



# Bringing Malting Barley Back to Western Wisconsin

August 15, 2019

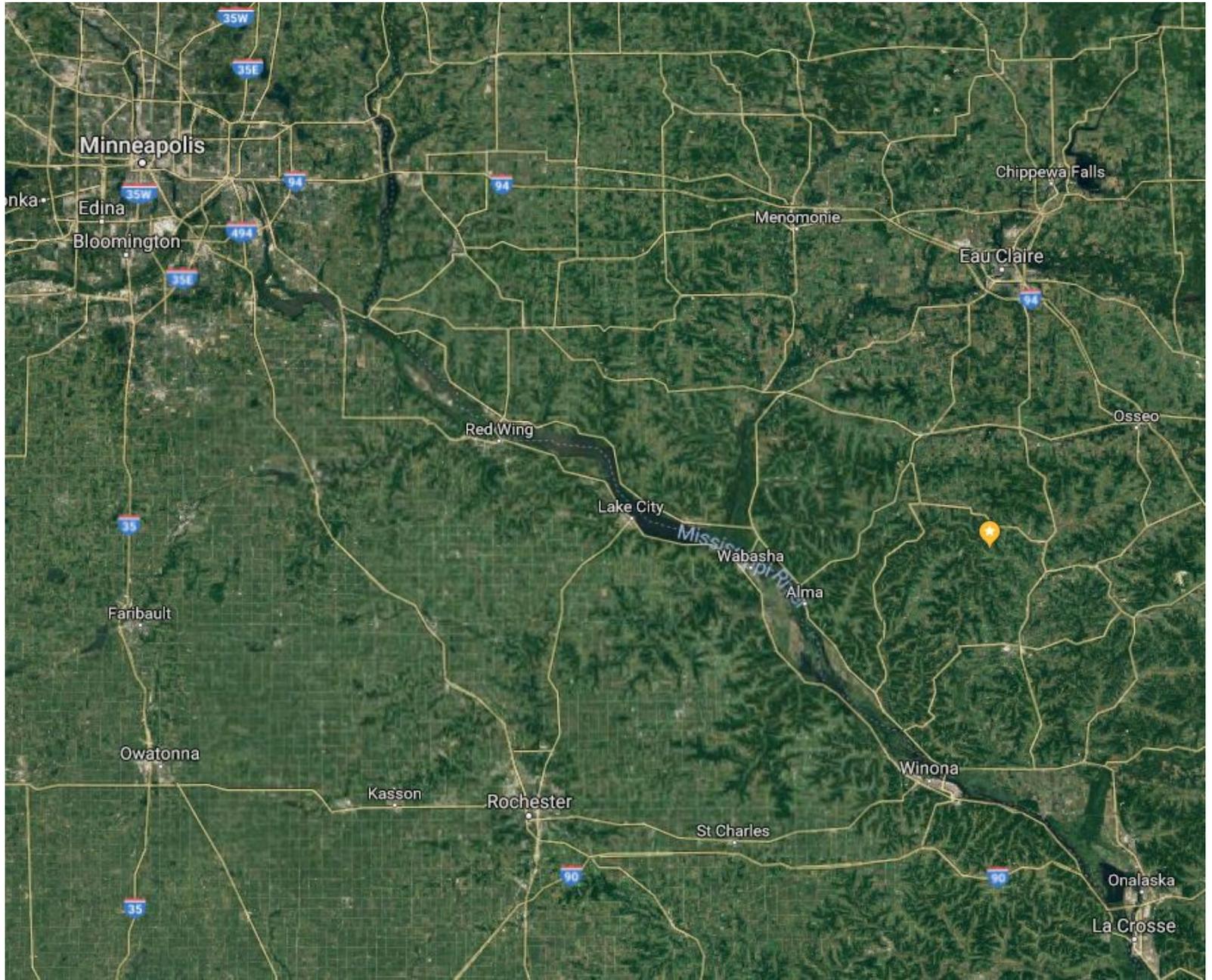
WI Dells, WI

Carl Duley, Agricultural Agent  
University of Wisconsin - Madison

# Why Barley in Western Wisconsin

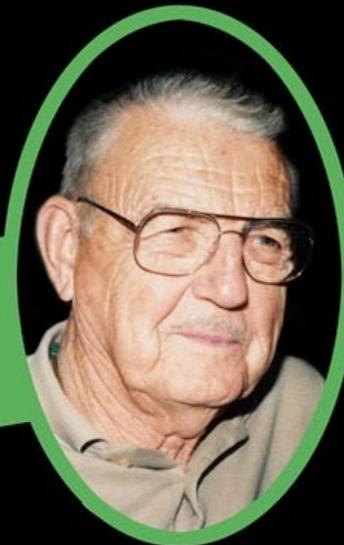


# Western Wisconsin



# Alma Beer Caves





## A BREWER'S LEGACY

Wilbert "Schmitt" Schmitt's life (1907-2002) has meant many things to a great number of people over the years, but to the Monarch Tavern, it signifies the rebirth of a legendary Wisconsin beer. A Fountain City native, Schmitt lived there his entire life up until his last couple of years. A true jack of all trades, one of his many jobs involved a 30-year stint as the assistant brew master at Fountain City Brewery. Its signature beer was Fountain Brew, a true pre-prohibition American-style lager and a popular beer locally. It was brewed for over 100 years in Fountain City! Sadly, in 1965 the brewery was shut down and was eventually demolished. Fountain Brew was no more. Schmitt continued to work as a self-employed electrician, full time parent, and grandparent along with his wife, Bootie. They loved spending time together with their family and friends, going out for supper, attending reunions, playing cards, and maybe even enjoying a beer now and then along the way.



