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Cultivating Biological Connections Organic/BioAg Symposium Opens Doors

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One of the fastest growing segments of agriculture in the United States is organic farming. For the past decade, the organic food industry has been growing at a rate of 20 to 30% annually, with a commensurate increase in land farmed under certified organic management and an increasing need for research and education on organic farming practices and systems. While certified organic farming is now specifically defined by the USDA National Organic Standards, many practices that are central to organic farming are being incorporated by farmers into their “conventional” systems to help meet economic and environmental goals. Similarly, research developments in “conventional” agriculture on biointensive IPM and biological control, for example, are expanding and are of direct benefit to organic producers. Thus, the commonality between “organic” and “conventional” is increasing.

At Washington State University, the Center for Sustaining Agriculture and Natural Resources (CSANR) is developing a research and education program on Biologically Intensive and Organic Agriculture (BIOAg) to encourage this common ground that can help all producers while clearly addressing public concern for environmental stewardship. The need for a more sustainable agriculture will require greater reliance on biological processes that are renewable, that are non-polluting, and that provide



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multiple benefits for farmers and society; hence the term “biologically intensive.” Organic farming is one of the better developed examples of this concept. Land grant universities such as Washington State University (WSU) are helping to meet the growing need for this type of information.

Seeds of the Symposium

A common misperception in the Pacific Northwest is that the land grant universities are not involved in organic farming research. In 2001, CSANR conducted an informal email survey of WSU agriculture faculty to determine the kinds of organic or organic-related projects, if any, they had completed, were underway, or were planned. Over 50 faculty members responded to the survey and reported 90 projects that related to organic agriculture. In October 2001, the CSANR hosted a day-long meeting where 50 faculty participated to plan organic farming research and education at WSU. The group proposed a symposium as a next step to bring researchers and their projects together with growers, educators, and consultants. Two goals were identified:

- 1) make the public aware of the array of relevant organic farming research underway, and
- 2) provide an opportunity for researchers and end users to meet, explore common ground, and plan future collaboration.

Planning for the Northwest Symposium on Organic and Biologically Intensive Farming became a team effort involving WSU, Washington Tilth Producers (a statewide sustainable/organic farming group), Oregon State University, and Oregon Tilth. The Symposium date was set to occur the day before the annual Tilth Producers Conference to provide as much crossover of participants as possible. A planning group consisting of university, non-governmental organization (NGO), grower, and industry representatives designed an agenda consisting of presentations on four key topics related to BIOAg, followed by a two-hour interactive poster session. The topics were soils, seeds and genes, pest management, and system studies. Speakers were selected to represent leading edge research. More practical presentations on organic farming methods occurred during the Tilth Conference itself. Funding for the event was provided by registration fees, an EPA mini-grant, CSANR, Western SARE, and contributions from industry sponsors.

Fruits of the Symposium

The Symposium succeeded in meeting both its goals. More than 220 people attended the event. About half the participants were growers, a quarter were researchers and extension agents, and a quarter were industry and agency representatives. Forty-eight posters were presented. Thus, a large number of people were exposed to the significant amount of research underway relevant to organic farming and biointensive agriculture. The poster session provided a great opportunity for interaction, confirmed by responses on the evaluation forms. Each poster author submitted a one-page summary. These were bound into a proceedings called "Cultivating Biological Connections" and given to participants for future reference (this document is available on-line at <http://csanr.wsu.edu/programs/Proceedings.pdf>).



Proceedings available at
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programs/Proceedings.pdf](http://csanr.wsu.edu/programs/Proceedings.pdf)

Branches of the Symposium

In the oral presentations, Chris Koopmans, from the Louis Bolk Institute for Organic Farming in the Netherlands, described his work on field measurement and modeling to predict soil nitrogen dynamics on organic farms. He is working with the NDICEA (Nitrogen Dynamics in Crop Rotations in Ecological Agriculture) simulation model that tracks soil nitrogen, organic matter dynamics, and crop uptake. The goal is to identify the nitrogen release characteristics of various organic fertilizers and use the model to best match fertilizer type and timing with crop need while minimizing residual nitrogen at the end of the growing season.

Steve Jones, WSU wheat breeder, highlighted his organic wheat breeding and perennial wheat development projects. His group is screening over 160 historical cultivars previously grown in the Pacific Northwest for traits of potential benefit to organic farmers, such as emergence rate, height, and resilience to mechanical weeding. John Haapala introduced the Farmer Cooperative Genome Project that he initiated, with

organic growers across the country evaluating vegetable germplasm in cooperation with Cornell University Vegetable Breeders Institute. Results include powdery mildew resistance for squash and cucumbers, blight-resistant tomatoes, and a new organic broccoli breeding effort at Oregon State University.

Advances in biointensive IPM of insects in tree fruit were presented by Ted Alway, including area-wide mating disruption and the role of surrounding habitat for natural enemies. His Wenatchee Valley Pear IPM project illustrated potential lower cost and better pest control with an “organic” insect pest management program. Matt Liebman, Iowa State University agronomist, illustrated his years of work on integrating crop, soil, and weed management to make systems more “weed suppressive.” He uses the term “many little hammers” to illustrate the need for multiple strategies that each deliver small gains in weed control rather than a “big hammer” replacement for herbicides.

Two contrasting farming systems studies were also presented. A field-scale replicated orchard systems experiment led by WSU’s John Reganold that included conventional, organic, and integrated production, has shown the organic system to have tree growth, fruit yield, and quality equal to the conventional system. Using the “Responsible Choice” environmental impact tool, he compared the three production systems. The Responsible Choice method assigns a numerical value to a range of factors pertaining to the pesticide such as acute LD50, effect on beneficials, and solubility, then combines these to arrive at a score. Using this method, Reganold found the organic production system to have the lowest impact and the conventional the highest.

The other farming system study was presented by Henning Sehmsdorf who introduced his integrated small farm where he is monitoring nutrient, energy, labor, and cash flows in his quest for a highly productive and renewable farm model. He and his colleagues used *emergy* analysis to evaluate ecological sustainability on the farm. (*Emergy* is defined as the available energy of one kind previously used up directly and indirectly in the production of a product) Vegetable, fruit and pork production required large amounts of imported resources in relation to the amount of locally available *emergy* that those sub-systems received from the environment. In contrast, beef, lamb, and grain production relied much more on local resources.

Offshoots of the Symposium

Future symposia are envisioned as a continuation of this initial cooperative effort. Rather than a broad range of topics, they will likely be organized around priority issues facing BIOAg, such as the potential convergence of organic farming and direct seeding.

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The first Symposium set in motion many new “biological connections” among the people who will shape a more sustainable agriculture in the region.

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The work described in this article is just one of many integrated pest management (IPM) efforts underway in Washington State. Several other Washington IPM projects are detailed in the March, April, and May issues of *Agrichemical and Environmental News*, available on the Internet at <http://aenews.wsu.edu> . For additional information on IPM in Washington State, please consult the following resources:

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