




Winter Malting Barley Research

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Project **GREEN**




American Malting Barley Association, Inc.



MICHIGAN STATE UNIVERSITY | Extension

Michigan State University
AgBioResearch

KBS
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Kellogg Farm



Winter Barley

- I'm excited about winter barley in Michigan!





Winter Barley Observations

- Yield is greater than spring barley
- More nitrogen fertilizer can be used than spring barley without increasing grain protein too high
- Grain protein is inherently lower than spring barley
- Winter hardiness is a question





Winter Barley Observations

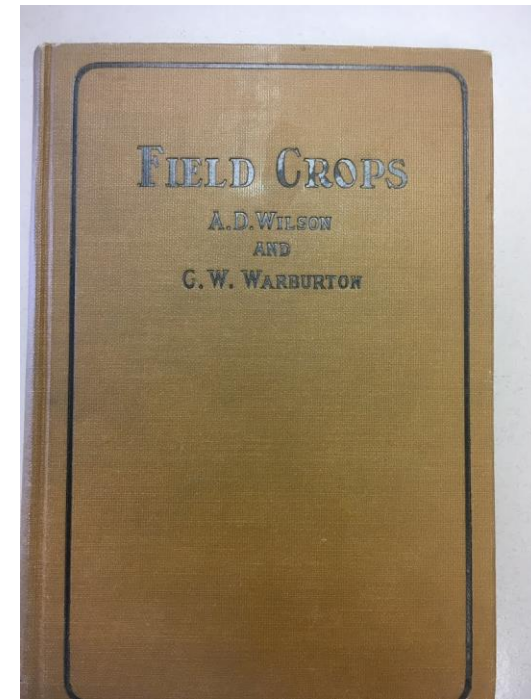
- Harvest timing is earlier than spring barley, and 2-3 weeks earlier than winter wheat
- Weed pressure is lighter than spring barley
- Diseases such as powdery mildew and fusarium head blight seem to need hot and wet conditions to thrive. Winter barley grows and matures much earlier than spring barley, potentially avoiding the hot weather





Important To Consider

- We used to grow a lot of barley!
- Keep in mind we only have one year of data to work with on winter barley
 - So – we are still learning, but can share what we've learned so far
- Manage winter barley a lot like wheat
 - http://www.canr.msu.edu/malting_barley/index
 - <https://stepupsoy.osu.edu/winter-malting-barley>
 - <https://fieldcrops.cals.cornell.edu/small-grains/malting-barley>
- Quality needed for malting barley makes it particularly unique





Key Research Questions

- Does winter barley consistently over-winter in Michigan?
- How much nitrogen should we use?
 - Does this change with variety?
- Does a fungicide application improve yield, or is it just a vomitoxin insurance policy?
- How much does yield vary across a field?
- Does Sulfur influence yield?
- Does split N application influence yield?



MSU Winter Barley Research

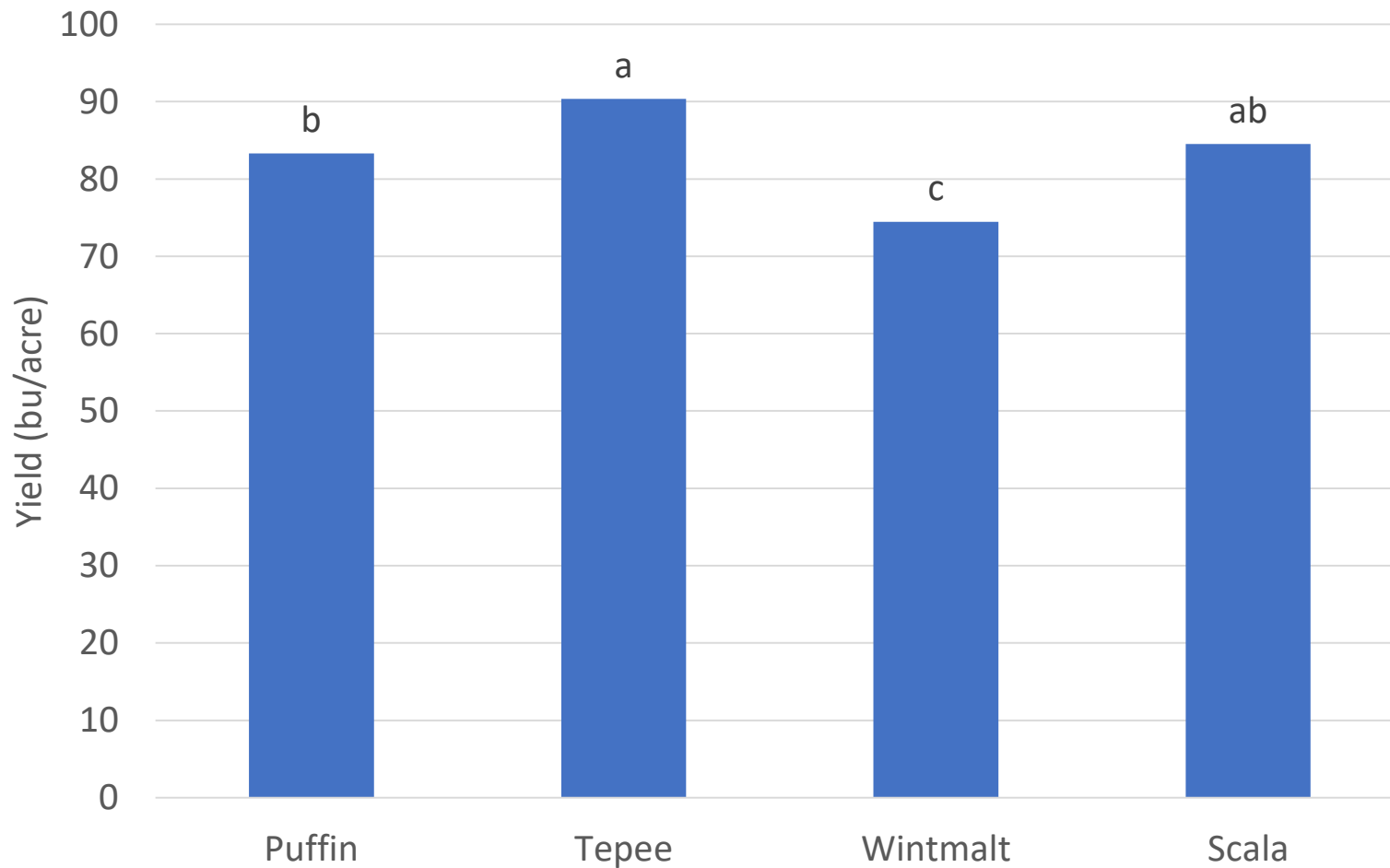
- Summary of 2017 MSU Winter Barley Trials
 - Variety Trials
 - Management Trials with 4 varieties, 3 nitrogen rates, w/ and w/out fungicide
 - Variations in Nitrogen Timing and Sulfur





