Current Status of Organic Research and Education in Washington and Oregon

David Granatstein, Center for Sustaining Agriculture and Natural Resources,
Washington State University

Organic farming has grown rapidly in Washington and Oregon over the past 15 years. Certified organic acreage in Washington alone increased 8-fold between 1993 and 2002. Yet the approximately 57,000 certified acres in the two states still comprises less than 1% of the total farmland base. With the growth of the organic sector in the region has come a commensurate expansion of research and education activities, which are described below.

Current Status of Organic Farming in the Pacific Northwest

Based on the most recent data from Oregon Tilth and Washington State Department of Agriculture Organic Food Program, the dominant certifiers in the region, in 2003 there were 25,928 certified acres and 854 transition acres in Oregon, and 30,640 certified acres and 1,914 transition acres in Washington. These numbers do not include farms certified by other certifiers. Oregon is a major producer of organic nursery plants, and accounted for nearly 50% of the national acreage of organic nursery/herbs in 2001. Organic dairy production is rapidly expanding today in Oregon and is not reflected in the above statistics. In contrast, Washington is a clear leader in organic acres of apples, pears, and cherries. Washington has 37% of the organic apple acreage in the U.S. and over 20% of that in the world (Granatstein and Kirby, 2002). Today large-scale vegetable production accounts for nearly 30% of the organic acres in Washington. Thus, while the two states have many agricultural similarities, the organic farming sectors are somewhat distinct in each state (Table 1).

Table 1. Certified organic cropland in Oregon and Washington in 2001 (USDA-ERS, 2002).

Crop Category	U.S. Total	OR	WA
Grain	454,598	1,100 (4)	2,739 (8)
Bean	211,405	nil	342 (1)
Oilseed	43,722	nil	nil
Hay	253,641	4,400 (16)	5,136 (15)
Vegetable	71,677	2,475 (9)	7,190 (21)
Fruit	55,675	1,925 (7)	9,244 (27)
Herb/nursery	14,599	7,976 (29)	3,424 (10)
Other crop	197,085	4,125 (15)	3,081 (9)
Pasture	**1,039,090**	**5,500 (20)**	**3,081 (9)**

[1] Number in ( ) is the % of the total organic land in this category in each state. 'Nil' is used for crops less than 1%.

Historically, organic farming in the Pacific Northwest had its roots on small farms that were commonly located near population centers. As the organic market has expanded, larger farms in the major agriculture production areas have become more common and more prominent. For example, western Washington has provided the philosophical, political and consumer base for the growth of organic farming in the state. However, in 2001, 82% of the certified organic acres and 98% of the acres in transition were in eastern Washington (Granatstein, 2002), which is the dominant commercial farming region in the state. In contrast, one-third of the organic farms

were in western Washington, and two-thirds were in eastern Washington. Farms in western Washington tend to be smaller than farms in eastern Washington. The two regions have quite different populations and biophysical environments, and correspondingly distinct research needs. The research community will need to track the demographic nature of organic farms in order to effectively serve them. The situation in Oregon is reversed, with western Oregon containing 79% of the organic farms, 42% of the certified acres, and 74% of the transition acres in 2003.

The Changing Land Grant University

Washington State University (WSU) and Oregon State University (OSU) are the land-grant institutions for their respective states, with the mandate to "to teach such branches of learning as are related to agriculture and the mechanic arts, …in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life" (Morrill Act of 1862). The Hatch Act of 1896 created the agricultural experiment stations at land-grant universities to "conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States…", and most of this mandate fits well with organic agriculture.

The Smith-Lever Act added the extension component in the early 1900s, creating the unique combination of teaching, research, and extension under one roof at land-grant universities. This system has proven very effective in solving specific problems and developing new technologies that are put in place on the land. And it can do the same for organic farming when resources are directed towards that end. Both WSU and OSU are increasingly investing in organic research and education through faculty time, courses, educational events, state research funding, and grants. Some 50 faculty at each institution have indicated current involvement or strong interest in organic farming, based on surveys done in the past two years (Stephenson et al., 2003; Miles et al., 2002a). Experiment station land is being certified organic in both states to provide a base for long-term studies. But it remains difficult to quantify the investment in organic agriculture research, as many 'conventional' research projects on such issues as biocontrol of insects or soil quality directly benefit organic growers but are not classified as organic research.