In 1997, at nearly the age of 90, on one of his many walks to the post office, Schmitt got into a conversation with John Harrington, the relatively new owner of the Monarch. During that conversation, the two began to discuss the possibility of bringing back Fountain Brew. Few knew that Schmitt had saved many of the brewing records and recipes from the original Fountain Brew. After some further discussion, Schmitt decided to offer the necessary information to Harrington in exchange for help in bringing Fountain Brew back to Fountain City. The deal was made. With some research and a little bit of re-engineering, the Fountain City Brewing Company was established and Fountain Brew was brought back to life. Upon taking his first sip of the new Fountain Brew, Schmitt smiled and said, "It tastes like another."



Kurtis Froedtert was head of the Froedtert Grain and Malting Company



# Malteurop in Winona, MN



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# Corn and Dairy Come

- Barley and wheat move north and west
- Dairy cows take over county
- Today – back to cash crop
  - Soybean erosive
  - Everything no-till
  - Need cover crops to meet conservation plans
- Future
  - ??????????

# Questions Needed to Answer:

- Quality of Barley – 2-row for Craft Industry
  - Can barley compete – other crops?
  - Does 6-row fit?
- DACTP requirements for small malting system(s)
  - Food Product ?

# Questions Needed to Answer (con't):

- Where does local barley and local malting fit with the malting plants that currently exist?
- Cost of malting barley (and other grains) on a small scale
  - Labor vs. Capital
  - Price – premiums
  - Business Agreements

