conservation tillage systems that maintain or improve soil organic matter levels and lead to soils of greater productivity that are better able to withstand erosion.

Economics of Irrigated Annual Winter Wheat after Burning and Plowing of Stubble Versus a No-till Wheat-Barley-Canola Rotation

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This study compared production costs and profitability under irrigation of a winter wheat-spring barley-canola rotation using no-till with various stubble management practices versus continuous annual winter wheat with burning and plowing of stubble. The experiment was conducted during 2001-2006 at the WSU Dryland Research Station at Lind, WA. The no-till rotation was sown (i) directly into standing stubble, (ii) after mechanical removal of stubble, or (iii) after burning stubble. The traditional practice of continuous annual winter wheat sown after burning and moldboard plowing was included as the check treatment. Six-year average net returns over total costs were similar over stubble management treatments for the 3-year no-till rotation. Based on long run average prices, annual average net returns were negative ranging from -$155 to -$160 per rotational acre. The continuous winter wheat system averaged slightly higher, but still negative, at -$145/ac. Net returns of the three residue management practices in the 3-year rotation and the continuous winter wheat system were statistically equivalent. Net returns for all systems would be near or above breakeven levels at farmer cooperator yields and the high 2007 crop prices. Winter canola was killed in 5 of 6 years by a combination of cold and rhizoctonia root rot that necessitated replanting to spring canola. Canola was the major economic loser in the 3-year rotation with an average annual loss of -$247 per acre. Average irrigated winter wheat and canola yields from the experiment were lower than those reported by farmer advisors because of the extreme difficulty of growing no-till irrigated winter canola and the fact that winter wheat, canola, and spring barley all require different timing of irrigation (not possible with hand lines in this experiment). Further research on alternative no-till irrigated cropping systems should probably exclude winter canola, and should be conducted where crop-specific irrigation scheduling is possible.

Crop Yield and Revenue Variability Across Time and Space at the Cook Agronomy Farm, 2001-2006

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Field-size strips of no-till spring wheat, winter wheat, and one of six alternative crops are planted across the hilly terrain of a 92-acre portion of the Cook Agronomy Farm near Pullman, WA. Strips of crop rotation alternatives were arranged perpendicular to the predominant slope in order to capture maximum field variability. After six years of trials (two complete rotation cycles) spring barley yields had the lowest yield variability with a coefficient of variance (CV) of 26%. Interestingly, winter wheat had the highest CV at 191%. Spring wheat had the second lowest CV of 31%.

Net returns to land were calculated based on actual costs and returns by year and by yield measurements taken at 369 georeferenced locations across the landscape. Net returns per acre by strip over the six-year period ranged from a high of $68 per acre with winter barley as the alternative crop to a low -$44 per acre for another strip with winter barley as the alternative crop in a different section of the farm. Land quality differences were more important than crop choice in this hilly landscape. However, the three strips with net returns to land greater than $50 per acre featured alternative crop choices with the lowest CV in the study: winter barley (CV = 31%), spring canola (CV = 38%), and spring barley (CV = 26%). Average returns by alternative crop choice across all strips were also highest for spring barley, at $40 per acre, and lowest for spring peas, at $17 per acre. Spring peas had the highest CV of the rotational crops in this study at 73%, as peas have been problematic in this no-till system.