

Organic Small Grain Production in the Pacific Northwest

*Diana Roberts, PhD
Professor & Regional Extension
Specialist
Washington State University
Extension*





Sustainable dryland organic grain farming

- **OREI grant**
- **Washington, Oregon, and Idaho**
- **Dryland organic grain**
- **Transition studies at WSU Boyd Farm, Pullman**
- **Farmer surveys**
- **Tristate Extension component**



Extension objectives

- **5 OFTs (On Farm Tests) on dryland cropping systems**
 - 2 in WA, 2 in ID, 1 in OR
- **Workshops and tours**
 - farmers as teachers
- **Online budgets**
 - user can adapt them
- **Electronic networking & info**
 - PNW website
 - Email listserv
 - 225 up from 85 a year ago
- **Extension bulletins**





On Farm Testing (OFT) principles

- **Grower driven idea**
- **Scientific design**
 - **Replicated in the field**
 - **Repeated over years**
- **Farm-size equipment**
- **Grower manages the field work**
- **Researchers assist with harvest, analyze data**
- **Farmer speaks at workshops, tours**



Challenges for Organic Grain Production in the PNW

- Soil fertility
- Weed management
- Crop rotations for diversity
 - Limited by lack of summer rainfall
- Soil fertility and weed management

Lentils

**We have no sure recipe
for success!**

11.08.2008 13:35

Oregon OFT

- **1 trial** - study looking at crop rotations, cover crops, tillage, rotation, weeds, organic matter, nitrogen.
 - Using an undercutter and minimum till.
- **Several crop rotations**



- **Cooperators:**
- **Eric Nelson at Pendleton (Umatilla County) with Stephen Machado (OSU) and Mary Corp (OSU Extension)**

Mary Corp photo

A man wearing a white t-shirt, a camouflage baseball cap, and glasses is kneeling in a field of golden wheat. He is looking down at the plants, possibly inspecting them. The field is vast and stretches to the horizon under a clear sky.

Idaho OFT

- 2 sites in Camas and Blaine Counties
- High altitude, short season, organic by default
- Applied composted dairy manure at varying rates
- Followed with barley
- Published results
- Farmers: Matt McLam, Bryan Wood, John Saili
- Cindy Kinder, Lauren Hunter (UI Extension)



Washington OFTs

- **2 trials comparing commercial organic fertilizer in wheat-fallow**
 - **Perfect Blend™ 4-4-4**
(granulated chicken compost)
 - **Nature Safe™ 13-0-0** (granular hydrolysed feather, meat and blood meal – no compost)
- **Several rates used**





Washington cooperators

**Owen Jorgensen
at Coulee City
(Douglas County)
and Dale Whaley,
WSU Extension.**



**Gregg Beckley
(2010 only) at
Benge (Adams
County) and Aaron
Esser, WSU
Extension.**







2010 Beckley OFT results

	18-Aug	1-Oct	1-Oct	15-Sep	15-Sep
Treatment (lb N/A)	Yield (bu/A)	Protein (%)	Test Wt (lb/bu)	Gross return (\$/A) at \$7.20¥	Gross-Fert Cost (\$/A) at \$7.20
0	67.5 a€	8.1 bc	60.6 a	366 a	366 a
15 PB*	69.8 a	8.2 bc	60.4 a	386 a	335 a
15 NS**	70.4 a	8.5 ab	60.4 a	396 a	343 a
30 NS	70.5 a	7.7 c	60.6 a	366 a	259 b
15 PB + 15 NS	71.8 a	9.3 a	59.8 b	434 a	330 a

* Perfect Blend 4-4-4 ** Nature Safe 13-0-0 €Means followed by different letters were significantly different at the 5% level ¥ Discounted for test wt & protein



2010 Jorgensen OFT

- **Wheat-fallow rotation**
- **8-10 in precip**
- **Plots seed & fert 9/4/2009**
- **Variety Eltan (SWW)**
- **5 treatments 4 reps**
- **Plots 1,000 ft long**
- **No problems with Nature Safe (not the case in fall 2010)**