# WI Driftless Area



**Barley just fits!!!**



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40% acres > 25% slopes







# No-Till to Meet Conservation Plans



# Wisconsin Barley grown for Wisconsin Product



University of Wisconsin-Extension

# 2018 Plot Day Relationship Building



# 2018 Small Grain Plot

DS Farms



Barley Fungicide

Barley Fertilizer Trails

Relay Planting

North

Oat Plot

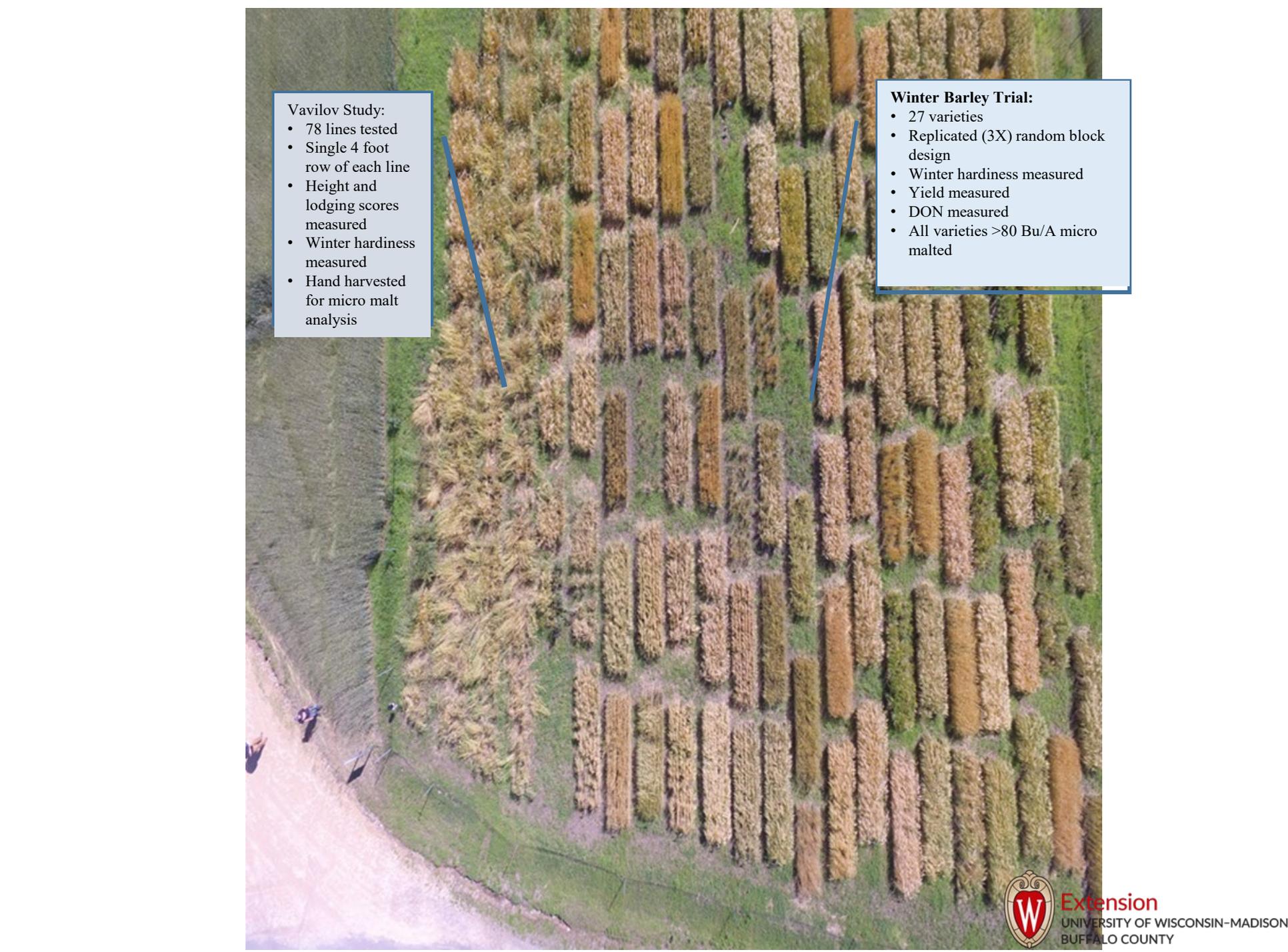
Barley Variety

Road

# Cooperating with UMN Research







Vavilov Study:

- 78 lines tested
- Single 4 foot row of each line
- Height and lodging scores measured
- Winter hardiness measured
- Hand harvested for micro malt analysis

**Winter Barley Trial:**

- 27 varieties
- Replicated (3X) random block design
- Winter hardiness measured
- Yield measured
- DON measured
- All varieties >80 Bu/A micro malted



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# Relay Planting – Soybeans into Barley



