

## POST-HARVEST MANAGEMENT OF RUSSIAN THISTLE

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Russian thistle (*Salsola iberica* Sennen and Pau) is the most problematic broadleaf weed in wheat in the low-rainfall (less than 12 inch annual) dryland region of the inland Pacific Northwest. At the request of the Benton County Wheat Growers Association, we have designed an experiment to test long-term post-harvest management on the control and ecology of Russian thistle. Benton County growers have two fundamental questions. Question 1: Given the high Russian thistle seed density throughout the low-rainfall dryland region, does it even pay to control Russian thistles after harvest? Question 2: Using a V-shape sweep for post-harvest control of Russian thistle is less expensive than herbicides, but is over-winter water storage greater when sweeping is not conducted?

Our study at the Lind Dryland Research Station compares three post-harvest Russian thistle control treatments in continuous soft white spring wheat. These treatments are:

1. Surefire herbicide (paraquat + diuron) at 24 ounces/acre applied 10 days after wheat harvest.
2. Tillage with overlapping adjustable-pitch 32-inch-wide V-blade sweeps on 28-inch centers conducted 10 days after wheat harvest.
3. Check (do nothing, let the Russian thistles grow).

Measurements are: Soil water to a depth of six feet at wheat harvest, after killing frost in the fall, and again in early spring; above-ground Russian thistle dry matter, seed production, and germination at wheat harvest and after killing frost in the fall; and wheat grain yield. Experimental design is a randomized complete block with four replications.

We completed the third year of this study in 2001. Controlling Russian thistle after harvest either mechanically with wide-blade sweeps or with herbicide significantly reduced Russian thistle soil water use, dry matter production (2 years), and seed production, resulting in subsequent higher grain yield (1 year) compared with the uncontrolled check treatment (Table 1). The soil was so dry after harvest in August 2001 due to drought and three years of continuous wheat that Russian thistle plants produced little post-harvest dry matter, but the check treatment still produced seed (Table 1). We plan to continue this study for at least two more years and then report the detailed results in both scientific and popular journals.

**Table 1. Soil water dynamics, Russian thistle growth and seed production, and subsequent spring wheat grain yield as affected by method of post-harvest Russian thistle control during three years at Lind, Washington.**

Crop Year	Post-harvest control method	Soil Water (inches)			Russian Thistle				Grain yield (bu./ac.)
		After harvest	After frost	Early spring	After harvest biomass (g/ m <sup>2</sup> )	After frost biomass (g/ m <sup>2</sup> )	Seeds (per m <sup>2</sup> )	Germination (%)	
1999-2000	Check	2.76	2.37 b	4.91	---	402 a	---	---	17.2
	Spray	3.09	3.06 a	5.04	---	155 b	---	---	21.5
	Tillage	3.06	3.06 a	4.90	---	131 b	---	---	19.0
2000-2001	Check	2.35 b	2.50 b	3.32 b	77 a	135 a	8857	56.0	2.8 b
	Spray	3.40 a	3.20 a	3.20 b	32 ab	7 b	0	---	7.8 a
	Tillage	3.66 a	3.16 a	4.50 a	21 b	5 b	0	---	12.0 a
2001-2002	Check	2.83	2.28 b	---	161	174	1548	76.7	---
	Spray	ab	2.30 b	---	243	189	148	55.2	---
	Tillage	2.52 b 2.98 a	2.97 a	---	244	180	0	---	---