- **Good winter survival**
- **Soil samples taken in April**



04/06/2010 16:57

- **Samples collected for test weight & protein**





2010 Jorgensen OFT results

	24-Aug	1-Oct	1-Oct	15-Sep	15-Sep
Treatment (lb N/A)	Yield (bu/A)	Protein (%)	Test Wt (lb/bu)	Gross return (\$/A) at \$8.20¥	Gross-Fert Cost (\$/A) at \$8.20
0	25.5 bc€	8.7 b	56.1 a	207 b	207 a
15 PB*	30.3 a	8.8 b	55.9 ab	246 a	196 a
15 NS**	24.5 bc	9.0 b	55.8 ab	199 b	146 b
30 NS	23.5 c	10.3 a	54.9 c	190 b	83 c
15 PB 15 NS	27.2 ab	9.9 a	55.6 b	221 ab	117 bc
* Perfect Blend 4-4-4 ** Nature Safe 13-0-0 €Means followed by different letters were significantly different at the 5% level ¥ Discounted for test wt					



Seeding 2011 crop



Nature Safe 13-0-0



Perfect Blend 4-4-4

- **Problems with Nature Safe...**
 - **Had to modify design**



Nature Safe hard to handle



- **Excellent seed zone moisture**
- **2011 OFT looking great going into winter**
- **Adjusted design hard to compare results**





Jorgensen 2012 OFT

- **Another redesign – by grower**
 - Interseeding winter pea with winter wheat





04/19/2012



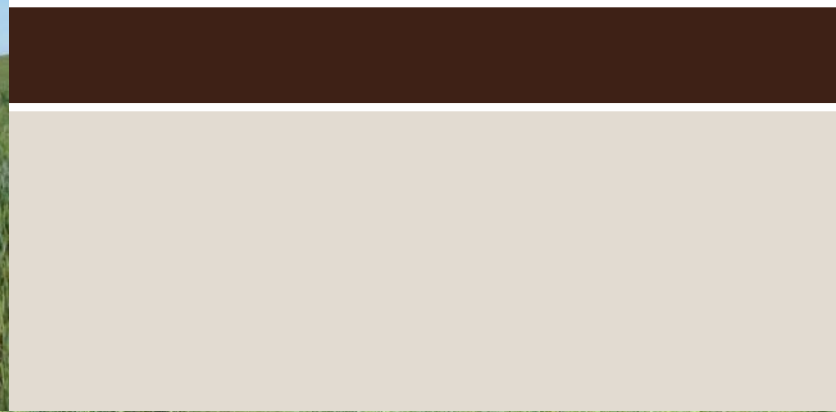
04/20/2012



04/19/2012



04/19/2012





Jorgensen 2012 OFT

Treatment	Mean (lb/A) Wheat + Pea
Wheat + 15 lb Perfect Blend	1332
Wheat + 90lb/A peas	984
Wheat + 45 lb/A peas	972
Wheat + 15 PB + 45 lb/A peas	1098
Wheat - Eltan at 55 lb/A, Pea Progene 7256 winter yellow edible split pea (short height)	
Trial seeded 9-16-2011 & harvested 9-18-2012. Pea shattering & short height reduced yield. Pea appeared to suck moisture from wheat Big problem with black mustard, despite harrow treatment	

- **Farmers are ever-creative**
- **We needed to fulfill terms of the grant...**
- **Decided to publish case studies of organic growers**



I'm going to lengthen my organic rotation to include peas – maybe winter pea-fallow-winter wheat...

What's next, Owen?

Washington State
University

Oregon State
University

University of
Idaho

PNW683

- **Louise Lorent, Diana Roberts, Ian Burke**
- **Smallgrains.wsu.edu**
 - **Organic production**
 - **Case studies**
- **Search PNW683 at WSU, OSU, UI publications**

**ORGANIC SMALL GRAIN PRODUCTION IN THE
INLAND PACIFIC NORTHWEST: A COLLECTION
OF CASE STUDIES**



Case studies

- 12 farm businesses in ID, eastern WA and OR
- Grain productiony focus
- Continuum of precipitation zones i.e. dryland to irrigated



Disclaimer: Grower experiences, not a university recommendation. Soil tests advised.



