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Administrator's View

Unexpected Hurdles

September 11th started like a normal day. I left the house early on my way to a State Weed Board meeting in The Dalles. I was booked on a flight to Oklahoma for a meeting on Karnal bunt that evening. Reports of the shocking terrorist attacks came to me on the radio while I was driving. By the time I arrived in The Dalles, the issues on the Weed Board agenda seemed trivial and concentration was difficult. Nevertheless, the Board completed the business on its agenda. The Karnal bunt meeting was postponed. By the time it was rescheduled, the economy was in recession and our budget was too tight for out-of-state travel. We relied on a cooperator from this area to fill us in on the substance of the meeting and commented on the resulting action plan during conference calls. In some ways, the whole year mirrored this pattern. Unexpected hurdles kept interrupting our progress, but we found ways to move forward and continue doing the important work of the Plant Division.

Hurdles

The following examples illustrate some of the challenges we faced.

1) Our department has been eradicating gypsy moth infestations since the 1970s. We're very proud of our record of protecting Oregon from this pest. ODA pioneered the use of B.t., a naturally occurring bacterium, for gypsy moth eradication. This material is much safer for the environment than chemical insecticides and is even used by organic gardeners. Quite unexpectedly, our 2001 eradication programs using B.t. generated considerable opposition from the City Council and some citizens of Ashland and from the Xerces Society in Portland. Kathleen Johnson and her dedicated crew deserve tremendous credit for surmounting this hurdle and completing the projects.
2) Sudden oak death reared its ugly head on August 8th. We'd been watching this disease in California for some time, but the closest infestation was several hundred miles away and we didn't expect it to reach Oregon so quickly. To make matters worse, the infested sites were not near roads and only visible from the air. The near simultaneous arrival of the fire season, a recession, and new political priorities resulting from the terrorist attacks left us with few resources to meet this major new disease threat. Luckily, we found allies at Oregon Department of Forestry, U.S. Forest Service, Oregon State University, U.S. Bureau of Land Management, South Coast Timber Company, and among the private landowners in the area. Working together, we were able to design and implement an eradication program. Our prompt action proved to be important in forestalling other states from taking regulatory action and in negotiating with Canada for a limited quarantine on Oregon nursery products.
3) Our presentation of the Statewide Noxious Weed Strategic Plan to the legislature was scheduled then postponed several times. It finally occurred in the waning hours of the session. Though well received and supported by testimony from important industry and environmental groups, the only action taken was a request for the department to work with interested parties to come up with new ideas for funding priority activities identified in the Plan.

Highlights

In spite of the unexpected hurdles, we accomplished a great deal in 2001. A partial list of the highlights for the year follows. Additional information can be found in the body of this report.

- Eradication treatments for infestations of kudzu, gypsy moth, and Asian gypsy were successful.
- Kathleen Johnson's passionate testimony to the Ashland City Council led them to reverse a vote opposing our gypsy moth eradication program.
- After the discovery of sudden oak death in Curry Co., Nancy Osterbauer put together a coalition of agencies and landowners to fight the disease.
- Inspection and certification of nursery stock and Christmas trees kept exports moving smoothly.
- 53 grants for weed control projects totaling $637,024 were awarded. Feedback on the grant program was extremely positive.
- A bill creating the Oregon Invasive Species Council passed through the legislature and was signed by the Governor. The Department has a permanent seat on the Council.
- Asian longhorned beetle, plum pox, nun moth, and Siberian moth were not found during surveys in the State.
- Glenn Miller discovered giant hogweed in Oakridge. An educational program through the media resulted in the discovery of several dozen additional sites. Landowners were supplied with information to help them control the plant without suffering from the effects of the poisonous sap.
- A proposal to create a control area in Jefferson County that would isolate genetically modified bentgrass from other varieties generated lively debate.
- Two new biological agents were released to control dalmation toadflax.
- Jim LaBonte and several other staff members participated in a pilot project to develop a rapid detection system for exotic wood boring insects.
- Our staff remained relatively stable. Rick Westcott, Randy Vial, and Jim Walker retired. Rick continues to carry out his duties as a volunteer and still comes to staff meetings! Deb Dickason resigned and Dawn Zielinski left to spend more time with her new baby.

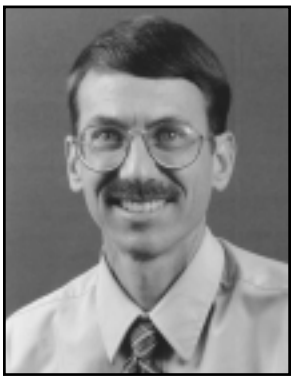
Future

The current budget squeeze and the near certainty of more plant pest, disease and weed invasions will test our resourcefulness and creativity in 2002. Challenging times like these will demand creative solutions and lots of hard work. We're lucky our ODA team is packed with talent and experience.

I am regularly reminded of the quality and professionalism of our staff. One day this spring I was handling the public information hotline during a gypsy moth eradication treatment. The helicopter was scheduled to take off a little before 6:00 am, so I arrived at the office at 5:30 am. Much to my surprise, the lights were on and I wasn't the first one to show up for work!

It is a pleasure to have such dedicated co-workers. I'm proud of the work they do and it is a pleasure to share it with you in this annual report.

Dan Hilburn
Administrator
Plant Division



Performance Measures

A year ago in the 2000 Plant Division Annual Report, we established a performance benchmark and set an ambitious goal. It is time to review our progress.

I) Success at excluding top ten plant pests, diseases and weeds that threaten to invade Oregon. These species are present in neighboring states or similar eco-regions and would have extremely serious negative impacts if they were to become established in Oregon (see the 2000 Annual Report for details). Our goal is to keep them out as long as possible. Here is a progress report for 2001:

1) Gypsy moth — Eradication treatments were applied to infestations in Ashland and Portland. Preliminary results indicate they were successful. A statewide survey found no breeding populations in the State. Future introductions are expected and public opposition to use of B.t. is growing. Grade: “A”

2) Japanese beetle — Introductions via cargo airplanes at PDX continue to be a concern. Statewide survey found no breeding populations in the State. Future introductions are expected and public opposition to insecticide-intensive eradication methods is likely to grow. Grade: “A”

3) Asian longhorned beetle — Survey results negative, though a related species, the citrus longhorned beetle was found in Washington State. Grade: “A”

4) Imported fire ant — A single specimen was found in a trap. Follow-up survey results were negative. Grade: “A”

5) Kudzu — An infestation was found in Portland this summer. It was treated with a systemic herbicide in the fall. Control at the two sites treated in 2000 was nearly complete with only one small patch requiring retreatment. We suspect there is an undetected “mother site” somewhere in the State. Grade: “A-”

6) Distaff thistle — Several dozen sites in Douglas and Jackson counties are being treated. The trend toward fewer plants appearing at these sites each year continues. Grade: “A”

7) Purple starthistle — A site in Clackamas County is being eradicated. The trend toward fewer plants appearing at this site each year continues. Grade: “A”

8) Hydrilla — This serious aquatic weed is established in both Washington and California. It is not known from Oregon, but surveys have been irregular and incomplete. ODA participated in the development of an Aquatic Nuisance Species Plan for the State.
Grade: “B”

9) Plum pox — Survey results negative.
Grade: “A”
Replace with sudden oak death.

10) Unknown — We must never forget that many exotic species could be harmful to the agricultural and native habitats of Oregon. Concentrating only on the known threats would leave us vulnerable to invasions by species currently not on our radar screen. Sudden oak death is a poignant example. It bumps plum pox off the ten worst list and could quickly become our biggest exclusion challenge. Grade: “C”

Combined Grade: “A-”

We're adding three additional performance measures this year. These measures were carefully chosen to track our success at fulfilling our state, agency, and division missions.

II) **Percentage of total exported nursery stock rejected at destination.** Tracking this rate over time will measure the effectiveness of our inspection and certification programs.

Formula: value exports rejected / (gross nursery sales x % exported) x 100 = percent rejected.

For 2001: $135,520 / ($584,000,000 x .73) x 100 = .03%.
Grade: "A"

III) **Percentage of approved exported seed lots rejected at destination.** Oregon exports the majority of the seed produced in the state. Comparing the number of exported lots rejected at destination to the total number of lots approved for export, measures the effectiveness of our laboratory testing and certification program.

Formula: No. seed lots rejected / No. seed lots tested and approved x 100 = percent rejected.

For 2001: 6 / 4335 x 100 = .14%.
Grade: "A"

IV) **Percent of biological control potential realized. For each available biological control agent, a county infested with its target weed host is a potential habitat.** We can measure the success of our biological control programs by calculating the percentage of these potential habitats where the biological control agent has become well established. The better we do at introducing and redistributing biological control agents, the higher this percentage will be. Over time, our program activities should cause the percentage to rise unless the number of new target weed hosts grows more quickly than our success at establishment and redistribution. If that happens, our program is falling behind.

Formula: No. of counties with each agent/ target combination well established /Total No. of counties with potential habitat x 100 = percentage biological control potential realized.

For 2001: weeds 460/1914 x 100 = 24% pest insects 1/31 x 100 = 3%.
Grade: "A-"

Overall, we're doing very well. There is room for improvement, of course, but in the current climate of shrinking budgets and increasing risk of invasive species introduction, just maintaining our straight "A" report card is going to be a challenge.

Plant Division Staff
Dan Hilburn, Administrator

Office Support
Gail Slater, Office Manager

Program Assistants
Steve Finch, Plant Pest & Disease
Sue Nash, Nursery/Christmas Tree
Dawn Zielinski, Noxious Weed Control

Plant Pest & Disease Programs
Kathleen Johnson, Supervisor

Entomologists
Barry Bai
Dick Jackson
Alan Mudge
Rick Westcott

Plant Pathologists
John Griesbach
Gene Milbrath
Nancy Osterbauer

Insect Program Specialist 2
Wayne Estabrook
Jim LaBonte
Karl Puls
Kerri Schwarz
Richard Worth

Plant Disease Program Specialist 2
Bev Clark
Cindy Fraley
Lisa Rehms

Insect Program Specialist 1
Bill Giacomazzi
Jennifer Williams
Terri Stafford

Plant Disease Program Specialist 1
Matt Traeger

Hawthorne Facility Worker
Jim Walker

Nursery & Christmas Tree Program
Gary McAninch, Supervisor

Lead Horticulturist
Jan Hedberg

Horticulturists
Debbie Driesner
John Ekberg
Gary Garth
Dan Hawks
Sherree Lewis
Dennis Magnello
Eric Reusche
Scott Rose
Susan Schouten
Kai Sjoblom
Randy Vial
Gordon Wogan

Noxious Weed Control Program
Tim Butler, Supervisor

Biological Control Entomologist
Eric Coombs

Integrated Weed Management Specialists
Bob Barrett
Tom Forney
Ken French
Dave Langland
Glenn Miller
Bonnie Rasmussen
Dan Sharratt

Section 1 - Nursery & Christmas Tree

The Nursery & Christmas Tree Program assists the nursery and Christmas tree industries in the production, marketing, and protection of Oregon nursery stock and Christmas trees.

We serve Oregon's nursery industry by:

- Assisting nurseries in providing viable nursery stock free of dangerous pests and diseases to the nursery industry and the general public.
- Providing inspection and certification of nursery stock shipments to other states and to foreign countries.
- Inspecting incoming shipments of nursery stock for compliance with Oregon and United States quarantines, in order to prevent the introduction of injurious pests and plant diseases not known to occur in Oregon.
- Preventing the spread of injurious pests, plant diseases and noxious weeds within the state of Oregon.
- Providing information to the nursery industry relative to the control of pests, plant diseases, noxious weeds and cultural problems.

We serve Oregon's Christmas tree industry by:

- Providing, when necessary, inspection and certification of Christmas trees grown and shipped from Oregon.
- Making information available to all licensed Christmas tree growers relative to import requirements of other states and countries.
- Providing pest and disease management information to the Christmas tree industry.
- Helping to prevent the introduction and spread of pests and diseases that could threaten Oregon Christmas tree plantations.

Nursery/Christmas Tree Program Activities

In addition to their normal inspection and certification duties, the Nursery/Christmas program field staff spent a considerable amount of time this past year conducting "special" surveys for various pests and diseases in Oregon nurseries. This year, we surveyed nurseries for Columbia root-knot nematode, chrysanthemum white rust, red imported fire ant, glassy-winged sharpshooter, scarlet flat mite, daylily rust, and sudden oak death (SOD). The payoff for conducting these "special" surveys, hopefully pest free status, can be considerable and became all too evident this year with the discovery of SOD in Oregon.

The discovery of SOD in Curry County prompted Canada to place the entire state under regulation which put in jeopardy the ability of Oregon nurseries to ship an estimated $20 million worth of plant material to Canada in the year 2001. During the summer, ODA cooperated with other federal and state agencies to survey Oregon's nurseries and forests for SOD. ODA nursery inspectors played a key role in conducting the nursery survey. Thanks to the survey and Oregon's SOD quarantine, put in place in early 2001, we were able to convince Canadian officials that there was minimal risk of introducing SOD into Canada from most of Oregon. In January of 2002, Canadian officials modified their statewide quarantine and deregulated all of Oregon, except for Curry County. Once again nursery stock could move with relative ease from most of Oregon to Canada.

Other pests and diseases appeared in Oregon during the past year as well. During the summer, daylily rust was discovered at a nursery in Benton County and chrysanthemum white rust was discovered during the fall at a nursery in Clackamas County. Though not as potentially devastating as SOD, both have the potential to

be disruptive to the nursery industry. Thanks to early detection, these diseases are well on their way to being eradicated with minimal impact to the nursery industry.

