

2018 Industrial Hemp Fiber Variety Trial

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2018 INDUSTRIAL HEMP FIBER 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 is emerging in

Table 2. Hemp varieties evaluated in the industrial hemp fiber trial 2018, Alburgh, VT.

Variety	Days to maturity	Seed company
Anka	110	UniSeeds
Canda	100-120	Parkland Industrial Hemp Growers
Carmagnola	160-170	Schiavi Seeds
Carmagnola selezionata	160-170	Schiavi Seeds
CFX-1	100-110	Hemp Genetics International
CFX-2	100-110	Hemp Genetics International
CRS-1	100-110	Hemp Genetics International
Eletta campana	160-170	Schiavi Seeds
Ferimon	129-134	UniSeeds
Fibranova	160-170	Schiavi Seeds
Joey	110-120	Parkland Industrial Hemp Growers
USO-31	122-127	UniSeeds

Table 3. Participating seed companies and contact information.

Hemp Genetics International	Schiavi Seeds	Parkland Industrial Hemp Growers	UniSeeds
Jeff Kostuik Saskatoon, Saskatchewan (204) 8210522 Jeff.kostuik@hempgenetics.co	Andrea Schiavi Lexington, Kentucky info@schivaseeds.com	Clare Dutchysen Dauphin, Manitoba (204) 6294367 info@pihg.net	Cobden, Ontario (613) 6469737 orders@uniseeds.ca

There were a total of twelve hemp varieties evaluated (Table 2). Seed was sourced from four seed companies (Table 3). On 9-Jul, the trial was fertilized with 15 lbs a⁻¹ of nitrogen, 3 lbs a⁻¹ of phosphorus, and 04 lbs a⁻¹ of potassium. Fertility amendments were based on soil test results. All fertility amendments were approved for use in USDA certified organic systems.

On 31-Jul, just prior to mowing, plant populations were recorded by counting the number of plants in a foot-long section of a row, three times per plot. At that time, data was collected on plant heights by measuring three randomly selected plants per plot. On 31-Jul, wet weight harvest yields were calculated by sampling the hemp biomass within a 0.25 m² quadrat. Harvest moisture was calculated by taking a subsample of hemp yield and drying it at 65°C until it reached a stable weight. Stem diameter was measured on 5 plant stems per plot, using a digital caliper. Infection rates from the disease *Sclerotinia sclerotiorum*, were recorded 1 month



Image 1. Custom built decorticator, Alburgh, VT, 2017.

When the stalks were still fresh, they were decorticated to separate the bast and hurd fibers, using a custom built decorticator (Image 1). As the stalks passed between the two moving gears, hurd fiber broke away and dropped to the floor or a bucket placed underneath.

The variety trial data were analyzed using mixed model analysis using the mixed procedure (SAS Institute, 1999). Replications within trials were treated as random effects, and variety treatments were treated as fixed. Mean comparisons were made using the Least Significant Difference (LSD) procedure when the F test was considered significant.

RESULTS

Table 7. The impact of variety on disease and arthropod presence in industrial hemp fiber before mowing (3-Aug), Alburgh, VT, 2018.

Variety	Aphids	Leafhopper	Japanese beetle	Flea beetle	Tarnished plant bug

DISCUSSION

Yield and Quality

Generally, the male flowers (pollen source) appeared 60 days after planting for early season varieties. The hemp was mowed when plants were still young and green and seeds not formed. For fiber intended for textile use, it is best to mow the crop when the male plants are shedding pollen, at that stage the bast fiber is not heavily lignified. Some hurd buyers prefer the hemp not to be retted; the process changes the fiber color. If retting is not required, windrows of hemp stalks can be baled when the straw is 12% moisture. Rotary rakes can be used to help the hemp dry.

Average dry matter yield across twelve varieties was 6938 lbs ac¹, within the average yields from Canada, which range from 5000 to 10000 lbs ac¹. Across all varieties, bast fiber comprised 32% of the stalk compared to the hurd fiber. Depending on variety and planting density, bast fiber typically represents 20% of the total fiber content. Across all varieties, the average population was 164 plants m², which was lower than the target population of 250 plants m². Plant populations will be indirectly related to stem diameter.

The average height across varieties was 2.1 m, while a desirable height is 2 m or greater. However, the taller varieties may leave more possibility for lodging. The lack of heat during the early part of the season may have contributed to shorter plants.

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.

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.

Early season weeds can pose a threat to hemp populations, however, due to the higher seeding rate it seemed the weeds were less competitive with the fiber hemp as compared to grain hemp, which has a lower seeding rate. The primary weeds observed in the hemp trials were lamb's quarter, ragweed, and foxtail. Currently, there are no pesticides (herbicides, insecticides, fungicides, etc.) registered for hemp in the U.S, so growers must follow best practices to reduce the impact of pests, especially weeds.

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. Additional research needs to be conducted to evaluate varieties under more growing conditions.

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