The increase in WSU and OSU involvement in organic research and education can be attributed to a number of factors including: the wide familiarity and acceptance of sustainable agriculture and conservation farming concepts; dramatic increases in organic acreage in the region; new sources of funding for organic research; and more receptive leadership within the universities. The entry of many mainstream farms and companies into the organic sector also helped to legitimize organic within the universities and provided support from stakeholders who have a long-standing university relationship.

Current Research and Education Activities on Organic Farming in Washington and Oregon

'Modern' organic agriculture research projects in the region can be tracked back several decades (Granatstein et al., 2003). A 1979 study by Kraten and Holland (WSU Agricultural Economics) compared the economics and energy performance of organic and conventional dryland grain farms, inspired by the oil crises of previous years. Studies by graduate students and faculty in the WSU Department of Crop and Soil Sciences during the 1980s compared soil fertility, soil biology, soil erosion, and crop rotation in conventional and dryland systems, and even included a study of some biodynamic treatments.

Since the mid-1990s, the number of "dedicated" organic research projects has increased. These are projects with a reference to organic farming in the title or main objectives, and include treatments or systems that would meet organic standards. Few have been conducted on certified organic land, and fewer yet on organic land that has gone through transition and is in "organic equilibrium." Many other research projects on soil management and pest management were directly applicable to organic farms but are often not counted as organic research. Thus, numeric comparisons are fraught with the judgment factor of what should be considered organic research.

To illustrate the trend of increasing organic research at the national level, the USDA SARE (Sustainable Agriculture Research and Extension) program database was searched for projects that included "organic" in the title. Projects were grouped into two time periods, the first half and the second half of the life of the SARE program, which was initiated in 1988 (Table 2).

Table 2. Projects funded by SARE (www.sare.org) that have 'organic' in the title.

	National	West	Northeast	North Central	South	WA	OR
1988-1996	50	13	17	12	9	3	1
1997-2004	141	16	53	32	39	3	0

The overall increase in organic projects is obvious, signaling that this public funding source was responding to the growth in the organic sector. However, the Western region, which includes Washington and Oregon, saw the smallest increase between the two time periods. Table 3 lists recent SARE funded organic projects for Washington and Oregon, some of which do not contain 'organic' in the title but that are taking place in organic systems. A similar search was done of the Organic Farming Research Foundation (www.ofrf.org) list of projects. For every year from 1993 to 2004, there were between one and three projects funded for Washington and Oregon, with a total of 13 projects in each state over the time period. Recently, funded projects include breeding for late blight resistance in tomato, organic wheat breeding, pastured turkey production, compost tea, and biocontrol of insect pests in organic vegetables.

Table 3. SARE funded projects on organic farming in Washington and Oregon from 1988 to 2002.

Washington
SW03-040 Assessing soil quality in intensive organic management systems. Research and Education grant.
SW03-101 Integrating biological control into cole crop production in the Pacific Northwest. Research and Education grant.
FW03-202 Controlling flea beetles in arugula using traps and sprays. Farmer/Rancher project.
FW99-089 Harvesting Alternatives for Burdock as an Alternative Crop in an Organic Production System. Farmer/Rancher Project.
FW98-076 Organic Soil Amendments and Fertilization Practices for Processed Vegetable Crops: A Study in Nitrogen Mineralization and Soil Quality. Farmer/Rancher Project.
EW98-008 Organic Food Production and Marketing -- Educational Resource Development. Professional Development Program
FW96-067 Organic vs. Synthetic Fertilizer- Container Nursery Trials. Farmer/Rancher Project.
FW96-016 Weed Control in Organic Apple Orchard. Farmer/Rancher Project.
EW96-006 Organic Food Production and Marketing - Tours and Resource Guide. Professional Development Program.

