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Welcome to the Third Annual Washington Small Fruit Conference

Each year we work to improve the conference. As always, we have researchers, farmers, and policy-makers presenting topics of new research, emerging issues, and novel ideas for you to take back to your farm and business. Topics covered include contentious issues of labor and water, pest and disease issues, and organic production.

New to the 2013 program, we have added a pre-license pesticide training session in the Fall Creek Nursery room. This session is open and applicable to anyone in the berry industry or others who may need a pesticide license. Topics presented will be valuable to those looking to take the pesticide license exam or for those looking to refresh their knowledge of good practices around pesticide use. This room will also host introductory sessions on insect, weed, and disease pest biology and management.

Again this year, we will feature a catered social hour following the program on Thursday. Many reasons to attend the 3rd annual Washington Small Fruit Conference. Hope to see you there!

Up to 11 WSDA pesticide credits available
### Agenda Overview

**Thursday, December 5**

<table>
<thead>
<tr>
<th>Whatcom Farmers Co-op Room</th>
<th>TIME</th>
<th>Fall Creek Nursery Room</th>
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</thead>
<tbody>
<tr>
<td>REGISTRATION</td>
<td>7am</td>
<td>REGISTRATION</td>
</tr>
<tr>
<td>Washington Blueberry Commission Annual Meeting</td>
<td>7:30-8:45am</td>
<td>Pesticide Certification Training—Laws and Safety</td>
</tr>
<tr>
<td>Opening Address: Chris Benedict</td>
<td>8:45am</td>
<td>Pesticide Certification Training—Pesticide Hazards</td>
</tr>
<tr>
<td>State of Berry Markets Panel</td>
<td>8:50-9:30am</td>
<td>Pesticide Certification Training (continued)</td>
</tr>
<tr>
<td>Labor Issues in Washington State</td>
<td>9:30-10am</td>
<td>Pesticide Certification Training (continued)</td>
</tr>
<tr>
<td>COFFEE BREAK AND TRADE SHOW</td>
<td>10-10:30am</td>
<td>COFFEE BREAK AND TRADE SHOW</td>
</tr>
<tr>
<td>Water: Quantity and Quality Issues Growers need to know</td>
<td>10:30-noon</td>
<td>Pesticide Certification Training (continued)</td>
</tr>
<tr>
<td>LUNCH BREAK</td>
<td>noon-1pm</td>
<td>LUNCH BREAK</td>
</tr>
<tr>
<td>Organic Production</td>
<td>1-2:40pm</td>
<td>Pesticide Certification Training—Pesticides Application</td>
</tr>
<tr>
<td>COFFEE BREAK AND TRADE SHOW</td>
<td>2:40-3pm</td>
<td>COFFEE BREAK AND TRADE SHOW</td>
</tr>
<tr>
<td>Weed and Vertebrate Pests and Blueberry Nutrition</td>
<td>3-4:40pm</td>
<td>Berry Breeding</td>
</tr>
<tr>
<td>CATERED SOCIAL HOUR and POSTER SESSION</td>
<td>4:45-7pm</td>
<td>CATERED SOCIAL HOUR and POSTER SESSION</td>
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**Friday, December 6**

<table>
<thead>
<tr>
<th>Whatcom Farmers Co-op Room</th>
<th>TIME</th>
<th>Fall Creek Nursery Room</th>
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<tbody>
<tr>
<td>REGISTRATION</td>
<td>7am</td>
<td>REGISTRATION</td>
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<tr>
<td>Washington Red Raspberry Commission Annual Meeting</td>
<td>7:30-8:30am</td>
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<tr>
<td>Keynote: US Representative Suzan DelBene</td>
<td>8:30-9:15am</td>
<td>Introductory Plant Pathology</td>
</tr>
<tr>
<td>Insect Pest Management</td>
<td>9:15-10:30am</td>
<td>Plant Pathology (continued)</td>
</tr>
<tr>
<td>COFFEE BREAK AND TRADE SHOW</td>
<td>10:30-10:45am</td>
<td>COFFEE BREAK AND TRADE SHOW</td>
</tr>
<tr>
<td>Small Fruit Disease Management</td>
<td>10:45-12:30</td>
<td>Introductory Insect Management</td>
</tr>
<tr>
<td>LUNCH</td>
<td>12:30-1:30pm</td>
<td>LUNCH</td>
</tr>
<tr>
<td>Below the Soil Surface</td>
<td>1:30-3:15pm</td>
<td>Introductory Weed Management</td>
</tr>
<tr>
<td>ADJOURN</td>
<td>3:15pm</td>
<td>ADJOURN</td>
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Participants who attend sessions with the SWD logo are eligible to receive pesticide credits. **Up to 11 WSDA pesticide credits available.**

