Oregon State University Extension Service http://cropandsoil.oregonstate.edu/newsnotes/

CROP and SOIL NEWS/NOTES

May, 2008
Vol. 22, No. 3

DATES AND PLACES

May 28 – Hyslop Farm Field Day, Corvallis. Details shown in article on page 2. Program is shown on page 19.

May 29 – Barley and Wheat CAP Meeting, 8 AM – 5 PM, LaSells Stewart Center, OSU Campus. For details, contact Mike Flowers (Mike.Flowers@oregonstate.edu or 541-737-9940).

June 3 – Hermiston Agricultural Research and Extension Center Grass Seed Field Day. Contact person is Don Horneck (don.horneck@oregonstate.edu or 541-567-8321).

June 3 – Hermiston Agricultural Research and Extension Center Wheat Field Day. For details, contact Don Horneck (don.horneck@oregonstate.edu or 541-567-8321).

June 3-4 – Dryland Cereals Working Group Spring Tour, Ontario and vicinity. Please see page 16 for details. Contact person is Steve Norberg (541-881-1417 or Steve.Norberg@oregonstate.edu).

June 5 – Malheur Experiment Station 2008 Treasure Valley Weed Tour, 9 a.m. to noon. Pesticide recertification credits are being requested for Oregon and Idaho. For further information, please contact Janet Jones (541-889-2174; email – janet.jones@oregonstate.edu

June 6 – Golden Jubilee Dinner, Crop Science Building, OSU Campus.

June 10 – CBARC Field Day, Pendleton, OR. Please contact the Research Center office (541-278-4186) for further information.

June 11 – CBARC Field Day, Moro, OR. Please contact the Research Center office (541-278-4186) for further information.

June 18 – 32nd Union County Crops & Conservation Tour. Begins at 7:30 AM at Western Farm Service on Booth Lane and ends at approximately 2 PM. See article on page 16 for more information. Contact person is Darrin Walenta (darrin.walenta@oregonstate.edu; 541-963-1010.)

June 25 – Hermiston Agricultural Research and Extension Center Potato Field Day. For details, please see contact Phil Hamm (Philip.b.hamm@oregonstate.edu or 541-567-8321).

July 9 – Malheur Experiment Station Annual Field Day, 8:30 a.m. to 1 p.m. Contact person is Janet Jones (541-889-2174; email – janet.jones@oregonstate.edu

August 19 – Hermiston Agricultural Research and Extension Center Sweet Corn Field Day. Contact person is Phil Hamm (Philip.b.hamm@oregonstate.edu or 541-567-8321).

August 26 – Malheur Experiment Station Onion Variety Field Day, 9 a.m. to 1 p.m. For information, please contact Janet Jones (541-889-2174; email – janet.jones@oregonstate.edu

October 21-22 – Oregon Society of Weed Science Annual Meeting, Hood River, OR. Please contact Rich Affeldt (541-475-7107; email: Rich.Affeldt@oregonstate.edu) for details.

Hyslop Farm Field Day on May 28

The Department of Crop and Soil Science will host their annual Hyslop Farm Field Day on Wednesday, May 28. Research scientists and extension specialists will cover various topics of interest to producers, those associated with the agriculture industry and the larger public.

This year's program has been organized around four modules focused on cereal production, oil seed crops, grass seed production and entomology. This is a departure from the traditional cereal tour in the morning and grass seed tour in the afternoon in an effort showcase more of the diverse research being conducted at Hyslop Farm. The full program will be given in the morning and then repeated in the afternoon. However, if one desires to take-in all four modules, they'll have to stay all day as only two modules can be witnessed in either the morning or afternoon.

This event is open to the public and will run from 9 a.m. until 4 p.m.with coffee and snacks starting at 8:30 a.m. The OSU Crops Club will be preparing a no-cost lunch at noon. The complete schedule is shown on page 19.

The grass seed module will cover nitrogen fertility, the role of roots, annual bluegrass control and choke in orchardgrass. In the entomology session, researchers will discuss barley yellow dwarf virus, crop pollination and bee populations and farmscaping for beneficial insects.

The cereal production module will include OSU's work on barley, wheat varieties, disease control on wheat and end use products. The oil seed production module will showcase OSU's research on winter canola, spring oilseed crops, camelina production and local oilseed processing.

Hyslop Farm is located six miles northeast of Corvallis on Granger Road, just off of Highway 20. Watch for signs.

For more information, contact Bill Young, OSU Extension seed specialist at 541-737-5859; e-mail: William.C.Young@oregonstate.edu; Mike Flowers, OSU Extension cereals specialist at 541-737-9940; e-mail: mike.flowers@oregonstate.edu; Andy Hulting, OSU Extension weed specialist at 541-737-5098; e-mail: Andrew.hulting@oregonstate.edu.

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SEED PRODUCTION

Bill Young

Revisiting Nutrient Amount and Value in Grass Straw

John Hart, Mark Mellbye and Bill Young

The rapidly increasing price of fertilizer heightened interest in the amount and value of nutrients in grass straw. We have written articles on the topic before, in 2001 and 2006, but continue to receive questions on the topic. To answer the question in a concise manner, this article provides nutrient removal and value per a ton of straw, formulas for calculating the value of nutrients in straw as fertilizer price changes, a summary of seed nutrient content, and the amount of nutrients supporting a perennial ryegrass seed crop.

The dollar estimates in Table 1 are calculated using retail fertilizer prices from March 24, 2008 of urea at $545/t, 11-52-0 at $790/t, and 0-0-60 at $450/t or N at $0.59/lb, P_2O_5 at $0.63/lb, and K_2O at $0.375/lb.

Table 1. Nutrient content per ton of perennial ryegrass or tall fescue straw and value of nutrients in straw using retail fertilizer prices from March 2008. Approximately 180 measurements from commercial fields since 1987 were used for the averages reported.

Nutrient	lb/ton	$/ton
Potassium (K_2O)	50	18.75
Nitrogen	20	11.85
Phosphorus (P_2O_5)	5	3.15
Magnesium	4	2.00
Sulfur	5	0.50
Calcium	6	0.50
Boron	.016	0.05
Approximate total value		36.80

Calculating the value of the nutrients in straw

Nitrogen

- To approximate the value of N in a ton of grass seed straw place the current price per ton of urea in the following formula:

  (Price per ton of urea/920) x 20 = approximate value of N/ton grass straw

  Example: if the cost of urea is $545/t: (545/920) x 20 = $ 11.85

- The availability of nitrogen from grass straw to the next crop is difficult to predict. However, after three years of returning the full straw load in tall fescue, N was taken into the crop faster and in greater quantity than in a treatment of vacuum sweeping the field. Approximately 20 lb/a more N was taken up by the grass grown on full straw load compared to the grass grown on vacuum swept plots managed with equal fertilizer N application.

