ranged from 302 to 1049 lbs/acre and averaged 574 lbs/acre (Fig. 1). Mean WW yield of 40 bu/acre in the 3-yr rotation was significantly lower (p=0.046) compared to 43 bu/acre in the 2-yr rotation. Soil profile water was significantly lower (p<0.001) after harvest of camelina compared to after WW harvest in the 2-yr rotation. This soil water reduction was consistently measured throughout the ensuing 13-month fallow cycle. There are no labeled in-crop broadleaf weed herbicides for camelina and populations of Russian thistle and tumble mustard were higher in camelina than in WW. This was likely a factor in the deep extraction of soil water in the camelina plots to a depth of six feet. Data from this study suggest that, with current varieties and management practices, camelina is not yet agronomically or economically stable or viable in a 3-yr WW-camelina-SF rotation in the low-precipitation (<12 inch annual) rainfed cropping region of the Inland Pacific Northwest.

Figure 1. The lowest camelina yield of 302 lbs/acre occurred in 2014 (left) when only 7.6 inches of precipitation occurred during the crop year. Note the infestation of Russian thistle. The highest camelina yield of 1049 lbs/acre (right) was in 2016 when 14.8 inches of precipitation fell during the crop year.

Conclusions: Regional farmers did not consider camelina either agronomically or economically attractive. Growing camelina in a wheat-based rotation did not enhance the subsequent WW yield compared to the 2-yr WW-SF rotation. Although the ability to effectively control grass weeds in camelina is a big benefit, the lack of in-crop broadleaf herbicides as well as lack of federal crop insurance are detriments. Interest in growing camelina would likely improve as new varieties, agronomic and management practices, and government programs are developed and refined. For example, during the past ten years, winter canola production in the PNW dryland region has rapidly expanded due to a focused multidisciplinary research and extension effort by university, USDA, and private-company scientists, the development of varieties with herbicide tolerance/resistance and other attributes, and the availability of federally-subsidized crop insurance.

WSU-WOCS Large-Scale Canola Variety Trials

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A major component of the Washington State Oilseed Cropping Systems (WOCS) Project since 2016 is the large-scale, on-farm winter and spring canola variety trials. With canola acreage increasing annually in Washington state and the Pacific Northwest, the trials are valuable to growers and industry when making not only variety selection decisions, but the full gamut of production components that are part of having a successful crop.

Winter canola plots were established at Mansfield, Ritzville, and The Dalles, OR during Fall 2017. Spring canola trials were seeded in 2018 at Davenport, Ralston, and Walla Walla. The Dalles, OR site marked the first time a trial was located outside of WA state. Yield results from the winter trials were only significant at The Dalles. Soil type and moisture variability at Mansfield, and weed pressure and a soil moisture gradient across the plot area at Ritzville likely contributed to the wide range of yield but lack of significance. The hybrid 'Mercedes' had the highest yield at all locations. Harvest at Ritzville occurred on two dates due to variable ripening on one end of the field. The Substation fire at The Dalles interrupted harvest so it was also completed on two different dates. Tours at all three locations attracted 122 people. Attendees at a fall 'stop 'n' talk tour at the Ritzville site included growers, crop consultants, WSDA employees to learn about blackleg scouting, and insurance adjusters to see differences in crop establishment.

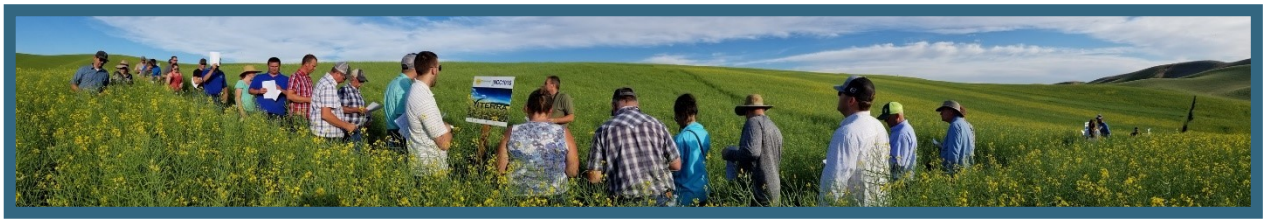

Figure 1. Tours were held at all spring and winter canola variety trial sites. Photo from the Walla Walla spring canola site.