### Registration Rates:

<table>
<thead>
<tr>
<th>Registration</th>
<th>Rate before December 1,</th>
<th>Rate after December 1,</th>
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<tbody>
<tr>
<td>2-Day Conference Registration (includes lunch &amp; snacks both days plus catered social hour)</td>
<td>$95</td>
<td>$105</td>
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<tr>
<td>Thursday Conference Registration only (includes Thursday lunch &amp; snacks plus catered social hour)</td>
<td>$60</td>
<td>$70</td>
</tr>
<tr>
<td>Friday Conference Registration only (includes Friday lunch &amp; snacks)</td>
<td>$55</td>
<td>$65</td>
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To register and for more information about the conference sessions: [http://whatcom.wsu.edu/ag/edu/sfc/](http://whatcom.wsu.edu/ag/edu/sfc/)
Spring marks a fresh start for the Small Fruit Horticulture Program at Washington State University’s Northwestern Washington Research and Extension Center, as native Iowan Lisa Wasko DeVetter joins the WSU Mount Vernon faculty as an Assistant Professor of Research and Extension here, after completing her Ph.D project in cranberry yield at the University of Wisconsin-Madison.

With a B.S. in biology and horticulture and M.S. work focused on evaluating alternative weed management practices in vineyard production systems and their effects on weed control, grapevine production and soil quality at Iowa State University, Lisa brings a new depth to small fruit horticulture research and extension in the Skagit Valley and surrounding region. She looks forward to engaging the community and learning more about Pacific Northwest fruit production, with the overall goal of promoting sustainability within fruit production systems.

Here are a few of her thoughts on her new job here as Small Fruit Horticulture Program Leader.

1. What is your official start date?

Officially, I start March 1, 2014. In my excitement, however, I have already begun discussing ideas for projects and laying the foundations for my future research and extension program.

2. What most attracted you to this position?

Many aspects of the position are both professionally and personally appealing. To name a few, the specific crops, people, and associated industries are of great interest. Visiting Washington and meeting future colleagues has only fueled this interest. The position is also perfectly aligned with my professional vision of building a high-impact research and extension program in small fruit production and physiology. Aligned with this vision is having a program that helps meet the needs of its stakeholders through a
programmatic approach that closely partners research with extension activities. The research opportunities are also attractive given my interests in investigating sustainable production practices through an approach that takes account of the integrated nature of biological, environmental, economic, and social systems that affect fruit production.

Furthermore, this position is well-poised for success given the support of the industries, university system, and other potential collaborative bodies. At the personal level, I am very excited to live in the Pacific Northwest. As a native Iowan, the opportunity to live, work, and raise my family in such a scenic community is a dream come true!

3. Describe the key components of the job, as you see it.

One critical component will be the establishment of a research and Extension program that is high-impact, complementary to other existing programs, and meets the needs of stakeholders. Accomplishing this will require building relationships and bringing together relevant groups that are representative of the small fruit industry.

4. What are some of your plans for moving forward here with the Small Fruit Horticulture Program?

One of my first tasks will be to collect input from associated industries, colleagues, and other peers as to what are the primary areas in need of research. With this information, I will move forward on building a program that addresses those needs. A few good candidates for research activities include (but are not limited to): investigating alternative practices to fumigation, evaluating the impacts of production practices on plant productivity, fruit quality, and soils, assessing the economic viability of production practices, investigating methods to enhance pollination and fruit set, and developing approaches for effective cane management in raspberry production. Additionally, I want to contribute to enhancing the pathology component of the program through strategic collaborations. I also want to develop informative resources for growers, which includes a small fruits website, workshops, field days, conferences, and other opportunities for professional development.