Potassium

- To approximate the value of K_2O in a ton of grass seed straw place the current price per ton of KCl, 0-0-60, in the following formula:

  (Price per ton of 0-0-60/1200) x 50 = approximate value of K_2O/ton grass straw

  Example for potassium as K_2O if the price of 0-0-60 is $450/t: (450/1200) x 50 = $ 18.75

- The potassium in grass straw is immediately available to the next crop.

Seed Nutrient Content

The seed harvested from these grasses contains approximately 20 lb Nitrogen, 8 lb P_2O_5, and 6 lb K_2O/1000 lb of seed. Grass seed contains little S, about 0.06% or less than a pound is removed by an average yield. Most of the S is contained in straw, approximately 0.25% or 5 lb/ton of straw. The value of nutrients in the seed is about $20/1000 lb.

Nutrients in Roots

Perennial ryegrass has approximately 4t/a of roots that contain 65 lb Nitrogen, 27 lb P_2O_5, 20 lb K_2O, 40 lb Calcium, and 6 lb Sulfur. Most of these nutrients, including the nitrogen, are available for use to crops following perennial ryegrass.

Summary

The value of nutrients in 2.5 ton of straw, an average amount removed per acre, is approximately $90. The value of nutrients in an acre of a perennial ryegrass seed crop producing 1500 lb/a seed and 2.5 ton/a straw is approximately $120.

WEED CONTROL
Andy Hulting

Poisonous Plants and Weeds in Pastures-Part 1
Karin Neff, Andy Hulting and Mylen Bohle

Over the last several weeks we have received many calls about managing weeds in different types of pastures. These calls always seems to happen this time of year as warmer and drier weather settles in and people notice and identify undesirable plants in their pastures both large and small. Examples across the state range from bulbous bluegrass to bulrushes. Though the window of time for effective cultural and chemical control of many of these species closes quickly this time of year it is never too late to consider managing weeds in pastures. Good pasture management practices are always important, but it seems now more than ever the goal of maximizing forage production within pastures is crucial given that supplies of purchased forage are tight and extremely expensive. Unfortunately, with this added reliance on maximizing forage in all types of pastures the potential to overgraze and degrade them exists. Taken to the extreme, this may force livestock, such as cattle, sheep and horses, to graze plants that they normally wouldn't eat. It is under these situations that toxic plants and livestock poisoning become an issue for landowners who are either unaware of toxic weed populations in their pastures or who simply can not afford to buy additional forage.

The following article is a portion of an upcoming publication on the description and management of poisonous plants in pastures. A partial listing of the types of toxic compounds found in plants, plant species containing these toxins and symptoms exhibited by livestock after consuming these toxins is provided this month. In the next issue of News and Notes we will discuss control and management strategies for some of these plants in pastures.

Pastures often contain weeds that are potentially dangerous to livestock. However, weeds with toxic compounds are generally not palatable to livestock unless no other forage is available. The toxic compounds in plants are usually a defense mechanism against predation and have a distinct, unpleasant odor or a bitter taste and are therefore avoided. However, consumption of unpalatable plants will increase under some circumstances.

Plant growth stages can influence the palatability and toxicity of certain plants, as can climate and time of year. Some plants, like those that accumulate nitrate, can increase in toxicity after rainfall or on cool, cloudy mornings and evenings. Some plants become more palatable after a frost. Many toxic plants have specific growth stages or plant parts that are most toxic. Avoiding grazing pastures that contain these plants when they are most toxic will greatly reduce the chances of livestock being harmed. Minimizing overgrazing, knowing the locations of established weed populations and managing weed populations to reduce size and spread will ensure the health of pastures and reduce the risk to livestock.

<u>Nitrate Poisoning</u>

Plants absorb nitrates from the soil and metabolize them into plant proteins. If plants absorb excess nitrates and are consumed by livestock before they are converted to proteins, nitrate poisoning can occur. Forage crops that are over fertilized before being harvested or grazed can be a common cause of nitrate poisoning. However, excess nitrate accumulation also occurs readily in some common pasture weeds. Nitrate concentration can vary widely among plants and growing conditions. Nitrates are highest in plants in mornings and evenings, and on cool, cloudy days (when plant metabolism is slower). Drought, fertilization and nutrient deficiency can result in nitrate accumulation. Highest concentrations occur generally in stems rather than leaves, flowers or fruit/seed.

An animal's metabolism converts nitrate (NO_3) to nitrite (NO_2), which is toxic. This occurs less frequently for horses, which do not readily convert nitrate to nitrite. In small quantities, nitrates are reduced by the rumen's bacteria to microbial proteins—it is the rapid absorption of large quantities of nitrates that can lead to poisoning, overwhelming the rumen's ability to convert nitrates into protein. Increasing the carbohydrates (energy content) in an animal's diet can prevent poisoning as it allows the conversion of nitrates to proteins to occur more quickly, reducing the likelihood of nitrate poisoning.

Symptoms of nitrate poisoning include drowsiness and weakness followed by muscular tremors, increased heart and respiratory rates, staggering gait and recumbency (inability to remain standing without support). Sub-lethal doses can cause abortion and reduced milk production. Animals suspected of having nitrate poisoning should be kept stress free and the suspect food source removed. Forages assumed of being high in nitrates, especially if they have been heavily fertilized with N-fertilizer or experienced drought, should be tested.

<u>Oxalate Poisoning</u>

Rather then absorbing excess nitrates, some plants store high quantities of potassium and sodium oxalates (salts). If large quantities of oxalate accumulating plants are eaten, the rumen is overwhelmed and unable to metabolize the salts and they are absorbed into the bloodstream. In the bloodstream they form insoluble salts that precipitate in the kidney, causing kidney failure.

Sheep are most susceptible, then cattle. Cattle are able to detoxify large quantities of oxalates in their rumen, reducing chances of poisoning. Animals can develop a tolerance for oxalate accumulating plants by building up the concentration of oxalate-degrading bacteria in the rumen. If eaten in small amounts over time, with other feed to dilute the concentrations in the rumen, oxalate accumulating plants cease to be a problem.

Within a few hours of poisoning, animals develop muscle tremors, tetany (calcium deficiency), weakness and recumbency. Coma and death can follow within 12 hours of consumption. Livestock should be adapted to oxalate plants over four days, incrementally increasing the time allowed to graze the plants, before being left in pastures containing high concentrations of oxalate-accumulating plants.

Common Pasture Plants Causing Nitrate and Oxalate Poisoning

Amaranthus retroflexus	Redroot pigweed
Chenopodium album	Common Lambsquarters
Malva neglecta	Common mallow
Rumex spp.	Dock species

Plants Affecting Liver Health

Photosensitization

Plants causing liver disease and photosensitization (sensitivity to sunlight) are often grouped together, as photosensitization is often, but not always, a secondary symptom of liver disease caused by poisonous plants. As chlorophyll breaks down, it becomes phylloerythrin, a phototoxic compound. In healthy animals, the liver filters phylloerythrin from the blood, preventing any damage. If the liver is compromised by toxins, it is unable to remove the compound from the blood and photosensitization occurs. Some plants contain compounds that, once absorbed into the bloodstream, react to UV exposure, without any effect on the liver. Photosensitization resembles severe sunburn. Plants from a variety of families can impact liver health or cause related nutrient deficiencies. Photosensitization symptoms are most significant on white skinned animals or white skinned portions of animals, around the face, and near hooves.

