

Exploration of Industrial Hemp for Fiber and Seed Oil Production

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Introduction

Interest in industrial hemp increased in Wisconsin due to recent legalization of the crop. No current research existed to assist farmers with decisions regarding variety selection and soil fertility management. Trials were planned and established in Buffalo County, Chippewa County and Monroe County at Whirling Thunder Farm with the Ho-Chunk Nation.

Objectives

The purpose of the study

- investigate industrial hemp variety performance for fiber and grain production
- Investigate optimum economic nitrogen application rates



The Buffalo and Chippewa County sites were grown under conventional management, the Monroe County site was managed using organic approved management and inputs.



Methods

The variety trial experimental design was a randomized complete block with four replications at three sites. Eight hemp varieties were evaluated. Seeding rates were adjusted for germination rates provided by companies for each variety.

Varieties Evaluated 2021-2022

Variety	County of Origin	Reproduction
Futura 75	France	Monecious
Tiborszallasi	Hungary	Dioecious
Secuieni Jubileu	Romania	Monecious
Felina 32	France	Monecious
Henola	Poland	Monecious
Bialobrzeskie	Poland	Monecious
Ferimon	France	Monecious
Fibror 79	France	Monecious

Educational Programs and Scholarly Products

Educational Field Days were held at each location where 97 participants learned about industrial hemp production and potential industry uses. Factsheets on budget estimates, soil fertility, variety selection, and forage quality were created. Research reports were developed for the Wisconsin Emerging Crops Accelerator.



Enterprise Budget Estimates for Fiber Hemp

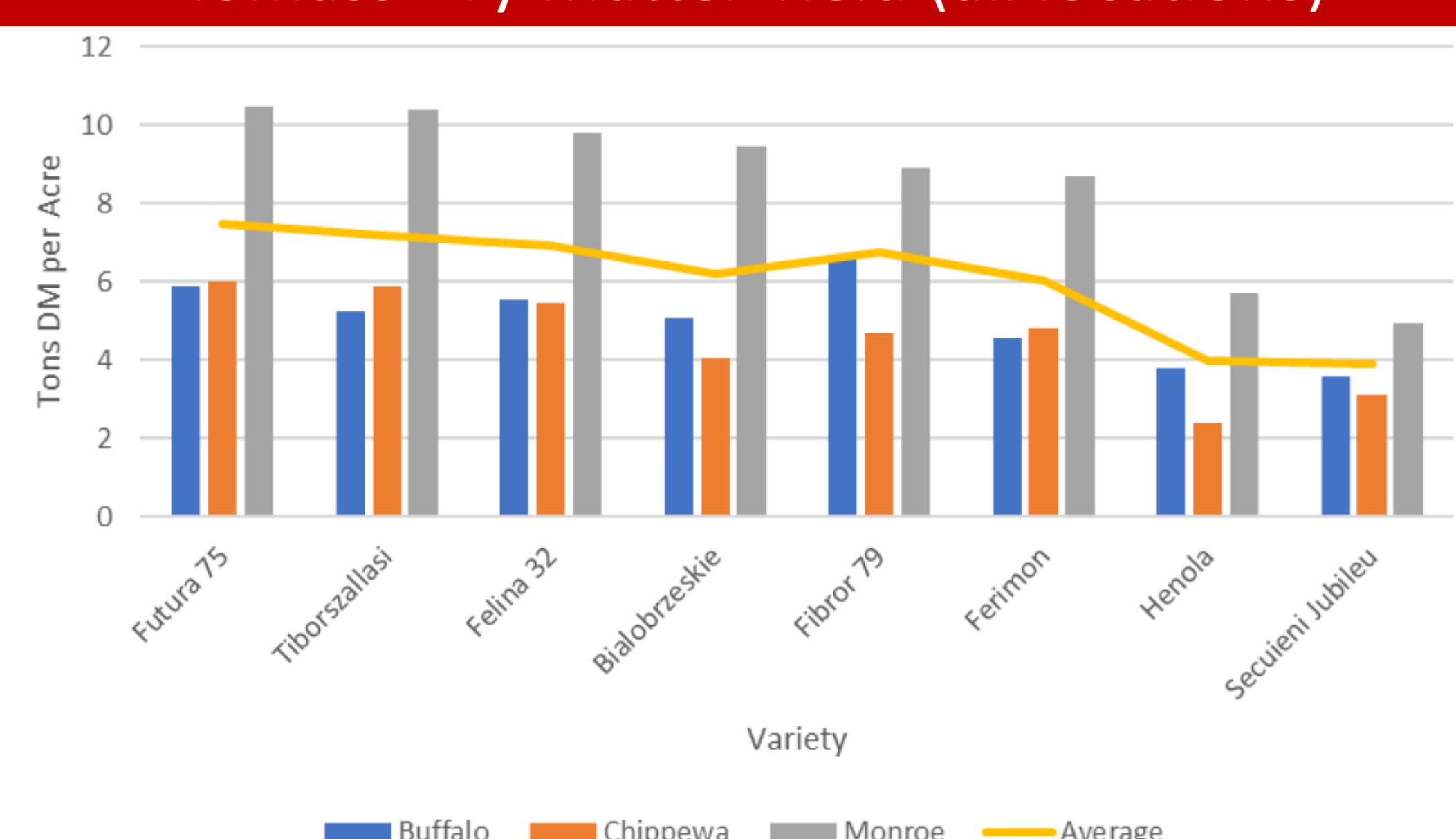
Expenses	Conventional	Organic
Fertilizer	\$101.90	\$339.25
Seed	\$220.00	\$220.00
Pesticides	\$6.00	\$0.00
Other (land rent, soil testing, permit, etc.)	\$159.45	\$159.45
Total Production Costs	\$437.35	\$718.70
Field Preparation and Planting	\$45.00	\$78.00
Harvest	\$162.25	\$162.25
Storage and Hauling	\$32.50	\$32.50
Total Costs (no return to management)	\$677.10	\$991.45
Breakeven Cost Per Ton (based on 5 ton per acre yield)	\$135.42	\$198.29