The increase in the global trade of plant material has led to an increase in the number of pests and diseases that threaten Oregon. As the threat increases, the Nursery/Christmas tree program has changed the way it does business to address this threat. We are spending an increasing amount of time conducting special surveys and inspecting plant material arriving in Oregon from foreign countries and other states. Thanks to our skilled and dedicated staff the Nursery/ Christmas tree program has been able to adjust to these changes.

Nursery and Christmas tree program highlights for 2001 include:

- Increased the number of inspections conducted at licensed nurseries.
- Inspected and certifying over 5,000 shipments of plant material destined for foreign countries.
- Cooperated with the Plant Pest and Disease Section to conduct special inspections and surveys for Columbia root-knot nematode, scarlet flat mite, chrysanthemum white rust, red imported fire ants, sudden oak death, glassy-winged sharpshooter and daylily rust at licensed nurseries.
- Eradicated a chrysanthemum white rust and a daylily rust outbreak at two Oregon nurseries.
- Hired Elena Victory to fill the horticulturist position created by Randy Vial's retirement.
- Worked with PP&D, USDA, and the nursery industry to convince the Canadian Food Inspection Agency to deregulate all of Oregon except Curry County for SOD.
- Issued 537 heat treatment certificates for solid wood packing material destined for China.

Gary McAninch
Supervisor, Nursery/ Christmas Tree Program

Back Row: John Ekberg, Gordon Wogan, Dennis Magnello, Scott Rose, Dan Hawks, and Eric Reusche.
Middle Row: Sherree Lewis, Sue Nash, Debbie Driesner, Jan Hedberg, and Kai Sjoblom.
Front Row: Elena Victory, Susan Schouten, Gary McAninch, and Gary Garth.

Nursery Program Staffing

The nursery program staff currently consists of 11.4 FTE (field staff), and two 0.84 FTE (program supervisor and program assistant). In addition, the program has authorization to hire two additional Horticulturists as the need arises. Timing for the hiring of these positions will depend on the need for these positions and the availability of funding.

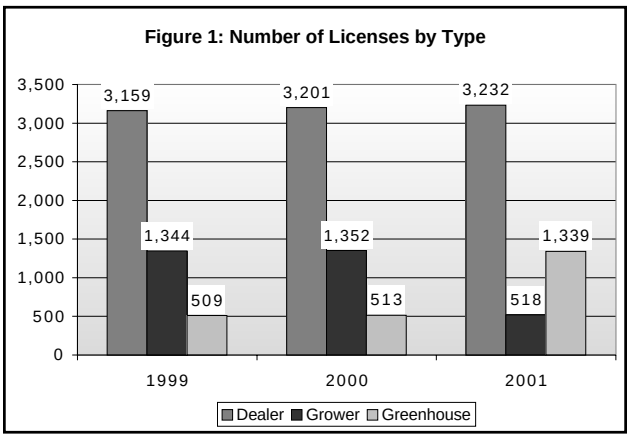
In September, longtime Horticulturist Randy Vial retired after working for the Plant Division as a nursery inspector for over nineteen years. He most recently worked with nurseries in the St. Paul, Mulino and Oregon City area, as well as central Oregon. Following his retirement, Susan Schouten took over duties in Randy's vacated territory.

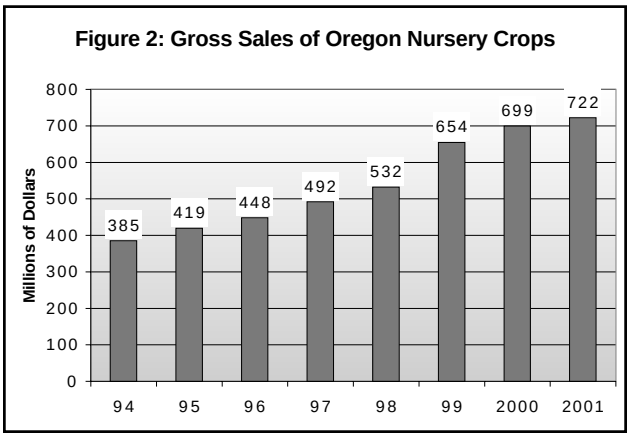
In December, we added a new nursery inspector, Elena Victory, to our staff. Elena will work with nurseries in the area previously assigned to Susan Schouten located in and around Hillsboro, Sherwood and Wilsonville. Elena has extensive horticultural experience, most recently teaching college horticultural classes at Mt. Hood Community College in Gresham and at Maryville University in St. Louis, Missouri. Prior to this, she worked as a regional horticultural specialist with the University of Missouri Outreach and Extension. Elena has a Doctorate in Horticulture from Washington State University. She and her family currently reside in Gresham. We are proud to have Elena working for our program.

Elena Victory

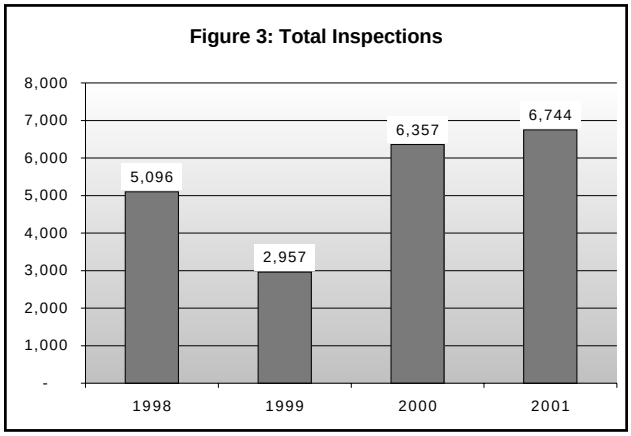
Nursery Program General Information

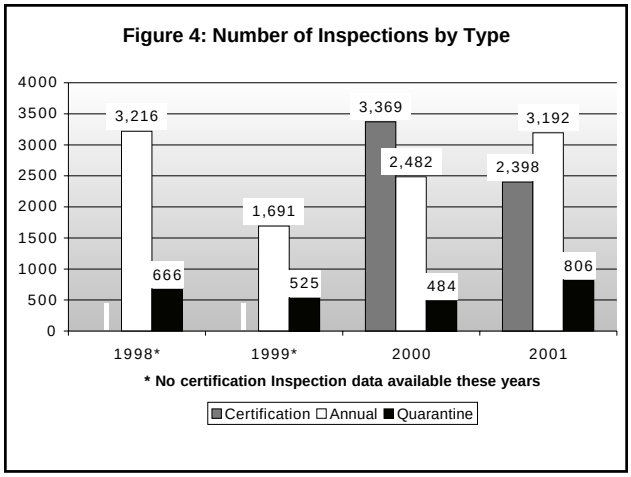
The nursery industry continues to be the largest segment of Oregon agriculture. The department's nursery inspection program is funded entirely from nursery license and certification fees. Three different nursery license types are issued, depending on the nature of the nursery business. The license fee is based on the wholesale value of nursery stock sold. A dealer license is required for businesses that buy and resell nursery stock. Garden centers, retail stores, florists and landscapers purchase a dealer license. Dealer license fees are based on the purchase price (wholesale cost) of nursery stock. Cut flowers are exempt from the licensing program. Two nursery grower licenses are available through the department. One is a license specific to greenhouse grown herbaceous plants, and the other is a license for all other nursery crops and collectors of native plants.





During the 2001-2002 licensing year, the department issued 3,232 dealer licenses ($139,964,603 reported purchases); 518 licenses were issued to greenhouse growers of herbaceous plants ($80,124,921 reported sales), and 1,339 licenses were issued to nursery stock growers and collectors of native plants ($502,136,057 reported sales) (figure 1). The total value of nursery stock purchases and sales reported to the department in 2001 was $722,225,581 (figure 2). During the 2001 calendar year, the nursery program conducted 6,744 total inspections (figure 3). Inspections are divided into the following general categories: routine and requested inspections, 3,192; inspections for Oregon quarantine compliance, 806; and certification inspections 2,391 (figure 4).





Country	# of Certificates
Canada	2,255
Japan	262
United Kingdom	111
Germany	80
Netherlands	37
China	35
France	29
NewZealand	26
Italy	26
Russia	17

Figure 5: Top Ten Countries Receiving Phytosanitary Certificates for Nursery Stock in 2001

The nursery program field staff issued 3,359 state and federal phytosanitary certificates for consignment of nursery stock to foreign countries. In addition, 595 federal phytosanitary certificates were issued for lumber going to foreign destinations. Five hundred thirty-seven heat treatment certificates for the shipment of coniferous solid wood packing material to the Peoples Republic of China were also issued.

Horticulturist Debbie Driesner inspects greenhouse-grown plants for pests and disease.

Nursery Research Assessment Fund

Nineteen nursery research grant pre-proposals were received in the 2001 grant year. These 19 grant requests were in competition for approximately $184,000 collected through nursery research assessment fees. The Nursery Research and Advisory Committee, working together with the Oregon Association of Nurserymen Research Committee, reviewed each pre-proposal and selected 11 research projects that met research priorities (figure 6). The ODA Advisory Committee also voted to provide a $15,000 grant to the National Horticultural Research Institute to match $15,000 the Oregon Nurserymen Association donated to the HRI Oregon Research Endowment. Several research projects not funded or only partially funded by ODA grant dollars were recommended to receive funding from several independent private sources including: The Oregon Association of Nurserymen, J. Frank Schmidt memorial trust, Crown Gall Fund and private industry. Final Nursery Research Reports for the 2001 grant year will be published in a bound book and distributed to interested nurserymen and researchers.

Project #	Title	Investigator	Total
01-4	Development of new, superior cultivars of ornamental pears and other landscape plants	Pellet	10,000
01-6	Nitrogen fertilization and defoliation on quality of dormant bare-root deciduous nursery plants and development of a chlorophyll and nitrogen and hand-held meter & software …	Fuchigami	22,200
01-7	Classical biological control of cherry bark tortrix, *Enarmonia formosana* (Scopoli) in the Pacific Northwest	Tanigoshi	24,240
01-8	Shade tree growth and pest infestations in response to protective porous particle film	Svenson	18,143
01-9	Port-Orchard cedar resistance to *Phytophthera lateralis* for the horticultural industry pathology	Hansen	12,200
01-11	Investigation of soil-applied Thiamthoxam for control of honeylocust pod gall midge, *Dasineuyra gleditsiae*	Rosetta	8,654
01-12	Assessment of insecticide efficacy for adult root weevil complex in Oregon nursery production sites	Rostetta et al.	20,002
01-18	Evaluating new Marchantia controls	Svenson	13,948
01-19	Special local needs (24C) for Exotherm Temil in cold storage warehouse	Pschiedt	6,000
01-20	*Phytophthera syringae* infection of flowering pear	Regan	6,740
01-21	Defining the status of the invasive crane fly, *Tipula oleracae*, as a pest in Oregon and Washington, its biology, distribution, and potential to be managed using biorational insecticides	Booth	8,000
	HRI Endowment		15,000
	Total Grant Expenditures		165,127

Figure 6: 2001 Nursery Research Grants

Cereal Leaf Beetle

California currently maintains an exterior quarantine for cereal leaf beetle, Oulema melanopus. Containerized, cut, or balled Christmas trees or nursery stock of Scotch, Austrian, or red pine (*Pinus sylvestris*, *P. nigra*, or *P. resinosa*, respectively) and grass sod, including containerized ornamental grasses are considered potential hosts and are prohibited entry into California unless properly certified and, when required, treated. We currently have 22 nurseries located in uninfested counties under compliance agreements that enable them to ship host plant material into California. We also have 76 nurseries located in infested counties under compliance agreements that allow them to transit host plant material through California to destinations in other states. (See related article in Plant Pest & Disease Section).

Chrysanthemum White Rust

On September 12, 2001, during a routine inspection of a retail nursery in Washington County, Chrysanthemum White Rust (CWR) was discovered on a Chrysanthemum plant of the 'Pam' variety. A sample was immediately sent for confirmation. After positive diagnosis, the infected plants were traced to a nursery in Clackamas County and APHIS, PPQ was informed.

Nursery workers collect infected Chrysanthemums for burial.

APHIS and ODA inspectors visited the supplier and requested that all plants shipped from that location during the previous two weeks be recalled and destroyed. Plants still on the premises were also inspected. Seven varieties were found to be infected with CWR: Pam, Erica, Yellow Sarah, Yellow Illusion, Rhapsody, Stephanie, and Helen. USDA issued an Emergency Action Notification. Approximately 25,000 infected and exposed plants were buried on site at the nursery. (See related article in Plant Pest and Disease Section).

Daylily Rust

The first detection of daylily rust, *Puccinia hemerocallidi*, was made in Oregon on September 9, 2001. An alert grower spotted the symptoms on plants imported to Oregon early in spring of 2001 and notified the ODA Horticulturist who cooperated in eradicating all infected plants. The infected plant material was double bagged and autoclaved. The growing beds and surrounding ground was treated with chemical to help control spread. Repeated inspections of the nursery and surrounding environs will be continued for the next two years. Nursery inspectors conducted a total of 227 inspections of host plant material in nurseries statewide with no additional finds of this disease.

Glassy-winged Sharpshooter

Because of the perceived risk of re-importing glassy-winged sharpshooter, *Hoalodisca coagulata*, into the state of California, all Origin Inspection Program (OIP) nurseries in Oregon were removed from the authorized nursery list maintained by the California Department of Food and Agriculture (CDFA). In order to be reinstated into the OIP, these nurseries were required by CDFA to be trapped for GWSS. As a result, 45 affected nurseries were trapped for GWSS using CDFA trapping protocol. No GWSS were trapped. Trap data were supplied to CDFA and all Oregon Origin Inspection Program nurseries were reauthorized to ship into California using their OIP shipping Permits. Continued trapping for the GWSS will be

required for each nursery to remain qualified to ship under this program.