Common Pasture Plants Affecting the Liver and Blood and/or Causing Photosensitization

Allium spp.	Onion species
Descuriania sophia	Flixweed/Tansy mustard
Equisetum spp.	Horsetail and Scouring rush
Hypericum perferatum	St. Johnswort
Pteridium aquilinum	Western brackenfern
Thermopsis rhombifolia	False lupine
Tribulus terrestris	Puncturevine
Trifolium spp.	Clover species
Vaccaria pyramidata	Cowcockle
Xantium strunarium	Cocklebur

Pyrrolizidine Alkaloid Poisoning

Pyrrolizidine alkaloids are the most common cause of liver damage. Found in numerous species, pyrrolizidine alkaloids are most toxic for pigs, then poultry, cattle, horses, goats and sheep, with sheep being the least susceptible. These alkaloids cause photosensitization, liver and kidney damage and can also cause cancer and heart failure.

Animals will not readily eat plants containing pyrrolizidine alkaloids, unless no other forage is available. However, plants become more palatable when dried and will be readily eaten in hay, with little loss of toxicity. Effects are cumulative, so symptoms may not appear until long after the toxic plant was eaten.

Common Pasture Plants Causing Pyrrolizidine Alkaloid Poisoning

Amsinkia intermedia	Fiddleneck
Cynoglossum officinale	Houndstongue
Senecio spp.	Ragworts and Groundsels
Symphytum spp.	Comfrey

Plants Affecting the Nervous System or Causing Sudden Death

Cyanogenic Glycosides

Cyanogenic glycosides are present in many plants and are converted to hydrogen cyanide or prussic acid when plant cells are damaged. The concentration of cyanogenic glycosides within a plant is variable: growth stage, moisture and time of day can all influence plant cyanogenic glycosides levels. Fertilization and herbicide application can increase cyanogenic glycoside concentrations. Chronic cyanide poisoning from eating sublethal doses over time causes loss of nerve function. Acute cyanide poisoning causes sudden death. Care should be taken to remove or exclose plants containing cyanogenic glycosides from pastures.

Common Pasture Plants Affecting the Nervous System	
Acroptilon repens	Russian knapweed
Apocynum cannabinum	Hemp dogbane
Centaurea solstitialis	Yellow starthistle
Cicuta douglasii	Western waterhemlock
Conium maculatum	Poison hemlock
Daucus carota	Wild carrot
Delphinium spp.	Larkspur species
Prunus spp.	Black cherry and Chokecherry
Trifolium spp.	Clover species
Triglochin spp.	Arrowgrass

Plants affecting cardiovascular health

Cardiac glycosides are the most common toxin affecting cardiovascular health and are found in wide variety of plant families. Generally all parts of the plant are highly toxic and lethal if eaten in small quantities. Plants containing cardiac glycosides are not a significant cause of livestock death, as most plants are not very palatable.

Common Pasture Plants Containing Cardiac Glycosides	
Asclepias spp.	Milkweed species
Digitalis purpurea	Foxglove
Solanum spp.	Nightshade species

Plants Causing Irritation

Some plant compounds will irritate the digestive tract, mouth or skin if consumed. Death seldom results from the consumption of these plants. Plants are not generally palatable and are generally avoided.

Common Pasture Plants Causing Irritation	
Conyza canedensis	Horseweed/Fleabane
Euphorbia esula	Leafy spurge
Juniperus occidentalis	Western juniper
Ranunculus spp.	Buttercup
Vicia villosa	Wooly vetch

Plants Causing Physical Injury

Many plants have characteristics that can cause injury to grazing animals. Many grasses can be palatable when young, but injurious once they have matured with long awns that cause injury to the nose, eyes, mouth and ears of grazing animals.

Common Pasture Plants Causing Physical Injury	
Bromus spp.	Ripgut brome, Cheat, Downy brome, etc
Cenchurus lonispinus	Longspine sand bur
Holcus spp.	Velvetgrass species
Hordeum spp.	Foxtail and Hare barley
Taeniatherum caput-medusae	Medusahead grass
Tribulus terrestris	Puncturevine
Urtica doica	Stinging nettle

Summary

Survey pastures-know what toxic weeds are present and understand their biology/ecology

Manage grazing to minimize risk and maximize forage

Manage pastures to minimize weed spread

Control weed populations when necessary

Make an adaptive management plan based on the resources available

Keep the plan flexible-evaluate effectiveness and change methods/timing if necessary

Monitor successes and failures in your plan

Use multiple management techniques to minimize costs and to avoid unintended effects

Additional Resources On Poisonous Plants

Brown, D. Cornell University Poisonous Plants Informational Database. Cornell University. Updated January, 2008. http://www.ansci.cornell.edu/plants/

Knight, A.P. and R.G. Walter. 2001. A Guide to Plant Poisoning of Animals in North America. Teton NewMedia Publishers, Jackson, WY.

Knight, A.P. Online Guide to Poisonous Plants. Colorado State University. Updated March, 2008. http://www.vth.colostate.edu/poisonous_plants/

CEREALS

Mike Flowers

Continuing with the series of newly developed wheat variety guides; in this issue I have included the variety guide for Norwest 553 hard red winter wheat. Norwest 553 was co-released by OSU and Nickerson, U.K. in 2007 and is best adapted for the high rainfall and irrigated regions of eastern Oregon and southeastern Washington.

Norwest 553 - Hard Red Winter Wheat

Michael Flowers, Extension Cereals Specialist, Oregon State University, C. James Peterson, Professor – Wheat Breeding and Genetics, Oregon State University, John Burns, Extension Agronomist, Cereal Variety Testing, Washington State University, and John Kuehner, Scientific Assistant, Cereal Variety Testing, Washington State University

Variety Description:

Norwest 553 is a common hard red winter wheat variety developed by Oregon State University and Nickerson U.K., in cooperation with USDA-ARS. It is an awned, short-statured, semidwarf variety with high yield potential and good milling and baking quality. Norwest 553 is resistant to stripe rust and tolerant to *Fusarium* crown rot (dryland foot rot). Norwest 553 is moderately resistant to *Cephalosporium* stripe and susceptible to strawbreaker (eyespot) footrot.

Area of Adaptation:

Norwest 553 is best adapted to the high rainfall (> 18 inches) and irrigated regions of eastern Oregon and Washington (checkered regions). The low to medium rainfall (12 to 18 inch) regions of eastern Oregon and Washington (striped regions) are considered a secondary area of adaptation. In these regions, the performance of Norwest 553 has been similar to other hard winter wheat varieties. However, tolerance of Norwest 553 to winter cold and/or drought conditions may be less than other hard red winter wheat varieties.

