

Transitioning to Dryland Organic, People, Small Bites, Events

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Failing for Success: Transitioning to Organic Grain on the Palouse

What choices do Palouse farmers have when they want to convert conventional agricultural land into organic grain production in order to earn the premium price on organic grain? Many, as it turns out, and the choices will have a significant effect on a farmer's success, Washington State University researchers have found. Grain is notoriously difficult to raise as an organic crop, as weeds and pests can easily get out of hand without pesticides, and grain protein content and yields can be low without synthetic fertilizers. But even without artificial inputs, choices made during transition will significantly influence weed prevalence, grain yield, and grain protein content when the land enters certified organic grain production.

Farmers wishing to convert land to grow organic crops need to go through a three-year transitional period where they must avoid non-organic inputs, and yet cannot market their crop as organic. How can they best manage their land during this economically challenging transitional period and during

subsequent organic production?

WSU Masters student Misha Manuchehri and Ph.D. student Kristy Ott-Borrelli, working with Ian Burke, an associate professor, and Pat Fuerst, an assistant research professor in the WSU Department of Crop and Soil Sciences, set out to answer this question, continuing a study initiated in 2002 by Robert Gallagher. To make the study relevant to the Palouse, they chose constraints likely to be faced by local farmers. Because the Palouse has very little animal husbandry, animal manures were avoided. “As a weed management issue, it would be very nice to plow,” said Fuerst, but they also avoided this practice due to concerns with fuel costs and erosion on the steep Palouse slopes. They decided to test different crop rotations at the Boyd Farm, a site leased by WSU for organic farming research, outside Pullman.



Aerial view of the Boyd farm, with test plots visible on the left. Photo: Washington State University.

How successful were they? Many of their rotations were not at all successful. “We fail, so you don’t have to,” Ian Burke told farmers at a recent Tilt Producers Conference. Since researchers determined that granular organic fertilizers can cost ten times as much as synthetic fertilizer for the same amount of nitrogen, they tried legume green manures, a category of cover crop grown mainly to add organic matter and nitrogen to the soil. They also tried different spring crops in rotation with winter wheat. Spring green manures, including spring peas, did not fare well, due to pressures from insects and weeds. Bell beans (fava beans) didn’t work as green manure, either, since they weren’t suited to regional conditions. Winter peas, however, added nitrogen while competing better with weeds. But farmers looking for profitability during transition might choose three straight years of alfalfa. “Forage was a great crop for the transition,” Ott-Borrelli said.

When testing the competitiveness of six spring crops that can be rotated with winter wheat, broadleaves such as lentils, garbanzos, and canola fared poorly. “Barley does a pretty good job, from what I’ve seen,” said Manuchehri. Since barley emerges relatively early, it has a head start against weeds. Researchers planted the barley about two inches deep, rather than the typical one to 1.5 inches. When it emerged, it was better established, and more able to stand up against the next weapon in weed control: the rotary hoe. This tillage instrument uses an array of spikes to puncture the soil without turning it. Delicate, sprouting weeds are vulnerable to these rolling daggers, but the



Field technician Dennis Pittmann mows winter peas at the Boyd organic farm. Photo by Rob Gallagher.

barley is well enough established that it is not harmed, according to field technician Dennis Pittmann, who drove the tractor that pulled the rotary hoe. Wet spring weather, however, can be an impediment to using heavy tractors and tillage instruments. “The earlier we can get in the field to control weeds,” said Manuchehri, “the better off we are.”

Another technique involved using higher seeding rates. To improve competition against weeds, organic grain growers might seed with 1.5 times as much grain as conventional growers. Manuchehri found that barley competed well with

weeds when seeded at twice the normal rate, but this still wasn’t a magic bullet in particularly weedy areas. Her recommendation to organic farmers? “Go off local grower planting rates and adjust from there.”

