

# Hemp Production in the Northeast

**Dr. Heather Darby, Agronomist  
University of Vermont**



COMMUNITY



4-H & YOUTH



ENVIRONMENT



AGRICULTURE



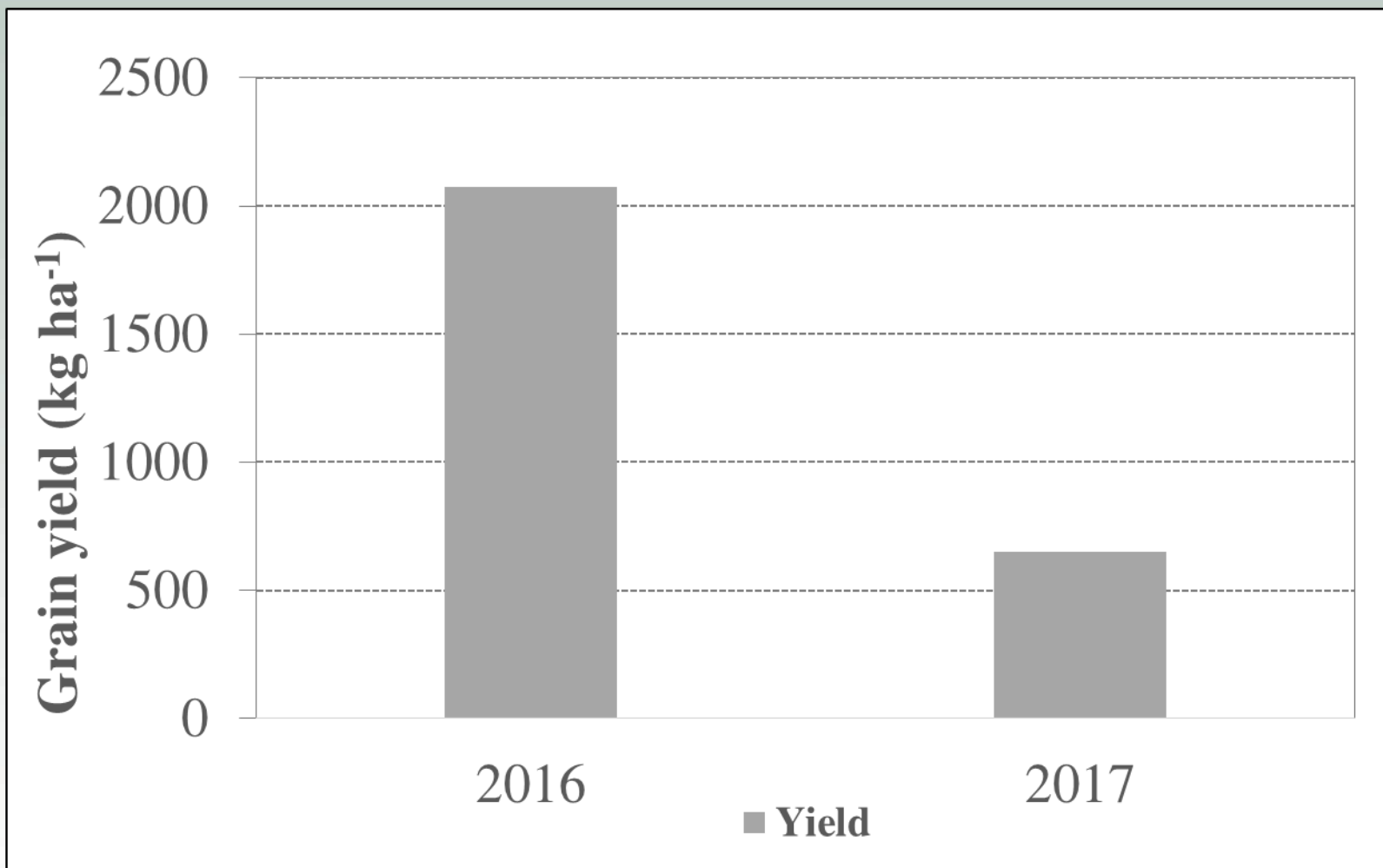
FOOD



UNIVERSITY OF  
VERMONT

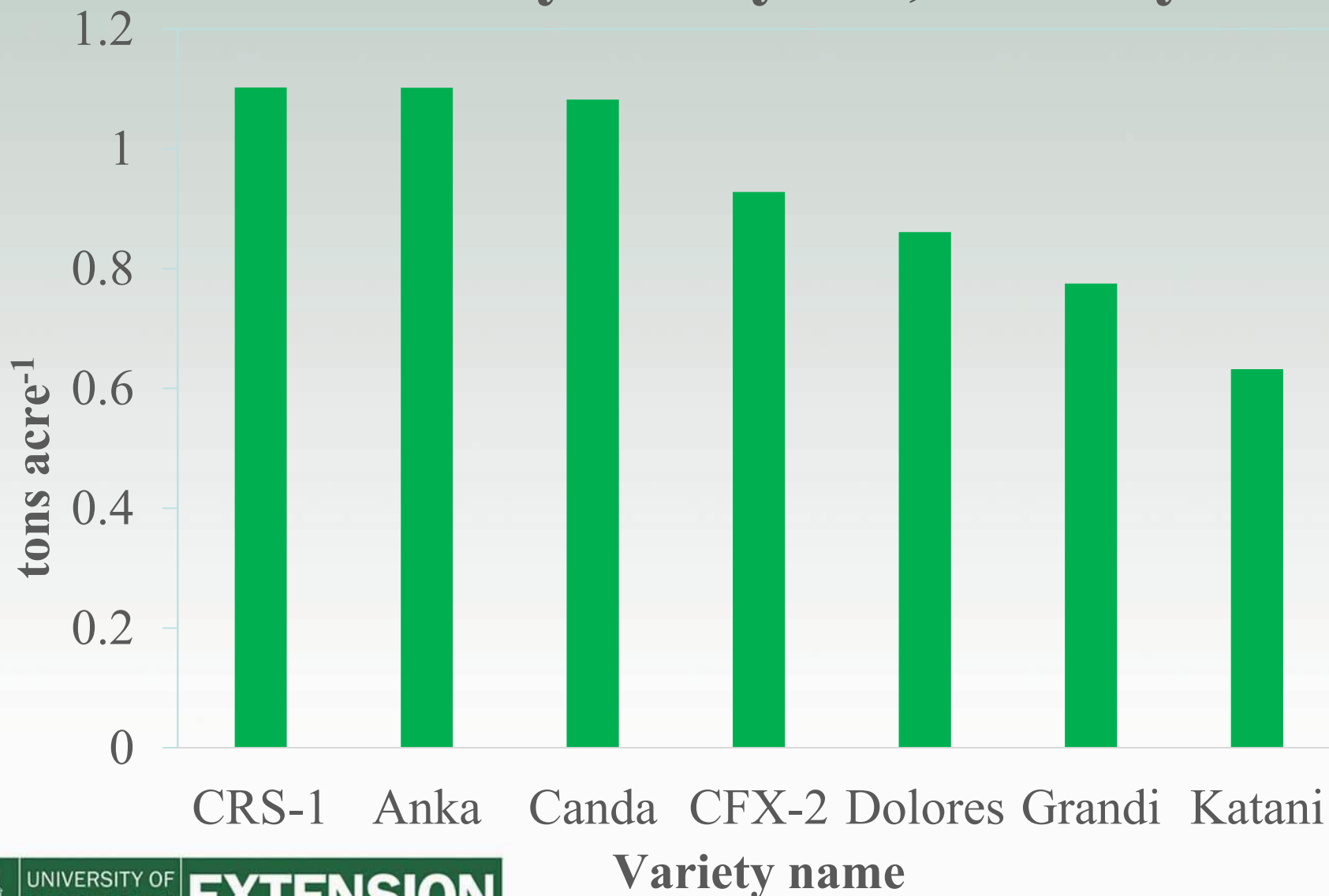
**EXTENSION**





**Figure 1. Average hemp grain yield comparisons of the 2016 and 2017 variety trials.