



Western SARE

Phil Rasmussen, Coordinator
Utah State University
Agricultural Science Building
Room 305
4865 Old Main Hill
Logan, Utah 84322-4865
phone: (435) 797-2257
fax: (435) 797-3344

Professional Development Program

Brian Tuck
Oregon PDP Co-Coordinator
Oregon State University
Wasco County Extension Office
400 East Scenic Dr., Suite 2,278
The Dalles, OR 97058
(541) 296-5494
Brian.Tuck@oregonstate.edu

Dan McGrath
Oregon PDP Co-Coordinator
Linn County Extension Office
4th & Lyons
Albany, OR 97321
(541) 967-3871
Dan.McGrath@oregonstate.edu

...

Western SARE Grant Categories

- Research & Education
- Professional Development
- Farmer/Rancher
- Professional + Producer
- Graduate Student
- Sustainable Farm Tours

Go to <http://wsare.usu.edu>
Click on: Apply for a Grant

INTEGRATED APPROACH TO SPUDS

Summary

The yield and quality of a potato crop are the result of complex interactions amongst crop nutrition, cultural practices and pest damage.

The Ospud project piloted a participatory approach to

learning and adaptation of novel farming systems strategies.

Researchers and farmers collaboratively evaluated insect pest management, plant disease management, and nitrogen management challenges in organic potato production.

Methods

Ospud project participants include researchers, farmers and Extension personnel. Grower meetings were held to collectively establish research protocols and budgeting details.

In this handout, we highlight the technical outputs of Ospud. A companion handout highlights the grower participation process and the impacts of grower participation

Results and Outcomes

Nutrient management

- Found that mineralization of N from soil organic matter supplied most of the N needed by organic potato crops. So, at most farms, expensive current season N inputs can be reduced.
- Adapted monitoring protocols (soil, petiole and irrigation water testing) to fit our organic potato production systems



- Developed planning values for crop N budgets in organic production systems.
- Provided site-specific guidance for farmers to

Research & Education Grant

Title: Integrated Soil and Crop Management for Organic Potato Production (*This handout highlights the technical outputs of the OSpud project.*)

Project Number: SW05-091

Principal Investigators:

Lane Selman
OSU Research Associate
(541) 737-3483
Selman@hort.oregonstate.edu

Dan Sullivan, OSU Extension & Research Soil Scientist
(541) 737-5715
Dan.Sullivan@oregonstate.edu

Alex Stone, OSU Vegetable Cropping Systems Specialist
(541) 737-4676
stonea@hort.oregonstate.edu

Mario Ambrosino, OSU Integrated Plant Protection Ctr.
(541) 737-2638
ambrisim@science.oregonstate.edu

Farm Collaborators:

Gathering Together Farm
Foundhorn Gardens
Persephone Farm
Sauvie Island Organics
Fields Farm
Ralph's Greenhouse
Fry Family Farm
Wintergreen Farm
Blue Fox Farm
47th Avenue Farm
Springhill Farm

Amount Funded: \$196,067

...continued on next page



Western SARE, a USDA organization, funds grants for research and education that develop or promote some aspect of agricultural sustainability, which embraces

- *profitable farms and ranches*
- *a healthy environment*
- *strong families and communities.*

The Western Region, one of four SARE regions nationwide, is administered through Utah State University.

Western SARE:
<http://wsare.usu.edu>

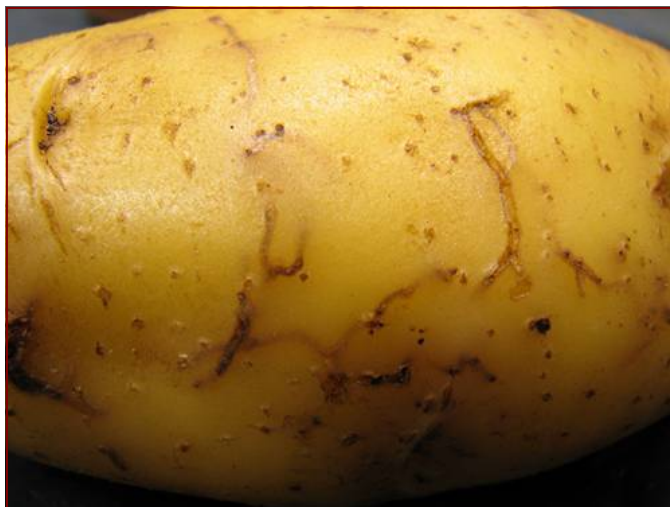
National SARE
www.sare.org

INTEGRATED APPROACH TO SPUDS

improve nitrogen use efficiency.

