Project title: Yield and Yield Component Responses to Camelina Seeding Rate and Genotype

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Objective: To investigate the yield and yield component response of different camelina breeding lines to three seeding rates in Montana.

Results:

This study was conducted to investigate how different camelina genotypes responded to seeding rate. In addition to seed yield, special attention was paid to how the yield components (e.g., racemes/plant, pods/raceme) of camelina, a plant known to have a strong compensatory ability, would respond to changes in seeding rate. Twelve genotypes (9 high-yielding and 3 low-yielding) were planted at three seeding rates (2, 4 and 6 lb/a) on May 16, 2009 and were combined harvested on August 25, 2009. The trial was also conducted near Amsterdam, MT.

Camelina stands were well established and the desired seeding rates were achieved (Table 1). Averaged across the camelina genotypes, camelina flowered 44 days after planting (June 29) and reached physiological maturity on August 11 (87 days after planting). Camelina plants stood about 37 in tall. Seed yield averaged 2,281 lb/a and average test weight was 52.1 lb/bu. Oil content was close to 39% which brought average oil yield to 900 lb/a (Table 1).

Although there was a slight trend toward reduced yield with increased seeding density, the differences among densities were not statistically significant (Table 1). Very few of the other agronomic traits (e.g., flowering time, oil yield) were affected by seeding rate; however several yield components were influenced by seeding density. At lower seeding rates, camelina plants displayed an increase in the number of reproductive branches (racemes), and more pods per raceme (Table 2). This translated into greater yield *per plant* at lower densities, and demonstrates the ability of camelina to compensate in reduced stands. Seeding rate did not affect the number of seeds per pod or the seed weight (Table 2).

Summary:

Camelina responded to increased seeding rates mainly by producing fewer racemes and less pods per raceme. Increasing the seeding density in camelina didn't affect seed or oil yield in a statistically significant way, but there was a trend towards reduced yield with increasing seeding rates. Despite that trend, increased seeding rates could help reduce weed problems in this crop.

Future Plans:
This study will be conducted again in 2010 at both locations, and may lead to future studies that could help to determine the role of increased seeding rates in camelina weed management.

Table 1. Seed yield and agronomic response of camelina genotypes to plant density

Seeding density *lb/a*	Plant density *plants/ft2*	Bolting *dap*	Flowering *dap*	Maturity *dap*	Plant height *in*	Seed yield *lb/a*	Test weight *lb/bu*	Oil content *%*	Oil yield *lb/a*
2	17	28	44	87	38	2501	52.2	40.2	1005
4	30	28	44	87	37	2224	52.2	39.2	876
6	41	28	44	87	36	2119	52.0	38.5	821
LSD (α=0.05)	0.5	ns	ns	ns	ns	ns	ns	ns	ns
Overall mean	29	28	44	87	37	2281	52.1	39.3	901

dap= days after planting

Table 2. Yield component response of camelina genotypes to plant density

Plant density *lb/a*	Racemes per plant *#/plant*	Pods per raceme *#/raceme*	Seeds per pod *#/pod*	Seed weight *g/1000*	Seed yield *g/plant*	Main raceme length *mm*	Pods on main raceme *#*
2	12	20	11	1.19	2.97	28.2	40.1
4	9	18	11	1.18	2.06	25.4	36.0
6	8	16	10	1.19	1.71	23.0	32.8
LSD (α=0.05)	2.0	1.8	ns	ns	0.604	ns	4.28
Overall mean	9	18	11	1.19	2.25	25.5	36.3