**

# 2016 Variety trial yield, 26-May

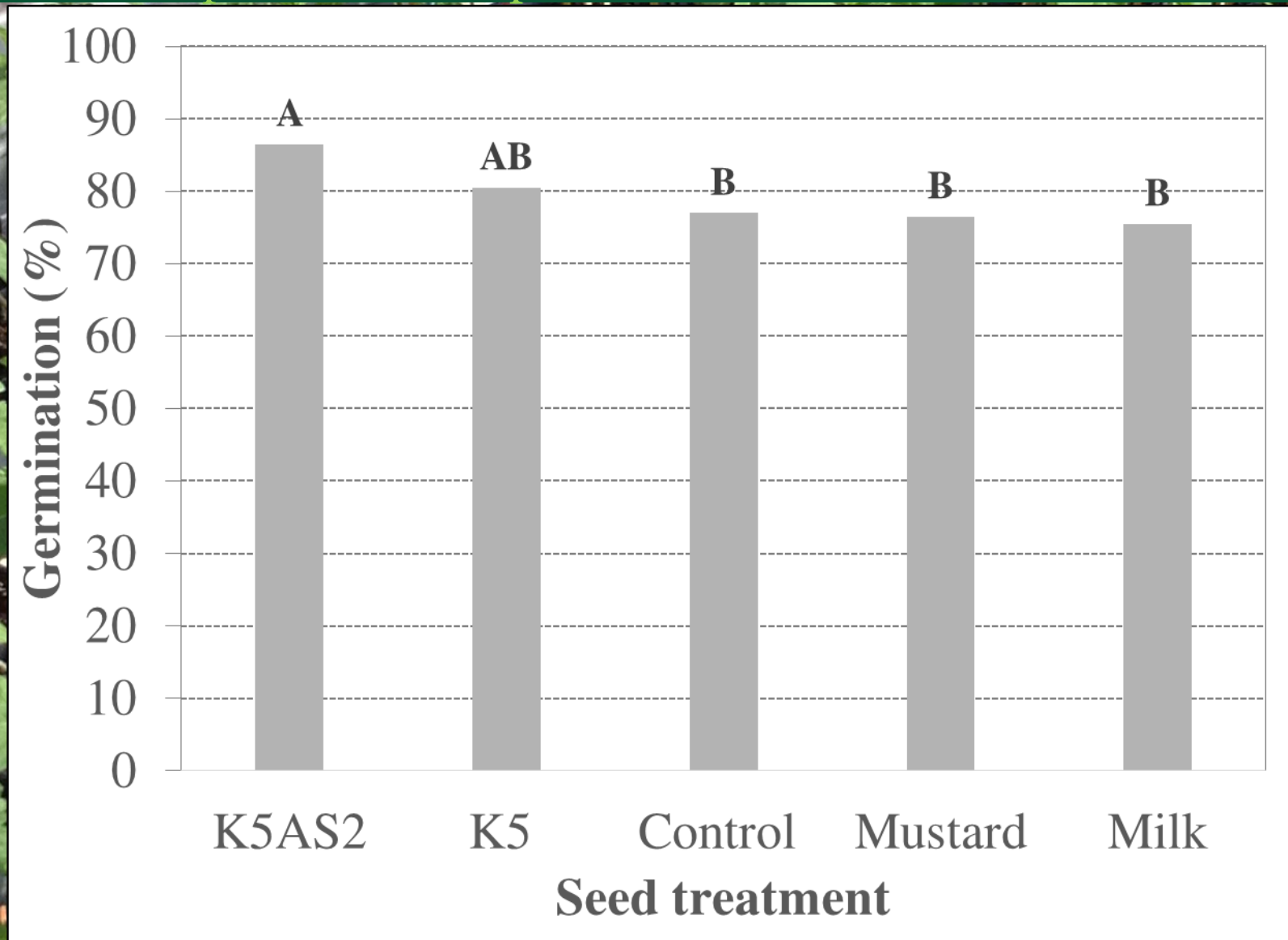


# Seeding Rate Trial - Pennsylvania

Seeding Rate	Yield (lb/ac)	Plants/ac	Height (in)
15	1281	102128	58
20	1526	96809	48
25	1662	154255	48
30	1704	163830	44
45	1700	286170	45
Mean	1575	160638	49
LSD(0.1)	176	92680	

