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.

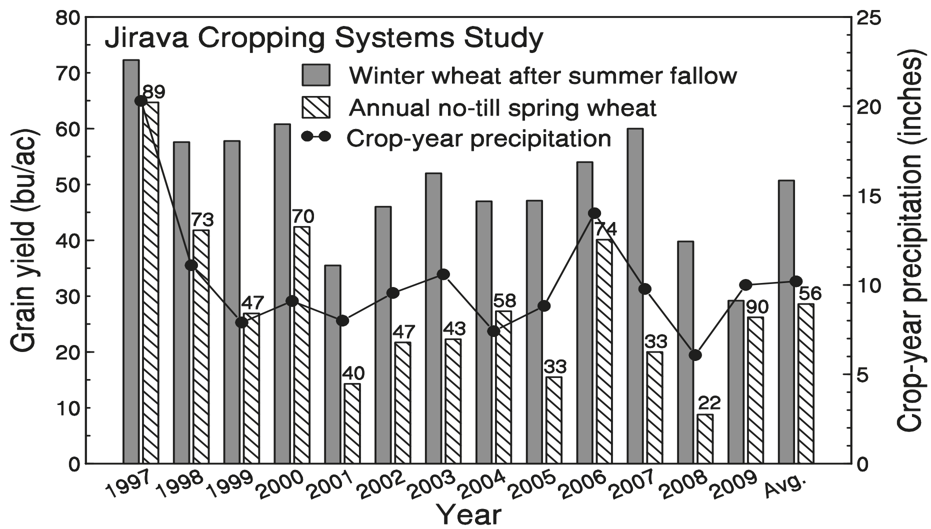

Fig. 1. Grain yield of soft white winter wheat after summer fallow (WW-SF) versus continuous annual no-till soft white spring wheat (NTSW) near Ritzville, WA. Numbers above the NTSW bars indicate the percentage of NTSW grain yield that was achieved compared to the grain yield in the WW-SF system.

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 this experiment and can say with certainty that the SW yield differences are not due to water. More likely, the yield increase is due to less Rhizoctonia bare patch disease pressure when SB is included in the rotation (see accompanying article on suppression of Rhizoctonia bare patch).

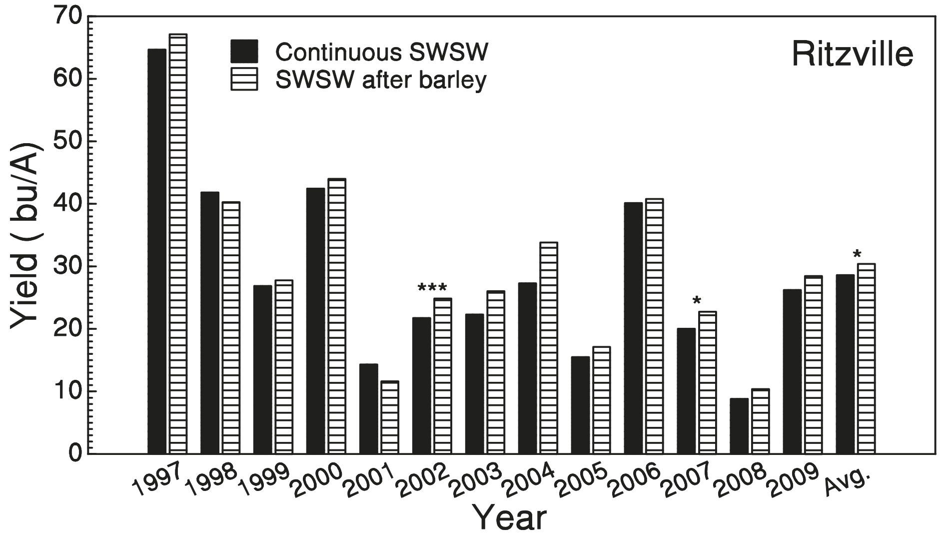

Fig. 1. Grain yield of continuous annual soft white spring wheat versus soft white spring wheat grown in a 2-year rotation with spring barley in a long-term dryland no-till cropping systems experiment near Ritzville, WA. * and *** indicate significant statistical differences at the 0.05 and 0.001 probability levels, respectively.

Land Area Devoted to Dryland and Irrigated Cropping in the Inland Pacific Northwest

W.F. SCHILLINGER, DEPT. OF CROP AND SOIL SCIENCES, WSU

Type of Farming	State †	Acres
1. Dryland		
Low (< 12 inches) ‡	Washington	3,021,000
	Oregon	825,000
Intermediate (12 to 18 inches)	Washington	1,534,000
	Oregon	798,000
	Idaho	62,000
High (18 to 24 inches)	Washington	944,000
	Idaho	924,000
	Oregon	163,000
2. Irrigation from rivers	Washington	1,203,000
	Oregon	178,000
3. Irrigation from deep wells	Washington	151,000
	Oregon	64,000

† Total dryland crop acres by state in the Inland PNW: Washington 5,498,000; Oregon 1,786,000; Idaho 985,000. Total irrigated crop acres by state in the Inland PNW: Washington 1,354,000; Oregon 242,000. These are 2008 data gleaned from the National Agricultural Statistics Service, USDA, Washington, DC.

‡ Numbers in parenthesis are average annual precipitation.

Improving Winter Wheat Seedling Emergence from Deep Planting Depth

AMITA MOHAN, KULVINDER GILL, WILLIAM SCHILLINGER, PATRICK REISENAUER, TIMOTHY SMITH, AND STEVE SCHOFSTOLL, DEPT. OF CROP AND SOIL SCIENCES, WSU

About two million dryland farm acres in eastern Washington receives less than 10 inches of annual precipitation. Winter wheat-summer fallow is a popular crop rotation in this region. Winter wheat is planted deep into tilled