# Relay Planting – Soybeans into Barley

Crop Estimated Costs and Returns 2017				
Per Acre	Corn grain	Soybeans	Barley	Barley - your farm
<b>REVENUE</b>				
Yield per acre	160	30	40	70
	bushels	bushels	bushels	bushels
Price per unit	3.40	8.00	6.00	6.00
Government payments	0.00	0.00	0.00	0.00
Miscellaneous income	60.00	0.00	0.00	80.00
<b>Total Revenue</b>	<b>\$604.00</b>	<b>\$240.00</b>	<b>\$240.00</b>	<b>\$500.00</b>
<b>COSTS</b>				
Seed	99.88	40.00	30.00	36.00
Fertilizer	108.60		6.00	25.00
Crop chemicals	26.60	25.00	30.00	88.00
Crop insurance (premiums minus indemnities)	0.00	0.00	0.00	0.00
Miscellaneous	2.00	2.00	1.00	1.00
Machinery, NOT Including Labor (below)	76.09	50.00	50.00	56.00
Crop drying	24.00	0.00	4.00	5.00
Transport & storage	32.00	20.00	25.00	39.00
Labor (\$12/hour)				0.00
Mangement (5% of gross income)	30.20	12.00	12.00	25.00
Rent	150.00	75.00	75.00	150.00
Interest on operating expenses, six months	0.00	0.00	0.00	
<b>Total Listed Costs</b>	<b>549.37</b>	<b>224.00</b>	<b>233.00</b>	<b>425.00</b>
<b>NET RETURN</b>	<b>\$54.64</b>	<b>\$16.00</b>	<b>\$7.00</b>	<b>\$75.00</b>

# Fungicide Trials



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# Data Collection – Deer Fence







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**Extension**  
Cooperative Extension

**FIELD  
DEMONSTRATION**

**Malting Barley  
Research**

10,086

10,077

10,078

# Field Days – UMN Students



Variety	Buffalo Yield (Bu)	DON	Chippewa Yield (Bu)	DON
Lacy	88.97*	1.85	44.25	0.59
Pinnacle	100.89*	1.16*	52.16	0.17**
Genesis	92.00*	3.10	57.97	0.12**
Odyssey	87.82*	2.90	60.21	0.57
Genie	43.06	4.25	33.63	0.75
Sienna	61.24	3.05	61.56*	0.13**
Opera	63.65	1.80	77.59*	0.22**
Tinka	78.99	3.45	57.82	0.43**
Fanfare	85.30	2.50	67.46*	0.45**
Amadora	75.82	2.70	57.39	0.24**
Robust	72.22	1.93	48.47	0.50**
Morex	86.21	1.90	57.3	0.54
Kewaunee	98.52*	1.63	50.91	0.49**
Rasmussen	89.42*	2.76	53.90	0.57
Full Pint	72.14	0.57**	48.72	0.26**
Quest	93.32*	1.06*	66.64*	0.12**
Conlon	95.44*	1.01*	41.45	0.11**
Trial Median	72.22		52.16	0.43
Trial Average	70.96	2.21	51.09	0.368

# 2018 Variety Trial



# 3 Year Variety Trial Results

		2018		2017		2016 (#)
Variety	2 or 6 Row	Buffalo Yield (Bu)	Chippewa Yield (Bu)	Buffalo Yield (Bu)	Chippewa Yield (Bu)	Buffalo Yield (Bu)
Lacy	6	88.97*	44.25	90.30	72.03*	88.97
Pinnacle	2	100.89*	52.16	98.15	69.09*	75.37
Genesis	2	92.00*	57.97	93.95	70.92*	93.01
Odyssey	2	87.82*	60.21	136.13*	73.25*	--
Genie	2	43.06	33.63	--	71.87*	--
Sienna	2	61.24	61.56*	--	--	--
Opera	2	63.65	77.59*	--	--	--
Tinka	2	78.99	57.82	--	--	--
Fanfare	2	85.30	67.46*	--	--	--
Amadora	2	75.82	57.39	--	--	--
Robust	6	72.22	48.47	--	--	--
Morex	6	86.21	57.3	--	--	--
Kewaunee	6	98.52*	50.91	--	--	--
Rasmussen	6	89.42*	53.90	85.84	68.32*	95.49
Full Pint	2	72.14	48.72	103.87	71.27*	81.48
Quest	6	93.32*	66.64*	87.99	71.84*	98.13
Conlon	2	95.44*	41.45	--	--	--
Trial Median		72.22	52.16	91.68	71.56	
Trial Average		70.96	51.09	97.72	71.07	