Data from Roth et al., 2017 Pennsylvania State University

# Greenhouse Experiment Hemp Seed Treatment Germination Results:

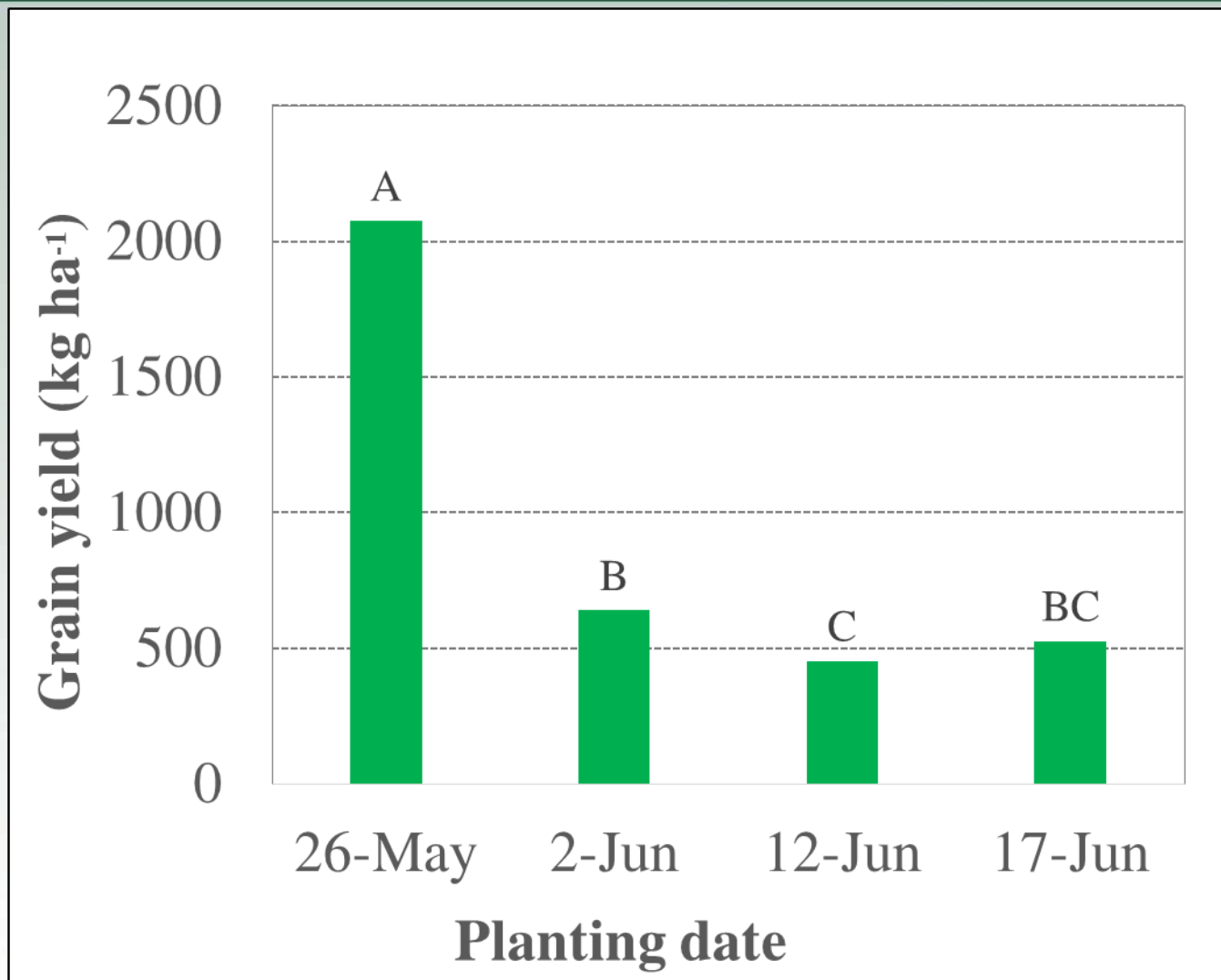


**Figure 8. Seed treatment effect on hemp seed germination. Columns with the same letter were not significantly different from each other, LSD (0.10) = 2.2, (0.05) = 2.1**

# Nitrogen Rate Trial - Pennsylvania

N-Rate (lb/ac)	Yield (lb/ac)	Height (in)
0	960	39
50	1345	43
100	1770	44
150	1850	46
200	1827	48
Mean	1550	44
LSD(0.1)	136	7

Data from Roth et al., 2017 Pennsylvania State University



**Figure 3. Yield of hemp planted from 26-May to 17-Jun. Columns with the same letter were not significantly different from each other,  $p < 0.0001$ ).**

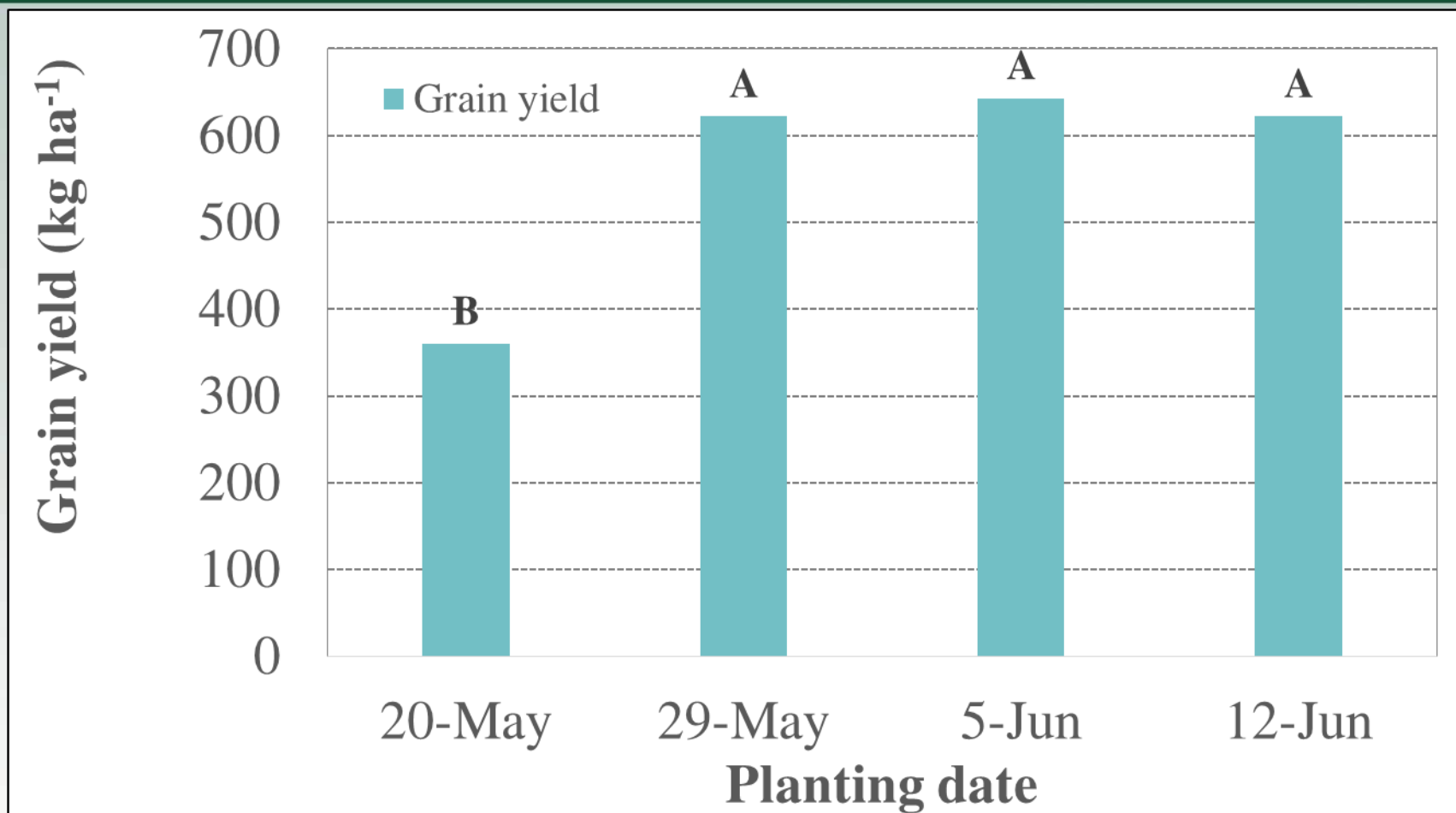


Figure 7. Hemp grain yields from four planting dates. Columns with the same letter are not significantly different from each other, LSD (0.10) = 179,  $p = 0.0075$ ).