Imported Fire Ant

Our field Horticulturists continued to survey for imported fire ants, Solenopsis invicta, at high-risk nurseries. Fifty-one nurseries were surveyed and no imported fire ants were found. (See related article in Plant Pest & Disease Section).

Scarlet Flat Mite

In fall of 2000, scarlet flat mite, *Cenopalpus pulcher,* was identified at several sites near Corvallis including the National Clonal Germplasm Repository (NCGR) and the OSU campus. Initially, host plant material from 30 sites identified as recipients of shipments from the NCGR was inspected and sampled. The mite was identified on neglected fruit trees near these sites. Additionally, 840 samples from 84 nurseries were collected and examined. Scarlet flat mite was not found in production nurseries.

Solid Wood Packing Material

In December of 1999, USDA, APHIS informed the department about newly adopted certification requirements for the movement of coniferous solid wood packing material (SWPM) to the Peoples Republic of China. All SWPM destined for China is required to be certified heat treated. In cooperation with APHIS, PPQ, the department developed and put into place procedures for our field staff to use when issuing SWPM certificates. The nursery staff issued 537 certificates of heat treatment for coniferous solid wood packing material shipped to China during 2001, an increase of 61 certificates from the year 2000.

Sudden Oak Death

During the summer, program horticulturists cooperated with an ODA Plant Pathologist on a survey for sudden oak death (SOD) in nurseries that produce rhododendrons. At each of 69 nurseries, the inspectors examined rhododendrons and collected leaf samples from plants that exhibited symptoms characteristic of Phytophthora infection. If no symptomatic plants were present, leaf samples from apparently healthy plants were collected. Approximately 2,657 leaf samples were submitted for analysis. Phytophthora ramorum, the causal agent of SOD, was not found. We plan to continue to conduct SOD surveys at nurseries for the foreseeable future. (See related article in Plant Pest & Disease Section).

Oregon's Grape Virus Quarantine

Oregon's Grape Virus and Phylloxera quarantine (OAR 603-052-0051) was temporarily suspended in August 2001. New federal import disease requirements and interest from the wine grape industry in importing non-certified grapevine stock were two factors that suggested the need for revisions in the quarantine. The Wine Grapevine Improvement Committee was reconvened, and work on determining the need and scope for a new quarantine is being explored during the suspension period. Increased interest in the Oregon Certified/ Registered Grape Program is anticipated.

Western Chapter of Horticultural Inspection Society

The third annual meeting of the Horticultural Inspection Society (HIS) Western Chapter Workshop was held October 2-4, 2001 in Sacramento, California. Four Horticulturists from ODA's Nursery & Christmas Tree Inspection Program attended this meeting: John Ekberg, the society's secretary, and members Jan Hedberg, Dennis Magnello, and Eric Reusche. Also present were plant inspectors from most of the contiguous western states including many California county inspectors and USDA representatives.

The purpose of this Society is: (1) to promote high standards of inspection work; (2) to combine and share expertise, knowledge, experience and training among plant pest inspectors toward stimulating interest in and professionalizing plant inspection work; (3) to provide a means of furthering fellowship among plant pest inspectors and allied workers, and (4) to provide a means of disseminating information

particularly pertinent to plant pest inspection work.

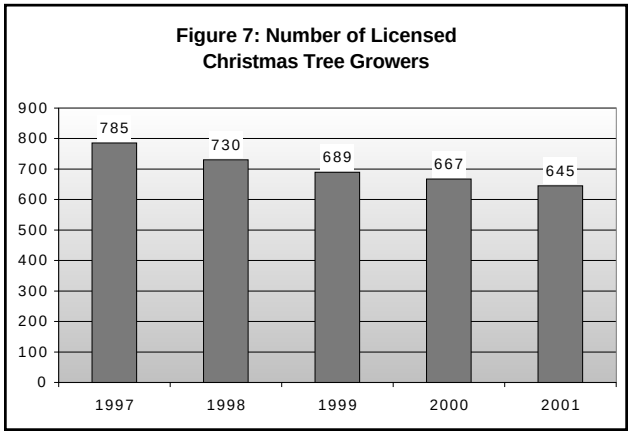
After a welcome address by Nancie Olson, Colorado Department of Agriculture, and Aurelio Posadas, Pest Exclusion Branch Chief, CDFA, workshop participants broke into groups for round table discussions of work duties, state laws, and other concerns. Throughout the rest of the conference, speakers from USDA, CDFA, and Extension Research presented information on topics such as glassywinged sharpshooter, red imported fire ant, G.I.S. mapping, sudden oak death, electronic federal phytosanitary certificates, and various international and domestic quarantine concerns. There was a demonstration of dog teams which detect produce and meat items in baggage and shipments; a trip to UC Davis Foundation Plant Materials Service, and a tour of the CDFA Plant Pest Diagnostics Center. Also included were state and county reports from representatives at the meeting, which highlighted pest, disease, quarantine, and other issues that horticulturists encounter in their regions. Such reports and interaction help further understanding of other states' inspection programs and the duties of their inspectors.

Elections of new officers were held during the business meeting on the last day: John Ekberg was elected as Secretary. Plans were made for the next meeting, October 1-3, 2002, to be held in Coeur' D'Alene, Idaho and tentatively for Arizona in 2003.

Christmas Tree Plantation

Christmas Tree General Information

In 2001, the department issued Christmas tree grower licenses to 645 growers (figure 7). Oregon's Christmas tree growers harvest 8.5 to 9 million trees annually from about 67,000 acres. License fees are used to fund 1.5 FTE (field staff) and two 0.16 FTE (program supervisor and program assistant) who provide service to the Christmas tree industry. The estimated value of the 2001 crop had not been determined at publication time. However, the value for the 2000 Christmas tree crop was estimated to be $135 million, which ranked Christmas trees as eighth among all of Oregon's agricultural commodities. Nationally, Oregon is the number one producer of Christmas trees. License fees collected by ODA fund a program that provides inspection services to assist growers in the production of high quality Christmas trees. The program also provides



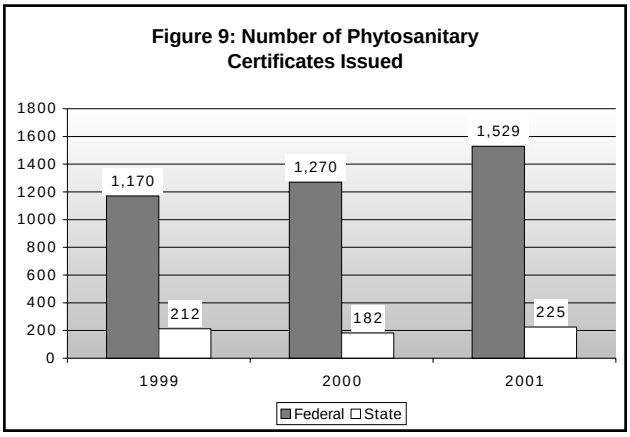
certification services to growers who market their trees to other states and foreign countries.

Program activities are concentrated in the months of September, October and November, and are mostly completed by the end of the first week of December. Over 80 percent of the Christmas trees harvested in Oregon are sold outside the state. The main activity of the Christmas tree program is certification for export of trees to foreign and certain domestic markets. Approximately 900,000 trees were prepared for sale, certified, and shipped to foreign countries during 2001. Figure 8 shows the top six foreign destinations for Oregon Christmas trees.

During the six-week harvest/shipping season, the program staff issued 1,517 federal and 225 state phytosanitary certificates for Christmas tree shipments (figure 9). ODA horticulturists conducted 847 certification inspections at Christmas tree plantations in 2001. Routine inspections of Christmas tree plantations numbered 495.

Country	# of Phytosanitary Certificates
Mexico	1461
Hong Kong	15
Japan	10
Guam	8
Guatemala	3
Singapore	3

Figure 8: Top Six Countries Receiving Phytosanitary Certificates for Christmas Trees in 2001.



European Pine Shoot Moth Certification

The Christmas tree program also provides a European pine shoot moth (EPSM) certification program to growers who grow and ship pine Christmas trees to California, Nevada and Montana. This program also addresses Mexico's phytosanitary certification requirements for pine Christmas trees. Ninety Christmas tree growing sites were trapped for EPSM during the year. Based on positive trapping results, four of these sites were disqualified from shipping to California during the 2001 harvest/shipping season. As a result of shipping restrictions posed by EPSM and cereal leaf beetle, Oregon Christmas tree growers are reducing their acreage planted to pine trees.

Horticulturist Eric Reusche checks a European pine shoot moth trap

Christmas Tree Shipping Season

Very few Christmas tree shipping problems related to phytosanitary issues were experienced during the 2001 season. We are aware of no Christmas tree shipments that were rejected at the Mexican border. This is the second year in row that we've had few problems shipping to Mexico. This can perhaps be attributed to Mexican phytosanitary authorities becoming increasingly familiar with Oregon Christmas trees and their relative freedom from injurious pests and diseases. Oregon's Christmas tree

growers also deserve much of the credit for producing high quality trees free of dangerous pests and diseases.

During the 1999 and 2000 shipping seasons, several shipments of Christmas trees were held at Arizona's border inspection stations pending identification of unknown organisms. Many of these shipments were ultimately rejected due to the presence of slugs. Trucks unfortunate enough to arrive at the border stations on Thursdays or Fridays were often held over the weekend until pest identification could be completed. Most shippers were unwilling to have their trucks sit in the desert for this amount of time, and when possible, directed the trucks to other destinations. In July, Gary McAninch and Christmas tree growers, Joe Sharp and Bob Schaefer, traveled to Phoenix, Arizona to meet with Arizona Department of Agriculture officials to discuss this situation and identify potential solutions. As a result of the meeting, officials from the Arizona Department of Agriculture agreed to remove slugs from their quarantine list. In addition, they agreed to have a supervisor available during weekends to release shipments if pest identification could be done at the border. This seems to have helped avoid delays and rejections at the Arizona border stations this year. Another visit to the Arizona Department of Agriculture is planned for 2002.

Christmas Tree Research

During 2001, the Oregon Department of Agriculture's Christmas Tree Advisory Committee approved funding for two research projects. Funding for these projects was made available through annual license fees paid by Oregon Christmas tree growers. Both projects are currently underway and should be completed by April 2002. The title of the first project is "Effectiveness of Cultural Practices in Reducing Annosus Root Rot Inoculum Levels in Noble Fir Christmas Tree Plantations." The principle investigator is Gary Chastagner of Washington State University. The second project is titled "Changes in Soil Conditions Over Multiple Christmas Tree Cropping Cycles." Chal Landgren, with OSU Extension Service, is its principal investigator. Results of these projects will be reported in our Christmas tree program newsletter, The Pitch & Needle.

Section 2—Plant Pest and Disease

The purpose of the Plant Pest and Disease Section (PP&D) is to protect Oregon's agriculture, horticulture, environment, and quality of life from damaging insect and disease pests; and enhance or maintain the value of our agricultural and horticultural products.

Our first line of defense consists of state and federal quarantines to exclude exotic pests from Oregon and state control area orders to slow their spread within Oregon. However, these regulatory tools do not exclude all potential pests. PP&D detection and survey programs provide a backup tool to protect our natural resources and markets. Where feasible, when an exotic pest or pathogen population is detected in Oregon, eradication and control programs following IPM principles are implemented. Our professional personnel also perform diagnostic and identification services, risk assessments and inspections for several federal permit programs (e.g., permits to ship plant pests, pathogens and transgenic organisms interstate). Certification testing and lab and field inspections for our agricultural and horticultural crops are done to meet the entry requirements of interstate and international customers. Sharing information with the public and with industry groups has become increasingly important in achieving our purpose. Our survey data are documented in PP&D databases and maps as well as nationally at <www.ceris.purdue.edu/napis/index>.

Highlights

Highlights from the first year of the new millennium include the detection of new invasive species, high-profile eradication and associated regulatory actions, surveys, pilot projects for rapid detection of exotic forest pests, and continued development of biological control. Lab seed testing for pest and disease increased markedly while imported timber inspections continued to decrease.

Detection, delimitation, and eradication programs for two insects and one plant pathogen dominated PP&D's attention during 2001: Asian gypsy moth in Portland (910 acres treated), gypsy moth 300 miles away in Ashland (160 acres treated), and sudden oak death (SOD) near Brookings in southwest Oregon (40 acres treated). A big thanks to the special people who have worked to make these programs successful, sometimes under difficult circumstances. Early detection, coupled with swift, effective eradication actions are critical to protect our natural resources and agricultural markets from these invasive species.

Conducting two gypsy moth eradication programs using aerial applications of the biological insecticide *Bacillus thuringiensis* variety *kurstaki* (B.t.k.) at such widely separated locations stretched our resources. Last done in 1992 for Asian gypsy moth and in 1997 for gypsy moth, these aerial applications triggered both public opposition and support. For the first time in Oregon, a city (Ashland) supported, rescinded that support and then, following lengthy work sessions, again reversed itself the next day and supported the implementation of the proposed aerial spray applications. Another first was the receipt of a standing ovation following the second gypsy moth public information meeting in Portland.

