

2017 INDUSTRIAL GRAIN HEMP PLANTING DATE 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 reemerging in 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, cpf"urqtvkpi"gswkr o gpv0"kpfwvvtkn"j g o r"ku"rqkugf"vq"dg"c"öpgy ö"

Table 2. Hemp grain varieties evaluated in the planting date trial 2017, Alburgh, VT.

Variety	Seed company	Days to
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Results by Planting Date x Variety

There were no significant planting date by variety interactions in this study. This indicates that the varieties responded similarly across the planting dates.

Results by Planting Date

Across all varieties, planting date had a significant impact on plant height, yield, and test weight (Table 4, Figure 4). The 5-Jun planting date was the top performer in all three of these categories and yielded 574 lbs ac⁻¹. The 29-May planting date performed comparably for yield and height. The 12-Jun planting date yielded comparably, as well.

Table 4. The impact of planting date across all varieties on plot characteristics and harvest yield of industrial hemp, Alburgh, VT, 2017.

Planting date	Height @ harvest	Population	Yield	Test weight
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When evaluating arthropod presence across varieties, low levels of aphids, leafhoppers, spiders, Japanese beetles, tarnished plant bugs, and insect damage were present at the female flower development stage (Table 5). The presence of leafhoppers was significantly lower for the 5-Jun and 12-Jun plantings; however, populations were generally low for all four planting dates.

Table 5. The impact of planting date on disease and arthropod presence in industrial hemp at female flower development across all varieties, Alburgh, VT, 2017.

Variety	Aphids # plant ⁻¹	Leafhopper # plant ⁻¹	Spiders # plant ⁻¹	Japanese beetles # plant ⁻¹	Tarnished plant bug # plant ⁻¹	Physical damage # plant ⁻¹

Figure 5. The effect of variety on yield (p-value = 0.03) and height (p-value <0.0001). Columns and lines that share the same letter did not perform statistically different from each other, Alburgh, VT, 2017.

Table 8. The impact of variety on disease and arthropod presence in industrial hemp at female flower development across all planting dates, Alburgh, VT, 2017.

Variety	Aphids	Leafhopper	Spiders	Japanese beetles	Tarnished plant bug	Physical damage
	# plant ⁻¹	# plant ⁻¹	# plant ⁻¹	# plant ⁻¹	# plant ⁻¹	# plant ⁻¹
Anka	0.188	0.050	0.013	0.013	0.025	0.725
CRS-1	0.150	0.138	0.000	0.013	0.063	0.700
Fedora	0.413	0.088	0.000	0.038	0.063	0.525
LSD (0.10)	NS	NS	NS	NS	NS	0.163
Trial mean	0.250	0.092	0.004	0.021	0.050	0.650

Physical damage from insect

the harvest, which affected the test weight. None of the treatments in the trial met the standard test weight for hemp of 44 lbs bu⁻¹.

Pest Pressure in Hemp: Disease, insects, weeds

Hemp has the potential to host a number of diseases and insects. For the most part, hemp growing regions have not indicated that disease and arthropod pests are of economic significance. During the growing season, a survey of pest incidence was conducted to gain a better understanding of any pressures that exist on hemp in the region. Early in the season, lesions on hemp leaves were noticed and later identified as being *Alternaria* spp., *Aspergillus* spp., and *Cladosporium* spp. These diseases did not appear to negatively affect yields. Aphids infested the hemp more heavily during later stages of plant development and but did not seem to affect plant yields, since most vegetative growth had already been completed. Similarly, *Sclerotinia sclerotiorum* infection increased later in the season, but did not seem to affect yields.

During the early growth stages of hemp, plants were small, weak, and had poor root development while weeds quickly grew. In the 2016 hemp trials, a