24 | 15% | None |
| SN-13-2007 | Malheur | 6 | Etna | 7/12 | 40% | 7/24 | 15% | None |
| SN-14-2007 | Malheur | 12.8 | Etna | 7/12 | 40% | 7/24 | 15% | None |
| SN-17-2007 | Malheur | 33 | Etna | 7/10 | 40% | 7/24 | 15% | None |
| SN-18-2007 | Malheur | 34 | Paulista | 7/10 | 40% | 7/23 | 15% | None |
| SN-20-2007 | Malheur | 59 | Pink Panther | 7/10 | 40% | 7/23 | 15% | None |
| SN-21-2007 | Malheur | 27 | Nerina | 7/13 | 40% | 7/23 | 15% | None |
| SN-22-2007 | Malheur | 35 | Merida | 7/10 | 40% | 7/23 | 15% | None |
| SN-24-2007 | Malheur | 2 | Cabernet | 7/12 | 40% | 7/24 | 15% | None |
| SN-25-2007 | Malheur | 23 | Cabernet | 7/12 | 40% | 7/24 | 15% | None |
| SY-12-2007 | Malheur | 10 | Stayton | 7/11 | 40% | 7/24 | 15% | None |

Potato cyst nematode survey

In 2006, pale potato cyst nematode (*Globodera pallida*) was detected in several fields in Idaho. In response, PPQ requested other potato-growing states to survey their commercial and seed potato fields for this pest; 10% of commercial potato fields planted in 2006 and 100% of seed potato fields planted in 2006 were to be surveyed. Within each field, 10% of the acreage was surveyed at the rate of three 5-lbs soil samples per acre. Sample collection focused on the field perimeters. Grower participation in the survey was voluntary.

Based on known commercial and seed potato acreage planted in 2006, the ODA estimated that 1,795 soil samples would need to be collected and processed to meet the PPQ requirements for the survey. We received sufficient grower cooperation to collect and process 1,297 soil samples (Figure 2). Samples were processed using USDA soil cyst washers (Figure 3). No *G. pallida* cysts were found. The results of this survey were entered into PPQ's International Species Information System (ISIS) database.

ground surveys. Based on the aerial and ground survey data, a total of 116 acres of mixed tanoak-conifer forest were found infected with *P. ramorum* this year.

The ODA and its cooperators, the ODF, USDA Forest Service, and Oregon State University, worked with the affected landowners to eradicate *P. ramorum* from these new areas. Treatment consists of cutting, piling, and burning all infected plants and all asymptomatic susceptible plants within 100- to 300-feet of each infection center. Treatment efforts focus primarily on tan oak, rhododendron, and evergreen huckleberry although other hosts may also be treated as needed. Tan oak trees are treated with an herbicide prior to cutting to prevent re-sprouting from stumps. The sites are monitored periodically after treatment to determine if the pathogen has been eradicated. This year we conducted two post-treatment surveys in Curry County with one survey during the month of April and the follow-up survey in October. During the spring visit we covered all of the post-treatment sites, collecting both soil and foliar host samples at each location and during the fall visit in October we only collected foliar host samples for testing. For the year 2007 we collected a total of 1196 foliar host samples and 144 soil samples from the post-treatment areas in Curry County. The lab testing yielded two positive detections of *P. ramorum* from soil samples collected in the spring and no foliar detections were made from the post-treatment materials collected for the entire year. Sites that remain free of *P. ramorum* for 2-yr post-treatment are declared eradicated. The pathogen has been eradicated from more than 40-acres since the program began in 2001. New treatment strategies are being tested for 2008. These strategies include aerial applications of Agri Fos® to protect plants from becoming infected and herbicide-treating tanoak trees outside of the designated eradication zone to provide an additional buffer against disease spread.

Although the majority of the new infection centers appear to be extensions of infection centers originally identified in 2006, six sites were located outside of the State's official quarantine boundary for 2007 (Figure 4), two to the north/northeast, two to the west, and two to the south. For the two northern sites, the pathogen apparently jumped about 2.5-mi from the nearest known infection center. These finds prompted the State to revise the official quarantine boundary to include the new infection centers plus a 3-mi buffer of apparently healthy plants. This new quarantine boundary will go into effect January 2008. For the first time, nurseries and a timber mill will be located within the quarantine area.

