



**REACCH**  
Regional Approaches  
to Climate Change –  
PACIFIC NORTHWEST AGRICULTURE

**Annual  
Meeting 2013  
Speed Science  
Presentations**



## ASSESSING PROFIT MAXIMIZATION STRATEGIES FOR WHEAT PRODUCTION IN ANTICIPATION OF CLIMATE CHANGE: A Case Study Approach Using *AgTools*<sup>TM</sup>

Clark Seavert, OSU



*AgTools*<sup>TM</sup> is a body of information designed to help agricultural producers make short, medium and long-run capital investment and management decisions. The software has been developed by a group of faculty at Oregon State University (lead institution, Clark Seavert), UC-Davis, University of Arizona, Washington State University, and University of Idaho.

*AgTools*<sup>TM</sup> consists of:

- a suite of software programs: *AgProfit*<sup>TM</sup>, *AgLease*<sup>TM</sup>, and *AgFinance*<sup>TM</sup>
- budget files containing return and cost information for crops and livestock,
- educational programs such as *AgTools*<sup>TM</sup> Academy,
- online grower training courses with video instruction modules.

Most of these tools and programs are free-of-charge at [www.agtools.org](http://www.agtools.org). It is used for both agricultural business decisions and as a learning tool for students interested in the business dimensions of agricultural and food systems. For the REACCH project it is being developed into a web-based format with direct links to policy and environmental factors, including climate change.

*AgTools*<sup>TM</sup> is being piloted with wheat producers and used to explore future capital investment decisions and their impacts on profitability of alternative cropping systems. It is designed to assist agricultural producers make long run decisions on a whole farm and ranch feasibility basis, centered on financial ratios and performance measures. We anticipate linking spatial information on climate change and yield changes.

This presentation was given at REACCH 2013 Annual Meeting. This handout and supplemental video are available at [reacchpna.org](http://reacchpna.org). Funded through Award # 2011-68002-30191 from the USDA National Institute for Food and Agriculture.



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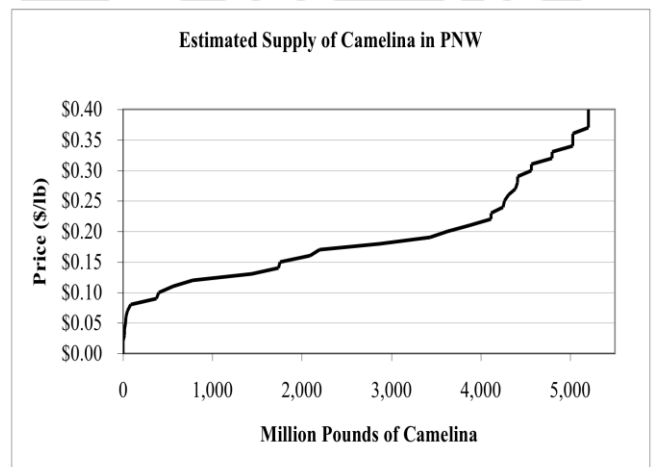
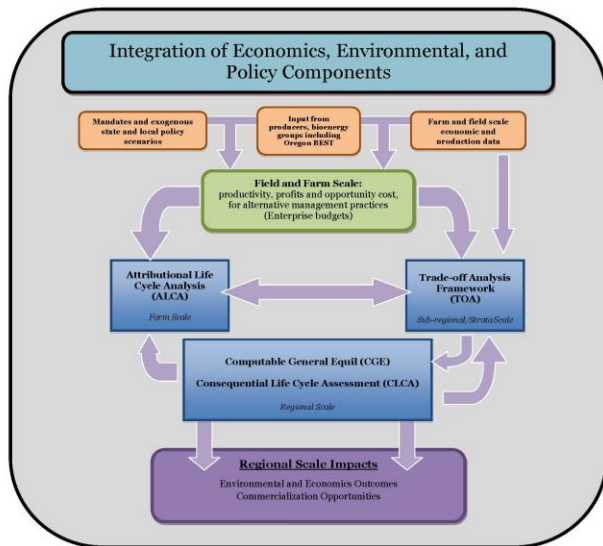