1. Read it online

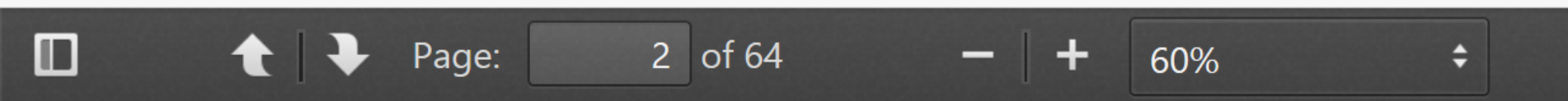


Table of Contents

Introduction	3
1. Eric Nelson, Nelson Grade Organics, Pendleton, Oregon	5
2. Owen and Alan Jorgensen, Sunrich Farms, Coulee City, Washington	12
3. Wade Troutman and Jane Whiddon, Open Heart Ranch, Bridgeport, Washington	17
4. Nathan Stelzer, Azure Farms, Dufur, Oregon	23
5. Seth Williams, W-7 Farms, Edwall, Washington	28
6. David Ostheller, Ostheller Farms, Fairfield, Washington	32
7. Ted Lacy, Lacy Farms, Worley, Idaho	37
8. Sam and Brooke Lucy, Bluebird Grain Farms, Winthrop, Washington	42

Abstract

Organic farming can be a challenge anywhere, but the challenge is often more pronounced by Inland Pacific Northwest organic small grain farmers. In this publication, several options for managing weeds and soil nutrients are few, and the regional climate doesn't make things much easier. Not all small grain farmers are out there, and a few are sharing their knowledge. This publication investigates the farming philosophies and practices of small grain producers across Washington, Oregon, and Idaho.



2. Download to PDF – loss of quality?



3. Print chapters/pages of interest

- Paper copy
- Can mark it up
- Lose hyperlinks





Hyperlinks work with Online and PDF versions

Bryan and John have used cross-seeding at half rates to increase ground cover and crop competition with weeds, but the increased fuel cost is not economical when organic premiums are low.

Like many farmers (both organic and conventional), Bryan says weeds are their greatest problem. Trying to take out their alfalfa field (Figure 11.3) can be problematic. Sometimes volunteer alfalfa in the field can cause problems when trying to harvest the barley, causing the combine harvester to get stuck.

Marketing and certification

John and Bryan sold organic malt barley (Figure 11.2) to Anheuser Busch in the past, but the \$4/bushel premium was insufficient. That market went away three years ago. They have worked with Lou Anderson (see [Lou Anderson's case study](#)), a grower in the area who also acts as a facilitator for farmers seeking marketing opportunities. In September 2013 they were concerned about being able to market their crops and whether organic production was viable for them.

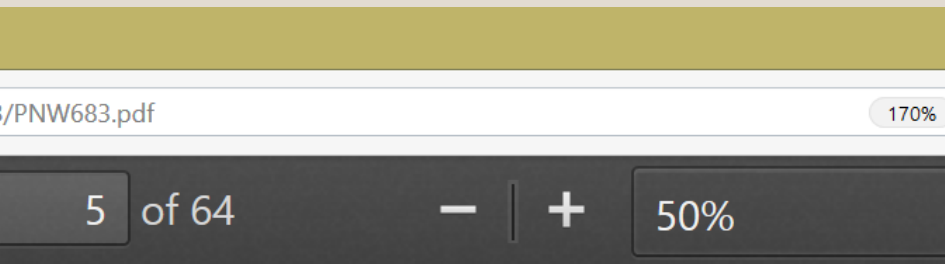
They had a situation where they plowed and disked the field six times the following year. The alfalfa came back. The barley was able to outcompete the alfalfa. They ended up losing organic certification in the process (and lost organic certification in the process).

Canada thistle can also be a problem. Sweeps set at an angle to cut the thistles. They follow up with disking in the fall.

Advice for other growers



Chapter topics



PNW PUBLICATION | ORGANIC SMALL GRAIN PRODUCTION IN THE INLAND PACIFIC NORTHWEST

1. Eric Nelson, Nelson Grade Organics, Pendleton,

Location: Umatilla County, Oregon

Annual precipitation: 10 to 12 in.