# Weed pressure – only early season





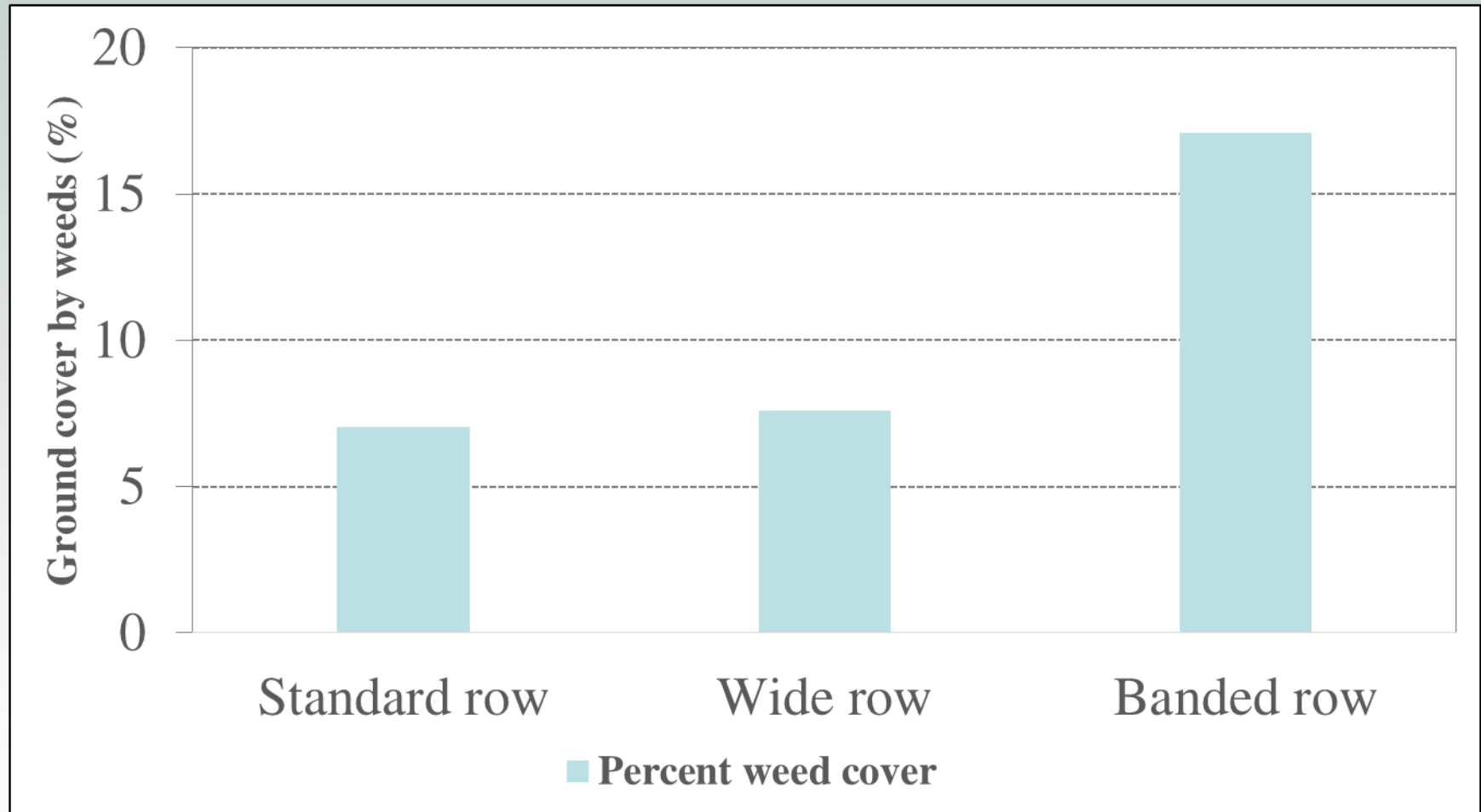
# Row Spacing & Weed Control

- BAND: 13 cm, band, 15 cm between row, custom built seeder made from a 12 row International row crop cultivator using a Gandy and a 6212 air box
  - Parallel linkage units mounted 12” apart and mounted with precision Dutch openers.