5. Tell us a little bit about your background and experience and how it all relates to the work you will be doing.

My first experience with horticulture was at my grandmother’s farm, located in northwestern Iowa. I never considered a career in horticulture until I went to college and got my BS at Iowa State University (ISU) in biology and horticulture. By that time, I came to the realization that I could actually study what I had a passion for – fruit crops. Moreover, I could contribute to promoting sustainability within small fruit horticulture through a career in research and extension. This led me to get a MS at ISU in horticulture and soil science, whereby I studied the effects of alternative weed management practices in Midwestern vineyards. This project exposed me to a systems-based approach to research in which I measured multiple variables in order to discern treatment effects on weed management, plant productivity, fruit quality, and soil quality. My PhD research at the University of Wisconsin-Madison was also holistic. The main project of my program was a synthesis of how genetic, physiological, and environmental factors influence yield components of cranberry. This project was extension-based and occurred entirely on commercial cranberry farms. I also completed several physiological studies on cranberry, which contributed to my breadth in knowledge of plant systems. These experiences have left me with a broad understanding and appreciation for the many scales and nuances influencing fruit production. Having these diverse experiences will help me better serve the industry through a diverse and
systems-based approach to research.

6. What would you like readers to know about you personally and your management style professionally?

Most people would define me as ambitious and hard-working. I am also very open, easy-going, and have a strong passion for fruit science and promoting sustainability within our food systems. Furthermore, I really value the relationships I form with people. My management style is to be transparent and have those around know that they are valued as both an employee and individual.

7. What do you see are the major benefits of the WSU Mount Vernon Small Fruit Horticulture Program to farmers, growers, educators and the community in general; and how will you reach out to and interact with them in the course of your work here?

One of the major benefits is that this program will be driven by the ultimate goal of promoting sustainability in small fruit production within the Pacific Northwest and beyond. Thus, expect to see a very active program with a diversity of research projects that seek to address this goal. Also, I favor a transparent, collaborative, and participatory approach to research that includes the involvement of stakeholders and other peers. There are virtually no limits as to how people can contact me, whether it be through a stop by the (WSU Mount Vernon Northwestern Washington Research and Extension) Center, an email, phone call, and so on. I will also personally reach out at conferences, field days, and any other venue that permits me to interact with stakeholders.

Contact:
Lisa Wasko DeVetter, WSU Small Fruit Horticulture Program Leader,
lwasko@wisc.edu
DISCUSSIONS OVER LABOR ISSUES

Alan Schreiber, Executive Director WA Blueberry Commission
Henry Bierlink, Executive Director WA Red Raspberry Commission and Whatcom Farm Friends

One of the consistent challenges facing berry production over the years has been the supply and cost of labor. The issue ebbs and flows, at times near the top of the priority list and at others a distant worry. The last few years has seen a dramatic increase in the importance of this issue with almost all berry farmers listing labor among their top concerns.

Labor has many dimensions. Farmers and farmworkers have concerns over adequate labor supply, labor costs, farmworker housing, and compliance with federal and state labor laws. While supply, costs and housing remain concerns the thrust of this article is focused on compliance with federal labor laws.

Farmers in SW Washington and Oregon were shocked to run afoul of federal labor laws in 2011. More violations occurred in Oregon and in Whatcom County in 2012 and a few more in Eastern WA this summer. The two concerns consistently cited by the federal Department of Labor (DOL) Wage and Hour Division were child labor violations and reported violations of the Fair Labor Standards Act in the so called “ghostworker” issue. DOL states it has evidence of berry pickers working on single tickets which makes it impossible for them to adequately insure that all workers are receiving their guaranteed minimum wages.

Berry farmers have, and will continue to debate, that this practice is as prevalent as DOL thinks it is. There are flaws in the logic DOL uses to calculate a “reasonable” amount of berries to be picked by a single worker. But there is also enough evidence to make it impossible for us to deny there have been violations of this nature. DOL perceives this to be a problem and as a result will be actively working to address it.

The chief concern farmers have expressed is over DOL’s use of the “hot goods” provision in the Fair Labor Standards Act which means that highly perishable crops like berries cannot be shipped for a thirty day period from the alleged violation. By invoking hot goods DOL leaves farmers little choice but to plead guilty so that they can harvest their crop in a timely manner. Our berry commissions, Whatcom Farm Friends, and the WA Farm Bureau have been vocal in expressing their concerns to media and to our Congressional team. Oregon farmers, the Oregon Farm Bureau and regional ag media like the Capital Press have led the charge to spotlight the unfairness of using this tool on perishable crops.