As required by federal regulation (7 CFR 301.92), nurseries that ship plant stock out of state are inspected annually for *P. ramorum*. The regulations call for a visual inspection of all *P. ramorum*-susceptible plants on each site and the testing of at least 40 samples collected from each site. This year, 29,665 samples from 754 grower sites were collected and tested in the laboratory using the federally approved qPCR, nested PCR, and culture plating protocols (Figure 5). *Phytophthora* species were detected at 316 of the sites surveyed or 42%. Five percent of all samples tested were infected with a *Phytophthora*. A few were infected with *P. ramorum*. This pathogen was detected in four samples collected from two sites (0.3% of all sites surveyed). The plants found infected were a *Camellia* sp., two *Rhododendron* sp., and a *Pieris japonica*. Both infected nurseries underwent the USDA Confirmed Nursery Protocol (CNP) v. 8.0. A total of 154 delimitation samples (146 plant, nine soil, and one water) were collected and tested from the two nurseries. In one nursery, an additional positive was

detected in the soil during delimitation. Infected plants and soil were treated as required in the CNP. No additional positives were found during the 90-d post-treatment monitoring period, although another *Phytophthora* was detected on a plant at one of the nurseries.

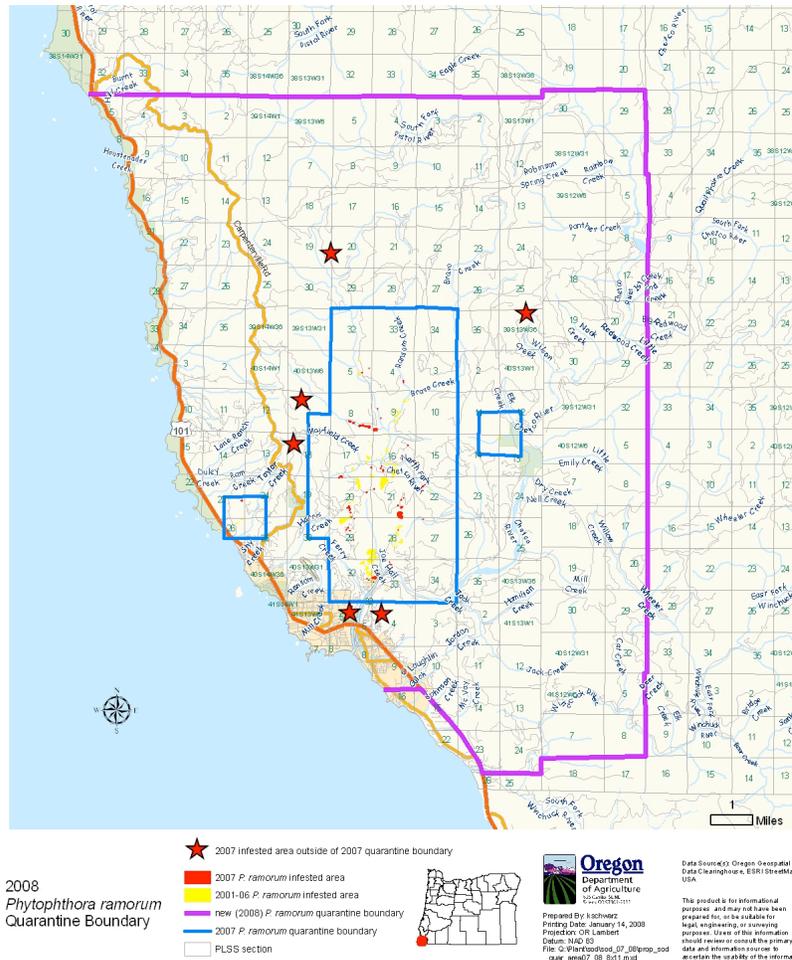
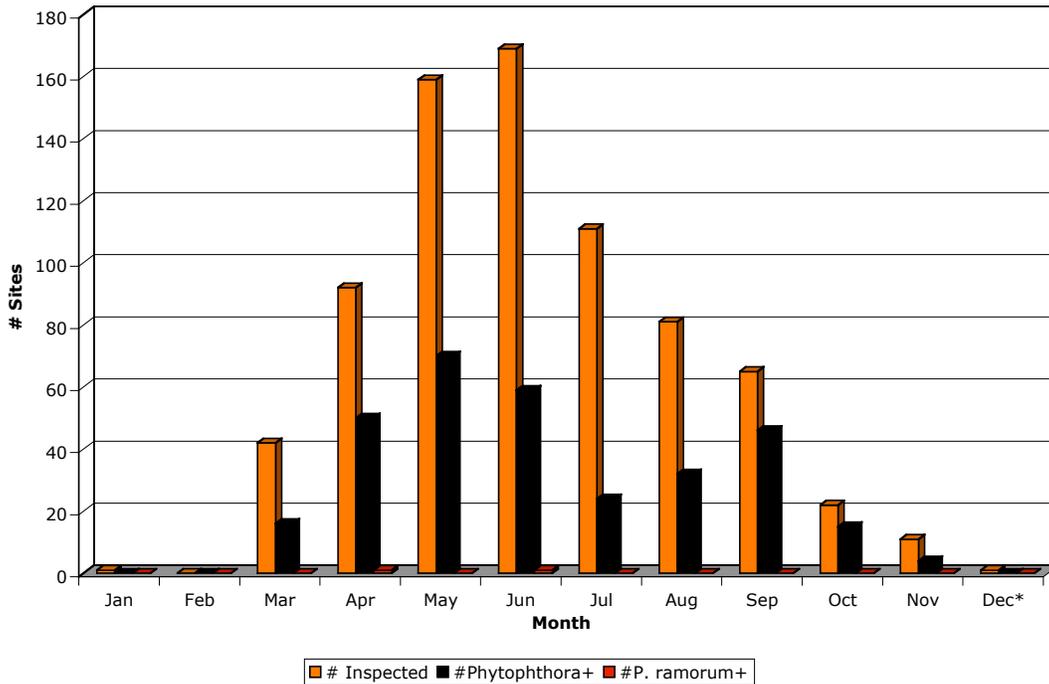


