



2023 Industrial Hemp Fiber Harvest Date Trial



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dates were originally trialed in this experiment, though data from HD3 on 21-Aug was lost. Thus, this report reflects results across three harvest timings: 7-Aug, 14-Aug, and 28-Aug; or 74, 81, and 95 days from planting, respectively.

On 8-May approximately 2.5 weeks prior to planting, the trial field received 300 lbs ac⁻¹ 19-19-19. Fertility amendments were based on soil test results. On 25-May, plots were seeded with a Great Plains NT60 cone seeder, and on 1-Jun plant emergence populations were recorded by counting the number of plants in a foot-long section of the row, three times per plot. Upon each harvest date, wet weight harvest yields were calculated by sampling the hemp biomass within a 0.25 m² quadrat from corresponding plots. Harvest moisture was calculated by taking a subsample of hemp biomass and drying it at 10 stable weight. Heights and stem diameters were recorded from five randomly selected plants within each plot before they were run through a custom-built decorticator (Image 1). While the stalks were still fresh,

not differ in yield. The difference between C and A is equal to 3.0, which is greater than the LSD value of 2.0. This means that the yields of these hybrids were significantly different from one another. The asterisk indicates that hybrid B was not significantly lower than the top yielding hybrid C, indicated in bold.

RESULTS

Seasonal precipitation and temperature were recorded with a Davis Instrument Vantage Pro2 weather station, equipped with a WeatherLink data logger at Borderview Research Farm in Alburgh, VT (Table 2). June exhibited cloudy weather with relatively departure from normal with 10.8 inches of precipitation, 6.74 inches more than the 30 year average. Much of Vermont experienced persistent rain in tandem with hazy conditions caused by Canadian wildfire smoke over the course of July and August. Despite the heavy rainfall, the well-saturated research farm did not experience the heavy flooding that wrought havoc on many other farms in the state. Overall, from May to September there were 23.4 inches of rain and 2038 Growing Degree Days (GDDs) accumulated, which was 124 GDDs below normal.

Table 2. Seasonal weather data collected in Alburgh, VT, 2023.

Alburgh, VT	May	June	July	August
Average temperature (°F)	57.1	65.7	72.2	67.0
Departure from normal	-1.28	-1.76	-0.24	-3.73
Precipitation (inches)	1.98	4.40	10.8	6.27
Departure from normal	-1.78	0.14	6.69	2.73
Growing Degree Days (Base 50°F)	303	483	712	540
Departure from normal	1.00	-41.0	17.0	-101

Based on weather data from a Davis Instruments Vantage Pro2 with WeatherLink data logger. Alburgh precipitation data from August-October was provided by the NOAA data for Highgate, VT. Historical averages are for 30 years of NOAA data (1991-2020) from Burlington, VT.

Table 3. The impact of harvest timing on plant characteristics and harvest yield of fiber hemp, Alburgh, VT, 2023.

Harvest Date	Plant height cm	Stem diameter mm	Dry matter yield lbs ac ⁻¹	Dry matter yield Tons ac ⁻¹	Harvest population plants ac ⁻¹	Harvest population plants ft ⁻²	Bast fiber %	Hurd fiber %
HD1 7-Aug (Day 74)	198	7.78*	18,370	9.19	1,011,714	23.2	38.6	61.4
HD2 14-Aug (Day 81)	190	6.23	18,541	9.27	833,652*	19.1*	22.5	77.5
HD4 28-Aug (Day 95)	216	8.20	22,132	11.1	530,138	12.2	25.6	74.4
LSD (p=0.10)	NS§	1.45	NS	NS	211,495	4.86	3.05	3.05
Trial Mean	202	7.40	19,681	9.84	791,834	18.2	28.9	71.1

bold (p=0.10).

LSD; least significant at the p=0.10 level.

§NS There was no statistical difference between treatments in a particular column (p=0.10).

The trial results by fiber hemp harvest date are summarized in Table 3. Our goal with this experiment was to observe the impact of harvest timing on plant characteristics and yield. The trial showed no statistically significant difference in plant heights or yield across the three harvest timings (Table 3). However, harvest date did appear to have an impact on stem diameter, with the thickest stems, averaging 8.2 mm, coming from HD4 on 28-Aug. Perhaps the most noteworthy data collected in this trial is that of bast to hurd ratio. The first harvest timing, which occurred 74 days from planting, yielded the highest percentage of bast fiber at 38.6% of the stalk. Neither of the following harvest dates yielded a statistically similar result. This data is aligned with the widespread belief that bast fiber quality and quantity can be expected to diminish with the onset of flowers and seeds. Given that the highest bast fiber percentage was observed in HD1 and the thickest stems were observed in HD4, it is likely that the hemp stalks are getting woodier as the plants transition from the vegetative stage to flowering. HD1 also saw the highest populations of plants at 1,011,714 plants ac⁻¹, with HD2 yielding a statistically similar result of 833,652 plants ac⁻¹. It is possible that the reduced population of plants in HD4 was the result of self-thinning or a die-off of smaller plants under the canopy by the time of harvest.

DISCUSSION

ACKNOWLEDGEMENTS

The UVM Extension Northwest Crops and Soils Program would like to give a special thanks to Roger Rainville and the staff at Borderview Research Farm for their generous help with the trials. This research was supported with funds from the USDA SARE and USDA CARE grant programs and our ongoing work can be identified as project numbers ONE22-410 and VTN-FP00003154, respectively. We would also like to acknowledge Anna Brown, John Bruce, Kellie Damann, Hillary Emick, Ivy Krezinski, Lindsey Ruhl, Sophia Wilcox Warren, and Sara Ziegler, for their assistance with data collection and data entry. This information is presented with the understanding that no product discrimination is intended and neither endorsement of any product mentioned, nor criticism of unnamed products, is implied.

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