Late blight management

- Taught farmers to diagnose late blight in the field.
- Identified at least 3 commercially available potato cultivars with late blight resistance and good market quality for organic fresh market production, and these cultivars have been adopted by project farmers.
- Demonstrated that copper fungicides effectively controlled late blight; one large scale farmer in a potato production region is now using copper fungicides to manage late blight. A 5 ton/acre increase in marketable tubers resulting from late blight control is worth approximately \$800 to \$8000 per acre to farmers.



Farmers learned how to identify symptoms of late blight in the field.

Insect pest management

- The tuber flea beetle was identified and confirmed as the most important insect pest in Western OR and WA.
- Flea beetle monitoring and tuber damage assessment methods were developed and methods that farmers can use are described in an extension publication.
- Wireworms: a tuber damage rating system was developed for consistent diagnosis. We demonstrated farmer-friendly methods for evaluation of wireworms (pheromone traps and larval bait traps).



Outreach

Several publications have resulted from the project:

McQueen, J.P.G. 2007. Estimating the dry matter production, nitrogen requirements, and yield of organic farm-grown potatoes. M.S. Thesis. Oregon State University, Corvallis, OR. Available at: http://ir.library.oregonstate.edu/dspace/bitstream/1957/6245/1/mcqueenj_MStheis.pdf

What's Wrong with my Potato Tubers?

Diagnosing tuber abnormalities in western Oregon and Washington

L. Tolman, H. Anderson, A. Stone, and A. Miller

EW 3044-02 January 2008

This bulletin is one of a series on organic potato production developed by "OFTED" - OFTOD is a collaboration among Oregon State University, parent and 11 farmers operating diversified organic vegetable farms. The purpose of OFTOD is to improve potato quality and profitability through a participatory learning process and on-farm, farmer-driven research. The first issue of OFTOD was supported by Western SARE (W-05-001). For more information on OFTOD visit ofterd.org.

Potatoes are susceptible to damage from environmental conditions, insect pests, and pathogens. This publication will help you diagnose common abnormalities of potato tubers in western Oregon and Washington. In this region, potato-related abnormalities are typically broad-spectrum. For example, tuber flea beetle larvae can cause extensive damage to potato tubers - an extensive cause resulting in tuber crop loss. This can be difficult to distinguish from wireworm damage. In addition, potato tubers can be damaged by wireworms, which are difficult to distinguish from tuber damage caused by other insects. This guide describes the steps for tuber identification, damage assessment, and management.

Additional information: page 10

Flea Beetle Pest Management for Organic Potatoes

Several species of flea beetles are commonly found in organic potato fields in North America. Adults of many of these species feed on the leaves of potatoes and other plants in the family Solanaceae, but tuber flea beetle larvae are the most common cause of flea beetle damage to potato tubers (Figure 1). Tuber flea beetle larvae feed on potato tubers, which are grown in the soil and are not visible to the farmer. This guide describes the steps for flea beetle identification, damage assessment, and management.

EW 3044-02 January 2008

Figure 1. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 2. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 3. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 4. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 5. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 6. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 7. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 8. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 9. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 10. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 11. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 12. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 13. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 14. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 15. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 16. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 17. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 18. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 19. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 20. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 21. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 22. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 23. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 24. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 25. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 26. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 27. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 28. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 29. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 30. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 31. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 32. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 33. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 34. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 35. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 36. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 37. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 38. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 39. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 40. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 41. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 42. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 43. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 44. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 45. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 46. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 47. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 48. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 49. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 50. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 51. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 52. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 53. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 54. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)

Figure 55. Damage from flea beetle larvae and other tuber insects. (Tuber shown in lower right corner.)