Mean yield at the three spring canola sites ranged from 611 lbs/acre at Reardan to 2323 lbs/acre at Walla Walla, with similar yield trends between the entries. Low yield at Reardan can be attributed to the late planting date and high heat during flowering. Yield data from Dr. Dave Huggins, USDA-ARS, showed a 50 lb/acre reduction in spring canola yield potential for each day after April 12 that canola is planted (data not shown). Using that information, it can be calculated that 1500 lbs/acre more yield was possible at Reardan had field conditions allowed earlier seeding. There were consistent trends in flowering timing of the entries observed at all locations. NCC101S and HyCLASS 930 flowered 7-10 days earlier than the other entries, which is a factor to consider in variety selection if early spring heat is a concern. Ninety people attended tours at the spring canola sites, with 6-8 speakers at each. Representatives from the national USDA-RMA office attended two of the tours to interact with growers about establishing an insurance program for hybrid canola seed production.

Yield results of 2017-18 On-farm Winter Canola Variety Trials

Variety	The Dalles[1]		Ritzvile[2]		Mansfield[3]	
	---------- lbs/acre ----------					
Mercedes	3,049	a	3,130	a	2,445	a
Griffin	2,785	ab	3,034	a	1,652	a
HyClass 320	2,550	bc	2,583	a	1,929	a
Edimax CL	----	----	2,621	a	2,163	a
Amanda	2,494	bc	2,828	a	1,817	a
HyClass 225	2,333	c	2,642	a	1,796	a
Claremore	2,241	c	2,857	a	1,722	a
Mean	2,585		2,814		1,932	
Tukey $HSD_{(0.05)}$	375		ns		ns	
CV (%)	7.0		12.1		30.2	

[1] Planted Sept. 22, 2017, harvested July 16 and July 23, 2018.
[2] Planted Sept. 19, 2017, harvested July 21 and August 6, 2018.
[3] Planted August 24, 2017, harvested 7/26/18.

It is worth noting the depth and extent of collaboration and assistance throughout the growing season from the grower cooperators, industry, WSU and OSU field technicians, grad students, and faculty that was crucial to the success of the trials. Our deepest thanks to all!

Winter canola trials were not seeded in 2018 due to poor planting conditions. Spring canola trials are planted at Wilbur (Brunner farm), the Cook Farm in Pullman, and as of printing were slated for the WSU Wilke Farm near Davenport.

Many thanks to our 2017-18 cooperators: David Brewer, Rob Dewald, Curtis Hennings, Douglas Poole, Mark & Brendan Sherry, and Paul Williams.

Seed provided by Bayer CropScience, BrettYoung, Caldbeck Consulting, Nutrien Ag Solutions, Croplan by Winfield, Dow AgroSciences, Kansas State University, Rubisco Seeds, Spectrum Crop Development, and University of Idaho.

Yield results of 2018 On-farm Spring Canola Variety Trials

Variety	Ralston[1]		Reardan[2]		Walla Walla[3]	
	lbs/acre					
NCC 101S	1,955	a	774	a	2,417	a
HyClass 930	1,864	ab	696	a	2,608	a
InVigor L233P	1,793	bc	693	a	2,433	a
BY 6080 RR	1,639	c	557	a	2,410	a
BY 5545 CL	1,694	c	529	a	2,319	ab
DG 200 CL	1,631	c	508	a	2,253	ab
HyClass 730	1,709	bc	—	—	—	—
Nexera 2024 CL	1,291	d	515	a	1,824	b
Mean	1,710		611		2323	
Tukey $HSD_{(0.05)}$	223		285		533	
CV (%)	4.8		19.4		9.8	

[1] Planted April 9, harvested August 6
[2] Planted May 11, harvested September 3
[3] Planted March 30, harvested August 1

Monitoring Pea Weevil (*Bruchus pisorum*) in Pulse Crops

DALE WHALEY
WSU EXTENSION

A quiet transformation is taking place in grain fields across central Washington. A mere decade ago, winter peas were once thought has a specialty crop with marginal acres being planted. The number of planted pea acres in Adams, Douglas, Grant and Lincoln counties for 2017 has increased to 18,182 (6,684 non-irrigated/11,498 irrigated) acres (FSA Data). The ability of peas to fix atmospheric nitrogen makes it a great rotational crop with the regions winter wheat crops. Winter wheat after winter peas with no applied fertilizer yielded 59.0 bu/acre with a grain protein of 10.8% (Howard Nelson, CWGG). Unfortunately, both winter and spring peas are under attack by the Pea Weevil, *Bruchus pisorum*. Heavy infestation of the Pea Weevil can reduce the pea seed to shells thereby severely impacting yields. A second impact to feeding by pea weevil is that it can actually make plants more susceptible to aphids and aphid-transmitted viruses.