Year Released:

Norwest 553 was released in 2007 and was co-developed and is co-owned by Oregon State University and Nickerson U.K. It is protected under Plant Variety Protection act with Title 5 option. Seed of Norwest 553 is available only as Certified seed through licensed seed dealers. Commercial growers may not retain or sell seed for the purpose of planting or replanting.

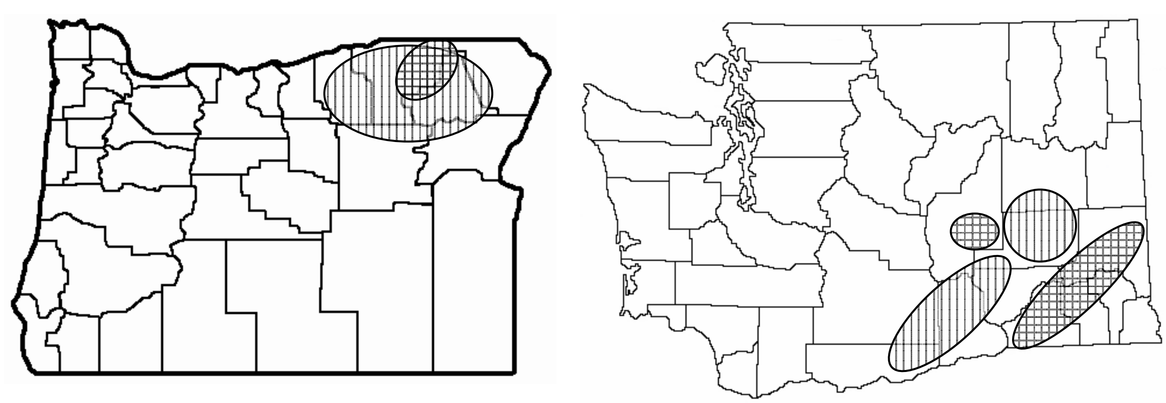
Agronomic Characteristics:

Height and Lodging Resistance

In trials over 12 site-years in Oregon and 19 site-years in Washington, Norwest 553 has averaged 28.6 and 28.3 inches, respectively. Norwest 553 is approximately 6 inches shorter than Bauermeister (HRW) and 3 inches shorter than Agripro Paladin (HRW) and Stephens (SWW; Tables 1 and 2). Straw strength is excellent and lodging has not been observed in any production environment.

Maturity

Norwest 553 is a mid-season maturing variety, similar to Boundary (HRW), Tubbs (SWW), and Agripro Paladin. It heads 3 days earlier than Bauermeister and approximately 2 days later than Eddy (HRW; Tables 1 and 2).



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Vernalization and Cold Tolerance

Norwest 553 is a winter wheat that requires vernalization to initiate flowering. Results from crown freezing tests, a measure of winter cold tolerance, conducted by the USDA-ARS have been mixed. Norwest 553 appears to have less cold tolerance than Boundary, and slightly less tolerance than Bauermeister, Agripro Paladin, and Eddy (Table 3). Norwest 553 should not be planted north of Highway 2 in Washington. Growers south of Highway 2 in Washington might experience some winter kill or injury during unusually cold winter temperatures, especially without adequate snow cover. Under normal conditions, growers in southeast Washington and northeastern Oregon are unlikely to observe winter injury during production of Norwest 553.

Disease Resistance

Norwest 553 is resistant to current races of stripe rust and moderately resistant to *Fusarium* crown rot. Both are important diseases of wheat in eastern Oregon and Washington. Norwest 553 also is moderately resistant to *Cephalosporuim* stripe and Septoria leaf blotch. Norwest 553 is susceptible to strawbreaker footrot. A seed treatment is recommended to control bunt and other seedling diseases (Table 3).

Yield

Norwest 553 has been shown to have high yield potential across a range of environments in Oregon and Washington. Norwest 553 excels in the high rainfall and irrigated production systems in both states. Over 6 site-years of OSU variety testing in high rainfall and irrigated environments, Norwest 553 averaged 114.7 bushels per acre, similar to Agripro Paladin and Stephens and 18 bushels per acre higher than Bauermeister (Table 1). Similarly, in 10 site-years of WSU variety testing in high rainfall and irrigated environment, Norwest 553 averaged 131.2 bushels per acre, similar to Boundary and 5 to 10 bushels higher than Eddy, Agripro Paladin, and Bauermeister (Table 2). In low to medium rainfall environments in Oregon, Norwest 553 averaged 61.5 bushels per acre across 9 site-years. This is similar to Bauermeister and Stephens and 6 bushel per acre higher than Agripro Paladin. In low to medium rainfall environments in Washington, Norwest 553 averaged 45.0 bushels per acre across 9 site-years. This is similar to Agripro Paladin and 5 to 13 bushels per acre lower than Eddy, Bauermeister, and Boundary.

Test Weight and Quality

Test weight of Norwest 553 averaged 63.0 pounds per bushel across 13 site-years in Oregon and 61.3 pounds per bushel across 19 site-years in Washington. These test weights are similar to Eddy and Agripro Paladin. Test weight of Norwest 553 ranged from 2 to 3 pounds per bushel more than Bauermeister and Boundary in Oregon and 2 pounds per bushel more than Bauermeister in Washington (Tables 1 and 2). Grain protein of Norwest 553 averaged 11.5% in Oregon and 12.6% in Washington similar to Agripro Paladin. Norwest 553 averaged 0.5 to 0.7% higher grain protein than Bauermeister and Boundary in Oregon and Washington. (Tables 1 and 2).

Milling and baking evaluations from the USDA-ARS Western Wheat Quality Laboratory and the Wheat Quality Council reflect that Norwest 553 meets the specifications for the hard red winter wheat class. Flour yield, flour ash, and flour protein values were similar to Agripro Paladin and Bauermeister. Mix adsorption was similar to Agripro Paladin and 1.5% lower than Bauermeister. Norwest 553 has superior protein and mixing quality as compared with current PNW hard red winter wheat varieties. Mixing time was 2.1 minutes longer than Bauermeister and 1.3 minutes longer than Agripro Paladin. Loaf volume was equal to Bauermeister and 44 cc lower than Agripro Paladin. Crumb ratings were equal to Bauermeister and Agripro Paladin (Table 4).

Development

Norwest 553 was derived from the cross 95B343/Isengrain made in 1996 by the Verneuil Company, FR. Norwest 553 was developed as a doubled haploid from an F1 plant in the 1997-1998 growing season and given the selection designation 00B553. From 1998 to 2001, 00B553 was evaluated in France in Verneuil Company breeding trials. In 2001, Verneuil was acquired by Limagrain Agro-Industrie S.A. In fall, 2001, seed of 00B553 was provided to Oregon State University under a germplasm exchange agreement with Nickerson, UK, a division of Limagrain Agro-Industry S.A. The selection was subsequently tested in Oregon under the experimental designation ORN00B553.

