

## Nitrogen Management in Sweet Corn (Final Report)

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MWFPA PCC  
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## Why is this Research Necessary?

- Improve Input Cost Efficiency
- Reduce N Loss from Runoff or Leaching
- Variety Differences in N Use Efficiency
- Seasonal Impact on Soil N mineralization
- Need for N Calibration with Newer Hybrids?



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## Approach and Design

- 3 – yr. Study
- High Organic Matter Soil, Non-irrigated Site (Waseca)
- 2 Varieties (GSS1477 and Magnum II)
- 6 N Rates (0, 40, 80, 120, 160, 200)
- 3 Populations (22, 25, 28 K/Acre)
- 2 Planting Dates (May 1 and June 1)



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## Use of Chlorophyll Meter to Characterize N Status and Yield Potential?

- Measures Leaf Greenness (chlorophyll)
- Measurements Collected a 8-10 Leaf Collar and Silking/Tasseling
- Can it be Used Reliably to Characterize N status?
- Can it be Correlated to N Use Efficiency and Yield?



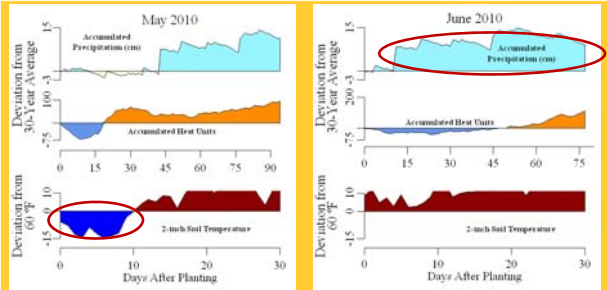
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Soil Test Results (0-12")

		pH	OM (%)	P (Bray, ppm)	K (ppm)	NO3-N (ppm)	NH4-N (ppm)
2010	May	6.1	4.6	27	178	4.7	1.9
	June	6.3	5.8	30	202	7.1	3.6
2011	May	6.6	6.8	37	180	13.1	6.0
	June	6.5	6.6	33	214	13.0	6.2
2012	May	6.1	7.2	37	243	14.4	2.4
	June	6	5.9	25	199	13.5	1.1

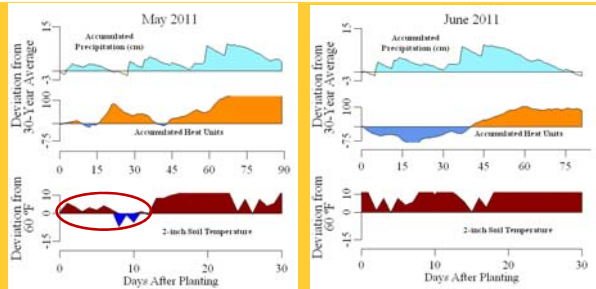
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Weather - 2010



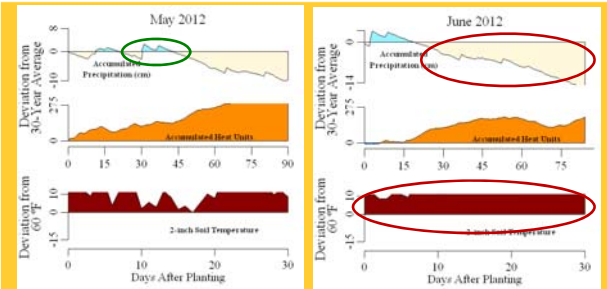
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Weather - 2011



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Weather - 2012

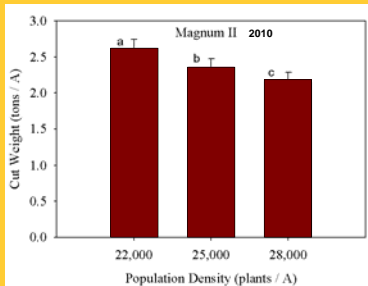


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## Impact of Population Density on Cut Corn Yield



Magnum II



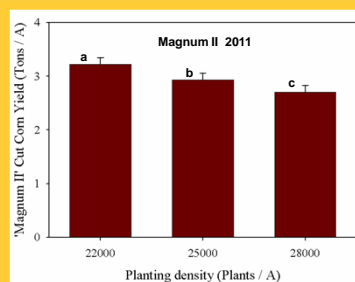
Averaged across  
N rates and Planting  
Dates

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## Impact of Population Density on Cut Corn Yield



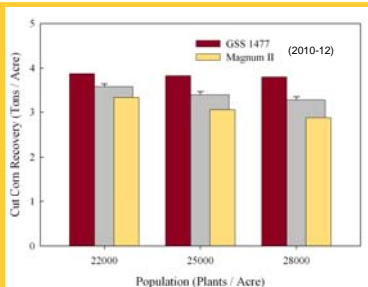
Magnum II



Averaged across  
N rates and Planting  
Dates

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## Impact of Population Density on Cut Corn Yield



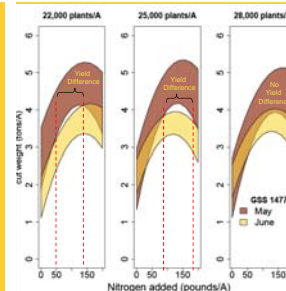
Averaged across  
N rates and Planting  
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## N, Population, and Planting Date Impact Cut Corn Yield