Results

Average Forage Quality Test Results

Variety	Height (inches)	% DM	DM/acre (tons)	Crude Protein (%)	TDN (%)
Futura 75					
Buffalo	63	24.34	2.6	NA	NA
Chippewa	50	19.47	3.1	17.56	58.00
Monroe	88	20.20	4.9	20.25	58.81
Tiborszallasi					
Buffalo	80	21.25	3.5	NA	NA
Chippewa	65	21.11	3.8	18.45	60.04
Monroe	86	20.98	6.5	14.50	56.41
Secuieni Jubileu					
Buffalo	65	23.18	2.5	NA	NA
Chippewa	43	23.32	2.0	20.36	61.02
Monroe	92	21.68	2.4	15.70	56.85
Felina 32					
Buffalo	58	20.78	2.8	NA	NA
Chippewa	47	20.99	3.5	22.69	62.35
Monroe	72	21.73	4.0	15.80	55.66
Henola					
Buffalo	57	23.50	2.4	NA	NA
Chippewa	40	24.47	2.8	19.04	60.00
Monroe	78	20.49	1.8	15.10	54.64
Bialobrzeskie					
Buffalo	64	22.28	2.2	NA	NA
Chippewa	48	22.01	2.6	17.71	58.90
Monroe	77	22.06	4.1	17.20	56.76
Ferimon					
Buffalo	63	21.72	2.7	NA	NA
Chippewa	49	19.47	2.5	21.10	58.47
Monroe	72	22.67	3.9	12.2	55.23
Fibror 79					
Buffalo	77	19.33	2.1	NA	NA
Chippewa	45	16.58	2.1	19.67	57.43
Monroe	79	17.04	3.3	20.2	55.40