An interagency survey detected *Phytophthora ramorum*, the cause of SOD, at nine sites in Curry County in southwest Oregon. In concert with our agency partners and landowners, ODA began SOD regulatory, delimitation and eradication actions immediately. Nursery and roadside detection surveys elsewhere in Oregon for SOD proved negative. Follow-up survey results in late 2001 for all three eradication programs were encouraging. SOD and gypsy moths pose unusually serious threats to Oregon's agricultural, forest, urban and natural environments.

Cooperative detection surveys were initiated for nun moth, Siberian moth, and golden nematode and were continued for Karnal bunt, plum pox

virus, and several fruit moths. None were detected, which kept important national and international markets open. Monitoring grasshopper populations on the eastside and advising local landowners on effective control strategies helped avoid the widespread outbreak conditions.

The importance of imported wood, including solid wood packing material and pallets, as a pathway for introduction of pests from other countries and parts of the U.S. was demonstrated by our continued exotic woodboring insect surveys. PP&D also helped develop and implement two USDA pilot projects for rapid detection of exotic bark and ambrosia beetles and of nun moth in 2001. Improved survey tools for exotic woodborers, such as *Tetropium castaneum*, an exotic longhorned beetle detected at The Dalles in 2000, were explored. The recent introduction of citrus longhorned beetle (for which I served on the Science Advisory Panel) into Tukwila, WA emphasized the threat this beetle and its woodboring relatives from Asia pose to Oregon.

Detection of a red imported fire ant (IFA) in a funnel trap at a mill site receiving lumber from IFA-infested areas led to a flurry of additional trapping using IFA bait traps throughout the site. No additional IFA were detected, but the site will be rechecked in 2002.

Eight gypsy moths (none of the Asian strain), six Japanese beetles and 16 cherry bark tortrix moths were trapped during our annual survey programs, emphasizing the need for vigilance. Delimitation trapping is planned around these positive sites in 2002. For the first time since 1990, no spring B.t.k. treatments for either Asian gypsy moth or gypsy moth are being planned.

Releases of an egg parasitoid to suppress cherry bark tortrix (CBT) populations are being planned for 2002. Cereal leaf beetle (CLB), now detected in 14 counties, caused increasing damage in 2001. Initiation of field insectaries for CLB egg and larval parasitoids is being planned with cooperators. Dr. Barry Bai will explore parts of China and Siberia for additional parasitoids for CLB and CBT in spring 2002.

PP&D continued its cooperative efforts with Nursery Section staff to enforce quarantines and detect new pests such as IFA, pine shoot beetle, and Chrysanthemum white rust. PP&D also worked with Noxious Weed Control Section to implement their small broomrape survey in 2001.

Critical issues for 2002 include improved cost recovery and additional authorization for lab testing and field inspection programs. Marked increases in seed testing for pest and disease have not been matched by increased other fund authority. The forest pathologist and its technical support position are more needed than ever with the discovery of SOD in southwest Oregon and a $642 million nursery industry and our environment at risk. Now, with drastic reductions in imported timber, these positions need a source of stable support.

Recent years, including 2001, have brought increased complexity and growth in responsibilities for both the entomology and plant pathology program areas of PP&D.

In recognition of this, splitting the PP&D programs in a way that facilitates the ability of both program areas to achieve our missions will begin in 2002. Look for some changes!

The ability of the PP&D Programs to respond effectively to new invasive pest threats in 2001 was enhanced because our dedicated, experienced team continues to learn new skills in support of our mission and is committed to a safe and cooperative work environment. Retired PP&D members also volunteered many hours. Thank you all and congratulations to the PP&D staff and our cooperators for these and our other shared accomplishments in 2001. It's been a pleasure working with you for another year!

Kathleen J. R. Johnson, Ph.D.
Supervisor,
Plant Pest & Disease Programs

Back row (left to right): Rick Westcott, Gene Milbrath, Rich Worth, Karl Puls, John Griesbach, Wayne Estabrook, Jim Walker, Terri Stafford.
Middle row: Barry Bai, Lisa Rehms, Nancy Osterbauer, Matt Traeger, Kerri Schwarz.
Front row: Bev Taylor, Jim LaBonte, Lisa Fraley, Kathleen Johnson, Alan Mudge, Bill Giacomazzi.

Insect Programs

Apple Ermine Moth

Apple ermine moth (AEM), *Yponomeuta malinellus,* was first detected in Oregon in 1991. By 2000, AEM spread to seventeen counties in northwest Oregon. Two hundred eighty traps were placed in 21 counties in 2001 to detect further spread and to monitor population levels, compared to 632 traps placed in 2000. No AEM were caught in any traps in 2001, contrasting sharply with the 23 moths trapped in 2000 and 57 moths in 1999. Infested counties currently include Benton, Clackamas, Clatsop, Columbia, Deschutes, Hood River, Jefferson, Lane, Linn, Marion, Morrow, Multnomah, Polk, Umatilla, Wasco, Washington, and Yamhill.

Apple Maggot

During 2001, apple maggot (AM), *Rhagoletis pomonella,* trapping was conducted to provide certification of apples for fresh market sales to Washington and Arizona under the terms of those states' permits and to detect AM in apple growing areas where it has not previously been known to be established. In Hood River County, 32 AM flies were trapped at eight sites. One conventional orchard was threatened, but the apples from it were placed into cold storage. An organic apple orchard found infested in previous years was removed. An apple maggot survey program was not conducted in 2001 in Wasco County, where all the commercial apples were placed into cold storage. However, 95 AM flies were caught in a large European hawthorn tree, which ODA used to monitor local AM populations.

Trapping in northeastern Oregon continued in counties with commercial apple production. AM was not detected in 2001 in Arlington, Gilliam County, Sherman County, and Echo, Umatilla County, where for the first time in northeastern Oregon, AM flies were trapped in 2000. The AM

infestation in Echo (at least 35 miles from the nearest commercial orchards near Milton-Freewater) and in Arlington were treated by city employees in 2001 and eradication appears successful as no flies were trapped there in 2001. AM was again found in Gilliam County (two in Condon) and Umatilla County (62 in Pendleton). No previous records of AM exist for Pendleton, although ODA has trapped there for the past 14 years. The infestation in ornamental hawthorn and a crabapple appears confined to a small area on commercial properties. Pendleton is about 30 miles from the commercial apple growing region of Milton-Freewater, where a meeting was held with the apple industry and other interested parties to determine a course of action. Delimitation trapping plans and the potential for eradication at one or more of these isolated sites are being explored for 2002.

Apple Tortrix

Apple tortrix, *Archips fuscocupreanus*, is a pest originally from Japan and Korea. It attacks apple, stonefruits, filbert, azalea, horse chestnut, potentilla, and other plants. This pest is considered the second most economically important pest on apples in Japan. Washington first detected apple tortrix in several western counties in 1995 during a statewide cherry ermine moth (CEM) survey. Because high numbers of apple tortrix moths had been caught in CEM traps in Washington, 254 traps with CEM lures were placed in 20 counties in Oregon to detect both CEM and apple tortrix in 2001. Apple tortrix has not been detected in Oregon to date.

Asian Longhorned Beetle

Asian longhorned beetle (ALB), *Anoplophora glabripennis*, is a woodboring beetle native to China and Korea. ALB larvae feed on the heart and sapwood of healthy as well as stressed hardwoods, eventually killing them. Maple, poplar, birch, elm, willow, and horsechestnut are the preferred hosts. ALB was introduced to Chicago and New York in solid wood packing material (SWPM) from China. Emergency survey, eradication and quarantine programs are currently underway in those areas.

	1999	2000	2001
Number Interviewed	44	62	22
High Risk	24	17	3
Potential Risk	6	8	11
Low Risk	11	40	6
No. Visually surveyed	26	35	3
No. Trees Surveyed	2,622	3,723	665

Figure 10: Asian longhorned beetle high-risk site survey

Year	Number of Counties Surveyed	Number of Sites Surveyed	Number of Host Trees Surveyed
1997	25	5,794	8,397
1998	22	2,813	3,993
1999	26	3,861	4,848
2000	31	5,421	8,863
2001	27	3,462	5,823

Figure 11: Asian longhorned beetle host survey

In cooperation with the USDA, ODA staff continued to identify sites at risk of ALB introduction. Companies known to import or handle solid wood packing material were visited and interviewed about their sources of wood and wood handling practices. ALB posters and pest alerts were provided to each business. Various importers, brokers, warehouses and wood and pallet recyclers primarily in the Portland metro area were visited (figure 10). At sites determined to be high-risk for ALB, nearby host trees were visually surveyed for ALB. Visual surveys of 5,823 host trees for ALB and its damage at 3,462 sites were also conducted throughout western Oregon by survey technicians (figure 11). No Asian longhorned beetles have been found to date in Oregon.

The citrus longhorned beetle (CLHB), a close relative of ALB, was found infesting Korean bonsai maple nursery stock in Tukwila, Washington in August 2001. The trees were being held as part of an USDA, APHIS, PPQ post-entry quarantine. Eight galleries with emergence holes were found. Three live beetles were captured on-site and a fourth was observed flying away. Four beetles remained unaccounted for and presumably also escaped into the

environment, illustrating how easily new exotic plant pests can avoid detection and be introduced into new areas. The Science Advisory Panel, on which Dr. Kathleen Johnson served, recommended quick action to eradicate this pest from Washington and to prevent its reintroduction into the U.S.

Cereal Leaf Beetle

Karl Puls sweep sampling for CLB

Cereal leaf beetle (CLB), *Oulema melanopus,* was first found in Oregon in 1999 in eight counties. Initial biocontrol releases in infested fields in Malheur County were made in June 1999. In 2001, oats, wheat, barley, rye, corn, and other grass fields were surveyed in uninfested counties, using sweep nets. CLB was found for the first time in Benton, Lane, Polk, and Wallowa counties. CLB has now been detected in 14 counties: Benton, Clackamas, Columbia, Lane, Marion, Multnomah, Polk, Washington, and Yamhill in western Oregon and Baker, Malheur, Umatilla, Union, and Wallowa in eastern Oregon. We also found CLB on pearl millet (Pennisetum typhoides) - a new host, in Multnomah County this year. A pesticide warehouse survey by USDA, APHIS in Oregon indicates that insecticide treated acreage for cereal leaf beetle has increased from none in 1999, to 1,390 acres in 2000, and 12,217 acres in 2001.

CLB life stages were found from April 24 to August 28, 2001. One adult CLB was trapped in a Lindgren Funnel trap near Forest Grove on March 15, 2001. Beetle development in eastern Oregon may be one to two weeks behind that on the west side. Adults were found moving from dry grain fields to corn crops in mid to late July. Highest CLB numbers were found in Washington County near Banks and in Union County near La Grande. CLB populations in Multnomah and Malheur counties also increased.

With USDA cooperation, our CLB biological control efforts markedly increased in 2001. Pre-release and recovery surveys found no natural enemies of CLB. ODA received shipments of the egg parasitoid, Anaphes flavipes, from Missouri and released 303 adults in Washington County. We also received CLB larvae parasitized by Tetrastichus julis from Wyoming, Montana, and Utah. About 10,000 parasitized CLB larvae were released in Multnomah County and 19,175 were released in Baker (2,000), Malheur (3,900) and Union counties (13,275).

To reduce the impact of California Department of Food and Agriculture's CLB quarantine on small grain producers, PP&D cooperated with Commodity Inspection Division (CID) to obtain a master permit to allow bulk shipments of small grains grown and stored in Oregon to be shipped to California from December 1, 2001 through April 30, 2002. CLB survey data allowed CID to certify hay from uninfested counties to be shipped into California. Nursery and Christmas tree growers were also affected by this CDFA quarantine. CDFA approved a new master permit to allow entry of pines less than 30 " in height and three years of age, if accompanied by the appropriate certification from ODA. (See related article in Nursery Section).

Cherry Bark Tortrix

CBT adult moth

Cherry bark tortrix (CBT), *Enarmonia formosana,* was first detected in Washington and British Columbia in 1991. By 1998, CBT had spread to the Chehalis area in Lewis County, WA about 30 miles north of the Oregon border. In 2000, a single adult moth was found in each of two traps set about five miles apart in neighboring Multnomah and Clackamas counties. In 2001, 264 cherry bark tortrix traps were placed in 5 counties in Oregon,

a reduction from the 632 traps placed in 2000. Traps were primarily placed in Multnomah and Clackamas counties around the two positive catches of 2000 to delimit the spread and distribution of CBT. Sixteen moths were trapped, ten from Multnomah and six from Clackamas counties in the Portland metropolitan area in 2001. The positive catches two years in a row and an increase in moth catches from 2000 to 2001 suggest a breeding population of CBT exists although field inspections to date have not detected other life stages of CBT or its damage. A cooperative biological control program using augmentative releases of an egg parasitoid has been proposed for the Portland area CBT sites in 2002. Such releases were done in the Seattle area in 2000.

Cherry Ermine Moth

Cherry ermine moth (CEM), *Yponomeuta padellus,* was discovered in British Columbia in 1993 and had spread into Washington by 1994. Only one CEM has been trapped in Oregon, in Multnomah County in 1996. About 254 CEM traps were placed in 20 counties along the Oregon/Washington border and throughout Oregon in 2001, a reduction from the 604 traps placed in 2000. No CEMs were detected in 2001.

Grasshoppers

Grasshopper survey in eastern Oregon in 2000 indicated only 170,000 acres were infested with more than eight grasshoppers per square yard. One species, *Camnula pellucida,* the clearwinged grasshopper was expected to be a severe local problem, especially in Lake, Harney, Malheur and Klamath counties in 2001.

