Oregon Processed Vegetable Commission Grower Meeting

Linn County Expo Center–100 Opal Court, Albany, OR 97322

Thursday, January 29, 2015

8:15	to	8:20	*Welcome*	Scott Zielinski
8:20	to	8:45	*Snap Bean Variety Improvement for Oregon Growers*	Jim Myers, OSU Horticulture
8:45	to	9:15	*Buffering Our Land*	Rose Kachadoorian, ODA
9:15	to	9:45	*2014 Nutrient Management Update for Snap Beans and Sweet Corn**	Aaron Heinrich, OSU Horticulture
9:45	to	10:05	Break (20 min)	Break
10:05	to	10:10	*Adopt a Farmer Program*	Geoff Horning
10:10	to	11:10	*Hitting the Target: Spray Nozzle Evolution and Design to Manage Drift **	Dugan Peterson, TeeJet® Technologies, Ft. Pierre, South Dakota
11:10	to	11:35	*Unmanned Aerial System Flights at OSU*	Michael Wing, OSU Forestry
11:35	to	12:00	*Diagnostics and Management of Phoma (black leg) in Brassica Vegetable Production **	Cindy Ocamb, OSU Botany and Plant Pathology
12:00	to	12:30	*Corn Density Tradeoffs and Other Lessons from the Summer of '14 **	Ed Peachey, OSU Horticulture
12:30			*Lunch*	

*2 hours (**1 Hour Core Credit****) of Oregon and Washington pesticide recertification credit hours have been approved.

Please RSVP by phone or fax by Jan 24 to reserve your complimentary lunch.
To RSVP by FAX. Flip this page over. Check the YES box and also indicate the number of people attending along with their names for the name tags. Then, FAX that page (with your mailing address info) to Lee Ann Julson, Dept of Horticulture, FAX (541) 737-3479.
To RSVP by PHONE: Call Lee Ann Julson at OSU Dept of Horticulture (541)737-3464

Tab here

OSU Horticulture
4017 ALS Bldg
Corvallis OR 97331-7304

Inside – processed vegetable growers meeting and research summaries

☐YES. Number attending: _____ Fax to: 541-737-3479

Names for name tags:

Abstracts of 2014 OPVC Projects

Find full reports at http://horticulture.oregonstate.edu/content/oregon-processed-vegetable-commission

Increasing the Nutrient Use Efficiency of Snap Beans Project leader: Ed Peachey Funding: $14,109
The overall objective of this multi-year project is to maximize nutrient use efficiency without compromising bean yield and quality. This year's project objectives were to: 1) evaluate crop response to P fertilizer at current soil P test levels in grower fields; 2) generate phosphorus (P) potassium (K), and nitrogen (N) nutrient budgets (fertilizer inputs vs. harvest removal); and 3) evaluate relationships among bean root rot disease, plant P uptake, biomass allocation (pods vs. leaves).

To evaluate P fertilizer response, paired field plots were set up at seven cooperator field locations in 2014, comparing pod yield for the grower P fertilizer rate vs. a zero P fertilizer control. When Bray P1 soil test levels were ≥ 55 ppm, no yield response to additional P fertilizer was observed. Yield was increased by P fertilization at one field site with a low P soil test value (34 ppm). Pooled data (2013 & 2014) indicates that significant savings in P fertilizer inputs could be attained by reducing P fertilizer rates to a minimal rate (30 lb P2O5 per acre) at sites with high soil test P (>55 ppm).

Nutrient uptake by bean plants was monitored at harvest time. Whole plant P uptake averaged 29 lb P2O5/A across 12 grower fields in 2013 & 2014. The range in P2O5 uptake was 21 to 41 lb/acre. Of total plant P uptake, approximately 45% was removed in pods at harvest, with the remainder left on the field in crop residue. Whole plant potassium uptake averaged 102 lb K2O/acre (range 91 to 141 lb/acre). An average of 35% of whole plant K was removed in the harvested product (pods), while 65% remained in the field. The average grower K fertilizer rate was 75 lb K2O /acre above the K fertilizer need predicted in an older OSU fertilizer guide (FG 28), suggesting that it may be possible to reduce K fertilizer rates without reducing crop yield and quality. Whole plant N uptake averaged 111 lb N/A (range 92-130) in 2014 and 140 lb N/A (range 110-172) in 2013. An average of 35% of whole plant N was removed in the harvested product (pods) while 65% remained in the field.

A preplant soil fumigation x P trial was conducted at the OSU Vegetable Research Farm in Corvallis (Bray P1 soil test = 99 ppm, a high value). The field was cropped to beans in 2011-13, resulting in high disease pressure in 2014. Gross pod yield was 4.8 tons/acre greater in fumigated plots compared to non-fumigated plots (12.6 vs. 7.8 ton/acre). Pod yields did not respond to P fertilizer application in fumigated or in non-fumigated treatments. This study suggests that longer rotations out of beans could significantly increase pod yield due to a decrease in bean root rot disease severity, and that P fertilizer rates do not need adjustment for fields with high soil test P and a high root rot potential.

