Soil Conserving Undercutter System Improves Profitability for Winter Wheat-Summer Fallow in Eastern Washington

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Conservation tillage winter wheat-summer fallow (WW-SF) systems are clearly an environmental success. Engineers’ have predicted that these systems reduce dust emissions by 50% during severe wind events compared to traditionally-tilled WW-SF. However, relatively few farmers in the low-precipitation region of the inland Pacific Northwest use these systems because of reluctance to change “tried and proven” traditional tillage fallow. We compared economic results from conservation V-sweep undercutter and traditional fallow tillage systems on a large case-study farm near Ritzville, Washington.

Before conservation payments, results showed the undercutter tillage method had a net return over total costs advantage of $10.92/2 acre versus $7.61 for traditional tillage. The 2 acre unit includes both the fallow and the winter wheat year. The undercutter system’s net returns over total costs was markedly strengthened by conservation payments that raised the profitability comparison for undercutter versus traditional fallow to $31.32 versus $7.61/2 ac. These case-study results with and without conservation payments show that the undercutter tillage system can be economically competitive relative to traditional fallow tillage. The results showed that the case-study farm produced soft white wheat at the very competitive cost of only $3.08/bu using the undercutter method. Other farms may experience different production costs.

The annual conservation payment in this study was $20.40/2 acre. Current USDA funding is insufficient for conservation payments of this magnitude for all farmers. Nonetheless, this payment is less than one-fourth the typical annual Conservation Reserve Program (CRP) rent of $40–$50/acre in Adams County. As a promising development, in 2006 the Washington Association of Wheat Growers secured a $905,000 federal grant to provide a 50% cost-share to purchase V-sweep undercutters for 50 wheat growers in 14 counties in Washington and Oregon. The results of our study indicate that the undercutter cost-sharing program has a reasonable chance of economic success.

Adjusting Yields in Reduced Size Crop Rotation Experiments for Possible Confounding by Weather

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To accurately portray annual income and income rotation variability from n-crop rotations in field experiments, it is necessary to grow all crops in the rotation every year. This captures the potentially different responses of different crops to annual weather and pest variations. The appropriate economic measure is income per rotational acre whereby annual income from each crop is weighted by (1/n) and summed. Unfortunately, resource constraints may prevent growing each crop every year in some (reduced size) experiments. However, in situations where every crop is grown annually at a nearby similar site, it is possible to better approximate annual rotational returns. We did this in a recently published reduced size six-year spring wheat-winter wheat-winter wheat (SW-WW-WW) experiment by using data from a larger experiment in the same field which grew every rotational position of SW-WW-WW every year. In the reduced size experiment, only one crop was planted each year. To illustrate the adjustment procedure, consider SW. SW yields in the larger experiment were tabulated for the two years in which SW was grown in the reduced experiment. If SW yields in the larger experiment in these two years were 90% of 6-yr average SW yields on the larger experiment, then SW yields in the reduced experiment were normalized by multiplying them by (1/0.90). Similar adjustments were made for first and second year WW. This approach may help address part of the confounding from weather when each rotational crop is grown only once over a 3-yr rotation. For example, if SW, first year WW, and second year WW all happen to be grown in years that weather adversely affected these particular crops, a downwardly biased estimate of the long run average annual economic return from the rotation would be provided if no adjustment were made.