Grasshopper population outbreaks in 2001 were similar to those in 2000. Most rangeland species remained below economic numbers, although during spring hatch, hot spots developed and quickly faded in Gilliam, Morrow and Union counties. Populations of the clearwinged grasshopper (CWG) exploded to extreme numbers in many flood meadows in the high desert counties of Harney, Lake and Klamath. As often happens during drought years in this typical CWG habitat, grasshopper populations reached hundreds per square yard over thousands of acres.

The growth regulating insecticide *Dimilin* was again recommended for early treatment of developing grasshoppers and, when used appropriately, control exceeded 90%. For land managers not reacting quickly enough, a combination of *Dimilin* and *Malathion* was suggested, but was more expensive and control did not exceed 75%. In all cases a reduced rate and application area treatment was recommended. Early treatments of developing infestations were still lacking on the part of some managers. It will take some time to break the old habit of delaying control activity until all the hoppers have emerged from the egg stage and before they have reached adulthood. We responded to thirty requests for assistance this season and treatment was conducted on 52,651 acres, per our recommendations. Most likely, many more acres were treated without our knowledge or assistance.

Our summer adult survey indicated only 185,000 acres of economic grasshopper infestations throughout Eastern Oregon. Most of these acres are flood meadow situations and therefore are vulnerable to the clearwinged grasshopper. If drought conditions continue in 2002 we expect a continuation of this problem.

Gypsy Moth

ODA maintains a high-level detection program for gypsy moth, *Lymantria dispar,* and its Asian strain (Asian gypsy moth). Early detection of gypsy moth introductions helps to keep eradication programs as small as possible. Eight gypsy moths were detected at six new sites in Oregon in 2001. This is the fewest gypsy moths trapped in Oregon since 1989. One moth found in Baker City, Baker County, marks the first time a gypsy moth has been trapped in eastern Oregon. Ten sites with single detections in 1999 and/or 2000 were negative in 2001. All moths were submitted to the USDA Otis Methods Development Lab for genetic analysis. No moths

bearing the Asian genotype were detected in 2001.

ODA has conducted numerous gypsy moth eradication programs since 1981. These have ranged from large-scale aerial spray programs of 225,000 acres to ground application programs of 10 acres. Early detection of infestations has allowed eradication programs to become smaller and less costly, a benefit for everyone. Two aerial gypsy moth eradication programs were conducted in the spring of 2001. One hundred and sixty acres were treated with three applications of *Bacillus thuringiensis* var. *kurstaki* (B.t.k.) followed by mass-trapping in Ashland, Jackson County Ten acres were treated there by ground in 2000. Later in 2000, six moths were trapped just outside these spring spray boundaries leading to the larger treatment area in 2001. In Portland's Forest Park, and the adjacent northwest industrial area, approximately 910 acres were treated with three applications of B.t.k. following the Asian gypsy moth detection there in 2000. No moths were found at either site in 2001. Another season of negative delimitation trapping will be necessary to declare eradication at these sites.

In 2001, 16,914 gypsy moth traps were placed statewide. Oregon Department of Corrections inmate labor has constructed all gypsy moth traps since 1995 resulting in considerable cost savings and efficiency. Traps were concentrated in western Oregon where population centers and potential host plants are located. Other sites at high-risk for introduction such as national parks, public and private campgrounds and RV parks were trapped. Major ports and waterways at risk from ships carrying Asian gypsy moth egg masses from the Russian Far East and other sources were also trapped. Asian gypsy moth was found in British Columbia in 1995 and 1996, in Washington in 1996, 1997, and 1999, and in Oregon in 1991 and 2000. This highlights the need for continued vigilance to keep Asian gypsy moth from entering and becoming established in Oregon.

Imported Fire Ant

Imported fire ants (IFA), Solenopsis invicta, have been a severe agricultural and health problem in the southeastern United States for almost 80 years. The recent establishment of IFA in southern California greatly increases the risk that these serious pests will be introduced into Oregon.

A survey for IFA using Spam ™ and Tender Vittles ™ (cat treats) bait stations was conducted throughout Oregon using protocols modified from those developed by the California Department of Food and Agriculture.

No IFA were found in the samples of ants collected from the 901 high-risk sites surveyed in 2001. The native thief ant, *Solenopsis molesta*, was found in several samples. (See related article in Nursery Section).

A single, dead, sun-bleached, minor IFA worker was found in a sample from a Lindgren funnel trap for exotic woodboring insects placed at a mill site in Sweet Home, Linn County. The specimen was verified as an IFA by the USDA's Systematic Entomology Laboratory. The mill has received lumber from at least one IFA-infested state. Several surveys of the immediate vicinity of the site and likely nearby areas of introduction were performed. Following these, a delimitation survey of the site was conducted. Approximately 1,200 bait stations were placed, using a 20 X 20 foot grid, over about 19 acres. No IFA or IFA colonies were detected. Consequently, this single IFA is believed to represent an isolated incident and not an established infestation. To ensure that this is the case, another delimitation survey is planned for the site in 2002.

Japanese Beetle

Western Oregon's relatively wet and mild climate, abundant suitable habitat and preferred host material are favorable for the survival and establishment of the Japanese beetle (JB), *Popillia japonica.* If JB became established here, many of Oregon's top agricultural commodities and urban and rural environments would be impacted. ODA has trapped 173 JBs and has

conducted three successful JB eradication programs in residential areas since 1988. These programs are costly, difficult to implement, and less publicly acceptable than other pest programs due to repeated soil and foliar pesticide applications. Maintaining effective exterior quarantines, regulatory programs, and annual statewide detection programs are the best way to keep Oregon free from Japanese beetles.

About 4,608 JB traps were placed statewide in 2001. Traps were concentrated near population centers in western Oregon where most JB host plants are located. However, all cities and towns statewide are considered at risk and are trapped. After trapping four JBs associated with cargo carriers at Portland International Airport (PDX) last year, 552 delimitation traps were placed at PDX and vicinity in 2001. Five Japanese beetles were trapped at PDX and vicinity in 2001. Four of these were associated with regulated cargo carrier locations. A fifth beetle was trapped on a golf course approximately 3/4 miles south of PDX. A sixth JB was trapped at a holly farm near the town of Carver, Clackamas County.

USDA monitors JB populations at eastern airports each year. As soon as population levels pose a risk of live beetles entering aircraft, the airport is declared “regulated.” Air cargo carriers must then follow treatment and safeguarding procedures for at-risk aircraft destined for Oregon and seven other western states. Airborne Express, Wilmington, OH and Kitty Hawk (USPS), Indianapolis, IN were the only two cargo carriers with regulated flights to PDX this year. Thirty-six aircraft inspections were performed in 2001, resulting in 69 JBs found (4 live, 25 moribund, 40 dead). If two or more live beetles are found on a single aircraft, an EAN is issued requiring cessation of all off-loading activities, closure and retreatment of the aircraft. No planes were retreated at PDX this year. Continued interceptions of JB on cargo aircraft and in traps placed at airports highlight the need for continued cooperation, monitoring, information sharing and commitment among state and federal regulators, industry representatives and private consultants.

Mediterranean Fruit Fly

Mediterranean fruit fly (MFF) trapping continued in Wasco, Hood River, and Union county apple growing areas to meet the USDA-China requirement for five years of negative survey. This was the fourth negative survey conducted at protocol levels for Wasco and Hood River counties and the third in Union County.

Nun Moth

USDA APHIS and Forest Service implemented a pilot project in 2001 to test protocols for the rapid detection of exotic lymantrids, specifically the nun moth, *Lymantria monocha*. Native to Europe and Asia south of the 60º latitude, the nun moth is considered one of the most serious exotic pest threats to western and northern U.S. forests of spruce, pine and Douglas-fir. Risk ratings for nun moth establishment, and economic and environmental impact potential are all high. Program costs, equipment and personnel needs for a more fully operational national program would also be developed.

The Naval Weapons Station Earle, Coltsneck, NJ and Portland, OR were selected as test sites based on the availability of suitable habitat for target species, suitable sample sites, and taxonomic and survey assistance. About 314 delta traps baited with nun moth pheromone (PheroTech, Delta, BC) were placed in the Port of Portland area and environs at a density of four traps/mi^2. No nun moths were found.

Pandemis Leafroller

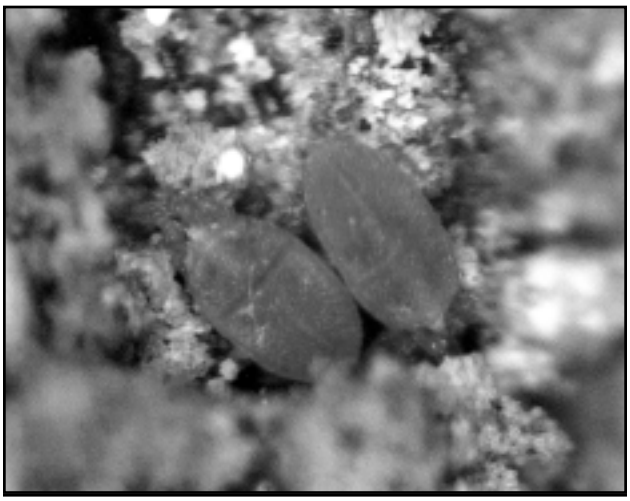
The Pandemis leafroller, *Pandemis heparana*, a pest from Eurasia, was first detected in British Columbia, Canada in 1978 and in Whatcom County, Washington in 1994 during a general survey of apple pests. About 30 *P. heparana* detection traps were placed in five counties in northwestern Oregon in 2001, compared to 104 traps placed in 2000. The Pandemis leafroller has not been detected in Oregon to date.

Scarlet Flat Mite

Scarlet flat mite, (SFM), *Cenopalpus pulcher,* is an occasional pest of neglected apple, pear, prune, and walnut trees in temperate northern Europe, where SFM has only one generation per year. In warmer and arid regions like Egypt, Iran, and Turkey, where it can have several generations per years, scarlet flat mite is a significant pest of quince and other fruit trees. The mite feeds upon leaves and buds, causing damage easily confused with nutritional deficiencies.

Never previously recorded from the U.S., SFM was identified in Oregon in 2000. First identified from pear trees at the USDA, ARS National Clonal Germplasm Repository (NCGR) in Linn County, SFM was soon discovered in stored samples taken in nearby Corvallis (Benton County) from a neglected orchard in 1990.

A survey of pear, apple, and *Prunus* spp. twigs from January 2001 to February 2001 detected SFM in Clackamas, Marion, Multnomah, Polk, and Washington counties. In this survey, C. pulcher occurred most often on bud scale scars but was found in much smaller numbers in lichen on the stem surface, smooth stem surface (no lichen), leaf scars, bud scales, and other stem areas. An additional survey in November 2001 detected SFM in Columbia and Lane counties. No mites were detected in Hood River, Yamhill, Jackson, Tillamook, and Clatsop counties. SFM was detected at 20 of 114 sites surveyed including seven nurseries (in unmanaged non-nursery trees), three sites near nurseries, five residential/urban sites, one agricultural research station, one rural site, one university orchard and one national germplasm repository. Feral trees, including trees outside of managed orchards and nurseries, were most often infested.



Scarlet flat mites

An additional survey was conducted from May to June 2001 in 91 production nurseries in nine counties to determine if SFM was present on nursery stock. Although 910 branch tips were examined for scarlet flat mites from host trees in these nurseries, none were detected. (See related article in the Nursery Section).

The USDA New Pest Advisory Group convened on April 26, 2001 and decided to delay action until more information on SFM phenology and biology, including its ability to spread several new viruses, was available. An ARS multistate project is being planned to fund basic research on nursery stock and germplasm issues. Although miticides are effective treatments for *C. pulcher,* a hot water treatment method was developed at the USDA/ARS National Clonal Germplasm in 2001. Budwood treated by dipping in 50º C water + surfactant for 5 minutes provided effective control of surface mites.

Siberian Moth

Siberian moth, *Dendrolimus superans sibericus,* is the most destructive defoliator of conifer forests in Northern Asia. Like the nun moth, risk ratings for Siberian moth establishment, and economic and environmental impact potential in the U.S. are high. In a new survey this year, 49 milk carton-style traps were baited with Siberian moth pheromone provided by Jerome Klun and Ashot Khirmian, USDA, ARS, Beltsville, MD. Four traps/mi2 were placed in the same general port area as for nun moth. No Siberian moths were found.

Western Cherry Fruit Fly

An orchardist in Kimberly, Grant County, continued with cherry fruit fly (CFF) eradication efforts in his four acre organic sweet cherry

block. Sixteen hundred sticky traps, twice the 800 traps set in 2000, were placed and chemicals approved for organic use applied by the orchardist. ODA personnel checked the traps twice and noted a total of three CFFs, down from the 16 trapped in 2000. Feral chokecherries, a native host of CFF, have been removed from the orchard environs as part of the eradication effort.

Insect Identification

During 2001, PPD's taxonomic entomologist identified about 530 submitted samples of insects, other arthropods and snails, the majority from the horticultural inspection staff. About 1,100 specimens of beetles were identified for university and museum collections, including those of ODA and OSU. Identifications were also made by phone for the general public and, as a Collaborating Scientist, for the Systematic Entomology Lab, USDA.

Timber Health Programs

Exotic Woodboring Insects

Surveys for exotic woodboring and wood-associated beetles and wood wasps, conducted by ODA since 1997, continued in 2001. Seventeen sites including ports, mills, solid wood packing material (SWPM) importers, wood recyclers, and urban forests were surveyed including one site at the port of Vancouver, WA and three sites in the La Grande vicinity in northeastern Oregon. The latter sites were maintained through cooperation of the U.S. Forest Service PNW Research Station. Three 12-funnel Lindgren traps were placed at each site: one baited with a 3-component exotic bark beetle lure, a second baited with alpha-pinene and ethanol, and a third baited only with ethanol. Scots pine bait logs, a preferred host for pine shoot beetle, were also placed at all trap sites, except those in La Grande.