**Gandy air seeder (left), row cultivator (right)**

# Weed Control trial



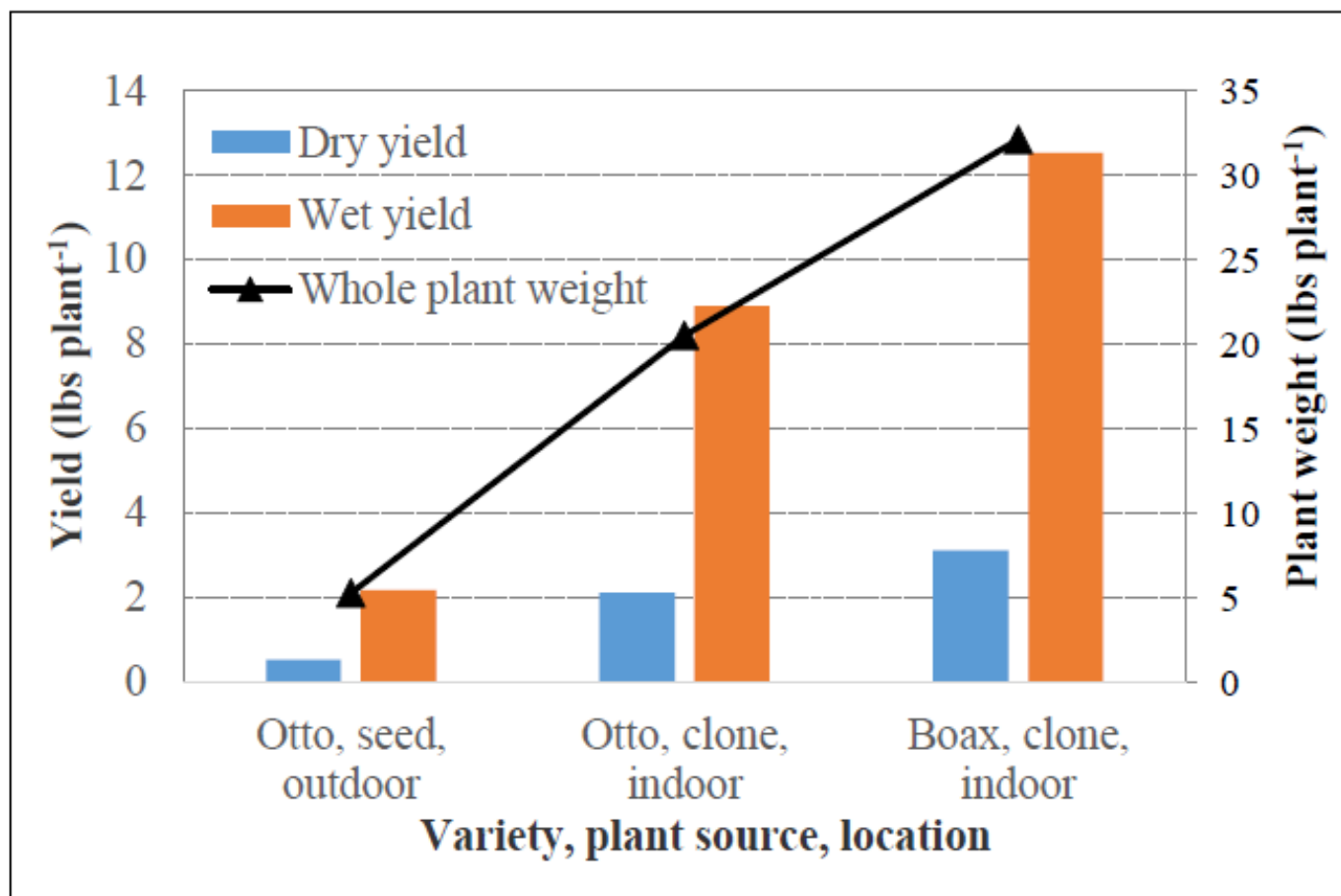
**Figure 9. Row spacing effect on percent of ground covered by weeds. No significant difference**



# 2017 CBD trial

- Planting dates:  
16-Jun (transplant clones),  
26-Jun (seedlings)
- Date harvested: 6-14 Oct
- Plant spacing: 5' x 5'