The WA Blueberry Commission, the WA Red Raspberry Commission, and Whatcom Farm Friends invited DOL to talk about these issues at the 2012 Small Fruit Conference in Lynden last December. They initially agreed but cancelled a week before the meeting. We tried again for the December 5-6 Small Fruit Conference this year. As a result DOL invited Alan Schreiber, the Blueberry Commission Executive Director and Henry Bierlink, Executive Director of the Raspberry Commission and Whatcom Farm Friends to an October 24th meeting at their regional headquarters in Seattle.
We were somewhat taken back by the importance DOL placed on this meeting. They had 4 members present including Donna Hart, the District Director, Richard Longo, the western region Director of Enforcement, Manuel Lucero, Assistance District Director, and Sheila Creel, Community Outreach. Their District includes 8 western States. They sat with us for 2.5 hours and it was us who determined it was time to leave. Also in the room was Ignatia Marquez, a labor relations specialist from WSDA who helped arrange this meeting.

While there were substantial disagreements between DOL and the berry representatives, the tenor of the meeting was honest, open, and productive. Clearly hand picking blueberries was the hot area and where DOL is focusing its enforcement attention.

Some reflections from our point of view:

- We sensed a disproportional targeting of berry farmers from DOL. They didn’t deny this. It is their sense that berries have habitual problems with 1) children in the fields, and 2) families or groups picking on a single ticket.

- They indicated that with a relatively small staff they have to pick their battles. Farmworker housing dominated their concerns since 2007 after they found some egregious violations. They now sense that is predominately fixed and now the ghostworker issues are high on their priority list. They are clearly under the impression that the violations in blueberry harvest are far more prevalent than in other fresh fruit harvests.

- Alan repeatedly pressed them to show evidence of this which they struggled to do. But they cited at least one example of finding 300 workers in a field and only 70 tickets.

- We impressed on them that farm owners and managers have no interest or benefit from combining tickets. We know it is illegal but prohibiting it and making sure it never happens is not easy. They understood this is a challenge for growers. They noted the family oriented nature of farming and the traditions of farm worker families working together. They respect that (at least by their words) but also emphasized that the law is perfectly clear about this. It can’t happen and if it does there will be consequences.

- We have no illusions they will not be coming after berry farmers for the next years until they feel they have this issue essentially fixed (i.e., farmworker housing).

- They do some strategic enforcement on habitual cases but also spend time riding around noting issues. Children in fields and records that don’t match the numbers in the field are pervasive problems in their minds. We might differ but we also have to understand that our protests didn’t make much progress. Their perceptions are the reality.

We argued about the nature of the problems but also spent a large amount of time over how they might be resolved. The discussion produced these points:

- A Department of Labor representative will be at our December 5th Conference in Lynden. Ruben J. Rosalez, Regional Administrator for the Western Region, USDOL/Wage Hour Division intends to make the trip from San Francisco, but in the event he is called to another part of the country at that time, he has committed his deputy: Juan Coria, Deputy Regional Administrator for the Western Region, USDOL/Wage Hour Division.

- The Berry Commissions are planning another round of Food Safety Workshops in Feb/Mar 2014. We offered to include a segment on Migrant and Seasonal Agricultural Worker Protection training in these
workshops. DOLs head of Enforcement has agreed to personally attend these meetings and provide training on how to comply with farm worker labor requirements

- In return for our cooperation in helping them impress the need to obey labor laws they essentially agreed to not invoke any “hot goods” actions on farmers who attended these workshops and took their instructions to heart. Clearly they cannot promise it will never be used but they continually impressed on us that they are willing to defer enforcement actions if they can see an honest effort by the industry to advance compliance with the laws. We believe them.

- We joked that all Workshop attendees would get a “Get out of Hot Goods Free” card and they never denied that this was essentially the bargain that we are agreeing to.

There are several legal actions in place between farmers and DOL. We stayed far away from any discussion of these as we recognize they are very thorny issues and that our comments on ongoing investigations or lawsuits would only muddle the legal issues. This discussion was ONLY about how we might be able to do things better in the future so that farmers don’t have to live in fear of the DOL and that the DOL senses that increasing law compliance is happening.

The result of this meeting and future dialogue will be improved communication between DOL and berry growers and DOL sensitivity to using “hot goods” as an initial tool to force grower compliance. If this truly occurs at least one of the high priority labor concerns should be minimized.
Silver scurf on potato tubers caused by the fungus, *Helminthosporium solani* has become a serious problem on smooth-skinned red, yellow and white potatoes grown in western Washington. Potato seed and commercial growers alike seek effective measures for controlling the disease because (i) the pathogen can be tuber-borne and (ii) the disease affects tuber quality and negatively impacts fresh market potato sales.

