

IRRIGATED CROPPING SYSTEMS RESEARCH AT LIND

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We have completed the first three years of a planned six-year irrigated cropping systems study at the WSU Dryland Research Station at Lind. The crop rotation is 3-year winter wheat - spring barley - winter canola sown

i) directly into standing stubble, *ii*) after mechanical removal of stubble, or *iii*) after burning the stubble. The traditional practice of continuous annual winter wheat sown after burning and moldboard plowing is also included as a check treatment. There have been no within-crop grain yield differences as affected by residue management, except winter wheat in 2003 when the burn/plow treatment had significantly less yield due to Take All disease compared with no-till winter wheat in rotation.

Stand establishment and weed control for all crops is almost always best in the burn treatment, but burning negatively affects over-winter precipitation storage efficiency (Table 1). Green bridge carryover from volunteer barley caused serious disease pressure in winter canola seedlings which necessitated replanting to spring canola during two years. We have implemented a new planting method for winter canola to reduce green-bridge-related disease pressure. Annual testing of soil shows that soil quality in no-till plots is increasing rapidly compared with the burn/plow treatment. Over three years and across residue management treatments average grain yield was: winter wheat, 92 bu/acre; spring barley, 2.48 t/acre; and canola, 1971 lb/acre. This study will continue for three more years.

Table 1. ANOVA combined over three years for plant stand, over-winter precipitation storage efficiency (SE), weeds, and grain yield as affected by residue management (standing, bailed, or burned) and crop (winter wheat, spring barley, and canola).

Source	df	Plant Stand	Precip. SE	Weeds	Grain Yield
Residue mgt. (R)	2	***	**	**	NS
Crop (C)	2	***	***	NS	***
R X C	4	NS	NS	NS	NS

** , *** Significantly different at the 0.01 and 0.001 probability levels, respectively.

Table 2. Grain yields of irrigated winter wheat, spring barley, and canola at Lind in 2001, 2002 and 2003 as affected by various stubble and soil management practices.

	Winter Wheat (bu/a)			Spring Barley (ton/a)			Canola (lb/a)		
	2001	2002	2003	2001	2002	2003	2001 ^A	2002	2003 ^A
Stubble burned	85	106	113 a	2.88	2.21	2.39	2574	2502	1027
Stubble bailed	67	110	96 a	3.03	2.33	2.24	2486	2226	1135
Standing stubble	69	107	101 a	2.88	2.26	2.08	2282	2188	1326
Burn and plow	75	97	74 b						
LSD (0.05)	NS	NS		NS	NS	NS	NS	NS	NS

Within-column wheat yields in 2003 followed by the same letter are not significantly different $P < 0.05$. NS = no significant differences. A: spring canola planted in 2001 and 2003 when winter canola failed.

*LATE FALL DORMANT PLANTING OF CEREALS USING POLYMERS

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Dormant planting is a practice where spring crops are sown in late fall or during the winter instead of the traditional March or April. Potential benefits of dormant planting include faster spring growth to compete with Russian thistle and other broadleaf weeds, reduced heat and water stress,