

for 100:0 and 200:0 (N:S) were similar but lower than when S was added at 20 or 40 lbs./acre. Agrotain® DM yields were similar to no Agrotain® treatments. Forage quality and effluent analysis is under way. Significantly less effluent is observed when the alfalfa cube absorbents were added to forage canola during the ensiling process.

Table 1. Dry matter (DM) yield (tons/acre) and sulfur (S; mg/kg tissue) of winter Canola harvested October 13 and 14, 2015.

Nutrient Treatment (lbs/acre)	DM Yield (tons/acre)	S (mg S/kg tissue)
100 N : 0 S	0.95	1682.0
100 N : 20 S	0.98	3152.0
100 N : 40 S	0.99	4156.8
100 N : 20 S + Agrotain	0.60	3835.8
200 N : 0 S	0.98	1746.8
200 N : 20 S	0.94	2777.8
200 N : 40 S	1.07	3503.6
200 N : 40 S + Agrotain	0.83	3167.2
LSD _{0.05}	NS	652.1

Development of a Herbicide Tolerant Camelina Variety

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While markets for Camelina oil and meal are slowly growing, barriers to efficient production in the Pacific Northwest (PNW) exist. One problem is its extreme insensitivity to group 2 herbicides (imidazolinones and sulfonylureas) which have residual activity in soils for multiple years. The popularity of some group 2 herbicides, like Beyond, has grown in recent years due to the popularity of Clearfield wheat varieties. This further limits the use of camelina as a wheat rotation crop. Following the identification of a mutant line that is tolerant to both imidazolinone and sulfonylurea herbicides, we established breeding populations by crossing the mutant to camelina varieties like Calina which have performed well in the PNW. The utility of lines carrying the mutation was demonstrated by planting after Clearfield wheat to which four times the recommended rate of Beyond herbicide was applied and observing no damage or yield reduction. Advanced breeding lines carrying the herbicide tolerant (HT) trait have now been tested in several locations over the past two years and evaluated for yield and oil content. Following final testing and seed increase this season, a variety is planned for release this fall. The variety will have yield and oil content similar to Calina along with the HT trait.

Evaluation of a collection of European camelina germplasm over the last three years has indicated that gains in other traits could be made in future varieties. A Danish variety was identified that appears to have significantly higher yield potential than Calina in dryland PNW environments. Lines have also been identified with much larger seed than commercial varieties. The large seeded trait should provide more consistent emergence and faster stand establishment for better competition with weeds. Lines with significantly different fatty acid composition in the oils have also been identified. One line has lower erucic acid, comparable to canola, which has potential as an FDA-approved cooking oil. Breeding populations have been developed for the purpose of combining these traits to make varieties with larger seed and higher yield with good oil content. Advances in fatty acid composition will also enable the development of specialty varieties for expansion or flexibility in potential markets.