Figure 4. Oregon’s 2008 *P. ramorum* quarantine boundary for Curry County.

In addition to the federally required nursery certification survey, the ODA performed additional inspections at nurseries that grow and ship *Rhododendron* and *Camellia* out of state. Surveys from previous years have shown that most (~80%) *P. ramorum* detections in nurseries are associated with these high-risk plant genera. When suspicious symptoms were found, samples were collected for laboratory testing as described above. Three thousand eighty additional samples were collected from 245 high-risk nurseries. *Phytophthora* species were detected at 127 of these sites (52%) and 25% of all samples tested were infected with a *Phytophthora*. In November, *P. ramorum* was detected at one site (0.4% of all sites) infecting a *Rhododendron*. The CNP was enacted at the site and 51 samples collected for testing during the delimitation survey. A nearby block of *Pieris* was also found infected at the site. During the first round of monitoring post-treatment, a block of *Camellia* was found infected and the CNP re-enacted at the nursery. The second round of delimitation samples is currently in process.

Figure 5. 2007 Annual Certification Survey By Sites



The ODA also conducted trace-out investigations at 21 sites with 55 samples collected for testing. *Phytophthora* species were detected at six of those sites (29%). However, no *P. ramorum* was detected. Trace-out investigations are conducted when the ODA receives information that potentially infected plants may have been shipped to Oregon or may have come from Oregon. Finally, the ODA inspected 16 incoming shipments of host and associated host species for *P. ramorum*. *Phytophthora* species were detected in two of the shipments (13%). No *P. ramorum* was found.

The data from the nursery certification and high-risk surveys have been entered in NAPIS. Due to database constraints, the Curry County aerial and ground survey data cannot be entered into NAPIS.

Grower Assisted Inspection Program

The ODA received a grant from the USDA Natural Resources Conservation Service to implement a novel grower assisted inspection program (GAIP) in nurseries that grow plant material at high risk for infection by *P. ramorum* (i.e., *Rhododendron* and *Camellia*). The goal of the program is to prevent the introduction or shipment of regulated *Phytophthora* species on plants and minimize the shipment of all aerial *Phytophthora* species. Nurseries participating in the program must conduct a hazard analysis to identify points in their procurement and production processes where aerial *Phytophthora* species (including *P. ramorum*) could be introduced. The nursery must then adopt and document best cultural practices that address those critical points. The ODA will then audit the nurseries to ensure they are following their best cultural practices.

To assist in this venture, the ODA is working with experts from the Oregon State University (OSU) Extension Service and USDA Agricultural Research Service to develop an online training module on *Phytophthora* management in nurseries. The module is expected to be available on OSU's E-campus in January of 2008. GAIP is a joint project of the Plant Health Section and Nursery and Christmas Tree Inspection Program (Plant Division).

