Summary of Presentations

WHIS Annual Meeting

Portland Oregon

October 7, 2008

Dan Hilburn, Administrator of the Plant Division, Oregon Department of Agriculture, welcomed the meeting attendees with an introduction to the agriculture industry in Oregon. He pointed out the importance of agriculture as one of the top three industries in the state, worth 5 billion dollars. Nursery and greenhouse is the top crop worth one billion dollars, grass seed production is number two, Christmas trees-eighth, pears-ninth, wine-tenth, and hazelnuts (filberts), eleventh. The Nursery Program is completely funded by industry with license fees that are determined by business size, up to a maximum of $20,000. The department also has access to a $250,000 reserve for industry emergencies, which is accessed with the oversight of a board of advisors. Compliance is achieved with education when at all possible and there is not much use of the penalty system.

Three of the presentations dealt with the subjects of insects, insect controls and mollusks.

James R. LaBonte, Survey and Taxonomy Entomologist, Oregon Department of Agriculture regarding **The Wonderful World of Exotic Scales and other "suckers"**.

Characteristics of this group of insects which includes the closely related mealybugs, were illustrated with excellent images:

- piercing/sucking mouthparts
- incomplete metamorphosis
- crawlers which are very small and mobile
- stationary female, often with obvious egg sacs
- winged males (one pair of wings), that are rarely observed
- types include-armoured, soft, cottony
- large host range, can include cacti, orchids and ferns
- mealybugs are really just specialized scales

Because these insects can be extremely prolific (50-1000 eggs produced/female), but hard to detect (can be as small as $1/10^{th}$ of a millimeter), their impact can include

- the vectoring of diseases such as beech decline
- preconditioners of diseases like sooty mold
- direct plant damage such as chlorosis, bud and fruit damage

Symptoms to look for:

- flocking-fine threads of wax that look like cotton-produced by all mealybugs and many scale species
- the presence of the "test" or hard shell-like covering produced by scale (female is larger)

- chlorosis or mottling of foliage
- honeydew which promotes sooty mold and fungus growth
- ants attracted by the presence of honeydew
- presence of insect predators such as coccinellids, lacewings
- identification to species is very difficult, must be slide mounted
- pheromone traps are being developed
- root mealybugs are often found on the larger, more mature roots

Dr. LaBonte who is also a bark beetle identification specialist, spoke briefly about **bark beetles native to western forests.**

Common species are:

Mountain pine beetle - *Dendroctonous ponderosae* (Dendroctonous means "tree killers")

Spruce bark beetle - *Dendroctonous rufipennis*

Northern spruce engraver beetle - *Ips perturbas*

Why are we having deadly outbreaks of native bark beetles???

First of all, bark beetles are naturally adapted to periodic outbreaks. But this tendency is being exacerbated by factors such as:

1. forest management practices
    - reforestation resulting in a monoculture of same age trees
    - dense stands caused by fire prevention
2. climate change
    - drought reduces the ability of the trees to produce pitch in order to "pitch out" attacking beetles
    - longer reproduction seasons, reduced winter mortality
    - increased geographical tolerance – can live at higher altitudes, overcome mountain barriers to increase spread, access to more areas of refugia
3. treatment difficulty
    - beetles are protected by bark
    - infestations are too large to treat
    - systemic insecticides are slow to act in mature trees

Jennifer Gervais, National Pesticide Information Center

(Note: the PowerPoint for this presentation can be viewed on our website whis.org)

The center is a collaborative agreement between Oregon State University and the Environmental Protection Agency. It has both a website, http://npic.orst.edu, and a help line, 1-800-858-PEST, which is available to answer questions from 6:30am-4:30pm PST, 7 days a week. The website includes fact sheets regarding active ingredients, labels, and toxicity.

The influences on pesticide toxicity were explained to be a combination of the active ingredient, the concentration, other ingredients which also can have toxicity, and formulation. Exposure occurs by dermal, inhalation or oral contact and can be limited through the use of personal protective equipment, re-entry intervals and pre-harvest intervals.

Significant aspects of some major groups of pesticides were covered:

Organophosphates/Carbamates (Lorsban, Malathion)-

- have a similar mode of action, both act as a cholinesterase inhibitor, binding to the acetylcholine in nerve synapses.
- acute symptoms are excessive salivation, tiredness.
- chronic exposure causes breakdown of the myelin sheath on nerves resulting in loss of motor coordination.
- they are highly toxic to humans and birds, moderately toxic to humans.