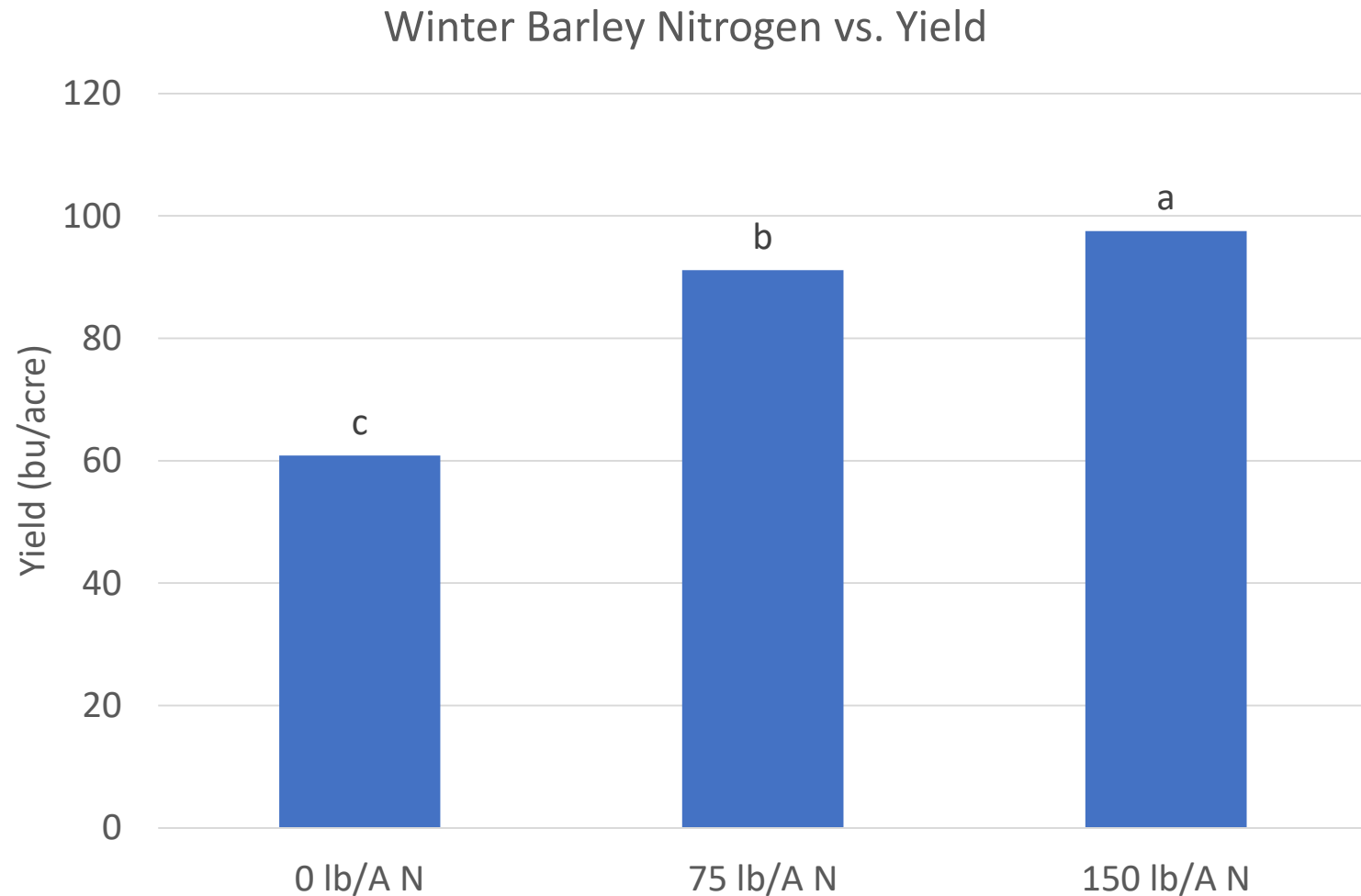
Variety Comparison

- Across all N rates and Fungicide



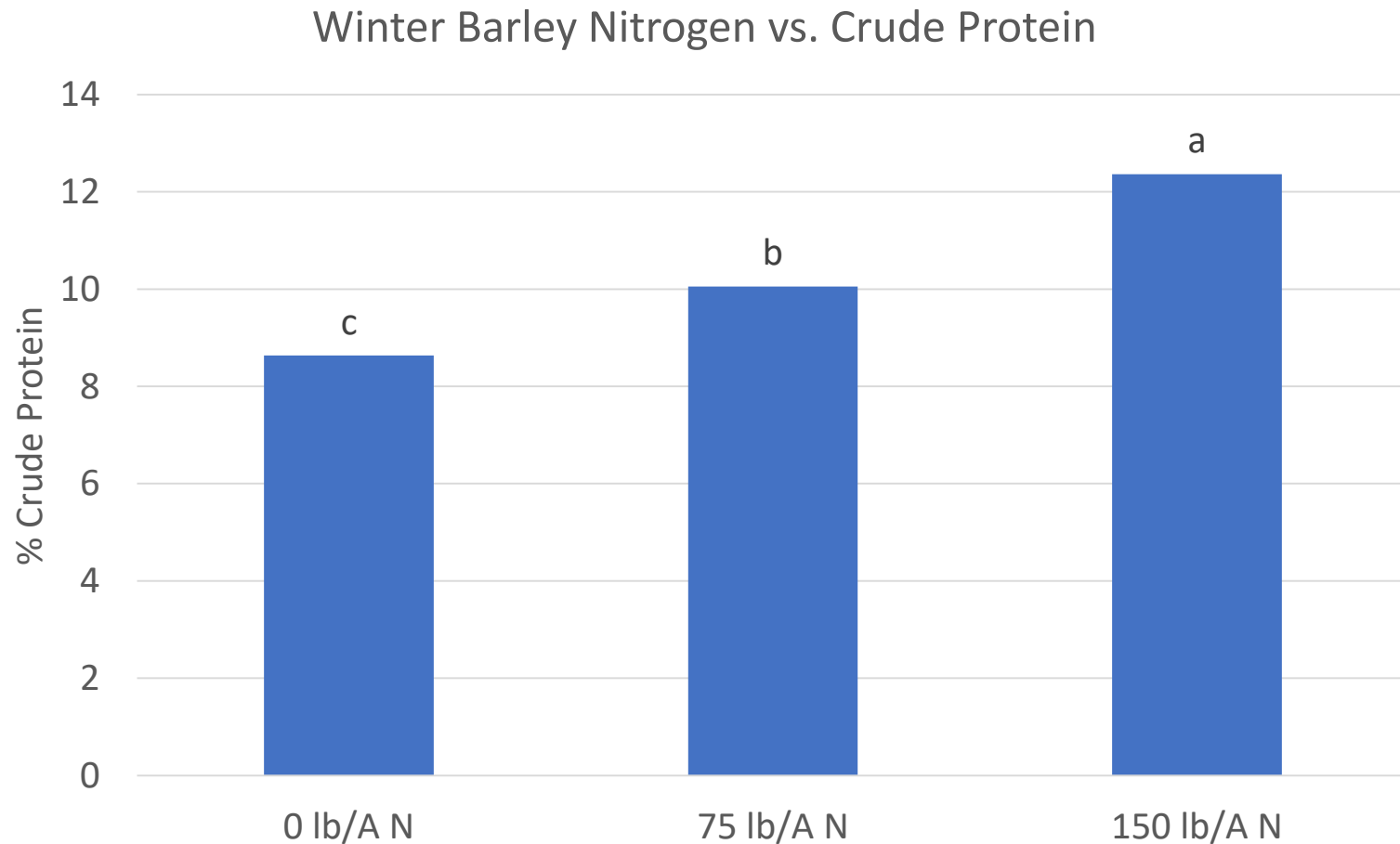


Nitrogen Fertilizer



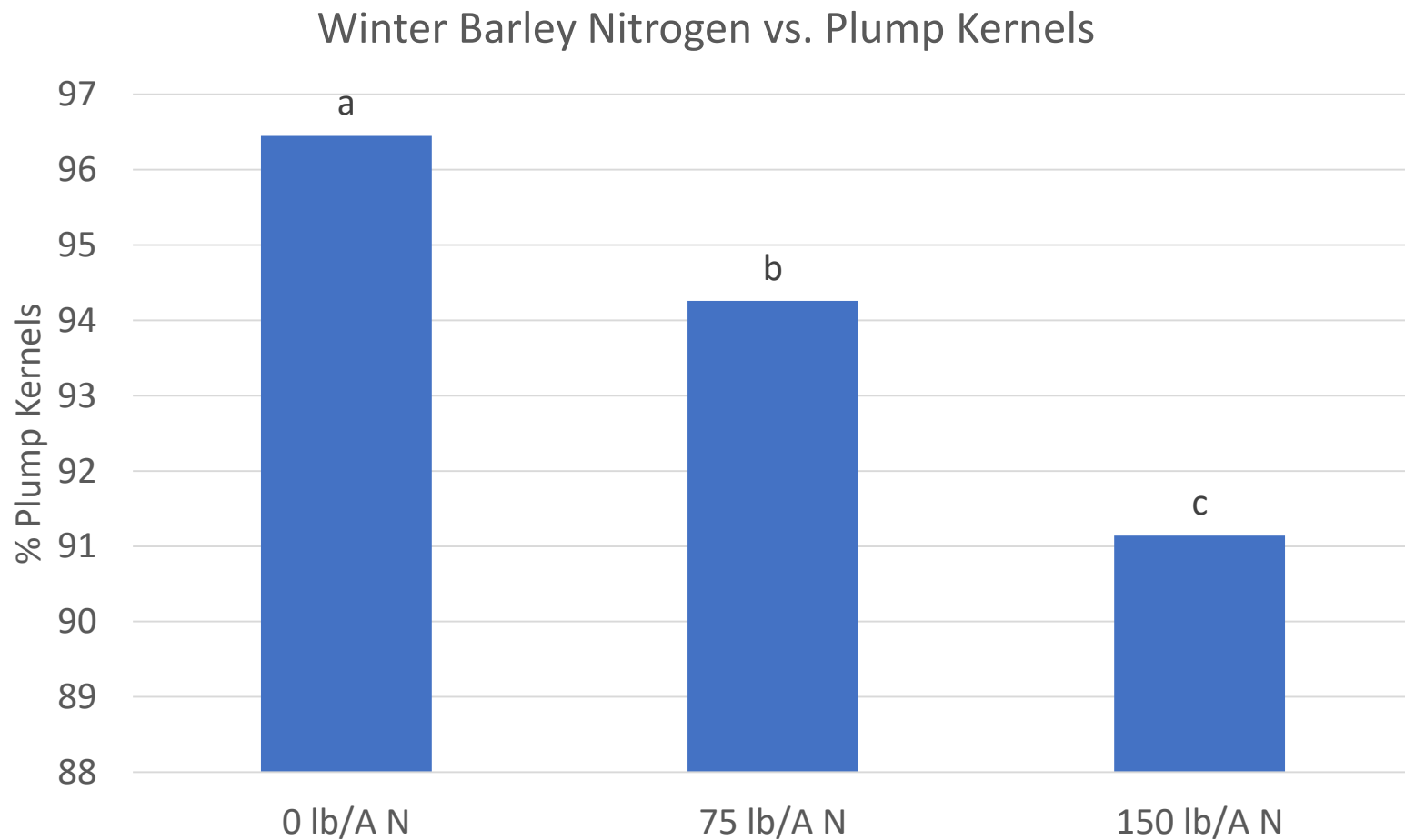