Ott-Borrelli focused on nitrogen dynamics during transition. Both legume green manures and alfalfa boost soil nitrogen levels, so how did transitional rotations affect subsequent organic grain yield? Since nitrogen from alfalfa is more quickly available, forage systems gave the highest grain yield the first year of organic certification. But the second year, yields fell somewhat. Wheat crops that followed a green manure rotation, however, showed the opposite effect. Yields lagged the alfalfa rotation during the first year of organic production, but as nitrogen from the green manure became more available in the second year, yields surpassed that of the post-alfalfa wheat.

Yield obviously translates to profitability, but so does the protein content of the wheat, as hard wheat needs to reach sufficient protein levels to be suitable for bread. Conventional agriculture frequently adds synthetic fertilizer to boost soil nitrogen and therefore protein levels in wheat. Without the use of expensive organic fertilizers or the availability of animal manure, careful crop rotation was the only option for boosting protein content. The three-year alfalfa transition did well with boosting protein in subsequent wheat crops, but green manure showed a slight advantage.

Through careful crop rotation, farmers wanting to transition their land in order to grow organic grain can have an impact on weed control and soil nitrogen levels, although economic challenges may persist. One of the most important tools, according to Fuerst, is flexibility. Farmers need to start small

and be ready to abandon unproductive practices and alter seeding dates and varieties to improve results.

Following their own advice, WSU scientists are changing parameters and exploring new techniques to advance the science of organic grain production. Ian Burke is developing an inter-row cultivator with precision guidance, allowing it to control weeds between rows while sparing the wheat. Researchers have also started finding local sources of animal manure for fertilizer. “Livestock integration with organic grain production makes a lot of sense,” noted Pat Fuerst.

Learn more about CSANR’s efforts in organic agriculture at <http://csanr.wsu.edu/Organic/>.

–Bob Hoffmann

People – Stories of Agriculture in Action

A Literary Track to Sustainability and Organic Food

For Kim Miller, embracing a sustainable, organic lifestyle didn’t come from being born into a farming family with generations of living off the land bred into her bones. In her case, the warm summers of eastern Washington, a WSU English degree, a culinary degree, and several great reads were enough. Miller did not come from a farming background at all, in fact. The manager of the Community Supported Agriculture (CSA) program for Tiny’s Organic of East Wenatchee grew up in Kent, Washington. Miller’s parents were avid gardeners, but being forced to weed didn’t stir in Miller an abiding interest for digging in the dirt. That came after she and her husband, Joe, bought a home on 2.5 acres in Ephrata, Washington, and planted their first vegetable garden.

Several other factors came into play for Miller, however. She moved from the rainy Seattle area to attend school in Pullman in 1990—and reveled in the region’s four distinct seasons, especially summer. The English degree she



WSU alumna Kim Miller loves her job at Tiny's Organic in East Wenatchee, where cuddling baby chicks are just one of the perks.

earned in 1994 helped her institute Tiny's weekly newsletter, "Fresh from the Farm," a direct communication link between CSA members and the farm. Full of historical and nutritional facts of the week's harvest and recipes, the newsletter is included in produce bags delivered to CSA members in more than 70 locations all over the state and to individual homes during the summer and early fall. Yet it was more than the degree that led Miller to Tiny's.

"Honestly, my English degree didn't help so much as the entire college experience as a whole," she said. "What I feel I really learned was not only the academic information (in terms of gathering knowledge) but also the process of being responsible for my actions, learning how to deal with people, and living on my own."

Add to those factors two books she read that changed Miller's course after graduating from WSU. An avid reader of anything related to food, health, and sustainability, Miller was working as a documentation specialist for a now-defunct Seattle shipping company when she read *The Making of a Chef* by journalist Michael Ruhlman. The book chronicles Ruhlman's entry into the Culinary Institute of America in New York and his intense experience of learning the art of cooking from "the Harvard of cooking schools."

"It alone caused me to throw caution to the wind and quit my very stable job to enroll in culinary school," said Miller, who attended the Art Institute of Seattle and graduated with her culinary degree in 1999. She went on to do an internship the next year at Indian Summer Golf and Country Club in Olympia, Washington.