Two specimens of a Eurasian longhorned beetle new to the United States, *Tetropium castaneum*, were trapped in ODA funnel traps at The Dalles in 2000. A close relative, *T. fuscum*, another European species, is responsible for extensive mortality of spruce in Nova Scotia. Consequently, a delimitation survey for this potential forest pest was conducted in 2001. In addition to the two sets of traps normally placed at a local mill site, fifteen alpha-pinene/ethanol traps were placed throughout the city. Placement followed a 1/4 mile grid, providing preferred hosts (spruce) were present. Spruce bait logs were also placed at or near these sites. No additional *T. castaneum* were found in the funnel trap samples. Data from the spruce bait logs will not be available until late summer 2002, since the emergence period for adults ranges from June through August. A delimitation survey for *T. castaneum* will again be conducted in 2002.

USDA Forest Service and APHIS implemented a cooperative pilot project in 2001, to develop protocols for the rapid detection of exotic bark and ambrosia beetles. ODA and others cooperated with the USDA to develop and implement this project. Three port cities in each of the north, southeastern and western regions were selected. In the west, these ports were Long Beach, CA; Portland, OR and Seattle, WA. Three sites, a solid-wood packing material importer, a port area, and an urban forest, were selected at or near each port. Following the general protocols used by the ODA, three traps were placed at each site, each with a different lure. In addition to trapping the three Portland sites, ODA identified all target and non-target species including all bark, ambrosia, and longhorned beetles and wood wasps for the western region.

A longhorned beetle native to eastern North America, *Xylotrechus sagittatus*, was found in a delimitation trap in The Dalles. This represents the first Oregon and western North American record for this species. No other new exotic species of woodboring insects were found in either the ODA or rapid detection pilot project surveys in 2001. However, several new county records for recently established species were obtained. Considerable numbers of an exotic longhorned beetle new to North America,

tentatively identified as *Arhopalus pinetorum*, were recovered from the California pilot project traps. A species of a non-woodboring exotic seed bug thought to be of European origin and tentatively identified as *Rhyparochromis vulgaris*, was found in funnel traps at Portland and The Dalles. This species was first recorded from North America earlier in 2001 from Washington.

Since 1997, about 334 species of woodboring or wood-associated beetles and wood wasps have been identified from the exotic woodboring insect surveys, including 17 new state, regional, western U.S., U.S., or western North American records. Of these new records, woodborers accounted for 14 species. Several of these species (e.g., *Hylastes opacus* and *Xylosandrus crassiusculus*) are known pests of trees or nursery stock elsewhere.

Almost every high-risk site trapped in 2001 yielded at least one of the "new" species. Most of the sites were new locality records for these species. These species appear to be well established and are apparently expanding their ranges in Oregon. Since 71% (10 of 14) of these species have hardwood hosts, dunnage and SWPM were probable pathways of introduction. Most of these species are also either exotics known from the eastern U.S. for many years or are natives of that region. At least some of these species may have arrived in Oregon in host material such as SWPM, raw lumber and firewood from the eastern U.S. These detections emphasize the continuing need to monitor international and domestic imported wood and SWPM pathways. Review of current federal and state regulations governing the movement of both manufactured and unmanufactured raw wood is also clearly necessary.

Imported Timber

ODA continued to monitor and sample shipments of imported untreated wood in cooperation with our USDA, APHIS, PPQ counterparts in 2001. This year, ODA inspectors examined 817,506 board feet of imported green lumber from Australia and 831,262 board feet of imported green logs from New Zealand for pests and pathogens.

Very few parasitic organisms were recovered from the Australian ponderosa pine lumber this year. Only a couple of the fungi recovered, *Aureobasidium* and *Cladosporium*, are considered problems on wood. Both cause surface stains. The pallets accompanying the lumber actually yielded more potential pests. In addition to the fungi mentioned above, a potentially plant pathogenic bacterium, *Pseudomonas*, was recovered. An unidentifiable wood-rotting basidiomycete was also found. All of the lumber was kiln-dried shortly after inspection. The pallets were chipped and burned as hog fuel.

The Monterey pine logs from New Zealand yielded few parasitic organisms. Three potentially plant pathogenic organisms were found: the fungus *Geotrichum* and the bacteria *Pseudomonas* and *Streptomyces*. Some *Geotrichum* spp. can rot wood while the bacteria can cause blights on woody and agricultural hosts, respectively. The logs were processed for veneer shortly after their arrival.

Plant Disease Programs

Allium White Rot

Department staff inspected 86 garlic and onion seed fields totaling 1,682 acres of garlic for the presence of white rot (*Sclerotium cepivorum*) in central and eastern Oregon. The inspection is a 100% inspection, designed to find single strikes of white rot. One field was too weedy to inspect and was not certified free from white rot. Another field suffered from herbicide damage causing premature senescence and was not inspected. The fungus was found in five of the 84 fields inspected. All other fields were found to be free of the pathogen and received certification documents. The white rot fungus was confirmed in Crook County for the first time in 2001. All other finds were in Jefferson County.

Chrysanthemum White Rust

Chrysanthemum white rust (CWR), caused by the fungus *Puccinia horiana,* was detected at two Oregon retail nurseries on September 12, 2001. A trace back that afternoon to the wholesale supplier found more infected plants of the same variety. The wholesale nursery was placed under a federal EAN on September 14 which required a 100% inspection of all mums, the destruction of infected material and all mums within one meter of infected plants and five weekly treatments of remaining hosts with myclobutanil. The wholesale nursery also recalled all mum stock that remained at the retail outlets it had supplied and all other mum stock within one meter of their stock. Approximately 25,000 plants were destroyed. Resurvey of the treated mums on October 10, 2001 detected no additional CWR and they were released for sale. A delimitation survey of all properties within $^{1}/_{4}$ mile (400M) of the wholesale nursery was conducted in late October 2001 and will be repeated in 2002. This is the first detection of CWR in Oregon since 1998. (See related article in Nursery Section).

Columbia Root-knot Nematode

Nursery Program staff collected 96 nematode samples from Oregon production nurseries found in 56.3% of the samples. Plant-parasitic nematodes were detected in 61 of the samples (63.5%). *Pratylenchus* spp. were the most abundant plant-parasitic nematodes, being found in 56.3% of the samples. *Meloidogyne* spp. were detected in two samples. No Columbia root-knot nematodes (CRKN) were detected in any of these samples based on morphometric analysis of juveniles and multiplex PCR. This survey is conducted annually at the request of Canadian agricultural officials to demonstrate that CKRN is not present in Oregon production nurseries.

Dutch Elm Disease

Bev Clark screening plates for plant pathogenic fungi

Dutch elm disease (DED), a deadly tree disease caused by the fungus *Ophiostoma novo-ulmi,* has been showing up recently in Oregon's Willamette Valley. It was first detected in 1978 in Portland. Its normally rapid spread has been slowed by a DED quarantine and a diligent survey and eradication program. In 2001, the City of Portland's Urban Forestry staff removed 39 infected trees from the elm forest inventory. These trees were removed in an effort to slow the spread to other, currently healthy elm trees in the immediate area. Two infected trees were also found in Corvallis and in Eugene, while one infected tree was discovered in Salem. City and/or county parks staff promptly removed the trees. Thirty-nine of 66 samples submitted to the lab were confirmed infected with O. novo-ulmi.

Golden Nematode

Plant Pest and Disease staff conducted a limited survey in September of 2001 for the golden nematode (*Globodera rostochiensis*) in commercial potato fields. The sample collection and processing procedures followed the federal golden nematode protocol. Two samples from Clackamas, Jefferson, Morrow, Umatilla and Washington counties were collected and processed, for a total of ten samples. Each six kilogram sample was composed of 400 scoops collected at or after harvest and processed by floatation. Part of the sample was also processed by the sucrose centrifugation procedure to detect non-cyst forming nematodes. No *Globodera* spp. or Columbia root-knot nematodes were recovered in these samples based on juvenile

morphology and PCR amplicon size. The number of samples was limited due to the high per sample cost of the golden nematode protocol.

Karnal Bunt

Karnal bunt is a fungal disease of wheat. After its discovery in Arizona, many countries implemented quarantines to prevent the introduction of this disease. In response to those quarantines, Oregon began participating in a national survey program that certifies wheat as free from Karnal bunt. Oregon has participated in this program since 1996 and has never found Karnal bunt. Karnal bunt spores were not found in any of the 57 wheat samples examined in 2001. Samples were obtained from the 9 counties that produced commercial quantities of wheat.

Mint Verticillium

The Plant Division offers a mint rootstock field inspection service to detect *Verticillium* spp. as established by control area orders. Mint growers in Union County submitted requests to inspect 11 fields totaling 167 acres. No *Verticillium* spp. was detected in Union County in 2001. In Klamath County, growers submitted requests to inspect six fields totaling 110 acres. Samples with symptoms suggesting Verticillium infection were observed and collected from one 20 acre field. Laboratory analysis confirmed *Verticillium dahliae*. Under the provisions of the control area order, the acres confirmed *V. dahliae*- positive can not be used as a rootstock source in Klamath County.

Potato Late Blight

Staff from the Commodity and Plant divisions conducted field surveys for the potato late blight fungus, (*Phytophthora infestans*) in northeast, south central, western and northwest Oregon. A total of 42 fields and 3,271 acres were inspected. One field in the Willamette Valley was found to have a low level of late blight. The varieties inspected included Lasoda, Norkota and Penta. The late blight-free fields were eligible to ship to Taiwan under a special agreement arranged by APHIS and Taiwan.

Plum Pox Virus

Plum pox virus was found in North America for the first time in Pennsylvania peach orchards in 1999. The infected orchards were immediately put under an emergency quarantine by USDA to prevent the movement of any Prunus materials out of the area until the extent of the infection could be determined.

As a result of this report, the Canadian Food Inspection Agency (CIFA) imposed a quarantine against the importation of certain *Prunus* spp. from the U.S. into Canada until further notice. Sweet, sour and flowering cherry varieties are permitted entry if they are products of a recognized virus certification and testing program. Oregon has twenty-five nurseries participating annually in its fruit and ornamental virus certification program. As part of a national survey program, 563 samples of *Prunus* spp. scion trees were collected from susceptible Prunus species growing in the vicinity of the nurseries participating in the virus testing program. Plum pox virus was not detected in any of the samples. Only 13 types of Prunus are approved for export to Canada at this time.

In 2000, the CFIA reported that plum pox virus was found in several peach orchards in the provinces of Ontario and Nova Scotia. In 2001, a survey was initiated to determine the extent and location of the infected orchards in 4 provinces (Ontario, British Columbia, Quebec, Nova Scotia). Ontario was the only province where plum pox virus was detected and 56 new sites were found. All of the properties have been placed under prohibition of movement of plant materials and notice to dispose of trees on the properties has been issued. CFIA is moving ahead with an eradication program and possible indemnification program for the loss of production.

Pennsylvania's eradication program continues. The virus has not been found outside the quarantine area. The current status of plum pox

virus in Pennsylvania can be accessed on the Pennsylvania Department of Agriculture webpage at: www.pda.state.pa.us.

On January 8, 2001, CFIA issued an interim policy for importation from the United States of susceptible *Prunus* spp. from states that participated in the national survey for plum pox virus. The nursery stock must originate from mother stock in a nursery that participates in an approved virus certification program and has been tested according to USDA methods and found negative. This change in policy has allowed the Oregon nurseries participating in the virus certification program to send *Prunus* spp. to their Canadian customers.

Sudden Oak Death

In August 2001, *Phytophthora ramorum*, the cause of sudden oak death, was detected for the first time in Oregon. An aerial survey performed by the Oregon Department of Forestry (ODF) and USDA Forest Service (USFS) detected several suspicious sites in southwestern Curry County near the town of Brookings. Follow-up surveys on the ground by ODA, ODF, USFS, and Oregon State University personnel verified the presence of P. ramorum on nine sites. Approximately 40 acres of tanoaks, wild rhododendrons, and evergreen huckleberries were identified as infested with the disease. The ODA, with the cooperation of the landowners, immediately quarantined and began an eradication effort on the sites. The treatment called for the cutting, piling, and then burning of all host plants within the infection centers and within a 50 foot buffer zone around the infection centers. By the end of 2001, 97% of the affected acreage had been cut and piled and 47% burned. ODA personnel also collected 2,657 samples from 69 rhododendron and azalea grower nurseries to test for the presence of *P. ramorum*. The fungal pathogen was not recovered from any of the samples. Surveys for sudden oak death will continue in 2002. (See related article in Nursery Section)

SOD eradication effort, photo courtesy of F. Arnold

Seed Field Inspections

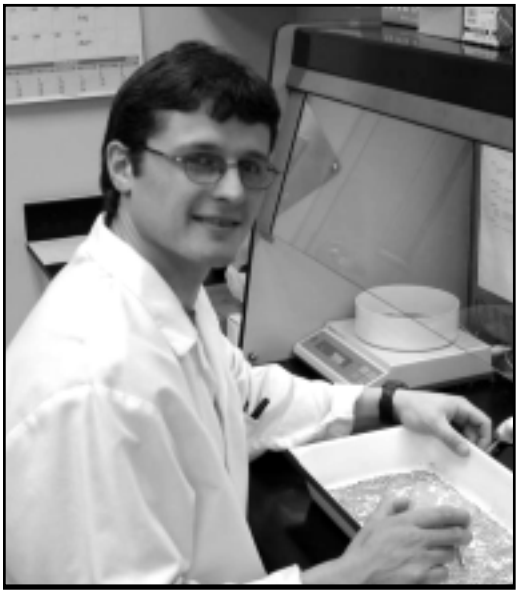
Staff from the Plant and Commodity divisions inspected 387 seed fields (6,690 acres) for the presence of seed-borne diseases of concern during the summer of 2001. This is a 22% decrease in the number of fields from the previous year. The inspectors surveyed for the presence of 102 different disease organisms on some 44 different host crops. Surveys found 293 fields (80.6%) free from all diseases of concern. Eighty fields were found to have at least one disease of concern. The most frequently detected pathogens included *Xanthomonas campestris* on carrots (49 fields), *Phoma terrestris* of onions (10 fields) and *Alternaria brassicae* on crucifers (7 fields).