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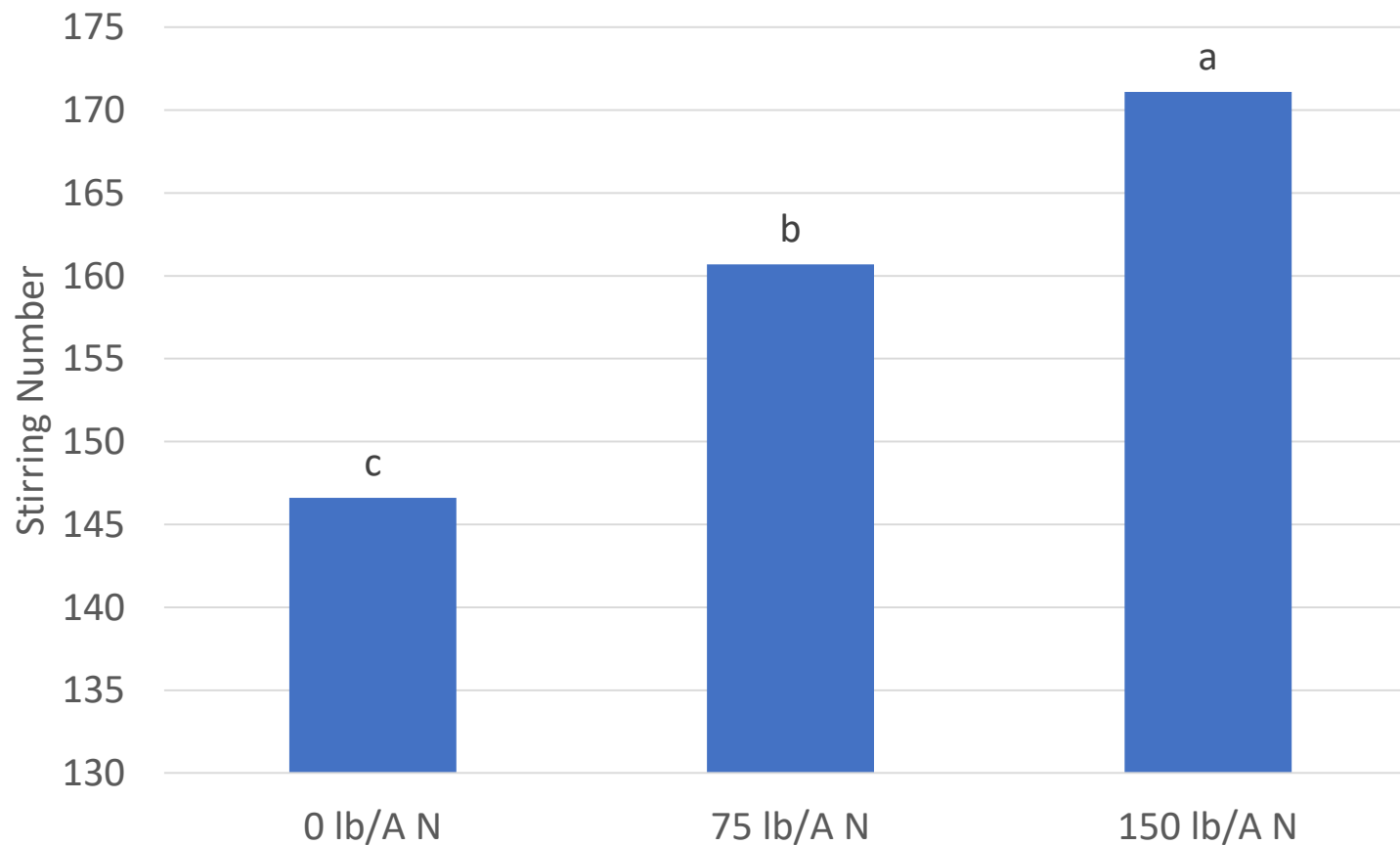
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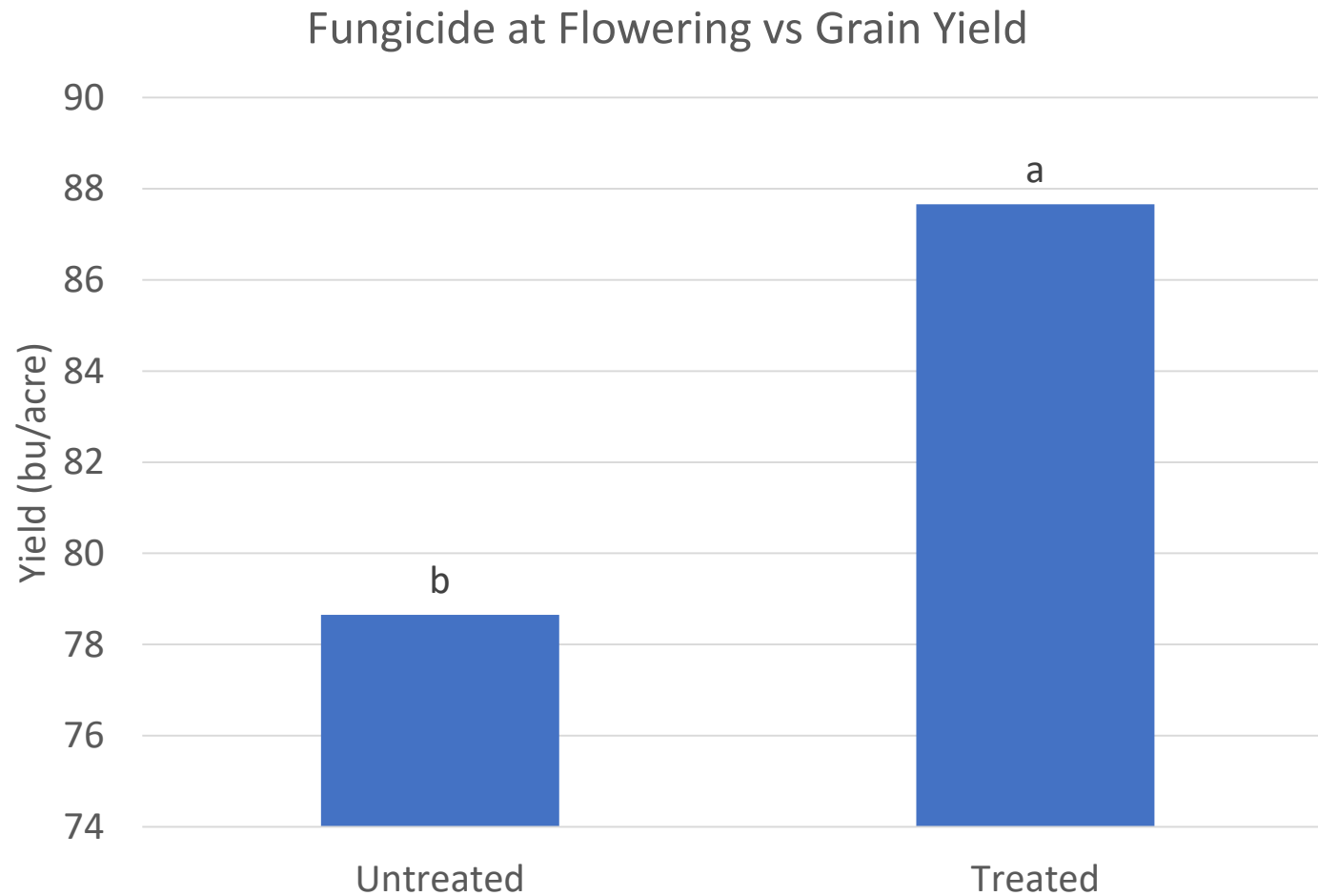
Nitrogen Fertilizer

Winter Barley Nitrogen vs. Stirring Number





Fungicide at Flowering





Fungicide at Flowering

- We did not have any problems with fusarium head blight in 2017, thus fungicide did not affect Vomitoxin (a.k.a. DON) levels
- Fungicide slightly increased stirring number by 4 points, but otherwise did not affect crude protein or kernel plumpness



Variety Differences

- Not all varieties responded the same!