Official certification and testing programs

Dutch Elm Disease

Dutch elm disease (DED), a deadly tree disease caused by the fungus *Ophiostoma novo-ulmi*, has been found in Oregon's Willamette Valley. It was first detected in 1978 in Portland. Its normally rapid spread has been slowed by a diligent survey and eradication program supported by a state quarantine.

Samples are tested for DED by plating onto a selective medium. This year, 37 samples were tested with 30 positive for DED (81%). The majority of the infected trees were found in Portland with two infected trees found in Molalla and one in Eugene. The City of Portland's Urban Forestry staff removed all infected trees from the elm forest inventory. The trees were removed in an effort to slow the spread to other, currently healthy elm trees in the immediate area. The infected trees in Molalla and Eugene were also removed.

Virus Certification of Nursery Stock

Spring testing

Twenty-seven nurseries participated in Oregon's fruit and ornamental tree virus certification program in 2007. *Malus* (apples and crabapples), *Prunus* (fruiting and ornamental cherries, fruiting and ornamental plums, peaches, apricots, etc.), *Pyrus* (domestic pears, Asian pears, and flowering pears) and *Cydonia* (quince) are included in the testing program. All of the participating nurseries, except for one, grow their materials in the Willamette Valley.

Individual *Prunus* mother (scion) trees for bud production and rootstocks and *Malus* spp., *Pyrus* spp., and *Cydonia* spp. individual trees and rootstocks are tested each year for Tomato Ringspot Virus, prune dwarf virus (PDV), and Prunus necrotic ringspot virus (PNRSV). Foliar samples were collected in the spring and samples were tested for the target viruses using commercially available ELISA test kits. A total of 9,766 samples were tested with 1% PDV positive and 1% PNRSV positive.

The number of trees tested varies from one year to another because of the nature of the collecting schedule and because the nurseries continually evaluate their domestic and foreign commercial markets and adjust test requests accordingly. This year, the demand for fruit trees was lower while the demand for ornamental varieties for landscaping projects remained strong. A summary of the virus-free varieties grown by each participating nursery is sent yearly to state, federal, and Canadian officials to facilitate the movement of the nurseries' products.

Fall Testing

For four consecutive years, nursery stock has been tested for apple chlorotic leaf spot virus (ACLSV), a latent virus that can infect *Malus* and *Pyrus*. This program was implemented

because of quarantine requirements imposed by the Washington State Department of Agriculture and to comply with Canadian and Mexican regulations for the import of plant material from the USA. The 4-year program was designed to test all rootstock and/or stoolbed material for ACLSV so that nurseries could clean up any existing infections in their certified stock. In 2007, 1,424 samples (bud sticks) were collected from of *Malus* and *Pyrus* rootstock and/or stoolbed materials for testing using ELISA. One hundred nineteen samples tested positive for ACLSV. This represented about 8% of the samples tested. Infected trees must be removed before the next season. Staff members are working with the affected nurseries to eliminate the infected plants. Testing for ACLSV in subsequent years may be limited primarily to new stool beds with some monitoring of existing beds.

Blueberry Virus Testing

We continued the official testing program of blueberry nursery stock for blueberry scorch carlavirus and blueberry shock ilarvirus (BIShV) in 2007. This program was implemented in 2004 at the request of nurseries to comply with the regulatory requirements of other states and countries. Nursery Inspectors collect official samples from participating nurseries and submit the samples to the lab for testing with commercially available ELISA test kits. This year, 22,695 leaf samples were tested, about twice the number of samples tested in 2006. Less than 1% of the samples tested were infected with BIShV. The infected samples came from three nurseries. The nursery owners were informed of the positive samples.

Laboratory Grass Seed Testing

Export seed

In 2007, Plant Health staff conducted tests to detect specific seed-borne fungi, bacteria, nematodes, viruses, pests, diseases, and other miscellaneous problems (Figure 6). Seed were tested according to standard, officially accepted protocols for the target organism(s). A total of 4,980 seed lots from more than 15 different crops were tested this year. This represents an 18% increase in number of seed lots tested from 2006. Four hundred fifteen of the seed lots (8.4%) tested positive for one or more pathogens of regulatory concern. The lots were tested at the request of Oregon seed producers to meet the phytosanitary requirements of their international and interstate customers.

Endophyte

In 2007, the Plant Health Laboratory received 105 seed lots of forage grass seed varieties to be tested for the presence of the endophyte fungus, *Epichloe* sp. This fungus produces alkaloids that can be toxic to livestock. To qualify for an endophyte tag, no more than 5% of the seeds in a lot can be infected with the fungus. Nineteen (19) of the seed lots tested positive for *Epichloe* sp. and were ineligible to receive the endophyte tag.