The lesions produced by *H. solani* on potato tubers are unsightly, and often difficult to differentiate from black dot (caused by *Colletotrichum coccodes*) or certain other tuber defects. Characteristic symptoms (Fig. 1) include silvery brown areas that tend to expand over time with tiny dark growth (the sporulating fungus which appears as groups of tiny black brushes) sometimes visible with a hand lens.

Potato seed fungicide treatments have been shown to have some efficacy in reducing silver scurf infections on progeny tubers (new tubers formed on plants grown from seed tubers) in certain regions. However in western Washington’s coastal climate, seed treatments have not been as effective, and aspects of the silver scurf disease cycle are unknown. Thus, we investigated how the disease spreads from infected seed tubers to progeny tubers under a typical potato field production environment.

**Methods**

A small field trial was planted near Mount Vernon with a potato seed lot of cultivar ‘Yukon Gold,’ having high incidence (100%) and severity (57% to 90%) of natural silver scurf infection. The experimental design was a randomized complete block with four replications. Trial plots were maintained for 10 weeks using cultural practices typical for growing fresh market potatoes under western Washington conditions, and were drip irrigated. Seed and progeny tubers and roots and stems were destructively sampled seven times during the growing season from three plants per plot to document infection and sporulation by *H. solani* below ground.

After digging, sampled tissues were placed in...
paper bags, immediately brought to the labora-
tory, directly observed (without washing) for signs (spores and spore forming structures) of
H. solani using a dissecting microscope at 40x,
and photographed within a few hours. Progeny
tubers sampled prior to harvest also were
shipped overnight to WSU’s Franceschi Elec-
tron Microscopy Center in Pullman for scanning
electron micrographs. The identity and
pathogenicity of H. solani from these potato tis-
sue sources was confirmed via pure culture iso-
lations in the laboratory and during greenhouse
tests.

Findings
Direct observations of planted seed tubers,
naturally-infected with H. solani, indicated that
this fungal pathogen is unusual in that it can
sporulate profusely on seed tubers below
ground, even after the seed tubers are rotted,
age, dried or shriveled (Fig. 2). These spores
then can spread onto newly developing potato
tissues, such as roots and stolons, and lead to
below ground infections on progeny tubers well
before harvest (Fig. 3) as well as to contamina-
tion of the surrounding soil. Tuber crevices, de-

Figure 2. H. solani sporulating below ground, on a
seed potato of ‘Yukon Gold,’ 47 days AFTER
planting.

Figure 3. H. solani spores forming below ground,
on a progeny tuber of ‘Yukon Gold,’ 103 days
AFTER planting and 14 days

pressions near the stolon end, and eyes and
sprouts were common locations for H. solani
sporulation on pre-harvested tubers. Some-
times sporulation can be prolific. Although sil-
ver scurf often has been considered to be a
disease in potato storages primarily, this evi-
dence suggests that infections occur in the
field before storage (Fig. 4) and that secon-

Figure 4. H. solani spores on the surface of a
progeny tuber of ‘Yukon Gold,’ 8 days AFTER har-
vast and 1 day BEFORE storage. Note that some
spores already have started to germinate on the
tuber surface.
Secondary spread of the fungus also can occur in the field via contaminated soil adhering to the tuber surface at the time of harvest (Fig. 5).

**Summary**
Planted seed tubers represent a primary source of inoculum for *H. solani* in western Washington, and infected seed tubers can initiate a silver scurf epidemic below ground. Seed treatments commonly are used to control silver scurf on specialty potatoes, but to be effective in this region, seed treatments must have long term residual activity. Moisture from rain or irrigation water percolating through the soil likely helps to facilitate reproduction and movement of *H. solani* conidia below ground. Soil disturbance during harvest operations can lead to secondary spread through movement of contaminated soil onto otherwise healthy tubers.

**Control**
Given the importance of the silver scurf disease cycle below ground, effective control means using pathogen-free seed and seed fungicide treatments. Also, limiting irrigation especially at the end of the season, minimizing the time between vine kill and harvest, drying tubers before storage, rotating fields out of potatoes for 3 years, and cleaning-out storages before use all are silver scurf intervention tactics appropriate for this region. For recommended chemical control measures, see the 2013 Pacific Northwest Plant Disease Management Handbook, [Pscheidt, J.W., and Ocamb, C.M., senior editors. 2013. Oregon State University, Corvallis, OR] online at [http://pnwhandbooks.org/plant disease](http://pnwhandbooks.org/plant disease).