Pyretheroids (Talstar, Scimitar, Tame, Tempo)

- used as a substitute for OP/Carbamates,
- synthetic version of pyrethum extracted from chrysanthemums
- often combined with piperonyl butoxide as a synergist
- resistant to breakdown
- not well absorbed by skin or lungs
- can accumulate in sediments that wash into streams impacting fish
- highly toxic to bees

Organochlorines (Thiodan / Endosulfan)

- persist in the environment, ex DDT and DDE
- banned in the US, still used in many countries
- highly toxic to mammals, fish and aquatic invertebrates.
- moderately toxic to birds and bees

Neonicitinoids – most often imadicloprid (Merit, Marathon)

- clothianidin is implicated in Colony Collapse Disorder of honey bees and has been banned is some countries
- Toxicity varies highly by product

Bacterial-

- Abamectin has a high acute toxicity to mammals
- Spinosad and abamectin are acinomycete fermentations

Azederactin-

- A growth regulator that blocks molting

The Shell Game: Exotic Snail and Slug Species of Concern to Nurseries? Robin Rosetta, North Willamette Research and Extension Center, Oregon State University

http://oregonstate.edu/dept/nurspest/mollusks.htm is very valuable website where this information and much more can be found.

Control of slugs and snails is with metaldehyde or carbaryl. Metaldehyde is quite toxic to cats and dogs.

There are more than 80 exotic species of gastropods that have been introduced:

- Aquarium trade
- As food
- Medicinal uses
- Bio control
- Pets
- In shipments of tile, agricultural and horticultural products, military supplies, vehicles, soil, aquaculture and attached to packaging such as shipping containers. 20% of exotic snail introductions have been on imported tiles.

Slug anatomy – the pneumostome, skirt color and slime color are all used for identification. Slugs are just snails with a completely reduced shell.

- sensory and optical tentacles
- mouth
- pnuemostome-breathing hole located on the right side
- mantle-covers the genitalia and anus
- foot
- keel-ridge on the dorsal side
- skirt
- sole

Snail Anatomy

- sutures
- whorls
- rim apex
- tentacles
- eye
- foot

No WHIS meeting held in Oregon would be complete without useful information about *Phythophthora ramorum*. Three talks dealt with this disease and other *Phytophthora* spp.

Dr. Jennifer Parke of the Department of Botany and Plant Pathology, Oregon State University, who presented **A Systems Approach for Managing *Phytophthora* Disease in Nurseries.**

A three 3-year study was done to evaluate sources of *Phytophthora* contamination in nurseries. *Phytopthora* species include foliar, soilborne, and waterborne diseases.

Sampling is done six times a year of the foliage of host material, the water supply, growing media, and substrate below containers such as gravel. Of 4000 samples 820 had *Phytophthora* species present. The most frequent occurrence was in the plants, followed by soil/substrate, water and then media. *Pieris cinnamomi* was the plant that was most often infected. *Phytophthora cinnamomi* was the most common species detected.

From this study critical control points were identified where *Phytothphora* could be spread and therefore managed. These control points included:

- Water supply
- Soil and/or potting media
- Used containers
- Incoming plant material

Oregon State University offers a useful free course through the extended campus online for nurserymen. *Phytophthora* Online Course: Training for Nursery Growers at is available at http://ecampus.oregonstate.edu/workforce/phytophthora.

Introduction to GAIP-Oregon's Grower Assisted Inspection Program, discussed by **Melissa Lujan, Oregon Department of Agriculture**

This was an overview of a new program to assist Oregon nursery growers in controlling *Phythophthora*. GAIP is being funded by an NRCS grant of $265,000 and will involve 25 nurseries. One of the requirements of participation, which is voluntary, is the development of a Mitigation Manual for *P. ramorum*. The manual is unique to each growing operation's protocols, flow of work and possible access points for contamination, and is completed with the assistance of ODA.

***Phytophthora ramorum* genetics and distribution research** by **Dr. Everett Hansen, Department of Botany and Plant Pathology at Oregon State University.**

Dr. Hansen provided the following facts regarding *P. ramorum* which have been determined by research on the genetics and distribution *of P. ramorum*:

- It is a water mold with deciduous sporangia (asexual reproduction), chlamydiospores (thick walled survival mechanism) and oospores (sexual reproduction)
- Dispersal occurs by wind carrying micro water droplets, and water splash
- The average distance of spread is 100 meters but can travel 300 meters or more
- Also found in forests of northern California and Curry County Oregon, as well as European forests.
- It has been found at or spread to nurseries in Europe, California, Oregon, Washington, British Columbia and other states throughout the US.
- There are two mating types but three distinct lineages.

EU1 – European mating type. Found in Europe and US nurseries.

NA1 – North American. Found in forests of northern California and Curry Co. Oregon. This was the type shipped out to many US nurseries from California before the federal order was in place. Has the most genetic diversity.

NA2 – North American. Only found in US nurseries. Originating in Pacific NW nurseries.

- The three lineages appear to be reproductively isolated.North American and European, which are genetically separate, the European type is the most virulent
- Both types have now been found in Oregon but no sexual recombination has been found

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The issue of invasive plants, both terrestrial and aquatic, was addressed in two presentations.