Var	Nrate	Fungicide	Yld	% plump	% thin	% CP	SN (RVA)
Puffin	0	T	70.3	92.7	0.8	8.8	146
Puffin	0	U	57.2	91.9	0.6	8.9	150
Scala	0	T	66.9	97.8	0.5	8.6	160
Scala	0	U	59.5	98.2	0.5	8.7	157
Tepee	0	T	67.1	96.6	0.1	8.1	135
Tepee	0	U	53.9	95.7	0.1	8.2	139
Wintmalt	0	T	60.8	98.1	0.2	8.8	146
Wintmalt	0	U	51.0	98.3	0.2	9.1	139
Puffin	75	T	96.8	90.3	1.1	10.4	160
Puffin	75	U	89.7	90.3	1.2	10.3	161
Scala	75	T	93.8	97.7	0.3	10.3	178
Scala	75	U	84.9	97.5	0.5	10.0	157
Tepee	75	T	107.5	93.3	0.3	9.3	156
Tepee	75	U	93.5	92.6	0.5	9.5	148
Wintmalt	75	T	81.4	95.4	0.4	10.3	166
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Puffin	150	T	92.7	85.6	2.0	13.0	161
Puffin	150	U	93.2	88.9	1.6	13.2	160
Scala	150	T	107.5	95.3	0.6	11.8	182
Scala	150	U	94.5	96.3	0.4	11.9	181
Tepee	150	T	115.5	86.3	1.0	12.1	174
Tepee	150	U	104.6	91.0	0.7	11.6	177
Wintmalt	150	T	91.6	91.3	1.0	12.8	168
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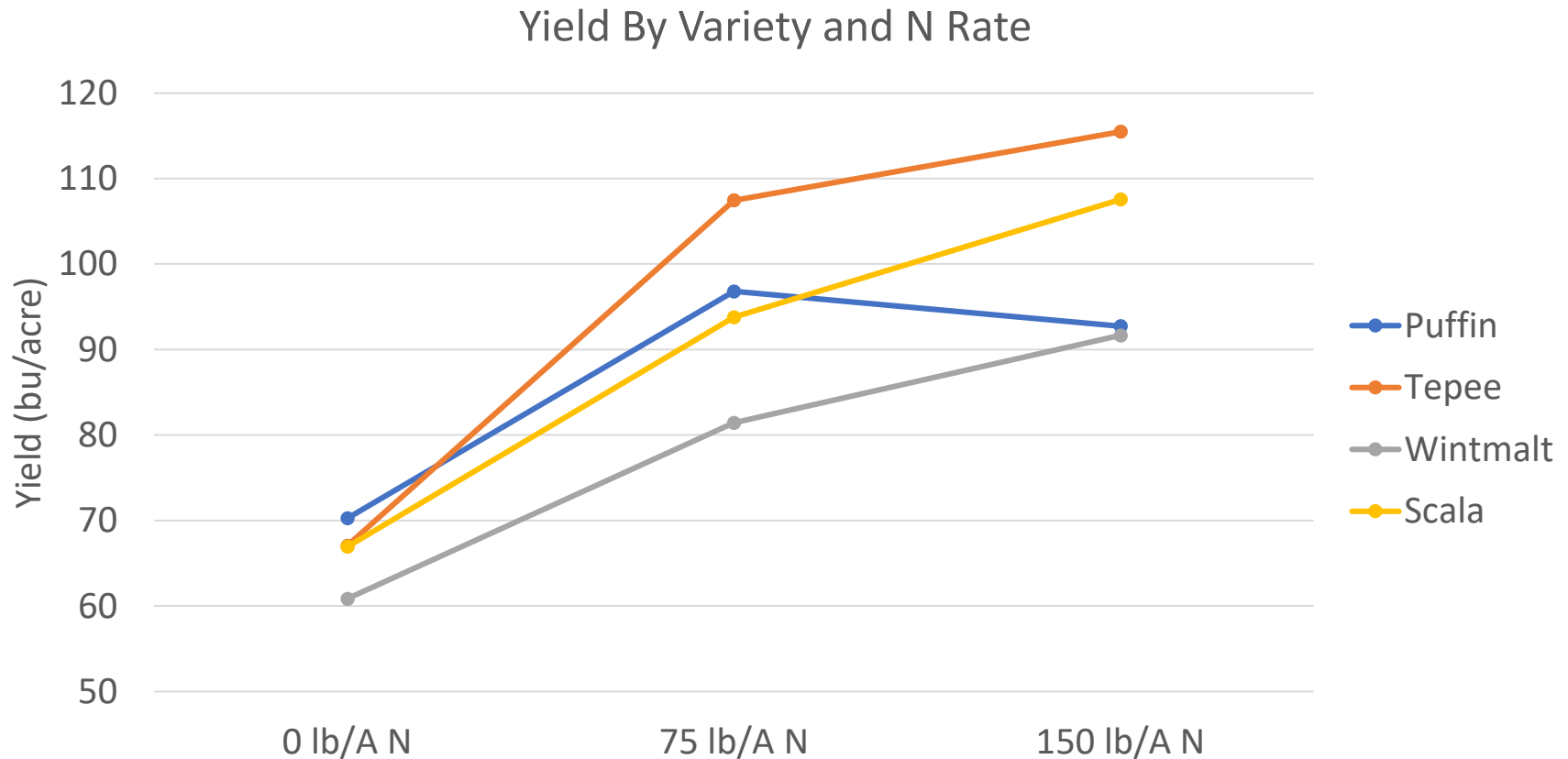
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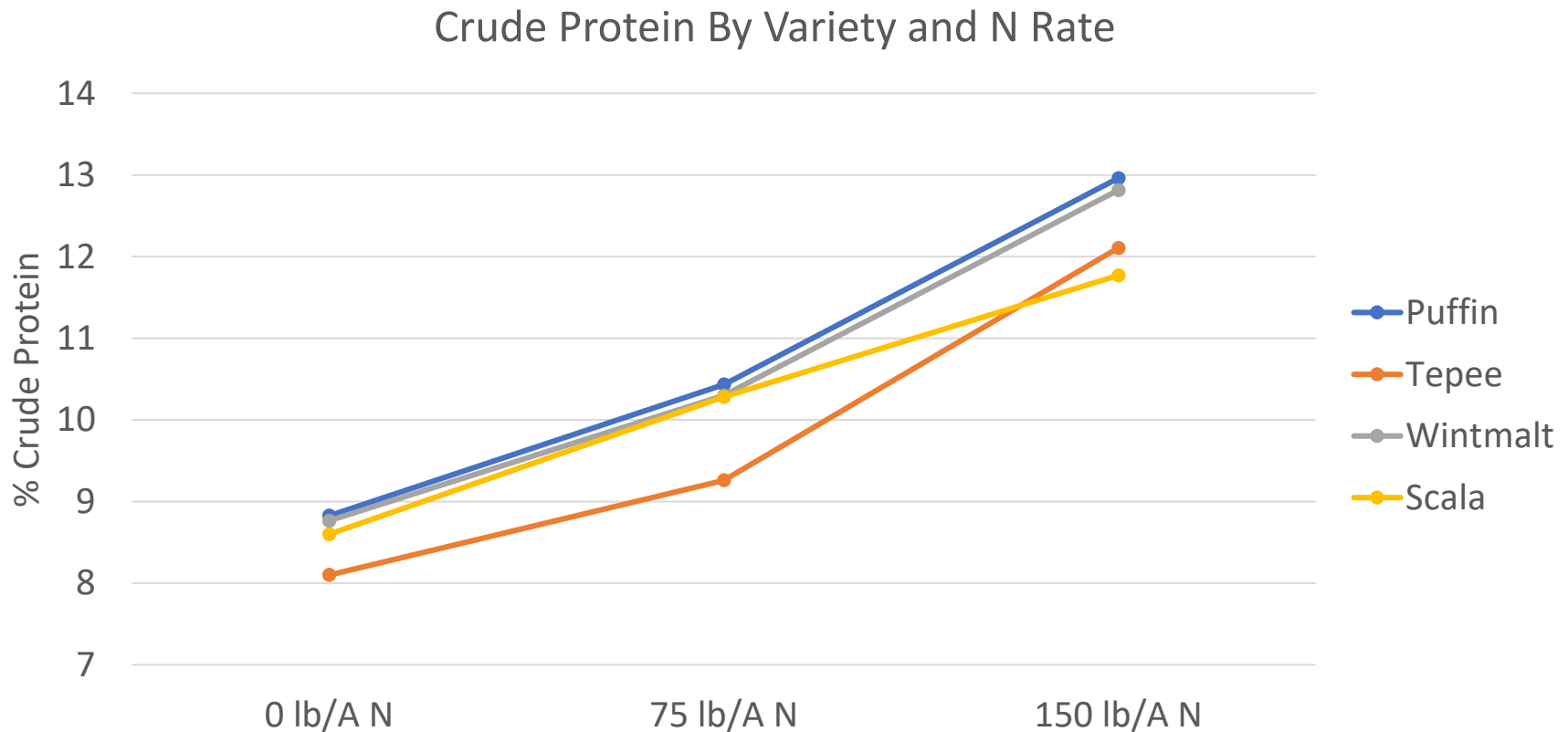
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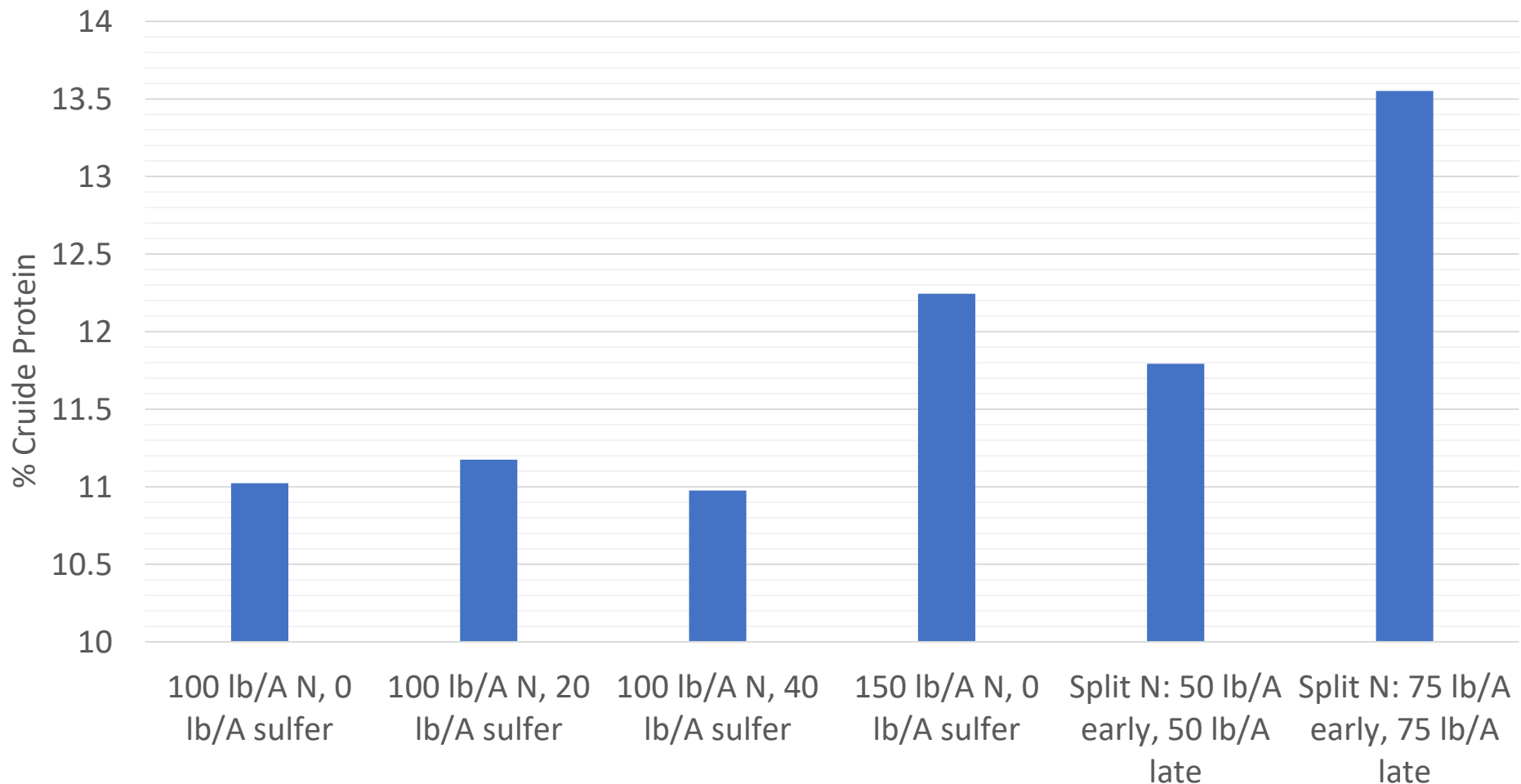
Key Research Questions

