

2016 INDUSTRIAL HEMP PLANTING DATE X VARIETY TRIAL

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Hemp is a non-psychoactive variety of *cannabis sativa L.* The crop is one of historical importance in the U.S. and re-emerging worldwide importance as manufacturers seek hemp as a renewable and sustainable resource for a wide variety of consumer and industrial products. The crop produces a valuable oilseed, rich in Omega-3 and other essential fatty acids that are often absent in western diets. When the oil is extracted from the seed, what remains is a marketable meal co-product, which is used for human and animal consumption. The fiber has high tensile strength and can be used to create cloth, rope, building materials, and even a form of plastic. For twenty years, U.S. entrepreneurs have been importing hemp from China, Eastern Europe and Canada to manufacture travel gear, apparel and accessories, body care and cosmetics, foods like bread, beer, and salad oils, paper products, building materials and animal bedding, textiles, auto parts, housewares,

Vermont farms that is nutritious, versatile, and suitable for rotation with other small grains and grasses.

To help farmers succeed, agronomic research on hemp is needed, as much of the historical

Table 3. Hemp varieties evaluated in the planting date and variety trials 2016, Alburgh, VT.

Variety	Seed company	Days to maturity
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Across planting dates

Table 9. The impact of planting date, across all varieties, on plot characteristics and harvest yield of industrial hemp, Alburgh, VT, 2016.

Planting date	Early season vigor		Yield		Test weight		Moisture @ harvest	
	1 to 5 rating		lbs ac ⁻¹		lbs bu ⁻¹		%	
26-May	1.86	C	1850	A	41.6	B	24.1	A
2-Jun	3.31	B	575	B	42.7	A	39.6	C
12-Jun	2.91	B	407	B	41.7	B	40.0	C
17-Jun	3.76	A	552	B	41.9	B	34.8	B
<i>p-value</i>	<.0001		<.0001		0.0001		<.0001	
Trial mean	3.00		812		42.0		65.0	

Early season vigor was rated on a 1 to 5 scale with 1 = low vigor and 5 = high vigor.

Within a column, values followed by the same letter are not significantly different from each other.

When comparing yield and quality measurements between planting dates (Table 9), there were many significant differences in vigor, yield, test weight, and harvest moisture of the seed. The 26-May planting date had the highest yields at 1850 lbs ac⁻¹ and the lowest moisture at 24.1%. The 2-Jun planting showed the highest test weight at 42.7 lbs bu⁻¹. The 17-Jun planting the best vigor performance and was likely due to warmer temperatures and adequate soil moisture at the time of planting.

DISCUSSION

Yield and Quality

All hemp varieties at all planting dates reached full plant maturity. Generally, the male flowers (pollen source) appeared after 38 days and late season varieties matured by 45 days after planting. Seed development occurred after 45 days and up to 60 days after planting, for the late season varieties. While the first planting date showed significantly higher yields, harvest yields for the following plantings were much lower than expected and were likely due to delayed harvest. The first planting date was harvested on time, when plants were still young and green and seed was 50 to 70% ripe. The first planting date produced average yields of 1850 lbs ac⁻¹ across varieties, and out-performed average yields from Canada, which range from 500-1200 lbs ac⁻¹. Unfortunately, the plot combine used to harvest experimental trials had an engine malfunction and caused our remaining hemp harvest to be delayed past optimum harvest stages. The remaining planting dates were harvested when the plants had gotten more mature, which made combining more difficult, and seed had shattered and dropped by the later date.

All measured populations averages at 3.45 to 5.33 plants ft⁻², which was lower than the ideal rate of 7-10 plants ft⁻² (generally

Moisture content varied by variety, with Anka

**Figure 1. *Sclerotinia sclerotium* infection on industrial hemp,
Alburgh, VT, 2016.**

It is important to remember that these data represent only one year of research, and in only one location. More data should be considered before making agronomic management decisions. It was clear that all varieties were able to mature when planted between 26-May and 17-Jun in northwestern, VT. Due to issues at harvest, we were unable to determine if yields were impacted by the planting date or the later than optimum harvest time. Additional research needs to be conducted to evaluate both varieties and planting dates in the northeast.

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