Fruit Tree Virus Certification

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

A total of 3,552 individual Prunus mother (scion) trees for bud production and rootstocks and 7,469 *Malus* spp., *Pyrus* spp. and *Cydonia* spp. individual trees and rootstocks were tested in 2001. The number of trees tested was down from previous years because of the nature of the collecting schedule. The nurseries continually evaluate their domestic and foreign commercial

markets and the demand for fruit trees was lower this year. Demand for ornamental varieties for landscaping projects remains strong. A summary of the varieties grown by each participating nursery is sent yearly to state, federal and Canadian officials to facilitate the movement of the nurseries' products.



Matt Traeger inspecting grass seed for export

Laboratory Seed Testing

ODA staff conducted 4,413 lab tests to detect specific seed-borne fungi, bacteria and nematodes, pest and disease tests, and other miscellaneous tests on seed of nine different crops in 2001. There were 1,994 tests done for pest and disease inspections. The other miscellaneous detection tests totaled 2,140. These tests are requested by Oregon seed producers to meet the phytosanitary requirements of their foreign customers. The number of tests requested in 2001 was approximately 70% over the 2000 level; a 290% increase over the 1995 level.

Two hundred seventy-nine seed lots of forage grass seed varieties were submitted to the Plant Health Laboratory for testing for the presence of the endophyte fungus. This fungus produces alkaloids that can be toxic to livestock. To qualify for the endophyte tag, no more than 5% of the seeds in a lot can be infected with the fungus. As a result of testing, 95% of the seed lots (6.6 million pounds total of forage grass seed) qualified for endophyte tags.

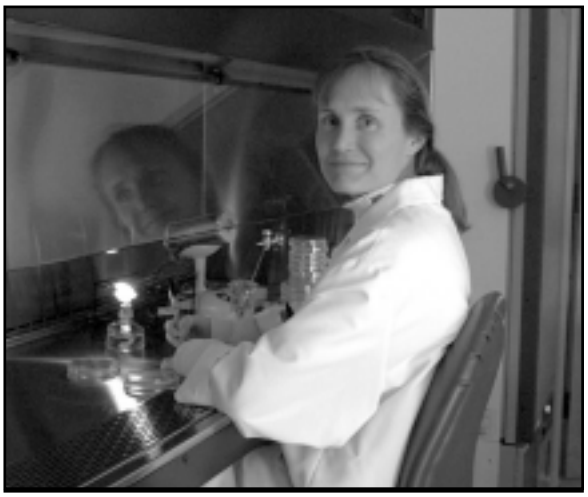
Oregon has a reputation for growing high quality seeds and is in a position to capitalize on the revitalized global market. Requests for seed tests have continued on an upward trend requiring expansion of the various testing programs.

A total of 117,098,134 pounds of seeds were tested in the Plant Health Laboratory in 2001. The amount of grass seed tested represents about 15% of Oregon's production.

Plant Pathology
General Diagnostic Tests

The Plant Health Laboratory provides a general diagnostic service for the nursery industry, various governmental agencies, licensed landscapers and other customers. Many tests are conducted in addition to those required by specific survey and certification programs. The laboratory activities related to certification programs are summarized elsewhere.

The Plant Health Laboratory performed 858 general diagnostic and nursery tests. Tests performed included screening for nematodes (mist chamber and sucrose filtration), fungi and bacteria (microscope and media), and visual analysis for pests and abiotic problems. Plant pathogens were found associated with 49% of



Lisa Rehms isolating pathogens in a sterile hood

the samples tested. Nematodes (17%) and fungi (27%) were recovered the most often. Other plant pathogens recorded included bacteria (3%), phytoplasmas, and viruses (both less than 1%). Of the other plant disorders, abiotic symptoms comprised 16%, while insects accounted for 2%. No pathogens were found on 33% of the samples.

Quarantines and Control Area Orders

Plant Division administers quarantines and control area orders found in Oregon's Administrative Rules, sections 603-052-0030 through 603-052-1060. The purpose of the quarantines and control area orders is to exclude exotic plant pests, pathogens, and weeds from Oregon or to limit their spread within the state. A summary of plant pest and disease external quarantines and the full version of all Plant Division quarantines can be accessed through the Plant Division home page: <oda.state.or.us/plant/plant_division_homepage.htm>.

Cindy Fraley sampling plants for later lab analysis

Oregon's state quarantines supplement various federal USDA quarantines which limit the spread of such organisms as golden nematode, gypsy moth, imported fire ant, pine shoot beetle, plum pox, and Japanese beetle. ODA detection and survey, eradication and control, quarantine and certification programs help protect Oregon's natural resources and assure market access for our agricultural and forestry products worldwide. Actions taken in 2001 on Plant Pest and Disease quarantines and control area orders follow.

Onion Maggot Control Area Order

Onion maggot was less of a threat to onion growers this season because good weather and good prices in the fall of 2000 precluded the carry over of huge amounts of culls into the 2001 season. Growers and ODA have worked together since 1958 in managing onion maggot populations through the use of a control area in Malheur County order aimed at reducing the numbers of overwintering maggots. This season one new packer/shipper needed some assistance in handling his culls in an approved manner. The remainder of the cull handling process was uneventful.

Permits

Biotechnology

In 2001, 51 notifications and permits for transgenic plants were reviewed by ODA. Fourteen different crops were modified for a wide variety of traits including herbicide

Crop	No. of Applications	Trait Added
Apple	2	PQ, BR
Bentgrass	12	AP, HR, IR, FR
Bluegrass	5	AP, HR
Corn	3	IR, MG
Strawberry	2	HR
Poplar	3	MG, IR, AP
Potato	3	HR, IR, VR, PQ, FR
Sugarbeet	12	HR
Barley	1	AP
Wheat	3	AT, AP
Alfalfa	2	HR
Red Rasberry	1	VR
Pear	1	PQ
Petunia	1	HR, PQ

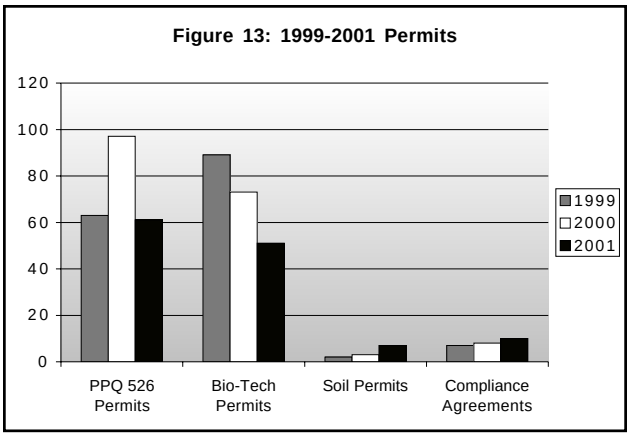
Figure 12: number of applications, crop species genetically modified, and new traits added in 2001

resistance (HR), insect resistance (IR), virus resistance (VR), fungus resistance (FR), bacterial resistance (BR), modified genotype (MG) and altered phenotype (AP) or phenotypic quality (PQ) (figure 12). The notifications and permits were reviewed to ensure that the transport and/or growth of the transgenic plants would not violate any existing state quarantines and control area orders and would not pose a significant risk to Oregon agriculture. Along with APHIS, PPQ officials, ODA representatives also inspected the research sites of several transgenic permit and/or notification holders. ODA does not have specific regulations for transgenic organisms.

PPQ 526

In 2001, 61 PPQ 526 Applications to Import Live Plant Pests or Noxious Weeds were reviewed. 37 of those applications were for butterflies. Butterflies listed on Oregon's approved list include: *Vanessa virginiensis, Pieris rapae, Danaus plexippus* (Western population), *Nymphalis antiopa, Colias eurytheme, Vanessa cardui, Vanessa atalanta, Vanessa annabella* and *Papilio rutulus.* All other species were denied.

Twenty-four applications were for other organisms including: biological control agents, other insects, snails, nematodes, plants, fungi, bacteria, and viruses.



Federal Compliance Agreements

Plant Division was notified of ten federal compliance agreements for materials including foreign soil, seed and screenings, and various other commodities requiring treatment. The facilities processing these high hazard commodities must have safeguards in place to prevent escape of potential plant pests and diseases.

Soil

In 2001, Plant Division received only seven soil permits for scientific soil analysis.

Section 3 - Noxious Weed Control

The primary purpose of the Noxious Weed Control Program is to:

- Provide leadership and technical expertise for noxious weed control programs statewide;
- Coordinate weed control efforts with federal, state, and county agencies as well as provide assistance to private landowners;
- Conduct weed surveys to detect new infestations and to manage new infestations before they become significant problems;
- Administer grant funds appropriated for weed control by the legislature;
- Work with the State Weed Control Board to prioritize weed control projects, and to supply the Board with necessary information to facilitate the allocation of special projects funding;
- Develop and implement biological control of weed programs;
- Promote and use integrated control methods to maximize weed control success while minimizing non-target effects to the environment.

Introduction

The Weed Control Program has 10 technical staff that are located in Salem, Canyonville, Klamath Falls, Redmond, Burns, and Union. The program also employs seasonal staff during the field season to assist in the implementation of noxious weed control projects.

The following is an overview of the Noxious Weed Control Program and a brief summary of activities for 2001. More detailed information can be found in the Noxious Weed Program Annual Report, which will be available in 2002.

Definition

Noxious weeds are defined by the Oregon State Weed Board as exotic, non-indigenous plant species that are injurious to public health, agriculture, recreation, wildlife, public or private property.

Highlights

Several major weed issues were confronted in 2001. This was a second year of small broomrape survey in all known red and white clover seed fields. Twenty two new infested

From left: Tom Forney, Glenn Miller, Dave Langland, Dan Sharratt, Tim Butler, Bonnie Rasmussen, Bob Barrett, Eric Coombs, and Ken French

fields were detected during the season in 7 western Oregon counties.

The Oregon Noxious Weed Strategic Plan was completed in early 2001. The Strategic Plan was presented to the Oregon State Legislature in June 2001. Reviewing noxious weed grants submitting recommendations to the Oregon State Weed Board for its approval and tracking of grants were also a primary focus.

Kudzu, an invasive vine known as the scourge of the South and identified for the first time in Oregon in 2000, was again a top priority project for 2001. One new site was detected in 2001 for a total to 3 sites in Oregon. Another site was detected across the river in Washington.

Giant Hogweed was detected for the first time in Oregon in 2001. This is an " A" designated noxious weed that is of public health and environmental concern.

Glenn Miller with giant hogweed

Noxious Weed Projects

Giant Hogweed

During 2001, giant hogweed, *Heracleum mantegazzianum,* was detected for the first time in Oregon. Two initial sites were first detected in Lane County. Additional sites were found in the Portland Metro area for a total of 44 sites detected. Most of the sites are small and consist of 1 to 6 plants that in many cases were intentionally planted as ornamentals. Weed Program staff are developing best management practices and a management plan that will be implemented during 2002.

Giant Hogweed grows as a native in the Caucasus Mountains, a region of Asia between the Black and Caspian seas. Planted as a curiosity in arboretums and private gardens in Europe and North America early in the twentieth century, it soon escaped and naturalized in surrounding areas, especially in riparian and urban sites. It is reported to be a problem weed in England, Scotland, Scandinavia and Germany. In North America it grows in Ontario, British Columbia, Maine, Maryland, New York, Washington and now in Oregon.

Giant hogweed constitutes a public health hazard. Its clear, watery sap contains a glucoside which causes phyto-dermatitis. Skin contact with sap followed by exposure to sunlight can produce painful, burning blisters that may develop into purplish or blackened scars.

Giant Hogweed is a member of the carrot or parsley family and its most impressive characteristic is its massive size. It looks very similar to cow parsnip, which is a common native plant in the northwest that grows in riparian areas and roadsides.

Kudzu

A major emphasis of the Weed Control Program is statewide survey and detection of noxious weeds. Detection of new introductions before they become major problems is a critical part of noxious weed management. In July 2000, Kudzu, *Pueraria montana,* was detected on a road bank in Clackamas County. This was the first infestation detected west of Texas. Kudzu is an aggressive climbing vine that smothers other plants. It is a native to China and Japan and is a major problem the southeastern U.S. where an estimated 7 million acres are infested. In August 2000, a second kudzu site was detected in Multnomah County and in June 2001 a third site was detected in Multnomah County. The two

Tom Forney Spot treating a Kudzu site in SW Portland

Small broomrape in clover

sites detected in 2000 were treated in the fall of 2000. In 2001, one of these sites was re-treated. The other site was monitored and no kudzu plants were detected. The new site detected in 2001 was treated in the fall and all sites will continue to be monitored and retreated as needed. All sites were spot treated with a selective herbicide called cloypralid (Transline), which is a very effective product for kudzu control.