Other Programs

Hop Stunt Viroid Testing

In 2007, the Plant Health Laboratory received 550 hop samples for hop stunt viroid (HSVd) testing from growers throughout Washington and Oregon. This recently detected viroid severely impacts infected plants by stunting their growth, thus greatly reducing the production of hop cones. HSVd may also cause chlorosis and necrosis on infected leaves. Each sample received was a composite, containing leaves from multiple plants in a single

growing area. The samples were tested using a reverse transcriptase PCR technique originally developed at Washington State University. One hundred twenty eight samples tested positive for the presence of HSVd, suggesting the viroid is widespread throughout the United States' largest hop producing region.

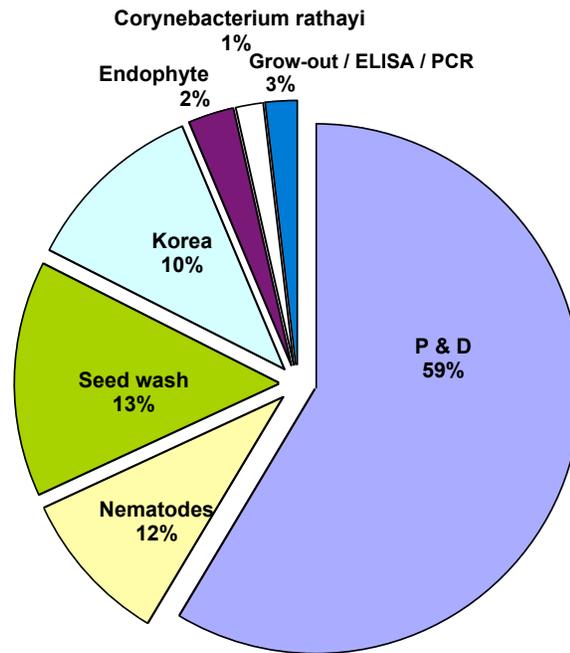


Figure 6. Percentage of different export seed tests performed in 2007.

Plant Health Lab Diagnostics

Plant samples are submitted to the Plant Health Lab for disease assessment to meet export requirements or for general diagnosis. In 2007, 287 samples were submitted with 58% for nematode extraction. Of the nematode samples, 16% were positive for one or more nematode species. The most common plant pathogenic nematodes detected were *Pratylenchus* and *Meloidogyne*. Also detected were *Longidorus*, *Mesocricconema*, *Xiphinema*, *Rotylenchus*, *Paratylenchus*, and *Tylenchorhynchus*. Of the remaining samples submitted for disease diagnosis, 45% were free from pathogens, 13% were abiotic disorders, 13% were diseases caused by fungi, 3% by bacteria, 3% by virus and 1% by insects.

Regulatory reviews

Quarantines and Control Area Orders

Four regulations were reviewed and updated in 2007. The Dutch elm disease quarantine (OAR 603-052-0114) was updated to include a new detection in Jackson County. The grammar was clarified in the oak wilt quarantine (OAR 603-052-0120). The *P. ramorum* regulations (OARs 603-052-1230 and -1250) were updated to reflect changes in the official host lists and federal protocols. Finally, the rules for the virus certification of Oregon

nursery stock (OAR 603-051-0855 through –0859) were updated to includes rules for container-grown stock and tissue culture materials.

Permit reviews

The Section continues to provide reviews of federal permits to import plants, pathogens and parasites, and genetically modified organisms to our state. The permits are reviewed for compliance with existing Oregon quarantines and regulations. In all, 67 permits were reviewed; 39 for pathogens and parasites, five for regulated plants, one for soil, and 22 for genetically modified organisms. Staff members also participated in federal inspections of facilities where genetically modified crops, such as grass and poplar were grown in the field.

Publications

Alderman, S. C., Ocamb, C. M., and Sedegui, M. S. 2007. Occurrence of *Ustilago striiformis* in *Dactylis glomerata* seed production fields in Oregon. Online. Plant Health Progress doi:10.1094/PHP-2007-1023-01-RS.

Bushman, B. S., Halse, R. R., and Sedegui, M. 2007. Waxy mannagrass is established in two Oregon counties. Online. Crop Management doi:10.1094/CM-2007-0924-01-RS.