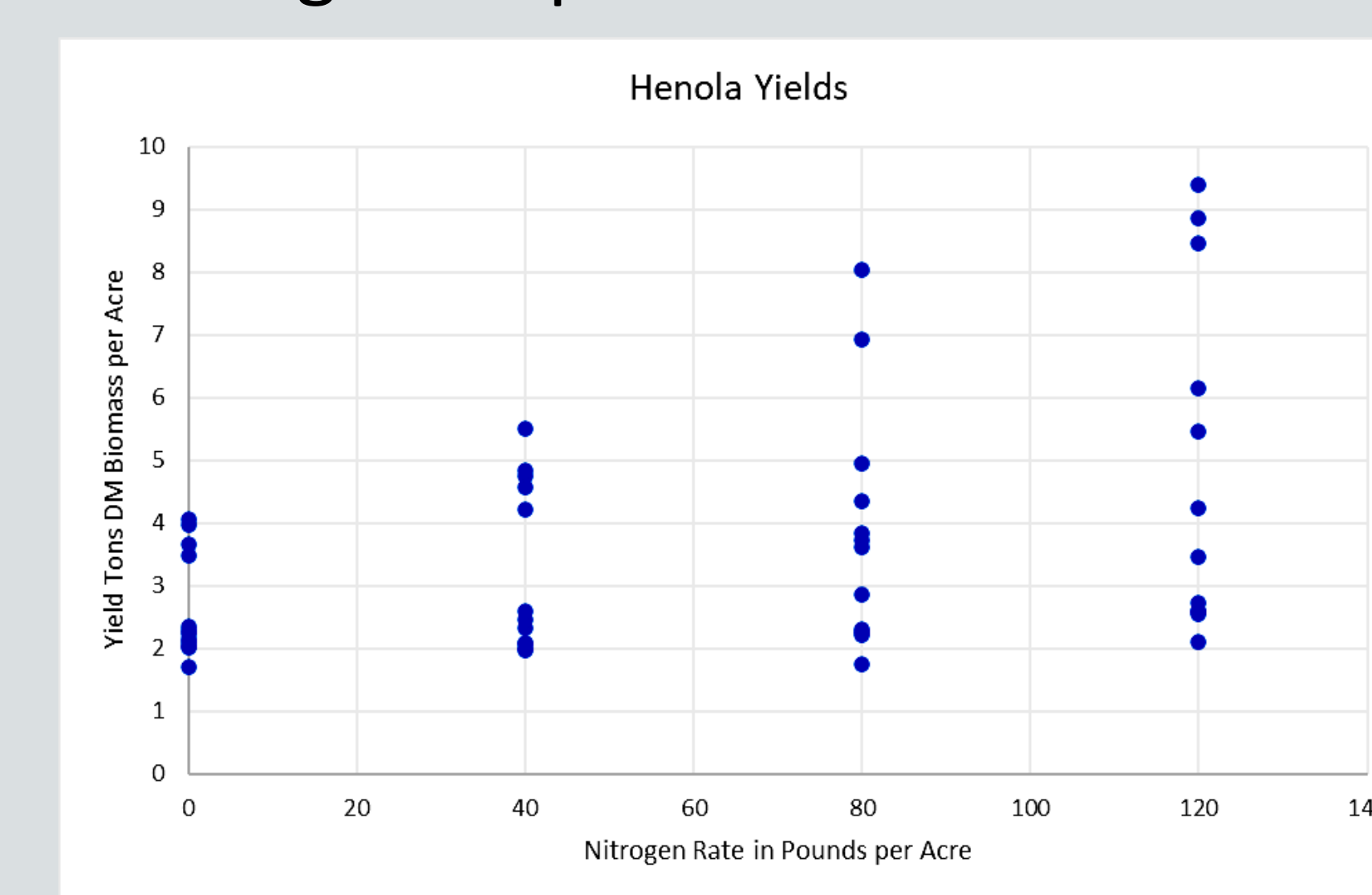
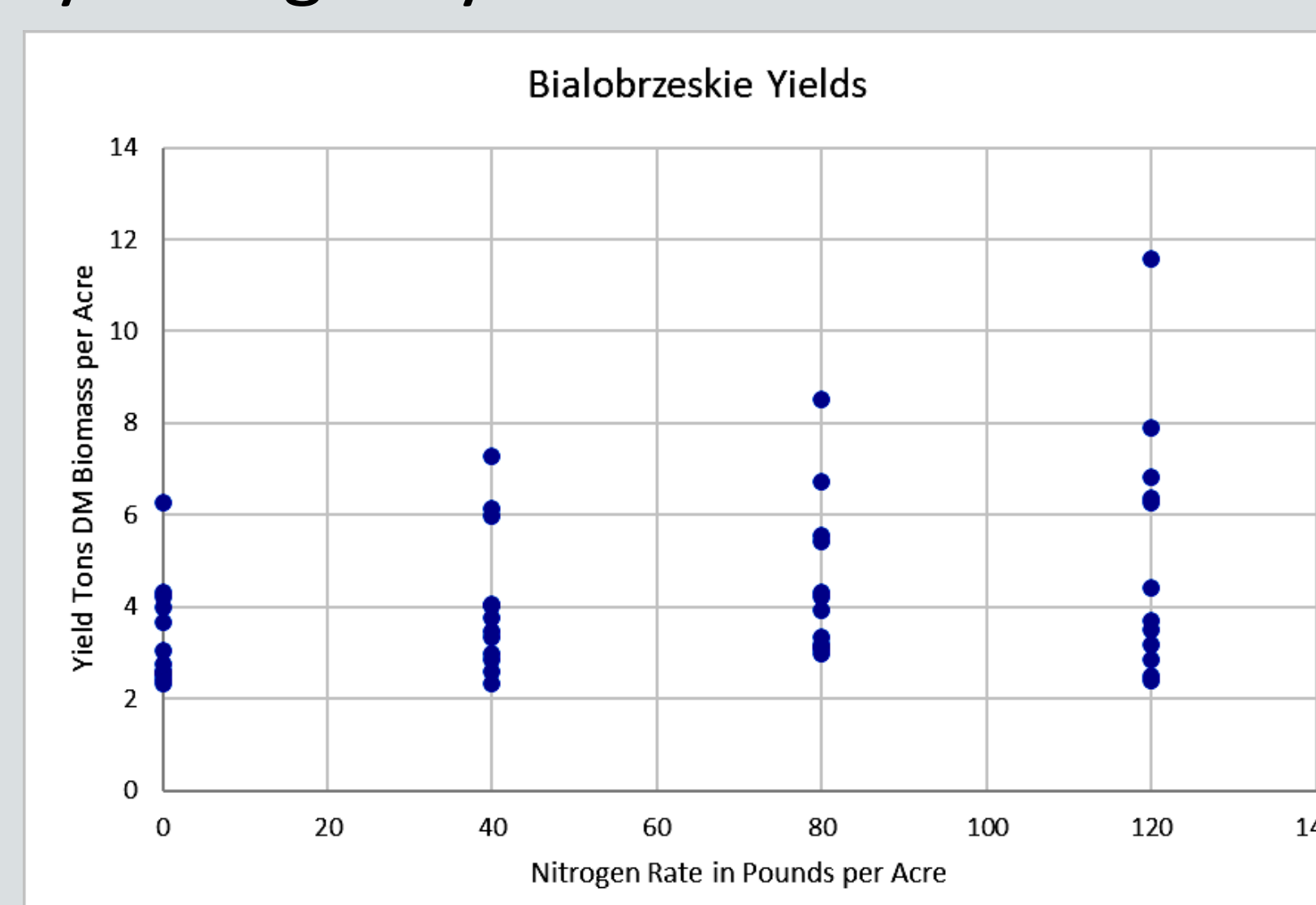
Biomass Dry Matter Yield (all locations)