Biological Control of Weeds in Oregon given by **Eric Coombs, Weed Program Entomologist at Oregon Department of Agriculture.**

The process of finding and introducing biological enemies of weeds in the United States was discussed. It takes 20-50 years and costs approximately a half million dollars per weed species. The process includes ID, foreign exploration, safety studies (host specificity), documentation for approval, importation, release, and redistribution.

Biological Control Programs of Weeds in Oregon include:

Tansy Ragwort - Cinnabar moth and flea beetle-control of this weed has saved cattle ranchers a significant amount of money in reduced poisoning incidents. Control takes place in about 5-7 years.

Scotchbroom - Four agents in use: a seed weevil, seed beetle, rust fungus, and broom gall mite.

Gorse – Gorse tip moth

Loosestrife - two leaf beetles

Morning glory - leaf gall mite, *Aceria malherbae*

Salt cedar - leaf beetle

Dalmation toadflax - toadflax stem weevil

Aquatic Invasive Species, Dr. Mark Sytsma, Environmental Sciences and Management, Portland State University

(Note: the PowerPoint for this presentation can be viewed on our website WHIS.org)

Presented many species with descriptions and photographs.

Characteristics of aquatic invasive plants:

- difficult to identify
- often confused with native species and legally imported species
- can reproduce from small vegetative fragments
- easily spread as hitchhiker species
- many are canopy forming which means they shade out other species and interfere with surface activities

The identifying characteristics of several exotic species were discussed:

- *Lagarosiphon major* - often called oxygen weed. African elodea (a federal noxious weed)
- *Egeria densa* - Brazilian elodea or anacharis. Has whorls with 4 leaves. Every 10 nodes a double whorl of 8 leaves occurs.
- *Hydrilla verticillata* - characterized by tubers and turions. Has monoecious and dioecious types. The former is more cold tolerant.
- *Myriopyllum spicatum* – Eurasian water milfoil. The leaves collapse around the stem when removed from water, the leaves of native species remain erect.
- *Myriophyllum heterophyllum* - Two-leaf watermilfoil, has two different types of leaves - emergent type above the water and another type below water.
- *Potamogeton crispus* - curly leaf pondweed, has lasagna-like leaves and turions
- *Myriophyllum aquaticum* - parrotfeather milfoil, is bright green and feathery
- *Iris psuedocorus* - yellow flag iris
- *Phragmites australis altissimus*
- *Typha angustifolia*—narrowleaf cattail—gap between male and female flower parts (two hot dogs on a stick)

- *Nymphoides peltata*—yellow floating heart
- *Trapa natans*—European waterchestnut has nusual spiny seed, triangular leaf floater.
- *Eichhornia crassipes*—water hyacinth
- *Salvinia molesta*—Leaves look like thumbprints. Hairs on leaves look like egg beaters
- Hitchhikers—snails, bivalves
- New Zealand mudsnail —5mm or less in length. Shell has 5 whorls, big to small end turns clockwise (if head is at bottom, opening of the shell will be to the right of animal).

Finally, two presentations were of regional subjects that overlap with the agriculture sector, and affect land and water use in Oregon.

Land Use Planning and Agricultural Land: The Oregon Perspective, Jim Johnson, Land Use and Water Planning Coordinator, Oregon Department of Agriculture.

Drastic loss of farmland in the late 1960's led to the adoption by the state of a land use policy in 1973. This policy protects high value farmlands from development and provided establishment of a specific court to address land use issues, the Land Use Board of Appeals. Statewide planning goals are to inventory agricultural land, protect agricultural land for farm use, contain urban development and develop appropriate rural services. The establishment of Urban Growth Boundaries ensures that farmland is the last resort for expansion with use of the worst soils first for development. The effects of these Urban Growth Boundaries was evident during the field trip the following day, where participants observed clearly defined small downtown areas and mile after mile of productive farmland, nurseries and greenhouses.

A Primer on Pacific Ocean Salmonids by retired ODA Horticulturist, founding member of WHIS and salmon enthusiast Kai Sjoblom.

Salmonids are placed in five categories, arranged here from smallest to largest

1. Pink – (humpback) smallest of the salmon, and most abundant
2. Sockeye – (red or bluebacks) distinguished by a hook nose and red sides
3. Coho - also have a hook nose, lighter red than sockeye, spotting on upper tail, are white along the gumline.
4. Chum – (kita, silverbright, dog) adults have canine teeth
5. Chinook- (king, blackmouth, tyee) found from Alaska to California, Largest was 126, caught commercially.

FROM EGG TO ADULT:

- Each fish lays 3000-10,000 eggs
- About 300 eggs survive to fry stage (1" long)

- About 50 fry make it to the ocean to spend 2 to 5 years
- About 5 fish survive to attempt to return to the spawn area
- Only about 3 fish complete the trip to spawn
- After they spawn, they die (trout go on to live some more)

WHIS Annual Meeting attendees were also given these words of wisdom:

“ A fish must swim three times: once in the ocean, once in butter, and once in wine.”