Figure 5. Scanning electron microscope photos of *H. solani* sporulating on a potato tuber below ground, prior to harvest.
Maintaining high levels of productivity while at the same time protecting water and soil quality is one of the grand challenges of modern agriculture. Farmers in our region are successfully using many different tools to meet this challenge including cover crops, reduced tillage, and compost. By several estimates, soil degradation caused by humans has already impacted almost half of the world’s agricultural land. Replenishing soil organic matter is an absolutely critical part of restoring soil quality, and therefore soil function.

Organic wastes, including manure and biosolids, contain nearly all essential plant nutrients and can be used to replace synthetic and mined fertilizer sources. More importantly, however, they contain carbon - food for the bacteria and fungi that keep the dynamic soil system alive and functioning! These tiny microbes have the very big job of cycling nutrients, boosting plant resistance to disease, and degrading contaminants in the soil.

At its most basic, soil quality is the capacity of a soil to function in three major areas: biological productivity, environmental quality, and plant and animal health. The ability of soil to sustain plant growth and other biological activity is a function of physical (structure, water holding capacity, etc.) and chemical (pH, nutrient availability, etc.) properties, many of which are directly affected by the use of organic wastes as soil amendments (Table 1).

While inorganic fertilizers supply plant nutrients in available forms, they do not directly contribute to improving soil quality and health. The properly managed addition of organic wastes to soil is essential for both long-term viability in agriculture, and environmentally and economically sound waste management.

### Biosolids

Biosolids are the solid, or semi-solid, byproducts of the wastewater treatment process. Depending on the treat-
ment process and the intended end use, biosolids may be semi-liquid (7-10% solids), cake (15-30% solids), composted (30-40% solids), or pelletized (95% solids). Each year over seven million dry tons of biosolids are produced in the United States, but only about half of this is recycled back into the soil—the remainder are typically incinerated or buried in a landfill. Biosolids are an under-utilized resource that can provide valuable soil organic matter and plant nutrients on farms, landscaping, turf, and gardens.

In Washington State, biosolids re-use is regulated by the Department of Ecology, following rules set by the US Environmental Protection Agency. All biosolids must meet certain requirements for pathogen reduction before land application and any material not meeting these standards cannot legally be land-applied. "Class B" biosolids products are treated to reduce, but not eliminate, pathogens. Final pathogen destruction occurs through natural processes after land application and for this reason public access and harvest of crops are restricted for a period of time after application. "Class B" products are commonly used as a soil amendment on pasture and rangeland, hay and other livestock feed, dryland wheat, hops, and orchards.

For all "Class A" biosolids products, the pathogen destruction process must be complete before land application. "Exceptional Quality" biosolids must meet "Class A" pathogen standards, as well as standards for heavy metals and vector reduction (i.e. flies). Composting is the most common method used to meet the "Exceptional Quality" standards, but drying and pelletizing is also used.

Applying biosolids to a hay field

Aerated compost bays at the La Conner Waste Water Treatment Plant

The compost process uses a thriving and diverse population of bacteria and fungi to break down raw organic materials (e.g. biosolids, food waste, yard waste, manure) into a stable, safe soil amendment. Compost piles reach very high temperatures (>130°F) that kill pathogens and destroy most toxins and weed seeds.

Community Attitudes and Opinions

The Town of La Conner recently received the "Excellence in Management" award from the Northwest Biosolids Management Association
whatcom agmonthly and produces 8,000 to 10,000 tons of "Exceptional Quality" biosolids compost annually. This is available to residents free of charge in a self-serve kiosk and can also be purchased in bulk for landscaping or farming. While some area residents take advantage of this local resource, it is not widely used on farms or public landscaping in the area.

In order to better understand potential concerns and barriers to adoption, WSU worked with the Town of La Conner to conduct a mail survey of residents of Skagit County. The intention was to gain a better understanding of residents' attitudes, opinions, and knowledge about the use of "Class A" biosolids both on agricultural land and in the community. The full report, including methodology, is available on the WSU Biosolids Management website (see "Additional Resources"). The survey population consisted of two sub-populations:

1. La Conner residents served by the La Conner Waste Water Treatment Plant (374 single-family households).
2. Randomly chosen sample of 1,000 single-family households in Skagit County, excluding the Town of La Conner.

The majority of survey respondents were supportive of the use of "Class A" biosolids on farm-land in Skagit County (Table 2) and were interested in using it as a soil amendment if it saved them money (Table 3).

