Economics of No-Till Cropping Systems across the Landscape: Cook Agronomy Farm, Pullman WA, 2001-2006

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**Background**

- Few farmers use continuous direct-seeding or precision agricultural practices in the dryland cropping region of the Palouse in eastern Washington.
- Research interest in field-scale direct-seed and precision conservation systems resulted in establishment of the WSU Cook Agronomy Farm in 1999.

**Methods**

- Geo-referenced locations (369 points) were established for sample and data collection, including crop parameters and exogenous variables.
- Three year crop rotations of hard red winter wheat-X-hard red spring wheat were established in 2001, where X represents six alternative crops: the winter and spring counterparts of barley, peas and canola.

**Results**

- 2001 - Preceding crop was spring barley, and the Fall Barley. Winter barley was grown on northern sloping and floodplains; few locations had negative returns.
- Low spring wheat profits were in part due to an unfavorable planting and seeding sequence. Winter wheat crops were largely negative; spring cultivars were the most profitable.

- 2002 - Winter wheat followed spring wheat. Spring wheat returns were highest for winter wheat with lowest erosion. Reduced spring seeding was used on depositional lowlands. Winter peas were the most profitable alternative crop following winter wheat. Returns for water canola were largely inferior for second consecutive year.

- 2003 - Summer drought limited crop yields, resulting in negative returns for all crops. High barley yields following winter barley were the only profitable crop. Crop rotation effects on net returns for wheat were not evident.

- 2004 - Winter and spring wheat profits were similar, but fall barley was profitable. Winter soybeans on northern slopes and fall barley were profitable in the southern slopes and uplands. Spring peas and spring barley were profitable following increased weed densities (before glyphosate).

- 2005 - This year had the lowest return of all years. Winter wheat and winter barley lands calculated for winter canola were the only profitable crops. Spring peas increased the net returns of the following spring wheat crop more than any other alternative.

- 2006 - Grownscreen was warmer in early spring. Returns for spring barley and spring canola were positive. Winter wheat and winter barley were the only profitable crops. Spring peas and spring barley were the only profitable crops. Spring peas increased the net returns of the following spring wheat crop more than any other alternative.

**Summary**

- Direct-fertilizer cost increase of over 46% during the study period, plus premiums increased from an average of $17 per ton in 1999 to an average of $21 per ton in 2005, much more acceptable returns to farmers and management during the period of stagnant crop and fertilizer prices. Adverse events are the only profitable crops during drought conditions. Further research on alternative winter crops in the Palouse is needed.
- Reducing nitrogen fertilizer inputs using precision nitrogen management could achieve yield and protein goals with less cost and less environmental damage.