	2017			
	Buffalo		Chippewa	
N Fertilizer Rates (lbs)	Yield	Protein	Yield	Protein
0	108.22	10.1	62.01	NA
25 (planting)	117.05	10.7	64.17	NA
50 (planting)	112.98	10.7	64.29	NA
75 (planting)	125.38	10.7	64.94	NA
25 (Feekes 5)	119.74	10.5	64.63	NA
50 (Feekes 5)	127.54	10.9	63.90	NA
75 (Feekes 5)	105.09	11.1	59.50	NA
25 (½ planting ½ Feekes 5)	119.39	10.8	59.06	NA
50 (½ planting ½ Feekes 5)	133.19	10.8	57.89	NA
75 (½ planting ½ Feekes 5)	129.34	11	57.78	NA
Plot Median	119.57		62.96	
Plot Average	119.79	10.78	61.82	

# 2017 Fertilizer Rate and Timing

		2018.00			
		Buffalo		Chippewa	
Variety	N Fert (lbs)	Yield	Protein	Yield	Protein
Conlon	0	63.11		29.06	
	30	86.39*		48.31	
	60	62.50		41.52	
	90	63.82		48.25	
Tinka	0	45.60		44.51	
	30	63.97		55.39	
	60	66.34		52.01	
	90	66.27		46.37	
Odyssey	0	39.60			
	30	60.56			
	60	62.19			
	90	61.15			
Plot Median		62.50		47.31	
Plot Average		59.56		45.68	

# 2018 Fertilizer Rate and Timing

# 2018 Fungicide Trial

## 2018 Fungicide Plot on Three Malting Barley Varieties in Two Western Wisconsin Locations

	Buffalo County		Chippewa County	
Treatment	Yield (Bu)	DON	Yield (Bu)	DON
1 Robust;Non-treated Check	49.280	4.533	40.503	0.613
2 Robust;Tilt Foliar App	57.700	3.450	48.477	0.578
3 Robust;Tilt Foliar App;Prosaro Head Emerge	51.968	3.225	51.820	0.498
4 Robust;Tilt Foliar App;Miravis Ace Head Emerge	53.006	2.450*	52.188	0.480
5 Robust;Prosaro After Head Apply 5-days after head emerge	57.494	3.067*	44.961	0.565
6 Robust;Miravis Ace After Head Apply 5-days after head Emerge	58.236	2.550*	50.461	0.558
7 Pinnacle;Non-treated Check	74.651	3.750	23.552	0.055*
8 Pinnacle;Tilt Foliar App	81.908*	4.200	37.356	0.090*
9 Pinnacle;Tilt Foliar App;Prosaro Head Emerge	84.908*	4.250	67.228*	0.218*
10 Pinnacle;Tilt Foliar App;Miravis Ace Head Emerge	85.056*	2.800*	83.260*	0.068*
11 Pinnacle;Prosaro After Head Apply 5-days after head emerge	81.304*	2.667*	57.956	0.078*
12 Pinnacle;Miravis Ace After Head Apply 5-days after head Emerge	75.235	1.660*	83.027*	0.100*
13 Odyssey;Non-treated Check	39.721	3.900	37.894	0.565
14 Odyssey;Tilt Foliar App	53.984	7.433	51.930	0.425
15 Odyssey;Tilt Foliar App;Prosaro Head Emerge	56.770	5.800	79.292*	0.310
16 Odyssey;Tilt Foliar App;Miravis Ace Head Emerge	49.651	4.975	62.580	0.240*
17 Odyssey;Prosaro After Head Apply 5-days after head emerge	62.259	3.167	73.217*	0.423
18 Odyssey;Miravis Ace After Head Apply 5-days after head Emerge	61.857	4.167	81.349*	0.245*