Breeder and Foundation seed will be maintained by Washington State Crop Improvement Association (WSCIA). Norwest 553 is being submitted for Plant Variety Protection with the Title 5 option. Certification classes recognized for Norwest 553 include Foundation, Registered and Certified. Certified seed will be produced and sold only under non-exclusive license with Oregon State University. Commercial growers may not retain seed for purposes of planting or replanting. Seed of Norwest 553 has been deposited in the USDA National Small Grains Collection, Aberdeen, Idaho. It is requested that the source of this material be acknowledged in future use by wheat breeding and genetics programs.

Acknowledgements

Appreciation is extended to the Oregon Wheat Commission for financial support in the development of Norwest 553.

Variety Development Team

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Table 1. Grain yield and agronomic data for five hard red winter wheat and two soft white winter wheat varieties grown across a range of environments in Oregon from 2005 to 2007.

		Grain Yield						Agronomic Data			
		High Rainfall and Irrigated Sites			Low to Medium Rainfall Sites			Test Weight	Grain Protein	Plant Height	Heading Date
Variety	Class	1-Year Mean	2-Year Mean	3-Year Mean	1-Year Mean	2-Year Mean	3-Year Mean	13-Site Years	9-Site Years	12-Site Years	2-Site Years
		bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	lbs/bu	%	in	DOY
Norwest 553	HRW	130.4	115.7	114.7	58.6	57.7	61.5	63.0	11.5	28.6	137.3
Stephens	SWW	121.3	112.5	111.5	60.3	55.5	60.5	60.2	10.8	31.8	136.2
Tubbs-06	SWW	130.6	119.7		63.7	59.0		59.8	10.4	35.3	136.7
Boundary	HRW	118.4	107.6		57.7	53.7		61.1	10.8	32.3	137.2
Bauermeister	HRW	121.7	99.5	96.4	65.7	58.9	61.6	60.0	10.8	34.7	141.0
Eddy	HRW	121.5			57.8			63.2	10.9	32.9	135.3
Agripro Paladin	HRW	115.7	110.2	108.1	55.4	52.5	54.7	63.1	11.5	31.9	135.8
Mean		122.8	110.9	107.7	59.9	56.2	59.6	61.4	11.0	32.4	137.1
LSD (0.05)		12.6	10.7	10.1	7.4	4.9	3.9	1.1	0.5	0.8	0.7

Table 2. Grain yield and agronomic data for five hard red winter wheat varieties grown across a range of environments in Washington from 2005 to 2007.

		Grain Yield					Agronomic Data			
		High Rainfall and Irrigated Sites			Low to Medium Rainfall Sites		Test Weight	Grain Protein	Plant Height	Heading Date
Variety	Class	1-Year Mean	2-Year Mean	3-Year Mean	1-Year Mean	2-Year Mean	19-Site Years	19-Site Years	19-Site Years	19-Site Years
		bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	lbs/bu	%	in	DOY
Norwest 553	HRW	118.9	127.1	131.2	41.0	45.0	61.3	12.6	28.3	147.3
Boundary	HRW	125.2	132.3	134.9	54.6	58.7	60.7	12.1	32.0	148.4
Bauermeister	HRW	126.1	120.3	121.0	55.5	56.4	59.5	12.1	35.6	150.5
Eddy	HRW	121.3	123.3	125.7	47.2	50.6	62.3	12.4	31.4	145.6
Agripro Paladin	HRW	115.9	121.6	124.0	44.6	48.0	61.9	12.7	31.9	146.3
Mean		121.5	124.9	127.4	48.6	51.8	61.2	12.4	31.8	147.6
LSD (0.05)		8.3	6.9	6.7	4.7	3.6	0.3	0.2	0.5	0.4

Table 3. Agronomic and disease ratings for five hard red winter wheat varieties grown in Oregon and Washington.

Variety	Maturity	Winter Hardiness*	Rust[†]		Septoria[†]	Crown Rot[†]	Cephalosporium Stripe[†]	Strawbreaker Foot-Rot[†] *Pseudocercosporella*
			Stripe	Leaf				
Norwest 553	Mid-Season	5	MR/R		MR/MS	MR/MS	MR/MS	S
Boundary	Mid-Season	8	MS	R		MS/MR		S
Bauermeister	Mid-Late	6	MR/MS			MR/MS	MR	S
Eddy	Mid-Season		MR/MS			S		S
Agripro Paladin	Mid-Season	6	MS/MR		R	MR/MS	MR	S

[*] Scale: 1 to 10, with 10 being excellent and 1 being poor.
[†] Scale: R = Resistant; MR = Moderately Resistant; MS = Moderately Susceptible; S = Susceptible
Data is complied from the following sources: Winter Grain Varieties for 2003, Special report 775, Oregon State University Extension Service; 2004 through 2007 Oregon Winter Elite Yield Trial Disease Ratings; and Variety Characteristics, Washington State Crop Improvement Association.

Table 4. End-use quality analyses of Norwest 553 hard red winter wheat in paired comparisons with Bauermeister and Paladin. Data provided by USDA-ARS Western Wheat Quality Lab.

Variety	Flour Yield	Flour Ash	Milling Score	Flour Protein	Mix Absorption	Mixing Time	Loaf Volume	Crumb Rating
	%	%		%	%	min	cc	1-9
Norwest 553	72.1	0.39	87.4	12.2	62.1	5.1*	877	4.3
Bauermeister	71.8	0.42	85.1	12.0	63.6*	3.0	909	4.7
Norwest 553	71.6	0.39	87.0*	12.2	61.9	5.1*	887	4.0
Agripro Paladin	71.6	0.41	85.7	12.3	61.7	3.8	931*	4.0

*indicates a statistically significant increase ($p < 0.05$) based on a paired t-test.

POTATOES

Jeff McMorran

The Potentials of True Potato Seed

A recent inquiry from Mercy Corps inquiring as to the expected price for true potato seed (aka **TPS**) lead me to wonder just how much TPS the potato world was using these days. Although the backbone of conventional breeding programs in the United States, TPS is not widely used in North America for commercial crops. Here essentially all commercial potato production uses cut up pieces of relatively disease free tubers (or ‘seed pieces’). Though these seed pieces produce a very uniform crop with fairly little labor inputs, they must also be carefully stored during the winter to prevent rots and sprouting, are rather bulky to transport and handle, and require around a ton per acre for planting.

The exacting requirement for uniformity and the cost of labor has limited the appeal of TPS here, though lately it has been promoted among ‘organic’ producers as a vehicle to obtain sources of their own local disease-resistant planting stock at a relatively low cost using a sow and select-from-the-survivors approach.

Potatoes do produce true seed, as evidenced by the small marble size green fruits found on the top of potato plants in August. Each fruit contains about 40-50 viable seeds, capable of producing a tuber-baring plant in one season. The progeny of these seeds are all different, just like you are different from your siblings, including variation in resistance to diseases, flesh and skin color, taste, maturity, etc. In addition, the yield of tubers produced on field-sown seed is generally less than with seed pieces. So why use them? Because the progeny of these seeds are also disease free.