Irrigation: None

Dominant soil type: Walla Walla Silt Loam

Crop rotation: Alfalfa–winter wheat–summer fallow–legume cover crop–spring cereal



Figure 1.1. Eric Nelson stands in Pendleton, Oregon. (Photo by Di

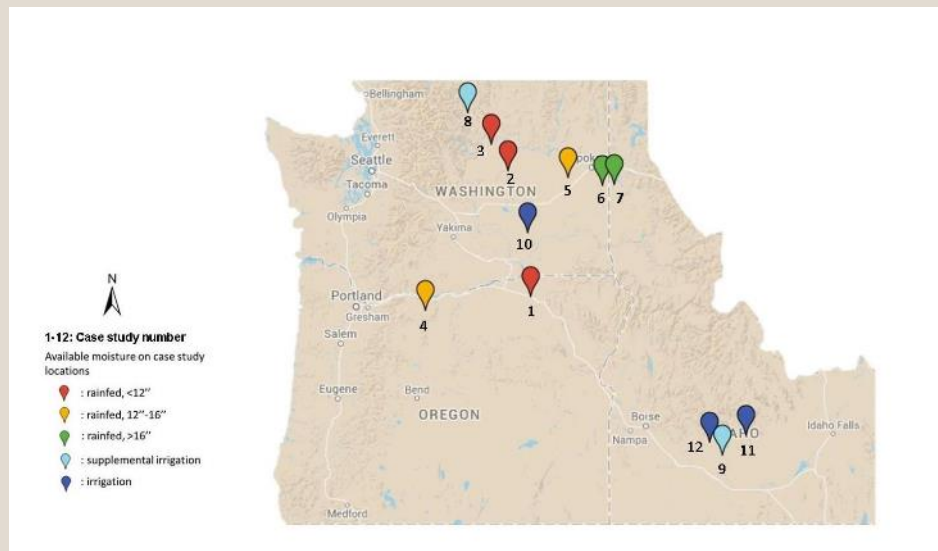
Farmers in Montana could inter-seeded as a companion foot tall intercropped with

- Introduction
 - Location
 - Annual precipitation
 - Irrigation?
 - Dominant soil type
 - Crop rotation
- Getting started
- Crop rotation
- Soil fertility
- Weed & pest management
- Marketing and certification
- Benefits & challenges
- Future plans & advice
- What does the law say?

In the mid-1990s, Eric Nelson returned to farm the land his family has farmed for four generations. He lives there now with his wife and two daughters. All of his 880 acres near Pendleton, Oregon, are farmed organically (Figure 1.1). His organic adventure started officially in 2005, when Eric began



Recommended reading



- Chapters on your precipitation zone
- Introduction for each chapter
- At the end of each chapter:
 - What the Law Says
 - Info boxes
 - Advice for Farmers




Recipe for success



No Uniform Solution

Trends and concerns

- Alfalfa often included as a transition crop
 - Weeds and soil fertility continual challenge
 - Post-emergent tillage used to manage weeds
 - Land often rotated in and out of organic
 - Longterm “organic wheat – fallow” rotation of questionable sustainability
 - CRP to organic questionable sustainability
 - Irrigation increases flexibility & diversity
 - Markets follow economy
- 
- A photograph of a farmer wearing a tan hat and blue jeans, working in a field of tall, golden-brown grasses. The farmer is bent over, possibly inspecting the plants. In the background, there are rolling hills covered in green trees under a clear blue sky. The text of the slide is overlaid on the left side of the image.

A green combine harvester is shown from a rear-quarter perspective, moving through a vast field of golden wheat. The harvester is leaving a neat row of cut wheat behind it. The sky is a clear, pale blue. The overall scene is bright and open, representing agricultural work.