Skeletonweed Control

For the third year in a row, members of the ODA weed crew, BLM personnel, and private contractors have been scouting for and treating rush skeletonweed on public and private lands north of Vale. In 2001, the Jackson fire covering 79,000 acres, cleared sagebrush and plant litter from a major portion of the treatment area. Having a clear view of weed infestations, 0.5 million acres were surveyed using a helicopter, ATVs, and horse crews. Within this area, 100 net acres of skeletonweed were located and treated. Over 3,000 individual site locations were recorded, ranging in size from single plants to 10 acres. Using fall treatments, the crew has obtained control rates that exceed 75%, well beyond success rates for summer treatments of skeletonweed. These treatments are scheduled to continue in future seasons.

Small Broomrape

Small broomrape, *Orobanche minor*, is a parasitic weed that attaches to the roots of host plants, hijacking their water and nutrients.

In 1999, small broomrape was detected in a certified red clover seed field in Clackamas County near Aurora. Small broomrape is a federally listed noxious weed that is of quarantine significance to many of Oregon's trading partners.

In 2000, nearly 4,500 acres of red and white clover fields were surveyed by ODA. This was approximately 1/3 of the red clover production in western Oregon. Thirteen new infested fields were detected in Clackamas, Marion, Washington, and Multnomah counties. In consultation with the industry, ODA established a quarantine that requires all red clover seed lots harvested west of the Cascade Mountains to be sampled and tested for small broomrape and shown to be free from Orobanche minor.

In 2001, ODA received a USDA grant providing funding for additional intensive survey. Over 7,000 acres of red and white clover seed production were surveyed. Twenty-two fields totalling 666 acres were found to be infested in Linn, Marion, Clackamas, Yamhill, Washington, Multnomah and Columbia counties. Also USDA grants funded research at Oregon State University for test plot work to identify effective control and best management

practices. OSU also conducted research on perfecting clover seed sampling techniques for Orobanhe. ODA implemented a research project with USDA grant funds to develop PCR testing procedures for identification of *O. minor* in clover seed and soil samples using DNA analysis. ODA is continuing to work with the Clover Commission, USDA, OSU, and other cooperators to develop long term management guidelines for the industry and to ensure that Oregon's clover seed is a clean, quality product.

Noxious Weed Control Grants

The Oregon State Weed Board (OSWB) has approximately $1.1 million of Measure 66 Lottery funds to be awarded for noxious weed control grants for the 2001-03 biennium. Priority projects are those that restore, enhance, or protect fish and wildlife habitat and watershed function. There continue to be substantial amounts of time allocated by noxious weed control program staff in the review and administration of the Noxious Weed Grant Program.

The number of grants awarded by the OSWB in the third and fourth grant cycles (2001) was 53 totaling $637,054.

Strategic Plan

During the 1999 Legislative Session, HB 2118 was passed which directed ODA and the Oregon State Weed Board to do a noxious weed impact assessment and create a strategic plan for addressing noxious weeds. Current statewide weed control efforts including federal, state, county, and private programs were evaluated.

The statewide noxious weed strategic plan was based on the assessments and designed to provide recommendations for a comprehensive approach for addressing noxious weed management in Oregon. The Strategic Plan was presented to the House Agriculture and Forestry Committee during the 2001 Oregon Legislative Session. The Committee instructed ODA to pull together an alternative funding work group to explore possible funding options for implementation of the Strategic Weed Plan.

Survey, Detection and Prevention Efforts

Perhaps the most important function of the Weed Control Program is identifying new invasive species before they become firmly established in Oregon. Plant risk assessments, are a tool that assists in this process by gathering background information. Other priority activities include networking with weed professionals worldwide, identifying the highest risk species, and conducting yearly surveys to detect new populations as they occur.

Not all newly recognized invasive species are new to North America. Certain ornamental species that have been around for years are now raising concerns because of their invasive nature. Species that have come to the forefront include: English ivy, pampas grass, and butterfly bush. Dialog between ODA, State Weed Board, and the nursery industry is essential so viable solutions to this problem can be jointly developed in the future.

"A" and "T" Weed Treatments

Annual treatments for the control of "A" and "T" designated weeds have reduced the net acreage of many large weed populations. Annual intensive control efforts for distaff thistle and purple/Iberian starthistle have currently achieved 98% control on most sites. Douglas County contains most known distaff thistle sites with the addition of one site in Jackson County and one new site in Umatilla County. Purple/Iberian starthistle is found only in Clackamas County and is fully contained.

ODA continues to meet program goals to limit or reduce acreages of all "A" rated weeds. Besides the two weeds listed above, this includes cooperative control projects for African rue, smooth cord grass, squarrose knapweed and matgrass. Statewide management plans for target noxious weeds are updated each year in January to identify priorities for the field staff as new problems arise. Weed awareness and weed site reductions continue to be achieved through public education, implementation of chemical control and containment projects, and biological control projects targeting susceptible weed species.

Weed Treatments

During 2001, there were 1,108 noxious weed treatments made by program staff using integrated control methods other than biological control. Of this, 980 sites were treated with herbicides and 128 sites were treated either manually or by mechanical methods. One thousand seven treatments were made on federal lands, 38 on state and county managed lands, and 63 on private properties.

Biological Control

The Oregon Department of Agriculture manages the most intensive biological weed control program in the U.S. Seventy species of classical biological control agents have been introduced against 31 species of noxious weeds. Several biocontrol projects have been successful in controlling targeted weeds, including tansy ragwort, St. Johnswort, musk thistle, Mediterranean sage, purple loosestrife, yellow starthistle, and diffuse knapweed, especially at sites that are managed to improve competitive vegetation.

New Releases and Recoveries

Dalmatian toadflax: The root gall weevil, *Gymnetron linariae,* was released in Wasco County. The stem-boring weevil, *Mecinus janthinus,* was released in seven counties. It has caused stand reductions in Canada three years after release.

French broom: The Scotch broom seed beetle, *Bruchidius villosus,* was recovered in the Eugene area for the first time on French broom.

Significant Accomplishments

Biological agents were released at more than 250 sites in Oregon during 2001. Over 150 biocontrol sites were monitored to determine establishment and impact of biocontrol agents. The USDA, APHIS, PPQ biocontrol program, under the direction of Gary Brown, has become a very important partner in implementing biocontrol in Oregon. ODA and APHIS typically supply surplus biocontrol agents to other states. The biocontrol program continues to work on cooperative research projects with Dr. Peter McEvoy and his staff at Oregon State University. The ODA biocontrol program also serves as the biological control of weeds data center for the western U.S.

Knapweeds: Large scale collection and redistribution of the seed head weevils, *Larinus minutus* and *Bangasternus fausti,* were made throughout Oregon on diffuse, spotted, and meadow knapweeds. The apparent impact from the weevils has caused declines in plant density at several sites near Heppner and The Dalles.

Leafy Spurge: In the Fox Valley area, a large population of the flea beetle, *Aphthona lacertosa,* served as a primary beetle collection site for other infestations throughout Oregon. Several leafy spurge sites in Oregon are nearly under control by the Aphthona beetles.

Purple loosestrife: The Galerucella leaf beetles have reduced several infestations of purple loosestrife by more than 90%. A cooperative rearing project funded by the Oregon State Weed Board was initiated with Dr. Peter McEvoy of OSU to rear and distribute the root weevil, *Hylobius transversovittatus.* Thirty-nine sites were treated with root weevils. Purple loosestrife can regrow following severe defoliation by the leaf beetles, thus increasing the need to widely establish the root weevil. The flower weevil, *Nanophyes marmoratus,* was

collected near Ontario and redistributed to numerous sites in western Oregon.

Yellow starthistle: Observations show that where the seed weevil, *Eustenopus villosus* is abundant at sites that are not overgrazed, significant reductions of yellow starthistle have occurred.

Entomologist Eric Coombs has been working as chief editor on the book "Biological Control of Invasive Plants in the United States." The book is expected to be published in late 2002.

Eustenopus villosus

Economic Benefits

Classical biological control of weeds has a good safety record, but a somewhat scanty track record of documented economic benefits. Most of the funding for biocontrol projects is utilized during the foreign exploration, host specificity testing, and introduction phases, with little appropriated for long term efficacy studies. Reported benefits cost ratios from around the world vary from 112:1 to 2:1. Biocontrol of tansy ragwort in Oregon yielded an 85% internal rate of return and a 15:1 benefit-cost ratio. On successful long term projects, benefits can occur as steady stream returns, i.e., $5 million/ year for the ragwort project in Oregon, where annual agency investment is now less than $10,000 per year, a 500:1 annual benefit-cost ratio.

Where feasible, it is economically advantageous to implement biocontrol in order to reduce annual losses. By actively redistributing ragwort biocontrol agents, the Oregon Department of Agriculture accomplished a successful regional project 5-10 years sooner than by the natural spread of the insects, averting $25 - $50 million in losses to agriculture.

A partially successful biocontrol project, i.e., one that reduces weed infestations by variable percentages over large areas, can provide a positive benefit-cost ratio, even though the degree of weed control may be less than desired. If biocontrol in Oregon reduced the top 12 weeds by 30%, annual losses could decrease by $20 million. A 10% reduction of Scotch broom alone by biocontrol agents would yield $1.5 million in annual benefits.

Section 4 - Miscellaneous

Employee Training

A quick scan through our training database reveals staff have taken advantage of a variety of training opportunities. Here is a selection: SAIFer Driving, Japanese beetle program review, annual gypsy moth review, public law conference, CPR/First Aid, pest management short course, Western Horticultural Inspection Society (WHIS), vertebrate pest control, conversational skills, retirement planning, and marketing in the public sector. Many staff members in the Department of Agriculture, along with staff from the Department of Land Conservation and Development, attended a four hour training session on Violence in the Workplace. The facilitator was Trooper Gaye McCabe of the Oregon State Police. She talked about ways we can protect ourselves from violence, both in the workplace and in our personal lives.

Twenty-seven members of the Plant Division staff participated in a total of 92 different training experiences in 2001 - an average of three sessions per person with 7 hours each (figure 14). Employee training is a high priority in the Plant Division.

Program	Classes Taken	Hours	Cost
Nursery/Christmas Tree	43	271.5	958.00
Plant Pest & Disease	29	272.5	2,037.71
Multi-Program	16	94	805.00
Weed Control	4	27	100.00
Total	92	665	3,900.71

Figure 14: Employee Training table

Safety Training

During 2001, the Plant Division continued the Safety Training Plan adopted in June of 2000. Once a month, a safety update prepared by a staff member, is presented at a staff meeting. Topics for Safety training in 2001 included: weather, chemicals/MSDS, driving safety, jumper cables, ergonomics/lab, downed power lines, hostile people, log inspections, falling hazards, power equipment, eye hazards, poison oak, and bee stings.

Ginseng

Since it was authorized in 1997, the Plant Division has administered a small Ginseng Management Program. The purpose of the program is to allow Oregon-grown, cultivated ginseng to be certified for export. Licensed growers are supplied with certificates of origin and can self-certify their ginseng crop. A five person Ginseng Advisory Committee provides feedback and makes recommendations to the Department. Depressed prices have hampered the growth of the ginseng industry in Oregon.

	No. Licenses		Amt. Harvested
Year	Growers	Dealers	(lbs dry wt.)
1997	17	1	-
1998	9	1	4,595
1999	12	1	1,971
2000	11	1	2,671
2001	8	1	3,508

Figure 15: Ginseng Program Summary

ODA Plant Web Page

Few major changes were made to the Plant Division web pages in 2001. However, the department-wide Web Development Committee established several guidelines that will greatly impact Plant Division's web pages and web page team in the future. These guidelines included a web page style guide, a standardized template for new pages, and a strict review process for all new pages. The committee also decided all old program- and division-level pages must change to the new standardized template to give the department-wide pages a more uniform look. These changes will take place in early 2002. Until then, customers can still access all of Plant Division's quarantines, publications, pest and weed alerts, forms and license applications, program specific home pages, and other contact information directly

from the division's home page, <oda.state.or.us/plant/plant_division_homepage.htm.>

The role of Plant's Web Team changed in 2001 because of the changes adopted by the Web Development Committee. Now and in the foreseeable future, the team's role will be to develop and review the contents (including text and graphics) of all web pages prior to publication. One person from the team, the web implementer, will publish new pages in and switch old pages to the new, standardized template.

Members of the 2001 Web Content Team included Nancy Osterbauer, Sherree Lewis, Kerri Schwarz, Karl Puls, Bonnie Rasmussen, and Dawn Zielinski. Nancy Osterbauer was Plant Division's representative on the Web Development Committee and will become our web implementer.

Jim Walker Retires

Jim Walker retired December 31, 2001, after working for the Oregon Department of Agriculture for 16 years. He started working for the Commodity Division in 1985 as a bee inspector looking for mites in honey bee colonies. When the program was discontinued, he was hired by the Plant Division to work at the Hawthorne Avenue field laboratory to work on the virus certification program. Jim took care of the field plantings of test trees and the greenhouse where additional plants needed for tests were maintained. After the February 1996 flood, the Hawthorne Facility became a temporary home for several divisions. Jim became the on-site coordinator to see that all requests could be met for the portable mobile homes and accessories at our temporary home. He took great pride in the appearance of the grounds and made sure it always presented a positive image for the Plant Division and the Department of Agriculture.

Jim can now spend more time caring for his bees, enjoying his family, and pursuing his hobbies. Enjoy your retirement and days of leisure, Jim, you earned it.

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