Buckwheat Control in Wheat

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS158E

Washington State is a large producer of buckwheat (*Fagopyrum esculentum*), much of which is exported overseas. Buckwheat is a popular crop choice for some Washington farmers with irrigated land because it's a second crop they can plant in mid-summer after wheat, timothy hay, or pea harvest. Washington also exports much of its wheat crop overseas.

Unfortunately, in recent years, some foreign grain buyers have been finding low levels of buckwheat (Figure 1) in their wheat shipments from the United States. Some of these shipments have been traced to eastern Washington. In 2014, buckwheat was detected in eight of 27 shiploads of exported wheat. Buckwheat levels in these shipments ranged from 1 to 4 seeds per 2.2 pounds (1 kilogram) of wheat. Although these levels are within purchase contract specifications, some wheat buyers and consumers consider buckwheat to be an allergen and any level of contamination concerns them.

In order to maintain the excellent relationship between Washington wheat growers and foreign wheat buyers, it is imperative we do everything possible to eliminate buckwheat in wheat grain. Fortunately, there are effective buckwheat control options available for wheat growers who also want to produce buckwheat on their farms.

Crop Rotation

Buckwheat is typically grown under irrigation as a double crop following winter or spring wheat, timothy hay, or peas.

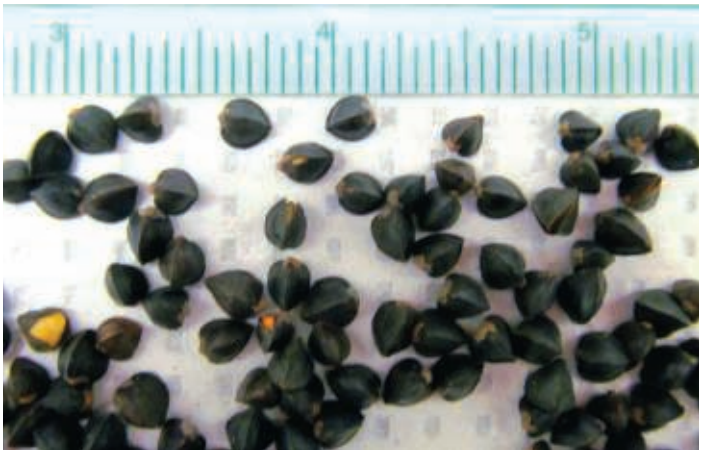

Figure 1. Buckwheat seed with a ruler (inches) for scale.

The simplest and most effective way to keep volunteer buckwheat out of wheat fields is to not plant wheat for at least one year following buckwheat production. Following buckwheat harvest, growers should use shallow tillage and irrigation, if available, to stimulate volunteer buckwheat to germinate and emerge, and then control it before planting another wheat crop (see Tillage, below). Cultivated buckwheat seed is not long-lived in the soil, particularly under irrigated conditions. Volunteer buckwheat is not considered a problem in crops grown more than two years after buckwheat harvest.

Tillage

Shallow tillage after buckwheat harvest will promote seed germination by improving seed-to-soil contact. Irrigation following shallow tillage will also promote buckwheat germination. Emerged buckwheat can be controlled with additional tillage or non-selective herbicides (see below); however, buckwheat that emerges in the fall will be killed by freezing temperatures before seed is produced.

Herbicides

Several herbicide options, including herbicides applied by chemigation, were screened for efficacy on buckwheat in irrigated spring wheat in 2016 and 2018. The best control was achieved by applying an early postemergence treatment when the wheat was just beginning to tiller (3- to 5-leaf stage) followed by a late postemergence chemigation treatment just as the wheat was entering the boot stage of development (Table). An early postemergence treatment alone did not provide adequate control of volunteer buckwheat. Huskie (pyrasulfotole + bromoxynil) followed by Maestro Advanced (bromoxynil + MCPA) provided top-tier control of buckwheat in both seasons, whereas other early postemergence followed by late postemergence treatments provided less consistent control across years.

Herbicides containing bromoxynil should be applied to buckwheat before plants have more than 8 leaves or are 4 inches in size. An effective early postemergence treatment is needed to control early flushes of buckwheat so that plants are not too large for effective control with late postemergence treatments. See the herbicide labels for specific information on use rates, application timing, and chemigation use and restrictions.

TREATMENT[a]		VISUAL CONTROL[b, c]		GRAIN CONTAMINATION[b]	
Early Postemergence	Late Postemergence	2016	2018	2016	2018
---------- rate is given in fl oz of product/A ----------		---------- % ----------		buckwheat seeds/kg wheat	
Huskie @ 13.5		90	78 b	2.9 c	12.3 abc
Huskie @ 13.5	Brox 2EC @ 32	91	96 a	10.0 b	7.3 de
Huskie @ 13.5	Maestro Advanced @ 25.6	100	96 a	0.4 d	7.0 e
Huskie @ 13.5	Starane NXT @ 27.4	91	97 a	6.8 b	6.1 e
Goldsky @ 16		86	81 b	9.3 b	19.6 ab
Goldsky @ 16	Brox 2EC @ 32	90	95 a	2.7 c	14.0 bc
Goldsky @ 16	Maestro Advanced @ 25.6	100	95 a	0.2 d	13.1 c
Goldsky @ 16	Starane NXT @ 27.4	95	98 a	0.1 d	11.7 cd
Nontreated check		—	—	29.3 a	22.7 a

[a] Treatments containing Huskie included ammonium sulfate at a rate of 1 lb/A and treatments containing GoldSky included NIS at 0.5% v/v.

[b] Means, based on four replicates, within a column, followed by the same letter are not significantly different at P = 0.05 as determined by difference between least squares means, which means that we are not confident that the difference is the result of treatment rather than experimental error or random variation associated with the experiment.

[c] Visual control was estimated two weeks after the late postemergence applications were applied.

Bromoxynil has a very short half-life in soil. Consequently, rotation restrictions are relatively short unless the herbicide contains active ingredients with longer soil residual than bromoxynil. For example, Huskie contains bromoxynil plus pyrasulfotole and has a crop rotation interval up to nine months long for some crops like potatoes, sunflowers, and timothy. See herbicide labels for specific plant-back intervals.

Other potential herbicide options include 2,4-D, MCPA, Affinity BroadSpec (thifensulfuron + tribenuron), Aim (carfentrazone), and Harmony Extra (thifensulfuron + tribenuron). See those herbicide labels for specific information on use rates, application timings, and use restrictions.

Nonselective herbicides containing glyphosate or paraquat may also be used to control emerged volunteer buckwheat between crops.

Summary

Minimizing buckwheat contamination in wheat grain is necessary to produce a premium wheat product for export. This can be achieved by controlling volunteer buckwheat in wheat fields through cultural controls such as crop rotation and tillage, and the timely and judicious use of herbicides in wheat.

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Title bar photo: Buckwheat flowering in WSU variety trials. Photo courtesy of **Kristofor Ludvigson**, WSU graduate student.

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