Variety	2015 Yield Bu/A	2016 Yield Bu/A	2017 Yield Bu/A	2018 Yield Bu/A
Charles	71.11	34.48	70.88	
Strider	76.14	95.39	--	
McGregor	54.52	84.57	98.98	42.04
08/258/17	66.56		--	
SU Mateo	109.14	72.39	120.06	46.05
Flavia	84.16		82.54	33.73
06-OR-9	60.43		--	
2011-F5-141-5	47.78		--	
10.1151			80.06	
DH30939			85.42	
DH130939			84.16	37.95
Endeavor		70.21	106.15	42.18
Hirondella		106.82	88.47	41.68
LGBB13-W102			129.41	66.55
Mission			98.48	
MW12-40007-001			94.38	49.53
MW12-4028-007			108.98	
MW13-4107-010			80.68	
MW13-4159-012			111.98	48.59
Puffin		91.57	80.83	
Thoroughbred		11.52	112.98	49.50
Wintmalt		43.94	84.95	19.04
6W13-7045		67.86		
6W13-7141		53.95		
Plot Mean	64.14	58.96	90.93	43.35
Plot Median	59.79	64.84	86.70	42.18

# Winter Plot Summary

Crop Estimated Costs and Returns 2017				
Per Acre	Corn grain	Soybeans	Barley	Barley - your farm
REVENUE				
Yield per acre	180	57	85	65
	bushels	bushels	bushels	bushels
Price per unit	3.20	7.50	5.50	5.90
Government payments	0.00	0.00	0.00	0.00
Miscellaneous income	60.00	0.00	80.00	50.00
Total Revenue	\$636.00	\$427.50	\$547.50	\$433.50
COSTS				
Seed	99.88	55.00	42.00	36.00
Fertilizer	108.60	5.80	6.00	25.00
Crop chemicals	26.60	52.64	49.21	88.00
Crop insurance (premiums minus indemnities)	0.00	0.00	0.00	0.00
Miscellaneous	2.00	2.00	1.00	1.00
Machinery, NOT Including Labor (below)	76.09	71.59	61.45	56.00
Crop drying	27.00	0.00	8.50	5.00
Transport & storage	36.00	11.40	39.00	39.00
Labor (\$12/hour)				0.00
Mangement (5% of gross income)	31.80	21.38	27.38	21.68
Rent	150.00	150.00	150.00	150.00
Interest on operating expenses, six months	0.00	0.00	0.00	
Total Listed Costs	557.97	369.81	384.54	421.68
NET RETURN	\$78.04	\$57.70	\$162.97	\$11.83

**You are NOT  
growing Corn**





# Storage

- You have a living organism – treat carefully
- Start with clean bins
- Manage fines
- Control Moisture
  - 13.5% for 9 months storage
  - 12.5% for over 9 months
  - Continuous natural air until dry or freezing
    - Attempt to keep < 60 degrees (night fans)
  - Heated air....below 110 degrees seed or malting
  - Check grain regularly...2-4 weeks cold, 1-2 warm
- May need to store for 6-9 months

# Field Selection:

- Not your BEST quality soils
- Previous crop (soybeans)
- Herbicide and Fertility history
- Not a wet site
- Moderately tolerant to drought, weeds, heat, low fertility



**BADGERS**  
UNIVERSITY OF WISCONSIN  
W

**FIELD DAY**  
**BREWING**  
**INGREDIENTS**

**UW**  
**Extension**

University of Wisconsin-Extension  
Buffalo & Vernon Counties





**FIELD DAY  
BREWING  
INGREDIENTS**

**Extension**  
University of Minnesota  
Ruffalo & Varney Consulting

10000  
10000  
10000

10000  
10000  
10000



# Questions:

- Time frame for winter hardy varieties?
- Small malting plant availability
- How are other states getting quality needed?
- Will “new” issues keep coming up that will affect malting quality?
- Should we give up?
- ???

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