Feral Rye Management in a Winter Canola Production System

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With the introduction of winter canola into the winter wheat/fallow region an opportunity exists for growers to better manage feral rye in their production systems. Winter canola was seeded into conventional summer fallow by cooperating growers in a natural stand of feral rye in early September for experiment one (Bridgeport) and late August for experiment two (Okanogan). Each year glyphosate-resistant winter canola, variety 'Hy CLASS 115W', was planted at approximately 3.4 kg ha^{-1} with 35-cm row spacing. Our data suggests that the use of split-applied quizalofop in conventional winter canola and glyphosate in glyphosate-resistant winter canola to control feral rye will allow the continued expansion of winter canola in the Pacific Northwest while delaying/preventing weed resistance.

Table 1: Effect of three herbicides on feral rye control, plant density and winter canola yield in 2014 at Okanogan, WA. [a] Abbreviations: F = fall; S = spring. Treatments applied October 10, 2013 and April 10, 2014. [b] Rates are expressed in kg ai ha^{-1} for clethodim and quizalofop and kg ae ha^{-1} for glyphosate.

		Control of Rye	Rye Density	Canola
Treatment [a]	Rate [b]	5/12/2014	6/25/2014	Yield
	kg ha^{-1}	%	no. m^{-2}	kg ha^{-1}
Nontreated	-	-	136	0
Clethodim (F)	0.105	70	22	745
Clethodim (F+S)	0.105+0.105	90	0	745
Clethodim (S)	0.105	35	106	85
Quizalofop (F)	0.062	97	0	865
Quizalofop (F+S)	0.062+0.062	100	0	785
Quizalofop (S)	0.062	83	14	430
Glyphosate (F)	0.866	96	0	840
Glyphosate (F+S)	0.866+0.866	99	0	1040
Glyphosate (S)	0.866	100	0	350

Why the Differences in Soil Water Loss During Fallow in the Lind Camelina Cropping Systems Experiment?

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We are currently in year 7 of a 9-year cropping systems experiment to evaluate camelina (C) produced in a 3-year winter wheat(WW)-C-tilled summer fallow (TSF) rotation compared to the 2-year WW-TSF rotation practiced throughout the low-precipitation zone. Experimental design is a randomized complete block with four replicates. There are 20 plots, each 250 ft x 30 ft. Camelina is direct drilled + fertilized into standing WW stubble in late February or early March. Winter wheat is planted into TSF in late August. Soil water content to a depth of six feet is measured in all 20 plots after C and WW harvest in July and again in March, and from the eight TSF plots in late August just before planting WW. Weed species in C and WW are identified, counted, and collected just before grain harvest. Surface residue remaining after planting WW into TSF is measured in both rotations using the line-point method.

Six-year average WW grain yield in the 3-year WW-C-TSF rotation is 37.1 bu/ac versus 39.5 bu/ac in the 2-year WW-TSF rotation (a 2.4 bu/ac or 6% difference). This slight WW yield decline in the 3-year rotation has occurred every year, although there have never been any statistically significant differences in WW yield between the two rotations.

The slight decline in WW grain yield in the 3-year rotation is likely due to difference in water loss in the two rotations that occur during fallow from mid-March to late-August. Although primary spring tillage with the undercutter V-sweep and any subsequent rodweedings during late spring and summer take place at the same time and at the same depth, an average of 0.5 inch of additional soil water is consistently lost in TSF after camelina compared to TSF after WW (Table 1). These values are further reflected in the precipitation storage efficiency (PSE) data in the last column of Table 1.

Table 1. Six-year-average soil water content at the beginning (after harvest), early spring, and the end of fallow (just before planting of winter wheat) and associated gain or loss of water and precipitation storage efficiency (PSE= gain in soil water/precipitation that occurred during the fallow period) in the 6-foot soil profile in summer fallow in a 2-year winter wheat-fallow rotation versus a 3-year winter wheat-camelina-fallow rotation. Average crop-year precipitation for the six fallow years from 2009-2014 = 9.42 inches. ns= no significant differences.

	Timing in fallow period					
	Beginning (late Aug.)	Spring (mid Mar.)	Over-winter Gain	End (late Aug.)	Mar. to Aug. water	PSE (%)
	Soil water content (inches)					
Fallow treatment						
After winter wheat (2-yr rotation)	6.2	9.7	3.5	8.9	-0.8	27
After camelina (3-yr rotation)	6.7	10.1	3.3	8.8	- 1.3	20
p-value	0.04	0.01	ns	ns	< 0.001	0.001

In 2015, we plan extensive field and laboratory testing of the surface soil mulch conditions in the 2-year and 3-year rotations to determine the cause of the consistently greater soil water losses from mid-March to late-August in the 3-year rotation. We expect the main reason may be surface residue cover, but it also could possibly be soil clod size distribution within the soil mulch. This expanded work on soil water loss will be interest to both farmers and scientists.

Washington Extension Legume Variety Trails in 2014 and 2015: Performance Information for Superior Variety Selection

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The WSU Extension Grain Legume Variety Testing (GLVT) program provides growers, the agribusiness industry, university and USDA-ARS researchers, and other interested clientele with comprehensive, objective information on the adaptation and performance of grain legume cultivars across several different climatic growing regions in eastern Washington. The GLVT program conducts comparisons using scientifically sound methodology, produces independent results, disseminates all data to clientele, and uses uniform testing procedures across multiple locations. The replicated dryland GLVT trials in eastern Washington were grown at four locations in 2014 using spring planted varieties of dry pea, lentil, and chickpea.

Winter adapted pea and lentil evaluation trials were planted in the fall of 2014 and will provide performance information on released and experimental lines that produce food quality seed. The release of food quality, winter adapted pea and lentil varieties have the potential to significantly expand the adapted areas, especially in the lower and intermediate rainfall zones, for economical grain legume production. Growing grain legumes in a wheat rotation will increase wheat yield potential. Winter adapted pea and lentil production systems have demonstrated much higher yield potential than spring planted types.

Trial results are available in printed form in: 2014 Cereal and Grain Legume Variety Evaluation Annual Report, and comprehensive results for last year, and previous years, can be found on the Variety Testing Web site (variety.wsu.edu).