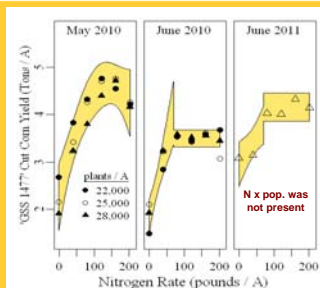
GSS 1477  
(2010)



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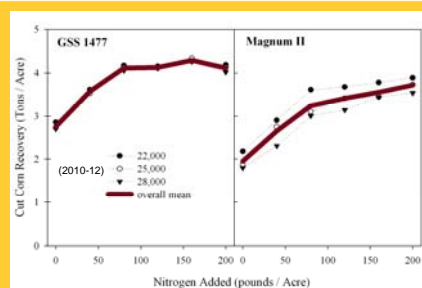
## N, Population, and Planting Date Impact Cut Corn Yield

GSS 1477  
(2010-11)



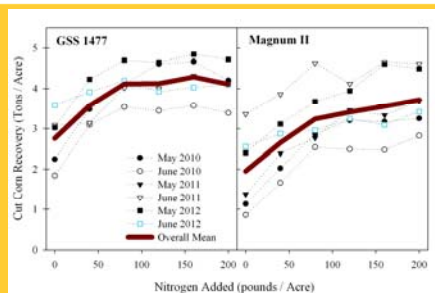
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## N Effect on Yield Across Populations



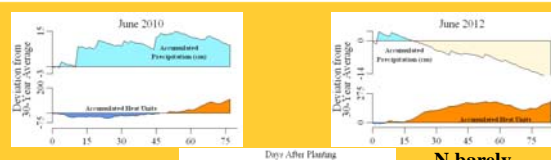
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## 3 yr. Average Yield Response to N



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## Comparing Seasonal Extremes



### N affected yield

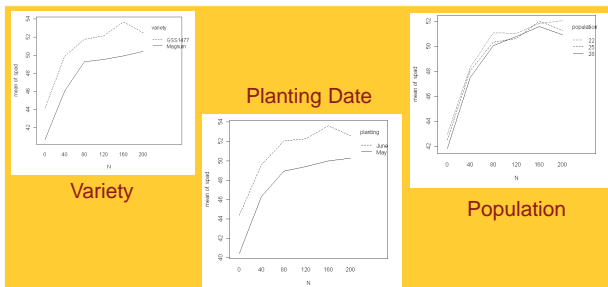
- N loss due to leaching/denitrification

### N barely affected yield

- Increased mineralization
- No leaching loss

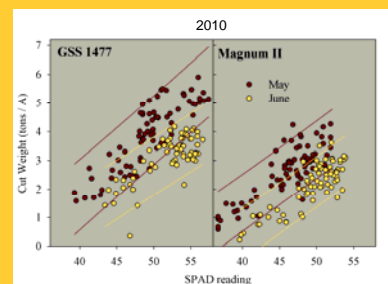
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## SPAD Correlates to N Rate (and Use?)



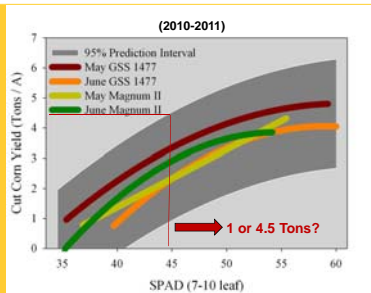
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## SPAD Correlates to Cut Corn Yield??



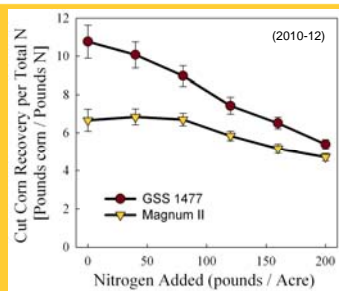
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## Can SPAD Reasonably Predict Yield?? So Far.....NO!



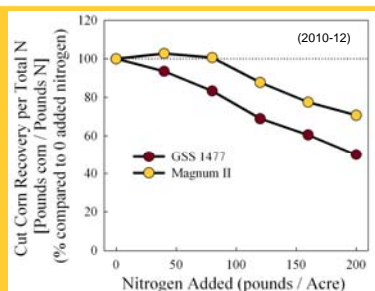
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## Yield Response vs. N Use Efficiency



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## Yield Response vs. N Use Efficiency



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## 3 Year Summary

- Significant treatment (and year) interactive effects on yield response in GS 1477
- Magnum II yield was affected mostly by single treatment factors and the response to N appears to be more predictable
- Yield potential is greater in GS1477 and produced more pounds of cut corn/lb. of added N
- Relative to the control (no added N), yield efficiency decline in Magnum II was less with increasing added N
- Increased plant populations resulted in reduced yield potential in Magnum II
- SPAD measurements initially appear to correlate well with N rate although appreciable yield prediction variation occurs

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Thank you

Midwest Food Processors Association



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