Enhanced Efficiency Fertilizer Technologies in Sweet Corn Project Leader: Dan Sullivan Funding: $28,421
Enhanced efficiency fertilizer (EEF) technologies have the potential to improve the crop N use efficiency (NUE) as well as minimize negative environmental losses compared to conventional fertilizers. The EEF fertilizer products consist of urea plus additives (to inhibit N loss). The major pathways for N loss in our sweet corn cropping systems are 1) N leached below the root zone as water soluble nitrate-N (NO3-N), and 2) gaseous ammonia loss (NH3-N) to the atmosphere following a surface urea application.

Field studies and a laboratory incubation study were conducted in 2014 to evaluate the potential for benefit from EEF products via reduced nitrate-N leaching. Three products were evaluated: ESN (polymer coated urea), SuperU (prilled urea containing both a urease and nitrification inhibitor), and Instinct (urea + nitrification inhibitor). Concentrations of soil ammonium-N and nitrate-N were measured in the lab and in the field to assess product efficacy in controlling nitrate-N release vs. urea alone. In general, about 20 to 50% of the urea-N applied was protected from conversion to nitrate-N for the first 3 to 6 weeks after fertilizer application. In a field trial at the OSU Vegetable Farm, corn ear yields were not different for urea alone vs. the EEF products applied at the same N rates. This field trial was managed to maximize opportunity for nitrate leaching (8.6 inches water was supplied via extra irrigations plus rainfall during the first 6 weeks after planting). We conclude that EEF products had measurable efficacy in slowing the rate of conversion of urea-N to leachable nitrate-N. However, even under a "worst case" leaching scenario on a medium-textured soil, the use of inhibitors was ineffective in achieving a corn ear yield response.

A field study was conducted to quantify gaseous ammonia loss from surface-applied urea (without tillage to incorporate fertilizer), and to evaluate SuperU for efficacy in reducing gaseous ammonia loss. Passive flux masts were used to capture and quantify ammonia lost during the first weeks after fertilizer application. Despite favorable soil moisture and temperature conditions for ammonia loss, the measured ammonia loss for urea alone was very small (< 2% of urea-N applied), so it was not possible to quantify benefit from SuperU. Additional research is needed to verify these results (insignificant gaseous ammonia loss) across a wider range of soil, crop management and weather scenarios.

Effect of Pop–up Fertilizers and Planting Density Project Leader: Ed Peachey Funding: $10,485
Prices paid for sweet corn are low relative to the cost of producing the crop, and every strategy possible must be used to maximize net return. Two strategies used to enhance profitability but that have received little research attention under Western Oregon conditions are the use of pop-up fertilizers and increased plant populations. Despite indications that popup

fertilizers improve early-season growth, concrete evidence that these fertilizers ultimately enhance growth and yield are often lacking. Seeding density also can be increased to improve crop yield up to a point, but intraspecific competitive ability and the competitive stress tolerance of varieties currently produced in the Willamette Valley are poorly understood.

In a single stress test of plant density on sweet corn growth and yield in 2014, popup fertilizer treatments had little impact with the exception of the variety Captain at the highest plant population on 40,000/A. The response of the two varieties differed slightly as plant population increased. Fresh ear weight, kernel yield, and gross return peaked at 40,000 plants/A for the var. Captain at 36000 plants/A for the var. 1477. Conversely, as plant population increased, ear length and width decreased slightly. Kernel yield followed trends very similar to fresh ear wt.

Costs associated with changes in plant population were estimated to be $69 and $99 for the varieties 1477 (@36000/A) and Captain (@40000/A), respectively, when accounting for the additional costs of greater planting densities. The additional costs associated with increased plant density lowered the adjusted gross return by 5 to 6%, but the value of corn at the optimum density still averaged $131 to $181/A more than the standard of 28000/A.

Monitoring & Reporting Insect Pest in Cole Crops and Sweet Corn Project Leader: Ed Peachey Funding: $20,450
For the past 18 years, processed vegetable growers in the Willamette Valley, OR have had a vital partner in crop pest monitoring – Oregon State University's VegNet. This regional pest monitoring program provides weekly activity reports for common broccoli, cauliflower, sweet corn, and snap bean pests. Data is published on www.oregonvegetables.com and is available as an email subscription newsletter. The main goal of the program is to provide an early warning to growers of potential outbreaks that may warrant increased field scouting and action.

Insect trap data collected over 18 years allows comparison of current insect trends with historical averages. When pheromone traps detect an increased level of adult moths compared to historical averages, we consider that to be an 'egg-laying event', and depending on the reproductive biology of the pest species, we can predict that larval damage may be evident in the days or weeks following an event. Growers are encouraged to ramp-up field scouting efforts (sweep netting, leaf samples, etc.) to determine if the regional trend is relevant to their plantings.

Black cutworm and corn earworm trap catches were well-above historical averages in 2014, indicative of outbreak years. Losses due to damage from corn earworm were significant for some growers, but primarily because of increased bird damage that often follows corn ear worm damage. Western spotted cucumber beetle populations also were high this year, especially late in the season. Because a proportion of beetles overwinter, it is likely that we will see increased numbers early in spring 2015.