Except for a very few virus-like diseases (i.e. Potato Spindle Tuber Viroid, PSTV) the diseases that tend to plague vegetative production of potatoes are left behind in the mother plant. Potato tuber production with TPS permits a way to have clean planting stock, at a low cost, with fairly little technology, in a form that can be easily stored and transported.

There are approximately 1.2 million seeds per kg and it only takes about 50 grams of seed to plant a hectare (4.3 oz/acre). Cost varies but at the current rate of $1,000 to $1,500 per kg (in bulk), that means it only costs around $50 to $75 in seed to plant a hectare of potatoes ($124-$185/acre). Compare that to cost of $1,000-$1,400/hectar ($500-$700/acre) to plant an acre with conventional seed pieces.

If TPS has so much potential, why isn’t it more widely used? In fact it is, or was, just not here in North America. According to Kerry Miller[*1], in 1997 these ‘magic seeds’ were used in 30 countries worldwide producing 40% of Nicaragua’s potato crop, over 10,000 hectares of India’s crop, and 9,000 hectares of China’s 3 million hectares. At that time private companies were marketing TPS in South East Asia, Africa, and Latin American countries such as Paraguay, Chile, the Dominican Republic, Nicaragua, Cuba, and Peru. According to Dr. Miller, in areas that were often plagued by pests and harsh climate conditions yields are equivalent to those obtained under optimal conditions in the United States. K.O Fuglie[*2] notes that at the end of the 1990’s in Vietnam, 10% of the total planted potato acreage was planted from TPS on over 100,000 small farms. In addition, growers were experiencing greater yields than they were able to achieve with seed pieces used from conventional sources.

There are some problems with the use of TPS however. It is difficult to successfully sow the seed directly into the field unless the season is very long and initial conditions are mild. TPS is generally sprouted in a protected environment and either transplanted into the field as plantlets, or used to produce 'minitubers' that are planted the following season. This system yields well but takes a large amount of labor. In China[*3] TPS use peaked in the 1970s with over 300 ha of TPS source plantings, but has declined ever since. Growers complained that their main problems with TPS use included lack of uniformity, difficulties in obtaining quality TPS, and the high labor cost of using TPS. Increased availability of clean tissue-culture derived material, and the occurrence of PSTV in TPS seed stocks, also lead to the decline of TPS use in many parts of the world.

How about the US? About 5 years ago Oregon Seed Certification Service was approached by Bejo Seeds Inc of Gilroy, CA about the possibility of certifying the progeny of two TPS 'varieties', Catalina and Zolushka, for the US market. Under this system, the Oregon Foundation Seed Project produced the minitubers which were then planted into an Oregon grower's field the next season. For an agency used to certifying uniform vegetatively propagated clones of genetically identical potato varieties, this was a bit of a challenge for the Certification Service. The resulting crop was healthy, but had a great deal of variation in plant type, flower color, and tuber shape. In this system there were minimal lab testing costs and no tissue culture required. The mini-tuber production cost and testing fees were the same as for the conventional tissue culture increased material.

This use of TPS in mainstream potato production in the US showed promise, but due to the variability of the planting stock, coupled with the costs, didn't seem to have much appeal for Oregon's major seed or commercial potato producers so the project was dropped. According to Peter van Hess, who headed up the endeavor, Bejo discontinued the production of these two varieties on a large scale and now concentrates on producing hybrid lines that can be more easily accepted by the 'conventional' potato seed industry by looking for ways they can sell seed without having the 'restrictions' imposed by registration and certification. Bejo now wants to go directly from TPS to marketable tubers, bypassing the certified increase phases. In essence, they want to be able to plant potatoes like one plants tomato crops, directly from true seed. The use of TPS in the US might still have potential for home gardeners or the small scale organic market for which this seed is still available, but at a much higher price.

In short, in areas of the world where the transportation and storage of potato seed pieces is not practical, and where labor is relatively inexpensive, TPS has shown to be economically viable. In areas of the world that are not under these constraints, the lack of uniformity tends to preclude the use of TPS as the major source of potato planting stock.

Selected & Cited References:

*1 - Kerry Miller, 1977: "True Potato Seed, a Blessing for the Poor" by Devel-L News 1997.

*2 - K.O Fuglie (et al), 2000: "Economic Returns to Research on True Potato Seed in Vietnam" (CIP Annual Report, 2000)

*3 - Song Bofu (et al), 1987: "True Potato Seed in China: Past, Present and Future" Am. Potato J 1987.

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SOIL JUDGING

Will Austin

Soil Judgers Competed at Nationals

The soil judging team traveled to Rhode Island to compete in the National collegiate contest. Rhode Island is a very small state, about the size of Benton County, Oregon. All though small size RI had a lot of features to challenge the soil judging team. First of all, there is no significant clay in the soils. The southern portion of the state is mostly glacial outwash, drumlins, eskers and moraines. The soils occurring on these features are inceptisols and therefore you should not expect significant clay illuviation. Secondly, there are Ap horizons below the A horizons!!?? This is because the land was cleared in the 1700's for farming, subsequently abandoned in the 1800's, and the forest has grown back and there you have it, A over Ap. Thirdly, there are sub aerial soils. To put this in clearer terminology, these are soils that occur under water. These soils are permanently under water in estuaries and glacial lakes. I am not wholly sold on this concept but I am willing to try and understand this new idea.

Mark Stolt at the University of Rhode Island put on a great contest. This was one of the best soil judging learning experiences I have attended. Well done Mark!

The OSU team placed 8th in the team judging portion of the contest and 12th overall. Our top judger was Phillip Iverson. Phillip placed 27th overall. This year's team members are Phillip, Jon Iverson, David Rand, Julie Collins, Priscilla Woolverton, and Daniel Meyers.

Oregon Department of Environmental Quality (DEQ)

The OSU soil judging team hosted a 2 day field experience for the DEQ. The field experience consisted of one day of practice pits and a second day of individual and team contest pits. The soil judgers acted as official pit judges and official scorers for both the practice and contest pits. There were 60 DEQ participants in attendance.

SEED CERTIFICATION

Terry Burr

Oregon Certification Acreage Sign-up Status for 2008

The Oregon Seed Certification Service prepares a status of sign-ups for Oregon certification each year.

We are reporting this year's acreage sign-up for Oregon Certification, as of May 1st 2008, Totals are 232,709 acres representing 5,629 fields (-6,637 acres, a decrease of 3% over last year) this compares to previous sign-up listing of:

May 1, 2007 was 239,346 acres
May 1, 2006 was 230,690 acres
April 29, 2005 was 245,570 acres
April 30, 2004 was 235,311 acres
May 1, 2003 was 217,787 acres
May 1, 2002 was 235,779 acres
May 1, 2001 was 243,390 acres
May 1, 2000 was 246,062 acres
May 1, 1999 was 256,778 acres
May 1, 1998 was 246,649 acres
May 1, 1997 was 223,958 acres
May 1, 1996 was 198,339 acres
May 1, 1995 was 203,692 acres
May 1, 1994 was 202,712 acres
May 1, 1993 was 211,929 acres
May 1, 1992 was 213,277 acres

Crops showing an **increase of more than 1,000 acres** in acreage signed up for Oregon certification over 2007 figures are: Tall fescue (+3,725 acres, an increase of 3% over last year) Wheat (+5,726 acres an increase of 80% over last year).

