Management of Fresh Wheat Residue for Irrigated Winter Canola Production

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We concluded a 3-year irrigated winter canola (WC) field study in 2017 at the Jeff Schibel farm near Odessa, Washington. The two major objectives of this experiment were: (i) to understand the physiological mechanism(s) governing health when planted soon after the harvest of winter wheat (WW), and (ii) to learn how to effectively and profitably produce irrigated winter canola without burning or excessive tillage of wheat stubble. Our hypothesis was that fresh wheat stubble is not phytotoxic to WC and that WC can be successfully produced in a direct-seed system after wheat harvest as a viable alternative to field burning plus heavy tillage.

Five winter wheat stubble management treatments were established in August and September each year. The experiment was embedded in a circle of irrigated WC. Irrigated WW stubble in the plot area was burned in treatments 1 and 3 (below) in late August and irrigation water immediately applied to promote germination of volunteer wheat. Glyphosate was applied to the entire plot area (except for treatment 5, see below) at a rate of 24 oz/acre in early September. Land was prepared as required by protocols for each treatment (see list of treatments in next paragraph). Winter canola was planted in treatments 1 to 4 in early September using a no-till hoe drill with 12-inch row spacing and openers staggered on four ranks. In treatment 5, WC was broadcast into the WW crop before WW harvest. Experimental design was a randomized complete block with four replications of each treatment for a total of 20 plots. Application of irrigation water, which totaled about 15 inches for the crop year, was managed by Jeff Schibel.

Satisfactory stands of WC were established in all treatments each year (Fig. 1). The hypocotyl (i.e., the stem from ground level to the growing point at the first leaves) of WC elongated up to four inches and leaves extended above the 15-inch-tall WC by mid-October (Fig. 2, plant on right). In contrast, in the stubble burned treatment the hypocotyl was only one-inch long in mid-October (Fig. 2, plant on left).