Miller then read Eric Schlosser's *Fast Food Nation: The Dark Side of the All-American Meal*, wanting to understand more about what she was actually putting into her body. Schlosser's book, among other things, examines how fast food "widened the chasm between rich and poor, fueled an epidemic of obesity, and propelled American cultural imperialism abroad," according to the book's description.

"That scared me enough to change my eating habits and really start to care about the relationship between health and food," Miller said.

Two other books paved the road for Miller to begin working for Tiny's last June: *In Defense of Food* by Michael Pollan and, especially, *Half Broke Horses: A True-Life Novel* by Jeannette Walls. "[Walls's] description of hauling water for her garden makes me feel very fortunate for our irrigation system," Miller said.

Tiny’s Organic was established more than 40 years ago by the McPherson family and is still owned and operated still by the family, which includes Greg “Farmer McGregor” McPherson and his children, Erin, John, and Jay. Located close to the Columbia River in Douglas County, the farm grows stone fruit (peaches, plums, nectarines, cherries) as well as mixed greens, summer squashes, tomatoes, and eggplant. Tiny’s has used organic growing methods for more than 20 years and is 100 percent certified organic, supplying produce to some 35 farmers markets. It also offers an internship to introduce people to farming and all aspects of its operation.

As Tiny’s CSA program manager, Miller said her favorite part of the job is “being a part of something that I think is so important to our future as humans. “The calm that comes from being able to look out my window at any moment and see our beautiful orchard while watching the chickens peck around outside doesn’t hurt either,” she said. “I absolutely love my job! I can’t see myself working anywhere else.”

To learn more about Tiny’s Organic, visit the website at <http://tinysorganic.com/>.

–Nella Letizia

Internship opportunity: Tiny’s Organic is looking for several interns for their organic farm for the 2012 July–Sept season. Internships provide an introduction to farming and all aspects of the growing operation. Interns will be primarily focused on organic vegetable production. Learning opportunities include soil and bed preparation, planning and transplanting, manual weeding and cultivation, insect and disease control, greenhouse and irrigation. The minimum length of stay is 30 days. Interns work 6 days a week, farm hours, and will report directly to the owner/lead vegetable grower. [Learn more »](#)



Sustainable Food Safety

Food processing and packaging that ensure health and safety without wasting energy or the environment is an increasingly global dilemma. Washington State University recently received

a grant to enhance training of Ph.D. students to address the challenge. Three fellows will be trained in an innovative outcomes-driven program that integrates research and professional experiences with coursework in engineering,



Gustavo Barbosa-Cánovas, left, Shyam Sablani and Juming Tang.

applied sciences and professional development, said Shyam Sablani, assistant professor in the Department of Biological Systems Engineering and co-principal investigator on the project.

“This program supports our vision to become a world leader in developing advanced processing and package solutions for commercial production of safe foods,” said Juming Tang, professor and co-PI.

Green technologies are the future of food production, processing and storage, said Gustavo V. Barbosa-Cánovas, professor and co-PI. The fellows project will continue to position WSU as a world leader in incorporating sound innovative approaches for sustainability, he said. [Read more »](#)



Washington-grown and -made ciders compare favorably with those from England and France. Photo: Brian Clark/WSU.

Hard Cider Culture: WSU Research Helps Growers Diversify, Meet Demand

Where can hard cider connoisseurs roam the countryside, traveling from estate to estate and sampling the artisan crafts of local producers? Western Washington will be the venue for such activity, if Washington State University researchers have their way. Their goal is not just improvement of production and harvest techniques, but creation of a “hard cider culture,” with thriving producers and ardent consumers.

Carol Miles of the WSU Northwestern Washington Research and Extension Center in Mount Vernon is leading a team that has identified two of the objectives necessary for establishing a Washington hard cider culture.