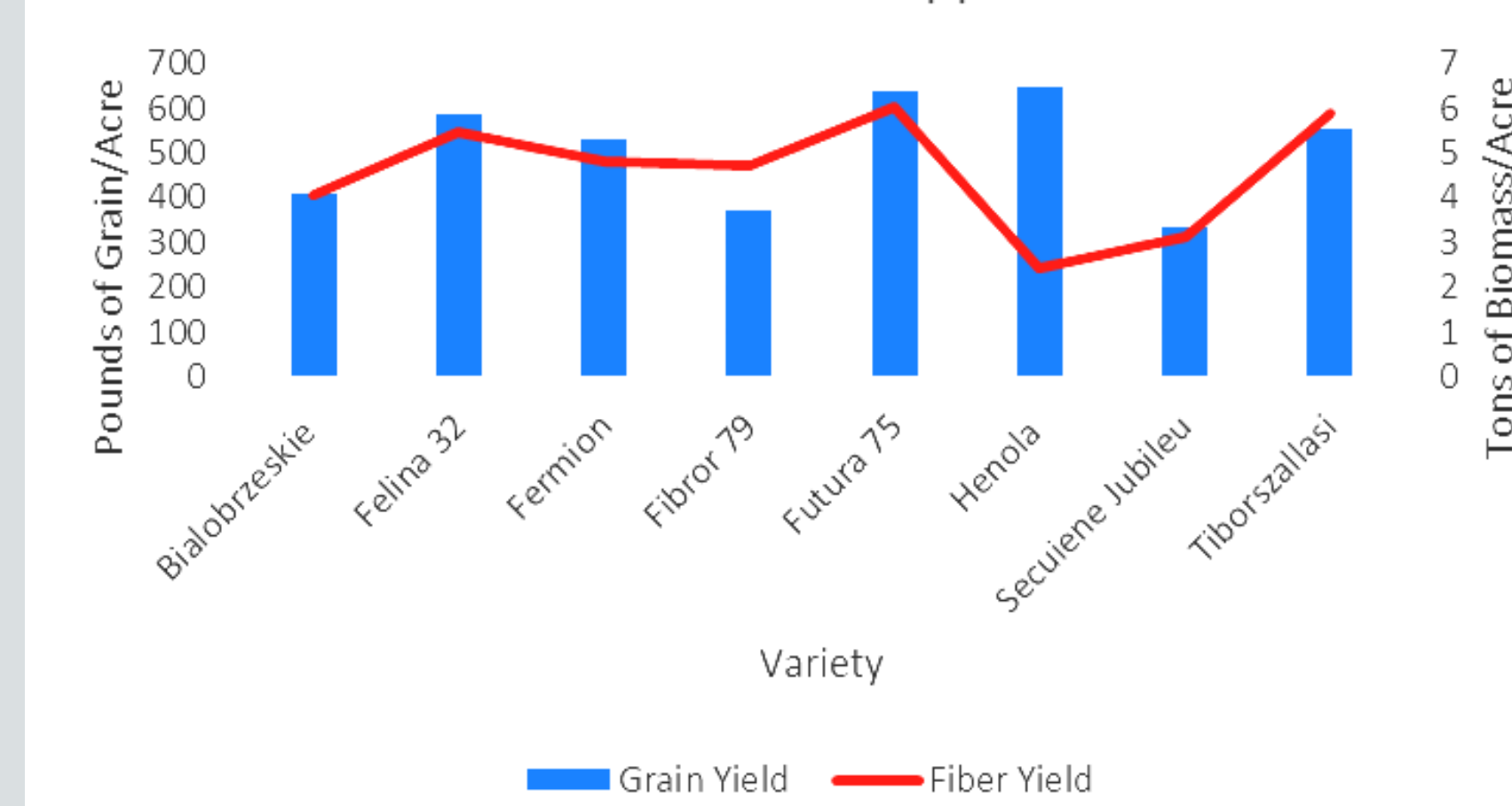
Results of the variety trials were variable in production between sites but did give some clear indications of higher performing varieties measured by yield of total biomass and stem biomass per acre.

Nitrogen Fertilizer Trial

A nitrogen fertilization trial was conducted with two varieties at all three locations. Plots received 0, 40, 80, or 120 pounds of nitrogen at planting (or just as plants emerged). Yield response was highly variable and did indicate a trend in nitrogen needed by the crop. Choosing varieties that are higher yielding may show more differentiation in nitrogen response.



Fiber and Grain Yield - Chippewa Location



For more information:

<https://www.emergingcropswi.org/hemp.html>

Hemp is a popular cattle feed in other parts of the world. Because of the short growing season (planted in mid-June and harvested in early August), it may fit as a planned forage crop or an emergency forage crop in Wisconsin. **It is important to note that hemp currently cannot be legally fed to livestock in the United States.**



Acknowledgements

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