## How Do Bioenergy Opportunities and Biofuel Policies Impact Alternative Options in the PNW

Penny Diebel and Susan Capalbo -- OSU Corvallis

A unique opportunity exists to explore the development of a regionally-appropriate oilseed crop production system in the Pacific Northwest (PNW) as part of a demand-driven supply chain for aviation biofuel production (Farm to Fly Initiative). This demand for aviation fuel creates an opportunity to integrate a viable bioenergy crop, camelina, into the dryland cereal agricultural production system of the region. Our collective effort will evaluate this initiative and other policy options and commercialization opportunities, and assess the economic and environmental sustainability of oilseed production systems as part of a regional biomass feedstock. This will be accomplished utilizing a science-based policy *integrative* framework that incorporates *multiple scales and multiple production and processing stages*. The focus on integration and multiple scales is deliberate. Characterizing producers and processors in the region, and the use of a suite of integrated economic-environmental research components, all calibrated to represent the region's biofuel processing and production systems and associated environmental outcomes, is critical to fully capture and assess the sustainability of the biofuels systems.



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## DIRECT SEED ADOPTION BY FARM SIZE AND ZONE

**Kate Painter, Dennis Roe, & Stephanie Kane, UI & WSU**



Pictures shown, from top to bottom, are:

- 1) Soil erosion on winter wheat
- 2) Direct seed mentor presentation
- 3) DS drill planting into stubble

Why has direct seed (DS) tillage adoption lagged in this highly erodible, highly productive dryland grain growing region? In this presentation we discuss barriers as well as innovative methods to access and encourage DS adoption.

**“Windshield Surveys”** A roadside transect survey plus GPS guidance were used to conduct fall and spring surveys along a route through two counties in Idaho and four counties in Washington from fall 2007 through fall 2009. DS adoption ranged from 12% in Lincoln County to 75% in neighboring Spokane County. While crop residue levels varied considerably, depending on crop type, yields, soils, slope, and post-harvest soil disturbance, the correlation between crop residue levels above 30% and direct seed adoption was strong.

**Direct Seed Mentoring Project** In this innovative approach to encourage DS adoption, mentors provide seeding and expert advice for those wanting to try DS. Mentors typically had larger farms, averaging 4256 acres, double the size of those they mentored. Under DS, operating costs were typically lower, particularly labor and fuel, while fixed costs, such as capital recovery, were generally higher. By zone, the highest economic benefits from DS were yield increases for spring grains in the intermediate cropping zone. Spring grains are often uneconomical there due to limited precipitation.

**Understanding DS Adoption** Growers in this region were surveyed regarding their farming practices and barriers to DS adoption in 1976, 1990, and 2009. Most recently, growers used seeding on the contour (70 percent), leaving stubble over winter (55 percent) and minimum tillage (56 percent) to control soil erosion. Just over 40 percent of respondents across this study area reported direct seeding on their operation.

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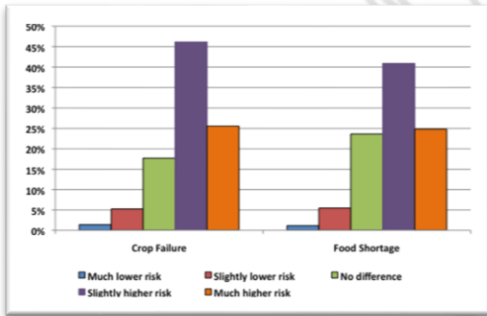


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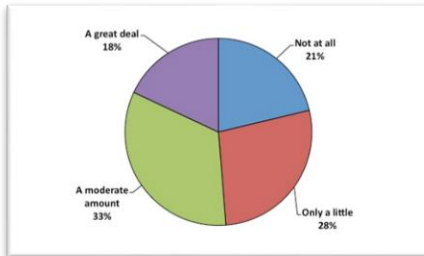
## ***Farm risk vs food shortage in the climate eye of the public*** **M. Reyna, J.D. Wulfhorst, S. Kane, and L. Bernacchi, University of Idaho**



Perceived effects to agriculture from climate change have received little assessment within the general public. In a Fall 2012 survey of urban and rural residents in the Pacific Northwest ( $n=1,300$ ), we asked respondents about 1) overall levels of concern about climate change; 2) perceived risk to crop failure caused by climate change; and 3) perceived risk to food shortage caused by climate change.