- How much does yield vary across a field?
 - Puffin ranged from 69-107 bu/acre when using 75 lbs N/acre
- Does Sulfur influence yield?
 - Not that we could detect this year
- Does split N application influence yield?
 - Not that we could detect this year



Key Research Questions

- How does N Fertilizer affect Crude Protein?





MSU Winter Barley Research

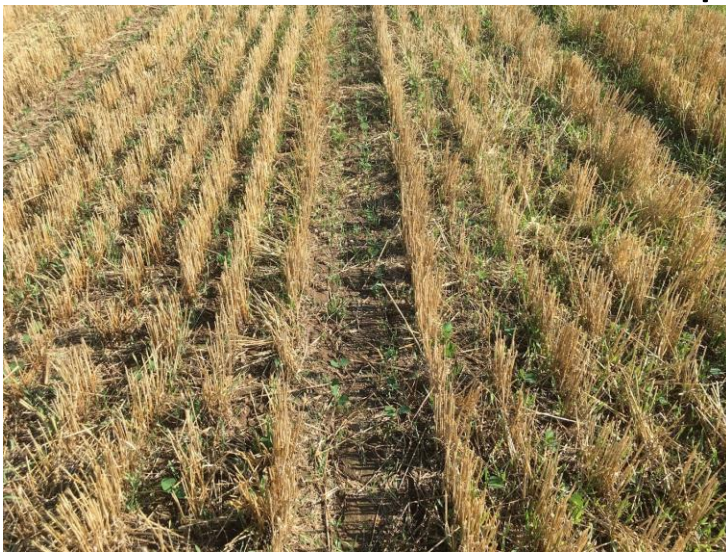
- 2018 Winter Barley Trials - Ongoing
 - Variety trials
 - 3 Planting Dates / 2 varieties
 - 7 nitrogen rates on Puffin
 - Fungicide study
 - Early and Late
 - Plant Growth Regulators
 - Double Cropping





Double Cropping

- SARE Partnership Grant to evaluate double cropping opportunities with winter barley
- Winter barley harvested late June
 - Can we reliably double crop beans after winter barley?
 - What are the best management practices to ensure success of both crops?





A Sales Pitch

- Winter barley fits our climate, **if it can consistently survive the winter!**
 - Grows when we have consistent moisture, whereas corn and spring barley grow during the summer
 - Provides opportunity for double crop / cover crop
 - Adds crop diversity
 - Higher protein grain than corn
 - Disease pressure....



Sales Pitch Part 2

- Livestock farms are particularly well suited to grow winter barley
 - If grain doesn't meet malting quality, or lack of market, feed it!
 - If it does meet quality grade, work with a brewer to feed the spent grain
 - Harvest the straw for bedding / feed
 - If planted early enough in fall, can we graze the early growth before winter?
 - Haul manure and grow a double crop of forage after the barley harvest
 - Drink a beer from the porch, watching the animals graze in the pasture



General Management Guidelines

Are there other questions about?

- Planting Date
- Crop rotation
- Harvest and Storage
- Planting Rate
- Seed depth and row spacing
- Fertility
- Weed Control
- Disease control
 - Foliar diseases
 - Fusarium Head Blight / Vomitoxin
- Pests?
 - Cereal Leaf Beetle, etc.



Questions?



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