

Winter Annual Oilseed Quarterly Update Fall 2018

Advances in Harvest Management in Winter Camelina – A Research Update

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Winter camelina (*Camelina sativa* L.) is an annual winter oilseed cash cover crop that can improve soil quality by providing ground cover from the fall, through the winter and early spring. Other than improvement in soil health, its integration into traditional corn-soybean rotation can also lead to enhanced water quality through reduction in leaching of nutrients and offsite movement of nutrients from the field. Recent study (Walia et al., 2018) have also shown that addition of winter camelina following sugar beet harvest inhibits weeds as well or better than herbicide metalochlor and thus, its inclusion in a sugar beet cropping system can enhance the economic returns to growers by reducing the need for applying herbicides. Winter camelina is winter hardy even in Minnesota and is an economically viable crop. It can yield up to 1700 lbs/ac and contains about 38-42% oil by weight. The oil from winter camelina seed can be used as a feedstock for both food and industrial grade oil. Winter camelina can be inter-seeded (September-early October) into corn before and immediately after its harvest (as double crop) and should be harvested before the planting of following soybean crop in sequential/double cropping scenario or while soybean is growing in a relay-cropping system. In double-cropping system, the second crop is planted following the harvest of first crop. Thus, the incorporation of winter camelina into already existing crops will provide economic benefits to growers as compared to planting of traditional crops alone, along with enhancement in environmental quality including food source for wild and domesticated pollinators.

Despite of these economic and environmental benefits resulted from inclusion of winter camelina into cropping system, there are concerns about its delayed harvesting and thus late planting of following crop in double-cropping system. To mitigate the yield loss (likely due to camelina seed shedding and/or avian predation, delay planting of next crop or disturbance to already standing crop), either we have to breed for early maturing camelina varieties or use the desiccants/swathing options for standing camelina crop. Desiccants are the chemicals that can be applied to the crop once the seed has fully developed, aids in hastening the maturity and thus its early harvest. The addition of desiccants to winter camelina will hasten the drying of seed and thus allowing rapid subsequent planting of the second crop in double-crop systems or reduce the damage caused by equipment to the next crop in relay-cropping system. Delay in planting of next crop will leads to reduction in the yield of following crop (Table 1). For instance, delay in

planting of soybeans by one month (from May 1 to June 4) resulted in yield loss of 18% in Minnesota. The timely harvest of winter camelina will thus enhance the overall production and economics of the growers.

Table 1: Influence of soybean planting date in Minnesota on percent yield loss and potential yield¹.

Table 2: How planting date affects soybean yield

Planting date	Yield loss	Yield potential
May 1	0%	100%
May 5	1%	99%
May 10	2%	98%
May 15	3%	97%
May 20	6%	94%
May 25	9%	91%
May 30	13%	87%
June 4	18%	82%
June 9	24%	76%
June 14	30%	70%

The Department of Agronomy and Plant Genetics, University of Minnesota in collaboration with USDA-ARS, Morris are working to develop the best harvest management practices for winter camelina crop to vacate the field earlier. Research experiment were initiated in September 2017 and winter camelina (Joelle) was planted at two locations Morris and Rosemount, MN. Treatments includes addition of desiccant (sodium chlorate 42.3% at application two rates) and swathing done at different growth stages according to BBCH scale (Martinelli and Galasso, 2011) ranging from 80 (i.e. when all pods have reached final size) – 87 (i.e. when 70% of pods were ripe). Preliminary results indicated that addition of desiccants and swathing (Fig. 1) reduced the seed moisture content and thus can lead to early harvest of camelina from the fields. Initial results also indicated that winter camelina seed yield and oil content were maximized when crop was swathed by end of June, corresponding to moisture content of around

10-15%. In fall 2018, the study was planted again for a second-year trial at same locations and we will discussing the results after completion of second year of experiment in future quarterly updates.



Figure 1: Winter camelina swathed on June 20, 2108 at Morris, MN

References

Naeve, S.L. and Nicolai, D. 2018. Delayed planting. Minnesota Crop News, University of Minnesota Extension.

<https://extension.umn.edu/soybean-planting/delayed-planting#planting-date>

Martinelli, T. and Galasso, I. 2011. Phenological growth stages of *Camelina sativa* according to the extended BBCH scale. Ann. Appl. Biol., 53–66.

Walia, M.K., Wells, M.S., Gesch, R., and Forcella, F. 2018. Controlling weeds with winter camelina planted following sugar beet harvest. Minnesota Crop News, University of Minnesota Extension.

<https://blog-crop-news.extension.umn.edu/2018/07/controlling-weeds-with-winter-camelina.html>