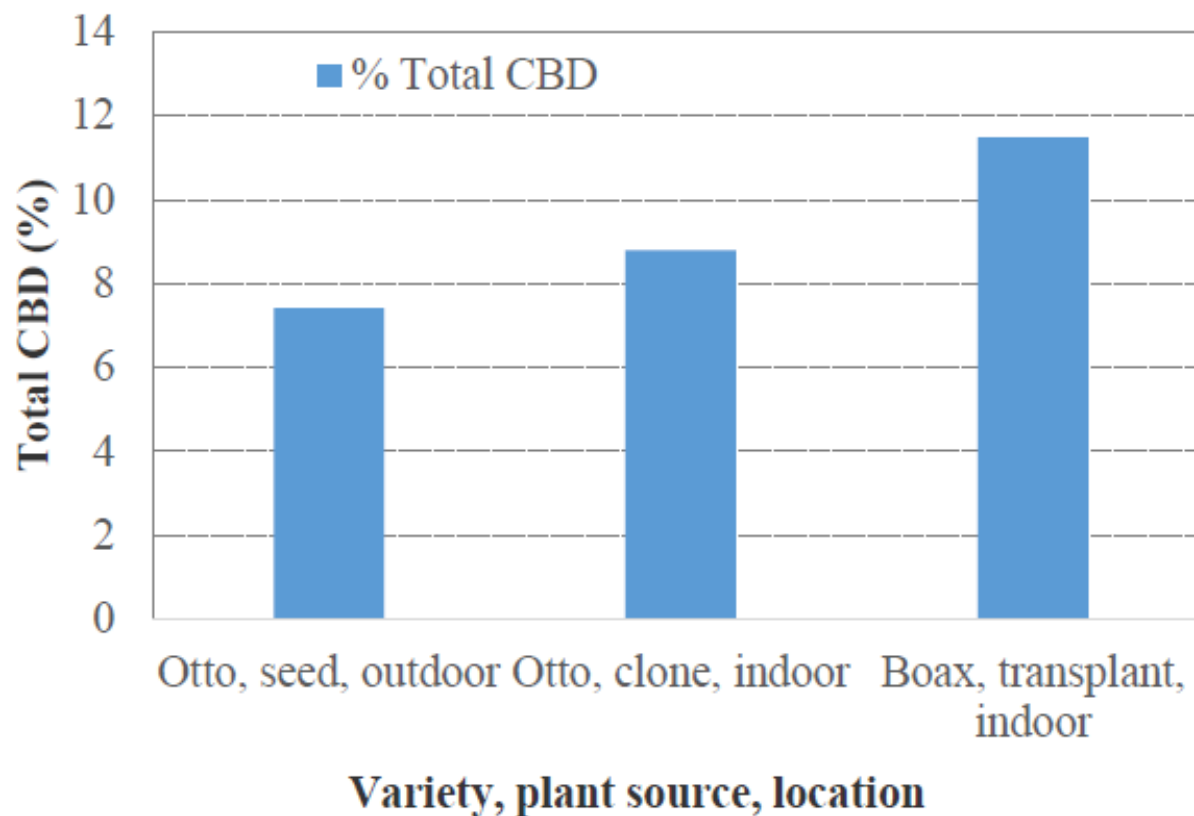




**Figure 1. Average yields of Boax and Otto, Alburgh, VT, 2017.**



**Image 1. CBD hemp grown under hoop house, Alburgh, VT, 2017.**



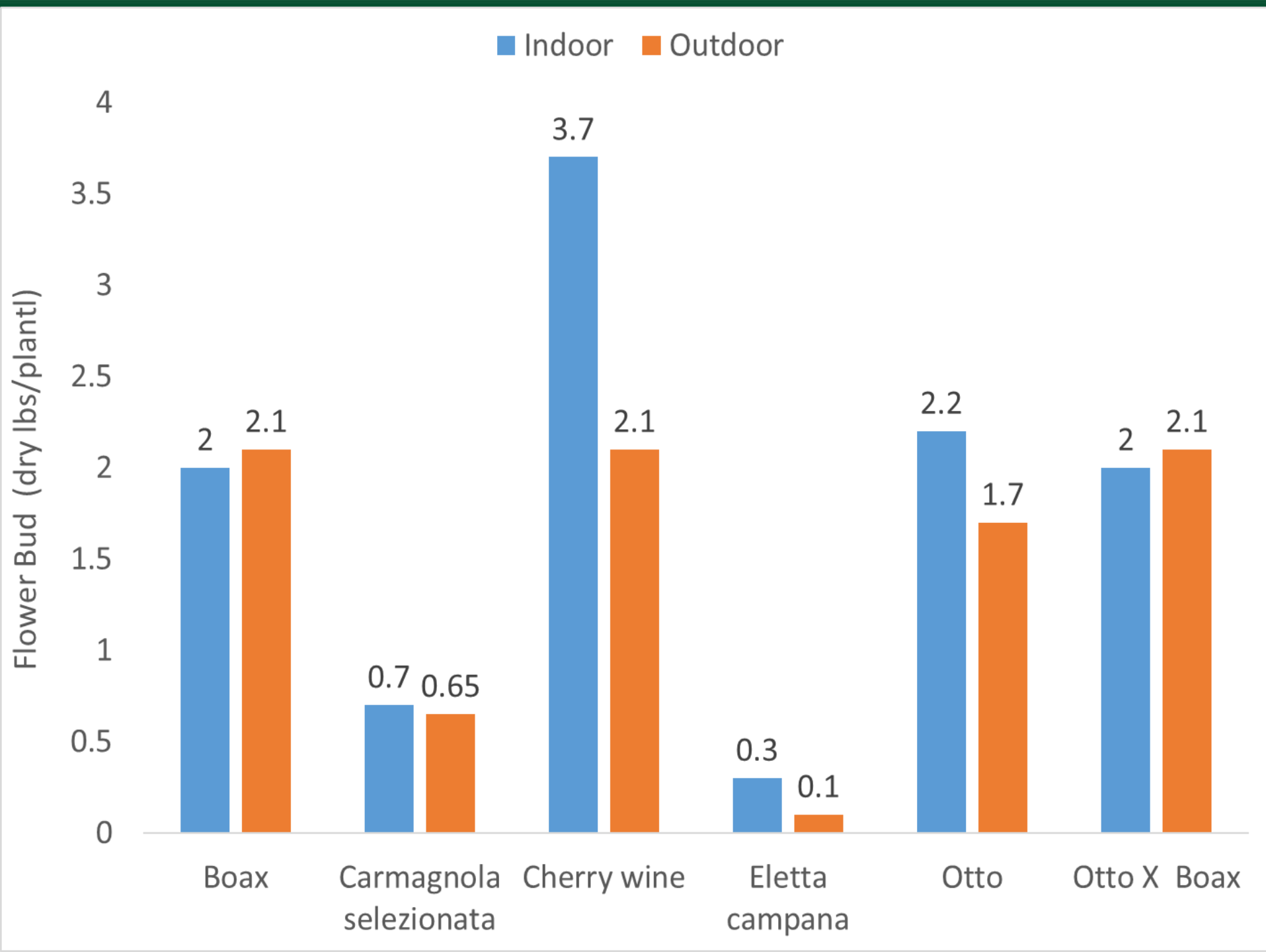
**Figure 2. Average cannabidiol (CBD) concentration of Boax and Otto, Alburgh, VT, 2017.**

# 2018 CBD trial

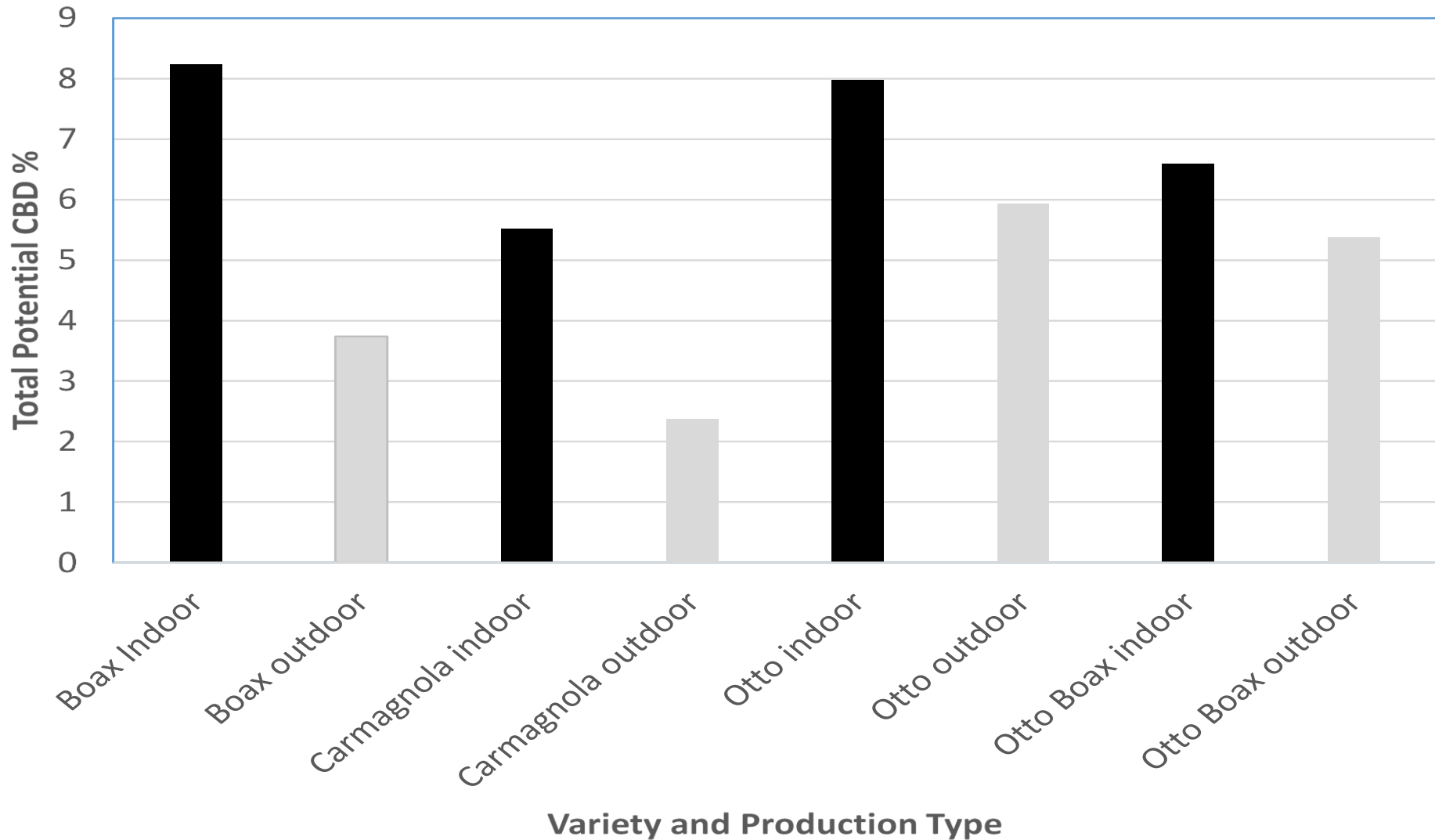
- Variety Trial:
  - 4 varieties
  - Indoor vs Outdoor
- Plant Spacing x Planting Date
  - 1ft, 3ft, 5ft
  - early, mid, and late June







