second half of the Columbia Basin Project was completed. Now, 50 years later, farmers still irrigate from deep wells, and the status of the second phase of the Columbia Basin Project remains uncertain.

Long-Term Comparison of Winter Wheat–Summer Fallow vs. Continuous Annual No-Till Spring Wheat

W.F. SCHILLINGER, R. JIRAVA, D.L. YOUNG, T.A. SMITH, S.E. SCHOFSTOLL, A.C. KENNEDY, AND T.C. PAULITZ, WSU, WASHINGTON ASSOCIATION OF WHEAT GROWERS, AND USDA-ARS

Grain yields of winter wheat grown after tilled summer fallow (WW-SF) were compared to those of continuous annual no-till spring wheat (NTSW) near Ritzville, WA during the past 13 years. Annual crop-year precipitation during the study period was 10.2 inches compared to the long-term annual average of 11.4 inches. Grain yields of WW-SF were relatively stable and averaged 50.7 bu/acre over the 13 years compared to 28.6 bu/acre for continuous annual NTSW (Fig. 1). Profitability of cropping systems fluctuates widely due to many factors such as cost of diesel, herbicides, and other inputs. However, as a general rule of thumb, recrop spring wheat needs to yield 65% of that of WW-SF to be equally profitable. Using this measure, NTSW was equally as profitable as WW-SF in 5 of 13 years at Ritzville (Fig. 1). A model has been developed to help farmers decide when it may be desirable to plant spring cereals (in lieu of summer fallow) based on measured over-winter soil water storage and expected spring rainfall.

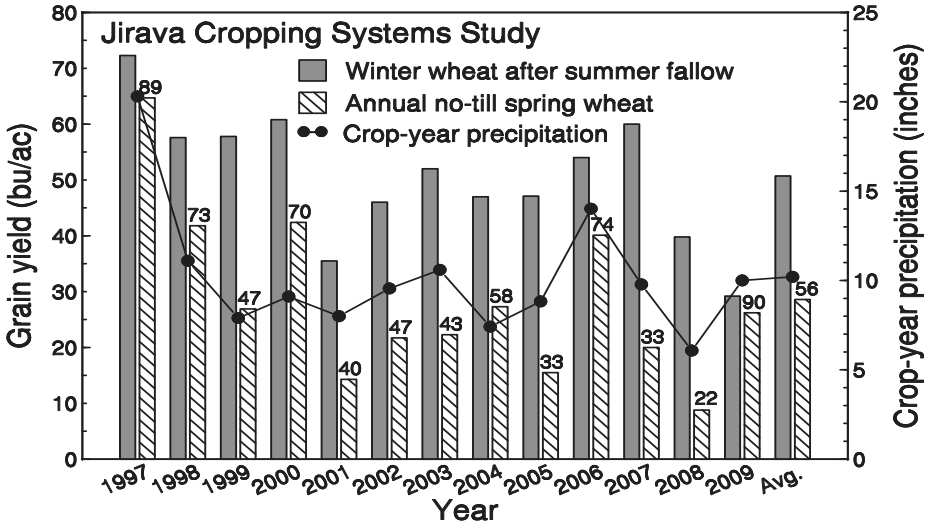

Fig. 1. Grain yield of soft white winter wheat after summer fallow (WW-SF) versus continuous annual no-till soft white spring wheat (NTSW) near Ritzville, WA. Numbers above the NTSW bars indicate the percentage of NTSW grain yield that was achieved compared to the grain yield in the WW-SF system.

Rotation Benefits of Spring Barley on Subsequent Wheat Grain Yield

W.F. SCHILLINGER, R. JIRAVA, T.C. PAULITZ, A.C. KENNEDY, D.L. YOUNG, T.A. SMITH, AND S.E. SCHOFSTOLL , WSU, WASHINGTON ASSOCIATION OF WHEAT GROWERS, AND USDA-ARS

We have conducted a large-scale (20 acre) dryland cropping systems experiment at the Ron Jirava farm near Ritzville, WA since 1997. Crop rotation treatments evaluated over the years include a 2-year soft white spring wheat (SW) – spring barley (SB) rotation versus continuous annual SW. The SW and SB varieties used are Alpowa and Baronesse, respectively. These crops have always been planted no-till during the 13 years of this experiment. Long-term average annual precipitation at the site is 11.4 inches, but only an annual average of 10.2 inches has occurred since the inception of the study. There has been high year-to-year variability in grain yields for both SW and SB.

One consistent pattern has occurred. Spring wheat grain yields following SB are generally greater than monoculture SW (Fig. 1). This SW grain yield boost following SB is not significantly different every year, but there are statistical differences when averaged over the 13 years (Fig. 1). The 13-year average grain yield of SW after SB is 30.4 bu/acre compared to 28.6 bu/acre for monoculture SW. We have intensively measured soil water dynamics in