While there was the strongest support for the use of "Class A" biosolids on non-food crops, approximately half of all respondents felt that fruits and vegetables were an appropriate use (Table 4).

**Table 2. Level of Support for the Use of “Class A” biosolids on Farm Land in Skagit County**

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<th>Level of support</th>
<th>La Conner (%)</th>
<th>Skagit County (%)</th>
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<tbody>
<tr>
<td>1 - Do not support</td>
<td>14.8</td>
<td>9.5</td>
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<tr>
<td>2</td>
<td>5.9</td>
<td>5.7</td>
</tr>
<tr>
<td>3</td>
<td>19.7</td>
<td>21.2</td>
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<tr>
<td>4</td>
<td>26.1</td>
<td>30.3</td>
</tr>
<tr>
<td>5 - Strongly support</td>
<td>33.5</td>
<td>33.3</td>
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**Table 3. Level of Interest in Using “Class A” biosolids as a Fertilizer and Soil Conditioner if it Saved Money**

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<th>Level of interest</th>
<th>La Conner (%)</th>
<th>Skagit County (%)</th>
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<tr>
<td>Not interested</td>
<td>21.1</td>
<td>19.6</td>
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<tr>
<td>Somewhat interested</td>
<td>28.1</td>
<td>33.2</td>
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<tr>
<td>Very Interested</td>
<td>43.4</td>
<td>35.8</td>
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<tr>
<td>Not applicable - I do not have a garden or farm</td>
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<td>11.4</td>
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</tbody>
</table>
the use of "Class A" biosolids products on farm land, especially for non-food crops, livestock feed, and products used to make beer or wine.

Researchers at the WSU research station in Mount Vernon are conducting field trials with biosolids compost produced at the La Conner WWTP. Compost and synthetic fertilizer was applied at varying rates to spring wheat, barley, and potatoes over two growing seasons. The impacts of compost on both yield and crop quality were positive. An experiment with biosolids compost and lime as soil treatments to reduce Fusarium wilt pressure in spinach seed production is also showing very promising results.

Results from this research, as well as other compost trials conducted in Snohomish County, will be presented at the Soil Quality Network event that will be held at WSU Mount Vernon on February 13th, 2014. For additional information about this event or WSU biosolids research, contact Caitlin Price Youngquist: pricecm@wsu.edu.

### Table 4. Appropriate Uses for “Class A” Biosolids in Agriculture

<table>
<thead>
<tr>
<th>Appropriate uses</th>
<th>La Conner</th>
<th>Skagit County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Non-food crops</td>
<td>92.5</td>
<td>7.5</td>
</tr>
<tr>
<td>Hay or grain for animal feed</td>
<td>70.2</td>
<td>29.8</td>
</tr>
<tr>
<td>Grains, hops, or fruit used to make beer and wine</td>
<td>62.2</td>
<td>37.8</td>
</tr>
<tr>
<td>Grain for human food</td>
<td>52.2</td>
<td>47.8</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>46.5</td>
<td>53.5</td>
</tr>
</tbody>
</table>

### Additional Resources:

Washington State University - Biosolids Management:
http://puyallup.wsu.edu/soilmgmt/Biosolids.html

Northwest Biosolids Management Association - Fact Sheets:
http://www.nwbiosolids.org/facts.htm

Spring wheat plots treated with biosolids compost at WSU Mount Vernon.
**LIVESTOCK EVACUATION DURING A DISASTER:**
**ONE FARM’S EXPERIENCE**

Mary Wilson  
Half Creek Farm, Bickleton, WA

The sun tries to shine through heavy smoke.

[Note—Ms. Wilson owns a small farm in south-central Washington where things get quite dry in the summer. In this requested article, she shares the challenges of evacuating livestock during a disaster. Her experience underscores the importance of being prepared for a disaster, whether it is a fire, prolonged power outage, flooding or other threat. Contact me if you are interested in disaster preparedness education. —Susan Kerr, WSU Regional Livestock and Dairy Extension Specialist, 360-848-6151, kerrs@wsu.edu].

I’ve always felt smugly prepared for whatever disaster might happen on our farm. I spent time organizing a plan in my mind that seemed pretty solid: my animals are used to being handled and all have a calm personality; I have a 3.4 ton pickup and a 16-foot stock trailer that I thought would probably hold all my goats; then I could likely move the cows and llama in the second trip and be done!

Arrogance will usually come back to haunt you and Mother Nature decided I needed a swift kick I guess, so along came the Mile Marker 28 wildfire in Klickitat County on July 24, 2013. We watched it slowly advance toward our farm over a week of hot, dry, windy weather. When we reached Level 2*, we knew we had to move the animals.