Improving the Utility of Triflsulfuron Herbicide in Table Beets Project Leader: Ed Peachey Funding: $3,426
Despite the availability of several herbicides in table beets, weed control is still problematic. UpBeet (triflusulfuron; DuPont) was recently labeled, but the labeled timings and rate are inadequate for optimum weed control, particularly for lambsquarters. An experiment was placed at the OSU Vegetable Research Farm to determine the tolerance of 2-leaf table beets to UpBeet when applied at double the currently labeled rate of 0.5 oz/A, and to beets at the cotyledon stage at 0.5 oz/A. Upbeet applied at these timings and rates significantly improved lambsquarters control and ultimately provided the largest yield. UpBeet injury to table beets at these rates and timings was insignificant. The UpBeet label could be expanded to encompass application of 0.5 oz/A at the cotyledon stage, or to increase the rate to 1 oz/A when applying to table beets at the 2-leaf stage.

Green Bean Breeding and Evaluation Project Leaders: Jim Myers and Bryan Yorgey Funding: $31,081
Oregon is the second largest producer of processed green beans, and cultivars are needed that are adapted to western Oregon. The types that have traditionally been used are the bush blue lake (BBL) green beans with high yields, excellent processing quality. On the other hand, then need improvement in plant architecture, disease resistance (especially to white mold), and are genetically isolated from other green beans. The primary objective of the OSU green bean breeding program is to develop high yielding and high quality BBL green beans with high levels of white mold resistance. In 2014, a preliminary yield and processing trial of 36 advanced lines was conducted. An additional commercial trial with 28 entries was also grown and evaluated. Two advanced lines (6771 and 6774) are undergoing intense scrutiny for release as the first partially white mold resistant lines commercially available. Data obtained over four years of evaluation supports their release and seed has been distributed to seed companies for preliminary increase and evaluation.

Broccoli Breeding, Evaluation and Seed Production Project Leaders: Jim Myers and Bryan Yorgey Funding: $11,939
Processors need broccoli with better quality traits than what is available in cultivars developed for California and Mexico fresh markets. Farmers need to reduce labor costs of broccoli production but mechanizing harvest. Most contemporary commercially available cultivars are not suitable for either mechanical harvest or processing. The objective of the OSU broccoli breeding program is to develop broccoli varieties adapted to western Oregon with suitable quality and high yields. The program operates on a one year cycle where cuttings from the field are taken into the greenhouse in the fall where they are rooted and hand crossed and self-pollinated to produce seed for the next generation. Seed is harvested in May and June and used to plant trials for fall evaluation. In 2014, six experimental hybrids were planted in a replicated yield trial, which

also included two commercial check hybrids and a new exserted commercial hybrid from Seminis. S446 x S458B had the highest net T/A head weight of the trial but this hybrid was also the latest in maturity. Fourteen advanced generation inbreds were selfed for seed production and an additional 15 early generation inbreds were advanced a generation. Two inbreds may have some level of drought tolerance compared to other inbreds. Fifteen CMS selections were backcrossed to various inbreds. Discussions were conducted with seed company representatives for commercializing the material in the OSU breeding program.

Clubroot Control Strategies in Brassicas Project leaders: Alex Stone and Aaron Heinrich Funding: $9,618
This research has demonstrated that liming clubroot infected soils to a pH ≥7.1 is an effective practice for reducing both the incidence and severity of clubroot. Liming does not kill the pathogen but rather prevents disease spores from infecting the plant. This research demonstrated that highly reactive calcitic lime products could be substituted for hydrated lime as they effectively raise the pH of the soil to the target pH of ≥7.1 within a week after application. The project also demonstrated that boron and Serenade drenches did not suppress clubroot under field conditions.

In the greenhouse, liming two heavily infested soils to a pH >7.1 almost completely eliminated clubroot symptoms on cauliflower (cv 'Artica'). Under field conditions, liming a soil to a pH ≥7.1 reduced clubroot incidence by 44-77% and severity by 74-90% in 3 trials conducted in the same field in the spring and fall of 2014. In the field, liming to pH ≥7.1 does not typically completely eliminate clubroot symptoms. Zones of lower pH occur in some areas of the soil volume due to the incomplete mixing of the lime into the soil volume, and where that occurs (in combination with clubroot spores), clubroot symptoms develop. Nonetheless, clubroot disease incidence and severity are much lower and yields are higher in limed fields.

The profitability of liming Willamette Valley soils to a target pH of ≥7.1 as a clubroot control strategy will depend on several factors: the degree to which clubroot will reduce yield if no lime were applied, the cost of the lime product used and the lime rate (which depends on the pH buffering capacity of the soil as influenced by clay content, organic matter, and pH), and the value of the crop. Liming should always be used as one tool in an integrated clubroot management tool box that also includes rotation (4 or 5+ years), soil and irrigation management (to minimize waterlogging), and sanitation (use of clubroot-free transplants and prevention of clubroot movement from field to field).