# Total CBD



# Plant Spacing Study

Plant spacing	Dry matter bud yield†	Unmarketable dry matter buds†	Dry matter bud yield†	Unmarketable dry matter buds†
ft x ft	lbs plant <sup>-1</sup>	lbs plant <sup>-1</sup>	lbs ac <sup>-1</sup>	lbs ac <sup>-1</sup>
1 x 1	0.084	<b>0.00</b>	<b>3669</b>	<b>7.16</b>
3 x 3	0.600	0.003*	2894	12.4*
5 x 5	<b>1.35</b>	0.049	2354	86.6
LSD (0.10)	<b>0.093</b>	<b>0.019</b>	<b>411</b>	<b>35.9</b>
Trial mean	<b>0.678</b>	<b>0.017</b>	<b>2973</b>	<b>35.4</b>

† Dry matter is at 0% moisture.

\*Treatments marked with an asterisk did not perform statistically worse than the top performing treatment (p=0.10) shown in **bold**

# Planting Date Study

Planting date	Dry matter bud yield†	Unmarketable dry matter buds†
	lbs plant <sup>-1</sup>	lbs plant <sup>-1</sup>
14-Jun	0.740	0.015
21-Jun	0.672	0.022
27-Jun	0.621	0.015
LSD (0.10)	NS	NS
Trial mean	0.678	0.0174



# Hemp Fibers – Bast Fiber Plant



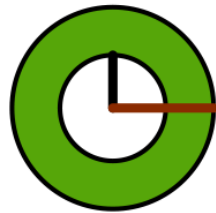
Photo courtesy of <http://www.hemptrade.ca/eguide/>

# Hemp Fibers



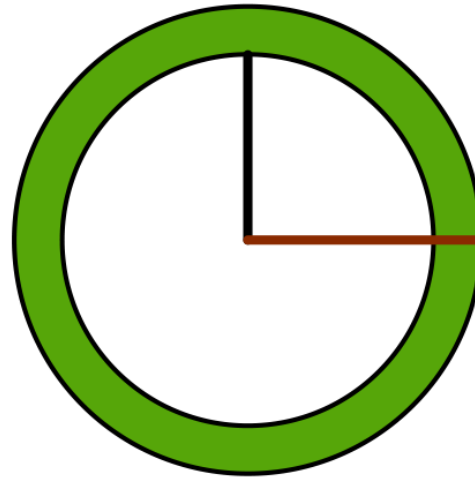
Photo courtesy of <http://www.hemptrade.ca/eguide/>

## Comparison of Bast to Hurd Ratio



stems of hemp seeded at  
high density of 300 seeds/m<sup>2</sup>

2.2:1



stems of hemp seeded at  
low density of 100 seeds/m<sup>2</sup>

0.7:1



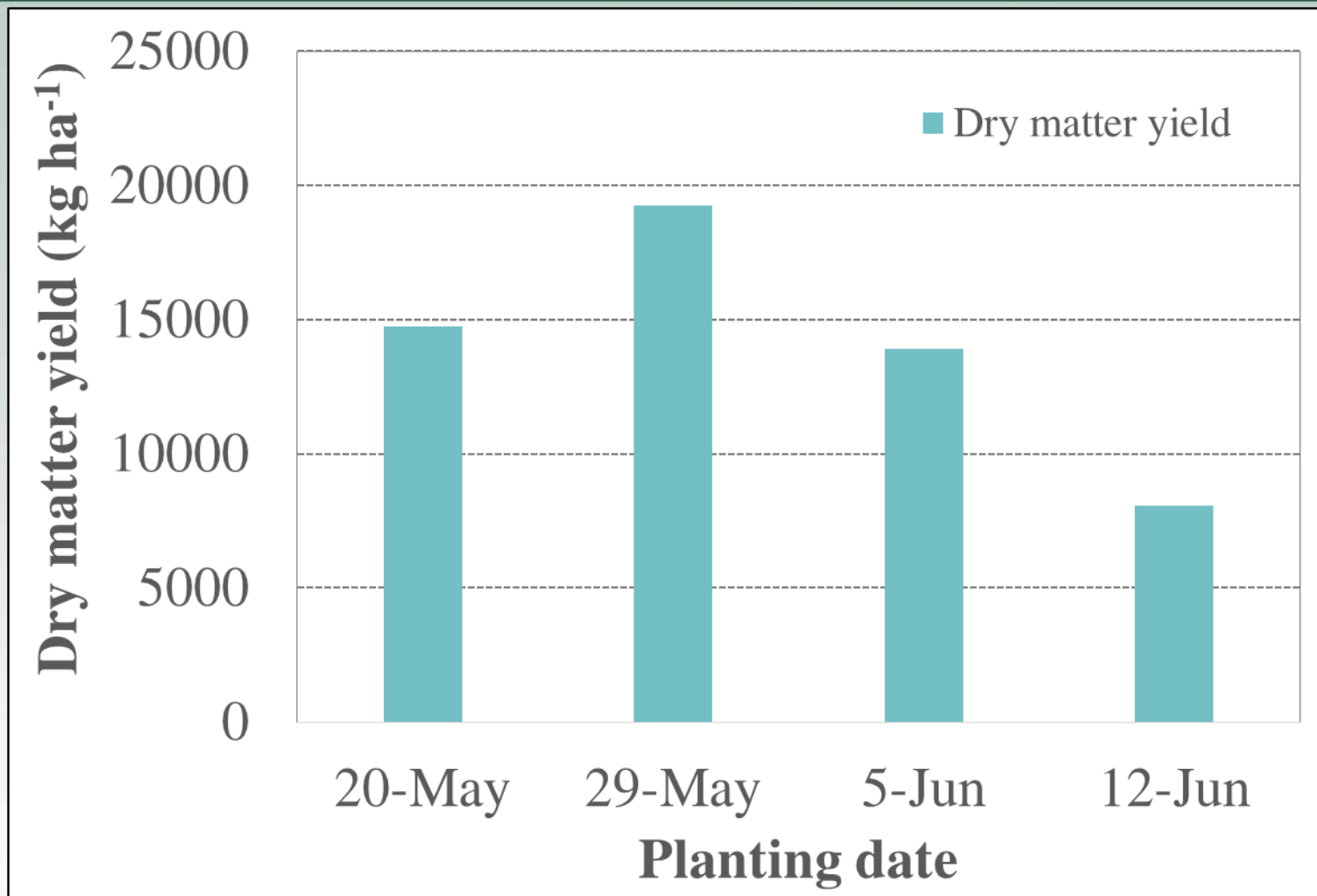


Figure 6. Hemp fiber dry matter yields from four planting dates. No significant difference.