Crops showing a **decrease of more than 1,000 acres** in acreage signed up for Oregon certification over 2007 figures are: Colonial bentgrass (-1,024 acres a decrease of 31% over last year) Kentucky bluegrass (-1,797 acres a decrease of 13% over last year). Perennial ryegrass (-13,314 acres, a decrease of 20% over last year).

Overall acreage totals will change as additional and late sign-ups come in and also where fields are withdrawn prior to inspection. Reviewing this year's response from seed growers, acres reported for Oregon Certification inspection are shown as follows:

76% of the acreage has been signed up for inspection, 6% of the acreage is not to be certified this year, and 18% of the acreage has been removed. As of May 1, 2008, there are 6,487 acres yet to be accounted for and could be signed up for inspection for 2008.

Oregon Certification is not complete until all record checks, field evaluations, and seed testing meets all standards and Oregon certification tags are issued and attached to individual bags of seed. Certification bulk shipping certificates can also be used with bulk or bag cereal grain.

Number of Fields and Acres Signed up in 2008 by Crop Kind and Generation

	Foundation		Registered		Certified		Total	
Crop Kind	Field	Acres	Fields	Acres	Fields	Acres	Fields	Acres
Alfalfa					7	296	7	296
Annual ryegrass	5	25	7	68	50	2,437	62	2,530
Barley			2	40	1	26	3	66
Big bluegrass			1	21	5	46	6	67
Blue fescue	1	2					1	2
Blue wildrye	3	3					3	3
Chewings fescue	5	19	4	33	177	7,357	186	7,409
Club wheat			1	20	3	426	4	446
Colonial bentgrass	1	7	1	5	60	2,212	62	2,224
Creeping bentgrass	8	19			171	4,615	179	4,634
Crimson clover			1	37	2	210	3	247
Durum wheat			1	10	1	56	2	66
Festolium					2	106	2	106
Hard fescue	4	20	3	24	56	2,330	63	2,374
Idaho bentgrass					1	49	1	49
Intermediate ryegrass	1	4			12	399	13	403
Kale					1	16	1	16
Kentucky bluegrass	23	75	24	118	301	11,831	348	12,024
Ladino clover	2	7			21	2,029	23	2,036
Lewis flax			3	26			3	26
Little burnet	1	5	1	8	6	165	8	178
Meadow fescue					1	24	1	24
Meadowfoam			1	14			1	14
Oat	1	1	3	41	5	229	9	271
Orchardgrass	9	29	2	42	205	7,309	216	7,380
Perennial ryegrass	35	204	35	282	1,158	50,638	1,228	51,124
Red clover	3	11	1	20	17	820	21	851
Red fescue	9	44	3	49	109	5,100	121	5,193
Red oat			1	21			1	21
Redtop	1	11					1	11
Riverbank lupine					1	3	1	3
Rough bluegrass	1	2			64	1,913	65	1,915
Seashore paspalum					18	255	18	255
Sheep fescue	2	19	1	6	7	434	10	459
Smooth brome	1	5					1	5
Tall fescue	73	398	23	217	2,607	114,499	2,703	115,114
Triticale					9	463	9	463
Tufted hairgrass	1	7			1	6	2	13
Velvet bentgrass					6	139	6	139
Wheat			49	2,143	161	10,741	210	12,884
White clover			1	3	23	1,340	24	1,343
Winter rape					1	25	1	25
Total	190	917	169	3,248	5,270	228,544	5,629	232,709

IRRIGATED CROPS, ENTOMOLOGY

Silvia Rondon

Tuber Resistance in Early Generation Selection of Potatoes to Potato Tuberworm

S.I. Rondon, M.I. Vales, D. Hane

Potato tuberworm *Phthorimaea operculella* (Zeller) is one of the most important potato pests worldwide. Typically found in tropical and subtropical regions, the potato tuberworm (PTW) was first detected in Oregon in 2002. By 2005, PTW spread extensively across Oregon and south eastern Washington. In 2006 and 2007, PTW populations were lower than the previous year, but the insect is still present in damaging numbers and well established in the region.

Potato tuberworm larva mines foliage and tubers tubers

Much research has been published on PTW around the world and a conclusion that can be drawn from this research is that an integrated pest management (IPM) approach is necessary for long term control of PTW. Work is being conducted to determine whether plant resistance in potatoes could be an effective

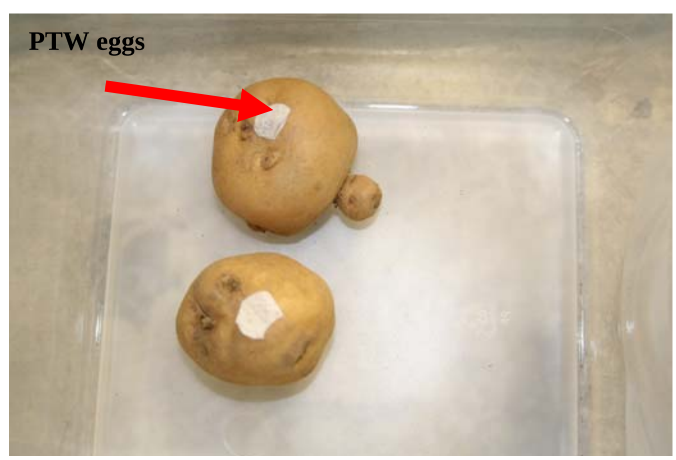
Severe potato tuberworm damage

tool in an IPM program to control PTW.

Potato tubers placed on the surface of the soil to be exposed to natural populations of PTW

<u>Plant breeding program efforts</u>

A total of 30 clones, including nineteen clones selected at Powell Butte and known to be tuberworm susceptible and resistant were planted at Hermiston in the field on April 25 2007. At harvest (September 10), potato tubers were graded to select similar size (6-8 oz) tubers. Tubers were stored at room temperature for 10 days to allow for infested tubers to become evident. Un-infested tubers were selected and stored in cold storage at 4 °C until evaluations began. Field trials (Table 1 – page 17) consisted of two tubers per clone per rep being placed on the soil surface for exposure to natural populations of potato tuberworm. In the laboratory (Table 2 – page 17), two tubers of each clone were placed in plastic containers and artificially infested with 50 tuberworm eggs each. A randomized complete block design with ten replications was used for both trials. Tuberworm damage was recorded three weeks after inoculation by evaluating larval survival, number of mines, and incidence of damage and average of severity. Resistance of potato clones was measured based on larval survival and damage. Analysis of variance was done using the PROC GLM procedure. Means were separated by Fisher's protected LSD test.