First, researchers need to evaluate the characteristics of different apple varieties and their juices to determine their suitability for cider making in the Pacific Northwest. Second, they need to automate harvest with machinery in order to make cidery economically feasible. [Read more »](#)

WSU Cook Farm Named a USDA Long-Term Agroecosystem Research Site

Washington State University’s R. J. Cook Agronomy Farm just south of Pullman has been named one of only ten long-term agroecosystem research sites in the country by the U.S. Department of Agriculture. “This designation is

testimony to the quality of work being conducted by ARS and WSU to make agriculture more sustainable on all fronts,” said Rich Koenig, chair of WSU’s Department of Crop and Soil Sciences.

The USDA Agricultural Research Service designated the sites to engage in research to address questions related to the condition, trends, and sustainability of agricultural systems and resources across the United States. Sustainable agricultural systems that provide a safe, nutritious, ample and reliable food supply; produce bioenergy; provide essential ecosystems services; and mitigate climate change are needed for the well-being and welfare of future generations, according to the ARS.

ARS’s Land Management and Water Conservation Research Unit in Pullman will coordinate the Cook Farm LARS. David Huggins, WSU adjunct soil scientist and USDA-ARS soil scientist, will be the principal investigator for the site. Cook Farm was established by a team of ARS and Washington State University scientists involved in direct-seed cropping and precision agricultural research.

Enhanced resources in the ARS program initiative on Environmental Stewardship in the FY 2013 President’s Budget will strengthen ARS’s capacity to conduct network-wide research in diverse agricultural systems across the country. Environmental data collected from this network will enable integration and synthesis of findings with the Long Term Ecosystems Research network and the National Ecological Observatory Network sponsored by the National Science Foundation.

Export Assistance Program

New-to-exporting and new-to-marketing firms with little or no expertise in international trade may want to consider consulting with WSU’s Export Assistance Program. The Export Assistance Program’s goal is to create a “culture of exporting” across the state and seeks to support embryonic export relationships, which can develop into long term partnerships. Research shows that firms located near exporters have a greater likelihood of exporting to those same destinations than otherwise. By creating a culture of exporting in



Cook Farm is named after R. James Cook, former dean of the WSU College of Agricultural, Human, and Natural Resource Sciences and emeritus professor of plant pathology and crop and soil sciences. Cook, who won the 2011 Wolf Prize for his contributions to science that have benefited humankind, stands here in front of the farm named in his honor. Photo by Dennis Brown/WSU

Washington, the program's team members hope to start a cascade effect, where exporting grows from one firm to another.

The Export Assistance Program provides:

- no-cost, confidential, in-depth, and long-term one-on-one export advice;
- assistance in preparing market and trade research and understanding export and exchange rate data;
- assessment of the client's export readiness;
- collaboration with the client to develop a plan that ensures short- and long-term exporting success;
- guidance in navigating international trade forms and paperwork; and
- additional resources as needed.

The Export Assistance Program at the School of Economic Science specializes in assisting agricultural producers. Its service is provided by Dr. Andrew Cassey and Dr. Yunfei (Eric) Zhao. They have research expertise and industry experience in international trade, plus many years of living and working abroad. In addition to experts in the School of Economic Sciences, the Export Assistance Program at the Small Business Development Center has four international trade specialists. Further, clients have access to 24 small business development centers statewide and 26 certified business advisors.

If you are considering becoming an exporter, and would like no-cost assistance, please contact Yunfei (Eric) Zhao at yunfei.zhao@email.wsu.edu.

Events

April 17 - June 19: Cultivating Success - Sustainable Small Farms Education Agricultural

Entrepreneurship. Do you want to grow your own grapes and start a winery? Do you want to sell directly to the market place? Are you taking Grandma's recipe to market? Then you need to cultivate success! 10-class agriculture entrepreneur course in Enumclaw at the Green River Community College Small Business Center. [Learn more »](#)



Masthead

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Green Times is edited by Brian Clark and the staff of Marketing, News, and Educational Communications in the WSU College of Agricultural, Human, and Natural Resource Sciences. Contact the editor with new tips, story ideas, and items for the vents calendar at bcclark@wsu.edu.

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