Oregon
SW03-033 Management of Garden Symphylans with Crop Rotation Tactics and Improved Soil Sampling Methods. Research and Education grant.
FW96-068 Organic Mulch for Weed Control in Rhubarb. Farmer/Rancher Project.

In an assessment of the number of WSU faculty involved in explicit organic research over the same time periods, 6, 8, and 30 faculty were involved in 1984, 1994, and 2004, respectively. This shows a dramatic increase in organic research in the region since the mid-1990s. More thorough assessments of organic research and education activities at WSU and OSU were recently conducted. In 2001, the WSU Center for Sustaining Agriculture and Natural Resources conducted an email survey of faculty in the College of Agriculture and Home Economics to determine past and current organic farming projects. Some 90 projects were identified by 58 faculty members, and the results were compiled into a publication (Miles *et al.*, 2002a). A group of OSU Extension faculty produced the "Organic Farmer's Guide to Oregon State University" in 2003 to familiarize organic growers with the faculty, units, labs, and publications at OSU that might be of assistance to them (Stephenson *et al.*, 2003). Both publications are available on line.

Recent meetings at WSU and OSU indicated a need to showcase organic agriculture research. A joint organic farming research symposium was hosted, along with Washington Tilth and Oregon Tilth, in Yakima in November 2002 that attracted 220 participants, and even more surprising, some 48 posters on current research and education projects in the two states. These were catalogued in the proceedings (Miles *et al.*, 2002b). A second symposium specifically on weed management in organic systems was presented in February 2004 (Miles *et al.*, 2004), and the current symposium on insect biological control is the third effort along these lines.
In 2003, WSU received a special grant from the USDA for organic crop research. Five projects were funded – organic seed production, transition rotations in Northwest Washington, understory

management in organic orchards, weed control in organic dryland wheat, and development of statistics on the organic sector. Funding was received again in 2004, and new projects on organic crop breeding, biodegradable mulches for weed control, biocontrol of nematodes, and cover crop systems were added. Further funding is anticipated in 2005.

Other current studies at WSU include a comparison of nutritional and anti-oxidant qualities of organic versus conventional strawberries, a major trial on organic wheat production, organic soil nutrient management, cover crops in organic grapes, biocontrol with nematodes, and mustard green manures. At OSU, other studies include nitrogen management, soil health, strip-till, creating disease suppressive soils, weed control in organic vegetables, conservation biocontrol, protein sources for organic livestock, organic cherry production, and crop breeding for organic systems. Organic research is underway at the USDA Agricultural Research Service labs in both states, and is also being conducted by commodity groups, private organizations, and individual farmers.

Numerous educational activities are also occurring. One of the main trends is the inclusion of organic sessions within many of the mainstream agriculture meetings, such as the Washington State Horticulture Association, the Western Washington Horticultural Association, and the Pacific Northwest Vegetable Association. Both universities are offering more workshops with a focus on organic agriculture. New graduate student opportunities are opening at the universities to study and conduct research on organic systems. WSU is launching a B.S. major in organic farming within the next year. Recently, an organic farming website was developed at WSU (http://csanr.wsu.edu/organic) to make it easier to find the variety of organic resources at the institution. The web site will include a database of all past and current organic projects to better identify the various activities.

Both WSU and OSU were major participants in the organic agriculture training project funded by Western SARE. The project has conducted two national satellite broadcasts, the first on the National Organic Standards, and the second on organic livestock. A training workshop was held in Portland, Oregon, and a training binder was developed that will be available on-line in the near future.

With funding opportunities expanding from USDA (Organic Transitions, OREI, SARE, NRI), EPA, OFRF, and other sources, organic research and education should continue to expand in Washington and Oregon. Even traditional sources such as the Washington Commission on Pesticide Registration are funding some organic projects under its IPM/biocontrol mandate. As many organic research findings find a home within conventional systems, because they work and they may reduce cost and risk, the demand for organic research will grow stronger and will be broader-based. More important, perhaps, is continued research that will make organic systems more sustainable – economically, environmentally, and socially.

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