Tubers were placed in plastic containers and artificially infested with 50 PTW eggs

None of the lines screened, with the exception of Spunta G2, a genetically modified clone, showed complete resistance, but quantitative resistance was observed in some lines. The number of larvae recovered and the number of mines generated under field conditions was lower than under laboratory conditions. The incidence of damage was slightly lower under field conditions, but the severity of damage (length of mines) was higher under field conditions.

Checking tuberworm damage

The host plant resistance observed was quantitative and needs to be combined with other pest management strategies to effectively control potato tuberworm damage.

FOR YOUR INFORMATION

Dryland Cereals Working Group Spring Tour
Steve Norberg

The tour for the Dryland Cereals Working Group this year will be held in and around Ontario, OR. The tour will run all day June 3rd, and the morning of June 4th. The highlight is a tour inside the Owyhee Dam (please bring a jacket as it is cool inside the dam). The tour will also highlight irrigated crops of the Treasure Valley. Just some of the things you will see include drip irrigated onions in producer fields, a tour of the Malheur Experiment Station, and Price and Sons Seed Farm. The morning of June 4th we will be looking at irrigated small grain trials at the University of Idaho at Parma for the majority of the time.

We can only accommodate 25 people to go down into the dam so please RSVP (Steve.Norberg@oregonstate.edu; 541-881-1417) to secure -your spot. The tour will start at 8 AM on June 3rd. Remember, we are in the Mountain time zone.

32nd Union County Crops & Conservation Tour
Darrin Walenta

Date:	June 18, 2008
Time:	Coffee & donuts 7:00 AM. Program starts at 7:30 AM and ends at approximately 2 PM
Location:	Western Farm Service on Booth Lane, 2.6 miles NE of Island City on Highway 82
Audience:	Growers, Ranchers, Ag Service Providers, University Faculty, Local Business, General Public, and anyone else interested in Union County Agriculture

You're invited to participate in a half-day bus tour of selected sites in Union County to view first-hand and learn about agricultural production, research, and conservation efforts in the area. Some of the topics to be covered this year include: the 2007 Conservation Farm of the Year – The Hassinger Family; Specialty Crops – Camelina and Waxy Barley; Elkhorn Valley Wind Farm; timber/livestock; and other interesting topics!

A short program will take place at 7:30 AM, immediately followed by the bus tour. As with tradition, a free lunch including barbecue steak, baked potato, and salad will be served at approximately noon at a site along the tour route. After lunch, bus passengers will be returned to Western Farm Service between 1:30 PM and 2 PM. Mark your calendars and plan on attending this fun and educational annual community event! For more information, please contact Darrin L. Walenta, OSU Extension Agronomist, at 541-963-1010 (email: darrin.walenta@oregonstate.edu) or Lenard Porfily, Western Farm Service, at 541-963-3735.

Table 1. Results of field screening (top ten) of Oregon early generation selections for potato tuberworm resistant, Hermiston OR 2007

Clone	Tuber weight average	Ave. # eyes	Ave. # PTW larvae	Ave. # PTW mines	Ave. incidence rating	Ave. severity
	(g)				(%)	
Spunta G2	217	9	0	0	0	0.0
Prince Hairy	181	5	1	1	70	1.7
OR05071-1	183	5	1	2	70	2.0
OR05075-1	159	8	1	2	75	2.1
OR05076-2	181	6	1	2	70	2.2
OR05081-1	248	5	1	2	75	2.3
A93157-6LS	204	11	1	3	80	2.3
T88-4	154	5	2	2	80	2.3
Q174-2	102	5	1	2	75	2.4
OR05070-1	172	6	1	3	75	2.4

[1]Severity is the length of mine
severity 1= mine length 1-2 mm
severity 2= mine length 3-10 mm
severity 3= mine length >1-2 cm
severity 4= mine length >2-3 cm
severity 5= mine length > 3 cm

Table 2. Results of laboratory screening (top ten) of Oregon early generation selections for potato tuberworm resistant, Hermiston, OR 2007.

Clone	Tuber weight average	Ave. # eyes	Ave. # PTW larvae	Ave. # PTW mines	Ave. incidence rating	Ave. severity
	(g)				(%)	
Spunta G2	233	11	2	2	13	0.4
OR05081-1	180	5	1	2	75	0.8
OR05080-2	161	4	3	4	100	1.0
Prince Hairy	140	7	3	4	88	1.0
T88-4	111	4	4	6	100	1.0
OR05080-1	143	5	3	5	100	1.1
OR05082-1	144	5	3	5	100	1.1
Q174-2	108	7	8	7	100	1.1
OR05012-1	180	11	7	8	100	1.3
OR05081-2	114	6	4	6	100	1.3

[1]Severity is the length of mine
severity 1= mine length 1-2 mm
severity 2= mine length 3-10 mm
severity 3= mine length >1-2 cm
severity 4= mine length >2-3 cm
severity 5= mine length > 3 cm

Hyslop Farm Field Day
May 28, 2008
Agenda

Cereal and Oil Seed Production

Title	Presenter	AM	PM
Coffee and donuts		8:30	
Welcome		8:45	
Winter wheat varieties for the Willamette valley	Jim Peterson	9:05	1:05
Disease control in winter wheat	Chris Mundt	9:20	1:20
Nutrient management for winter wheat in the Willamette valley	Mike Flowers	9:35	1:35
Wheat CAP Update	Oscar Riera-Lizarazu	9:50	1:50
Wheat and barley products	Andrew Ross	10:00	2:00
β-glucans in food and beer	Pat Hayes	10:15	2:15
Spring oil seed crop production	Daryl Ehrensing	10:30	2:30
Camelina production	Daryl Ehrensing	10:50	2:50
Willamette biomass processors	Tim Parker	11:10	3:10
Winter canola production	Tom Chastain	11:30	3:30
Lunch / Adjorn		12:00	4:00

Seed Crops and Entomolgy

Title	Presenter	AM	PM
Coffee and donuts		8:30	
Welcome		8:45	
Predicting N rates for perennial ryegrass seed production	John Hart	9:05	1:05
The role of roots in perennial ryegrass seedcrop management	Tom Chastain	9:25	1:25
Impact of row spacing, fertilizer timing and glufosinate(Rely herbicide) timing onannual bluegrass control in perennial ryegrass	Andy Hulting	9:50	1:50
Management options for choke/insect complex in orcahrdgrass	Sujaya Rao	10:10	2:10
Slug research/successes/ developments and sod webworm	Glenn Fisher Amy Dreves	10:30	2:30
Management challenges for Barley Yellow Dwarf Virus disease in grasses	Glenn Fisher Cindy Ocamb	10:50	2:50
Crop pollination and bee populations	Sujaya Rao	11:15	3:15
Farmscaping for beneficial insects	Gwendolyn Ellen Mike Russell	11:35	3:55
Lunch / Adjorn		12:00	4:00

Lunch prepared by the OSU Crops Club

Lunch Sponsors

Oregon Wheat Growers League
Oregon Seed Council

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