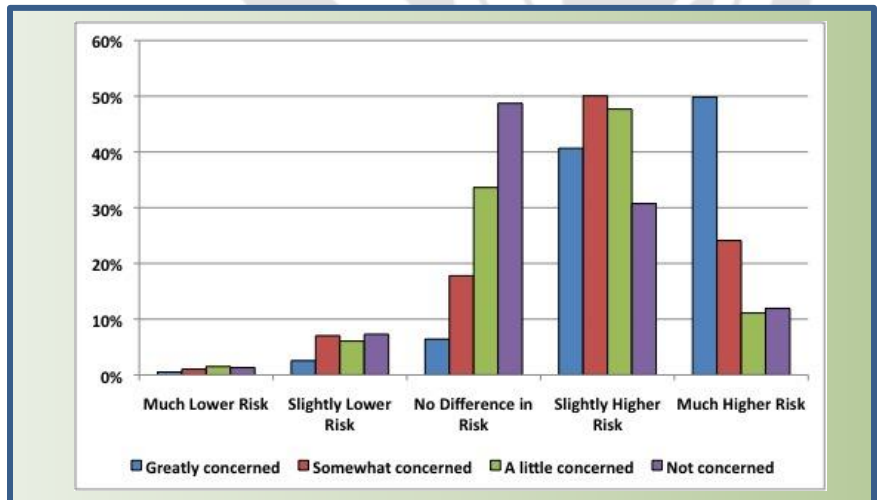


As illustrated by the figure below, most respondents perceive either *no difference or higher risk of food shortages* in the future. However, among those who indicate less concern about climate change tend to perceive no difference in risk to future food shortages, while those who do indicate greater concern about climate change tend to also perceive greater levels of risk to food shortages. Among those feeling very informed about climate change, there is also a tendency to perceive much higher risk to future crop failures.



Pictures shown, from top to bottom, are:

a) Survey results: “In the PNW in the next 30 years, climate change will cause more / less risk to crop failure & food shortages”; b) Palouse hills; c) Survey results: “Climate change will cause harm to my family”.



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## Longitudinal Survey of Growers

Hilary Donlon, Kate Painter, Dennis Roe

University of Idaho & Washington State University



The longitudinal survey interviews farmers across the four agroecological zones collecting year to year economic data. The purpose is to build a baseline for the cost of wheat production in the Inland Pacific Northwest. The longitudinal survey plans to compile four years of data ; which will document year-to-year changes in prices and costs. While interviewing farmers about their farm economics questions about technology use, pests, and demographics are asked.



Documenting the economic differences of the agro ecological zones will help policy makers understand farming operations very greatly in nearby regions . The results will be useful to describe the unique characteristics of each agro ecological zones.

Yield & Costs of Production  
by Zone

Zone	Yield Bu/acre	Standard Deviation Bu/acre	Average TC of Winter Wheat \$/bushel	Standard Deviation \$/bushel
1. Annual Cropping	88.4	23.2	\$5.01	\$.68
2. Transition	83.0	18.3	\$5.08	\$.76
3. Grain/Fallow	62.7	18.8	\$5.49	\$.85
4. Irrigated	152.5	.71	\$6.55	\$.97

The second year of data collection is underway, the difficult part of surveying farmers is finding time to sit down and talk with them. Also continuing to have willingness to participate from each grower over the four years remains a concern.

Pictures shown, from top to bottom, are: Grower locations in the survey; Zone 1 landscape; Yield & Cost of Production by Zone for Year 1 (2011).

REACCH scientists can use the longitudinal survey to ask specific questions to the group of participants. Also the economic portion of the survey records detailed farm operations which are useful to biotic teams to know the type of tillage system. Further into the project the data set could be added to other studies.

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