I loaded the stock trailer with the first load of goats, having found it would not hold the entire herd. It actually took three trips to move the goats. We also needed two trips to move the cows and llama, for a grand total of…yes, five trips! The cows--always big pets and easy to handle--turned into uncooperative behemoths when the smoke started moving in. The goats were nervous and agitated and needed to be packed much looser than we anticipated--a beautiful doeling got crushed on the trip. Because we have so many animals, I had to evacuate them to three farms. The wildfire had of course also affected my close neighbors, so I had to move my animals out of the area, which required a move of nearly 30 miles. By the time I loaded the animals, transported them, unloaded them and returned for another load, over two hours had passed. It took five total loads and over 10 hours to move everyone. Not only was this very time consuming, it was also expensive and it didn’t stop there. Several places we hauled to had corrals but the animals all needed hay, so each day we would bring hay and check on animals.

One of my daughter’s rare British
Guernsey does kidded at her refugee farm. Fortunately she didn’t have any trouble and we arrived to find a clean, dry doeling.

Our animals were gone about four days; we had to go every day to check them and be sure they had food and water. The farm that took the cows and llama were experienced with cows—they put the cows and llama out on pasture and I didn’t need to make a daily trip to check them.

When we were finally able to bring our animals home and things settled down, we went over our “what worked and what didn’t work” thoughts, so hopefully we’ll be better prepared for next time:
1. Plan on at least $300 worth of gas to move.
2. Plan on a daily trip to check animals and bring them hay every day they are gone.
3. Plan on tame, good-natured animals turning into flighty, panic-ridden kooks.
4. Accept that you may not be able to catch all your animals.
5. Don’t forget dogs and cats in your rush to save livestock. Sometimes in an evacuation you’ll move from Level 2 to Level 3 and authorities won’t let you back in to an evacuated zone. Keep beloved pets with you.
6. Leave pasture gates open so wildlife trying to escape won’t be trapped in your pastures.

*Level 1 = Get ready; wildfire in area—monitor fire status and be prepared to evacuate.
Level 2 = Get set; be ready to evacuate immediately if so advised.
Level 3 = Go! Evacuate—personnel and property are in immediate danger.
**WEATHER UPDATE**

All information here is derived from the four weather WSU AgWeatherNet stations ([http://weather.wsu.edu/awn.php](http://weather.wsu.edu/awn.php)) in Whatcom County. Current weather conditions can be found at: [http://whatcom.wsu.edu/ag/currentdata.html](http://whatcom.wsu.edu/ag/currentdata.html). Station information can be found here.

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**Max/Min Temp & Precipitation**  
*Whatcom County*  
**10/16/13 - 11/15/13**

- **Max. Air Temperature (F)**
- **Min. Air Temperature (F)**
- **Accumulated Precipitation (in.)**

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**Growing Degree Days, Whatcom County**  
**10/16/13 - 11/15/13**

- 2013
- 2012
- 2011
- 2010
- 30 Year Average
November

Focus on Farming
November 21, 2013
Everett, WA
The tenth annual Focus on Farming Conference "Back to our Roots" will be held at the Comcast Arena in Everett. The conference will feature two nationally recognized keynote speakers, networking opportunities, and 24 workshops in six industry tracks. Online registration is now available.

December

Washington Small Fruit Conference and Lynden Ag Show
December 5&6
Northwest Washington Fairgrounds, Lynden, WA
Washington Small Fruit Conference is a 2-day conference with latest relevant research information delivered by the scientists performing the research. Lunches each day are provided. This conference is presented in association with the Lynden Ag Show, a trade show featuring vendors serving the small fruit community.

Far West Agribusiness Association Winter Conference
December 9&10
Pasco, WA
The conference provides a blend of innovative research and continuing education for crop advisors and consultants, regulatory updates and management solutions to retail business, along with the opportunity to discover new products from the exhibitors.

January

Northwest Ag Show
January 28-30
Portland, OR
The region's largest agricultural trade and consumer show is held at the Portland Expo Center.

Pacific Agriculture Show and Horticulture Growers' Short Course
January 30-Feb 1
Abbotsford, BC
Showcase the latest and most innovative equipment and technology for the agriculture industry. Join thousands of farmers and agri-food producers in comparing and investigating what over 250 dealers and manufacturers have to make your operation more efficient.