Best advice

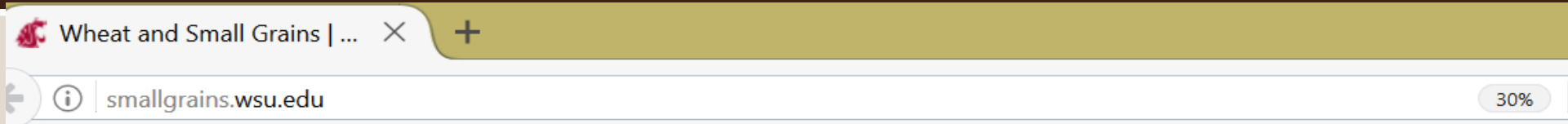
“START SMALL”

“USE BEST GROUND”

Photo by Brad Bailie



Email listserv



<http://smallgrains.wsu.edu/subscribe/>

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Timely Topics
Variety Selection & Testing
Soil & Water Resources
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Insect Resources
Weed Resources
Marketing & Economics
Grain Quality Resources
Weather Resources
Organic Production
Production Systems
Additional Resources

SEARCH

WASHINGTON GRAIN COMMISSION
WHEAT LIFE

CAHRS and WSU Extension
Wheat and Small Grains

SOIL & WATER RESOURCES

Timely Topic
A Win-Win: Building Soil Health While Gaining Yield & Profit

Timely Topics

- Standing Crop Residue Can Reduce Snow Drifting and Increase Soil Moisture
February 4, 2017
- Grain Quality Resource Page Launched!
February 2, 2017
- Soil Health Workshops in February
January 25, 2017
- A Win-Win: Building Soil Health While Gaining Yield & Profit
January 24, 2017

To view more Timely Topics, click [here](#).

Identification and Diagnostic Programs

Plant Diagnostic Clinic

Dynamic decisions help you make informed management choices.

- AMS Sprayer Mile Calculator
- Winter Wheat Herbicide Efficacy Tables
- Herbicide Mechanisms of Action (MOA) Tool
- Variety Selection Tool
- Nitrogen Application Calculator
- Spring Wheat Yield Calculator
- Post Harvest Nitrogen Calculator
- Grain Growing Degree Calculator

Wheat and Barley Production in Washington

For decades Washington has been known throughout the world as the home of high quality soft white and club wheat production. Washington farmers also raise superb hard red winter, hard white, hard red spring wheat, and barley.

In 2015 there were 2.2 million acres of wheat harvested in the state of Washington, yielding more than 111 million bushels, and barley was harvested on 100 thousand acres for a total production of 4.8 million bushels.

Upcoming Events

Soil Health Workshop -
Spokane Valley
February 16 @ 8:00 am - 4:00 pm

Soil Health Workshop -
Walla Walla
February 17 @ 8:00 am - 4:00 pm

View All Events

Keep up-to-date with the Small Grains team & receive email notifications when new content is posted:

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Anatone
Asotin County, WA
February 03 10:45 PM
Air Temperature: 42.5F
Wind: 55F-4 mph
2" Soil Temperature: NA
2" Soil Temperature: 42.25F
Precipitation: 0.00"



Organic grain sales bulletin board

Organic Production - Whe... X +

smallgrains.wsu.edu/organic-production/

50% Search WSU Web/People

A-Z Index Statewide myWSU WSU Home

<http://smallgrains.wsu.edu/organic-production/>

- Grain wanted
- Grain for sale
- Searchable



CAHNRS and WSU Extension Wheat and Small Grains

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Variety Selection & Testing
Soil & Water Resources
Disease Resources
Insect Resources
Weed Resources
Marketing & Economics
Grain Quality Resources
Weather Resources

Organic Production
Transitioning to Organic
Case Studies
Crop and Weed Management
Soil Management
Farm Economics
Grain Quality
Publications
Organic Grain Sales Bulletin Board
Production Systems
Additional Resources



WHEAT LIFE

Organic Production

Overview:

As consumer and market demands for organic grains and forage continue to increase, opportunities exist for crop producers in dryland regions. University researchers in Washington, Oregon and Idaho have been collaborating with Pacific Northwest farmers to address common challenges and embrace opportunities for dryland organic crop production.

Find information on:

- [Transitioning to Organic](#)
- [Case Studies](#)
- [Crop and Weed Management](#)
- [Soil Management](#)
- [Farm Economics](#)
- [Grain Quality](#)
- [Publications](#)

Growers share their experience

Learn more about organic farming from the farmers themselves on the [Case Studies Page](#).