## Bast Fiber

Variety

Ferimon  
Anka  
USO-31  
Carmagnola selezionata  
Carmagnola  
Canda  
Fibranova  
Eletta campana  
CRS-1  
Joey  
CFX-1  
CFX-2

0

10

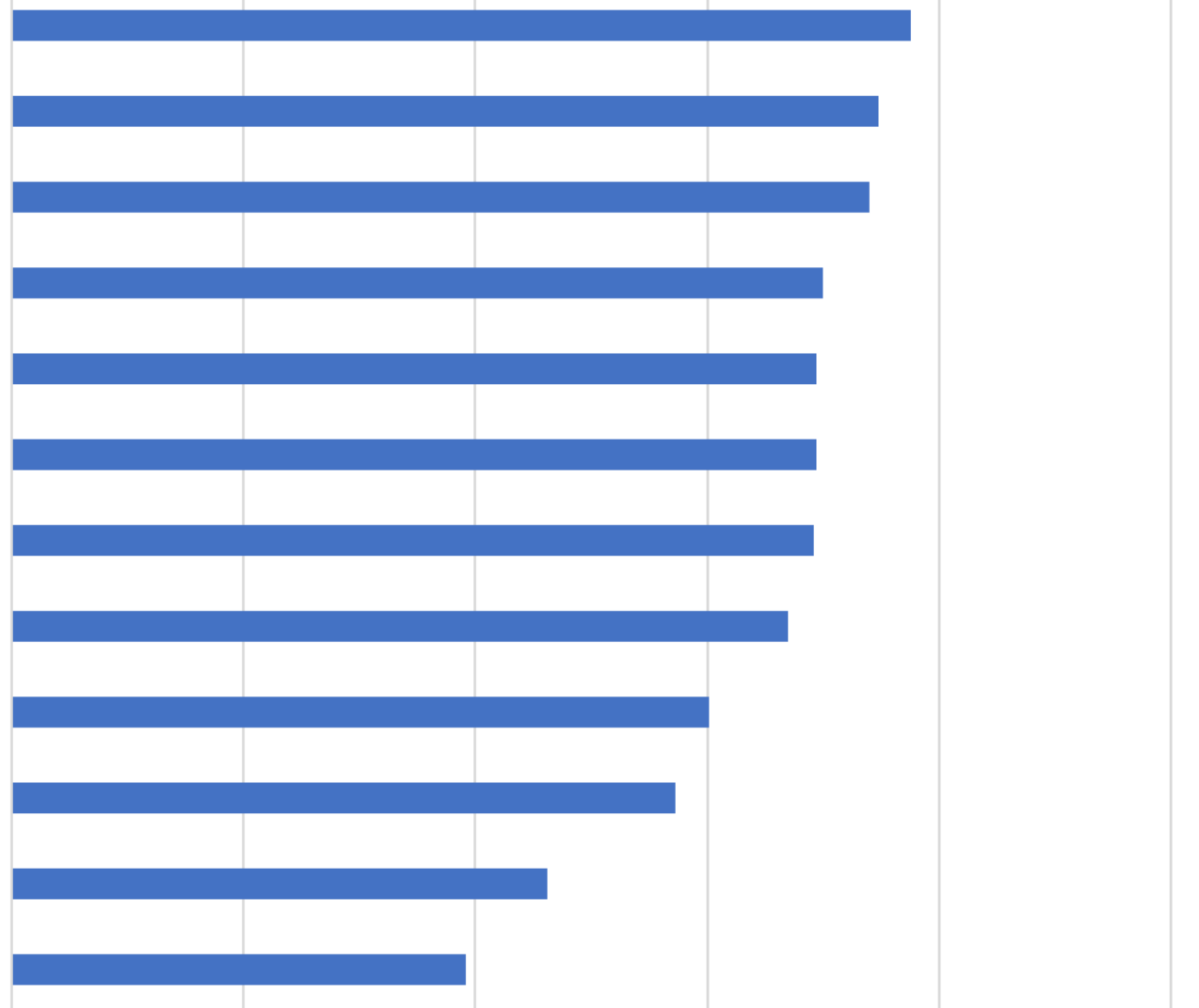
20

30

40

50

Bast Fiber (%)



Hemp webpage -

<http://www.uvm.edu/extension/cropsoil/hemp>

[heather.darby@uvm.edu](mailto:heather.darby@uvm.edu)

802-524-6501

The screenshot shows the website for the University of Vermont's Northwest Crops & Soils Program. The header includes the UVM logo and navigation links: ABOUT UVM, ADMISSIONS, ACADEMICS, STUDENT LIFE, RESEARCH, ATHLETICS, OFFICES, and OUTREACH. A red 'APPLY TO UVM' button is also present. The left sidebar contains a menu with links to UVM Home, UVM Extension, Northwest Crops and Soils Program, About the Northwest Crops and Soils Team, Forages, Grains, Oilseeds, Hops, Soil Health and Nutrient Management, Organic Farming, Events and Calendar, Videos, Out Croppings, and What's Happening. The main content area features a 'Welcome' message, the program title 'NW CROPS & SOILS PROGRAM' in large green letters, and a collage of five images: a person holding a large round object, a close-up of green leaves, a field of crops, a person working in a field, and a close-up of sunflowers. Below the images, it states the mission of the UVM Extension Northwest Crops and Soils Team. A section titled 'OUT CROPPINGS: Important crop news from the field!' includes two articles: 'Northern Corn Leaf Blight' and 'Cereal Grain Testing'. The bottom of the page features a banner for the 'Northeast Hop Alliance'.

The University of Vermont

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The mission of the UVM Extension Northwest Crops and Soils Team is to provide the best and relevant cropping information, both research-based and experiential, delivered in the most practical and understandable ways to Vermont farmers.

OUT CROPPINGS: Important crop news from the field!

**Northern Corn Leaf Blight** Once again, We have seen increased Northern Corn Leaf Blight (NLB) pressure in our area. Northern leaf blight is a fungal disease found in humid climates wherever corn is grown. Click [here](#) to download entire article.

**Cereal Grain Testing** comes to the Green Mountains! UVM Extension Northwest Crops and Soils Team Grain Quality Laboratory is up and running! Our lab is currently accepting samples and will continue to do so until December 1, 2010. Click [here](#) to download a Cereal Grain Test Submission Form.

**Northeast Hop Alliance** Presents Hops 101 and 201 Courses, Saturday-Sunday, October 9 and 10, 2010