See what we have been up to:

- [Complete results of the 2014 Survey of Northwestern Organic Producers](#)
- [Preliminary Results of the 2014 Survey of Northwestern Organic Producers](#)
- [2014 Dryland Organic Research Review and Farm Tour](#)
- [2010 Farm Walk Program](#)
- [2009 Farm Walk Education Series](#)



Project Support:



Organic case studies

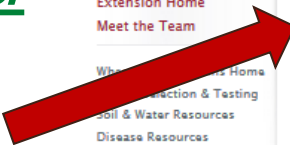
Organic Production - Whe... Case Studies - Wheat and ...

smallgrains.wsu.edu/organic-production/case-studies-3/

50% Search

<http://smallgrains.wsu.edu/organic-production/case-studies-3/>

- PNW683
- Bob Quinn Family Farm
Big Sandy, MT



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Insect Resources
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Grain Quality Resources
Weather Resources
Organic Production
Transitioning to Organic
Case Studies
Crop and Weed Management
Soil Management
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Bulletin Board

Production Systems
Additional Resources

Search

WASHINGTON GRAIN COMMISSION

WHEAT LIFE

CAHNRS and WSU Extension

Wheat and Small Grains

Case Studies

Growers who are producing certified organic small grains share their experience... Read their stories to learn more about successful strategies for organic crop production, fertility management, weed control, transition rotations, marketing approaches and more.

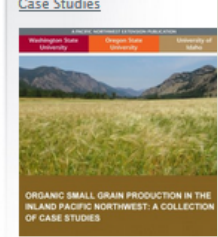
[Organic Small Grain Production Case Studies](#) *new*

Organic farming can be a challenge anywhere, but the obstacles encountered by Inland Pacific Northwest organic small grain farmers are unique. Their options for managing weeds and soil nutrients are few, and the limitations of the regional climate don't make things much easier. Nonetheless, organic small grain farmers are out there, and a few are sharing their experience. This publication investigates the farming philosophies and practices of 12 organic small grain producers across Washington, Oregon, and Idaho.

["Feeding the soil, not the plant" The Bob Quinn Family Farm](#)

Bob Quinn has grown certified organic wheat, barley, alfalfa and other crops for more than twenty years, using cover crops as a keystone for fertility and weed management. Diana Roberts (Regional Extension Specialist, WSU) to learn more about cover cropping with sweet clover and Austrian winter pea, weed management with crop competition, alternative marketing strategies, on-farm fuel production and more.

Organic Small Grain Production Case Studies



ORGANIC SMALL GRAIN PRODUCTION IN THE INLAND PACIFIC NORTHWEST: A COLLECTION OF CASE STUDIES

Why cover crops?

Austrian pea cover crop, Bob Quinn farm, Big Sandy, MT

- 14 inch precip, 40% in May and June
- Zone 3 (-40 F)
- 4,000 acres
- Certified organic since 1991
- 9-yr rotation
- 50% in cover crop all the time
- NO supplementary fertilizer

Yellow sweet clover cover crop

- Seeded with nurse/companion crop (barley)
- Disked down at flowering after 14 mths



Bob Quinn, "I feed the soil, not the crop."

Bob Quinn homestead



	Winter Pea	Buckwheat	Oats
Emergence/ft	4.2	0.4	1.4

Companion crop with winter pea fall 2015



	Winter Wheat	Buckwheat	Faba Bean	Tillage Radish
Emergence/ft	10.5	0.6	0.5	1.2

Companion crop with winter wheat fall 2015



Principles should apply to any cropping system





USDA SARE Cover/companion crop project report

Production Systems - Wh... X +

smallgrains.wsu.edu/production-systems/

80% Search

A-Z Index Statewide myWSU WSU Home

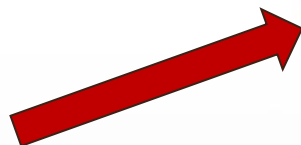


CAHNRS and WSU Extension

Wheat and Small Grains

<http://smallgrains.wsu.edu/production-systems/>

- No recipes
- Further research needed!



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Production Systems

SARE Cover Crop Project
Northwest Dryland
Cereal Legume Project
Solutions to
Environmental &
Economic Problems

Production Systems



Like any crop, wheat should be grown as part of entire crop production system. Decisions made throughout the production system will impact the success of the winter wheat crop. On this page you will find information that would be beneficial to your overall cropping system.

Questions?

Diana Roberts

Email: robertsd@wsu.edu

