

# Nitrogen Strategies for a New Millennium

## Technology and Biotechnology

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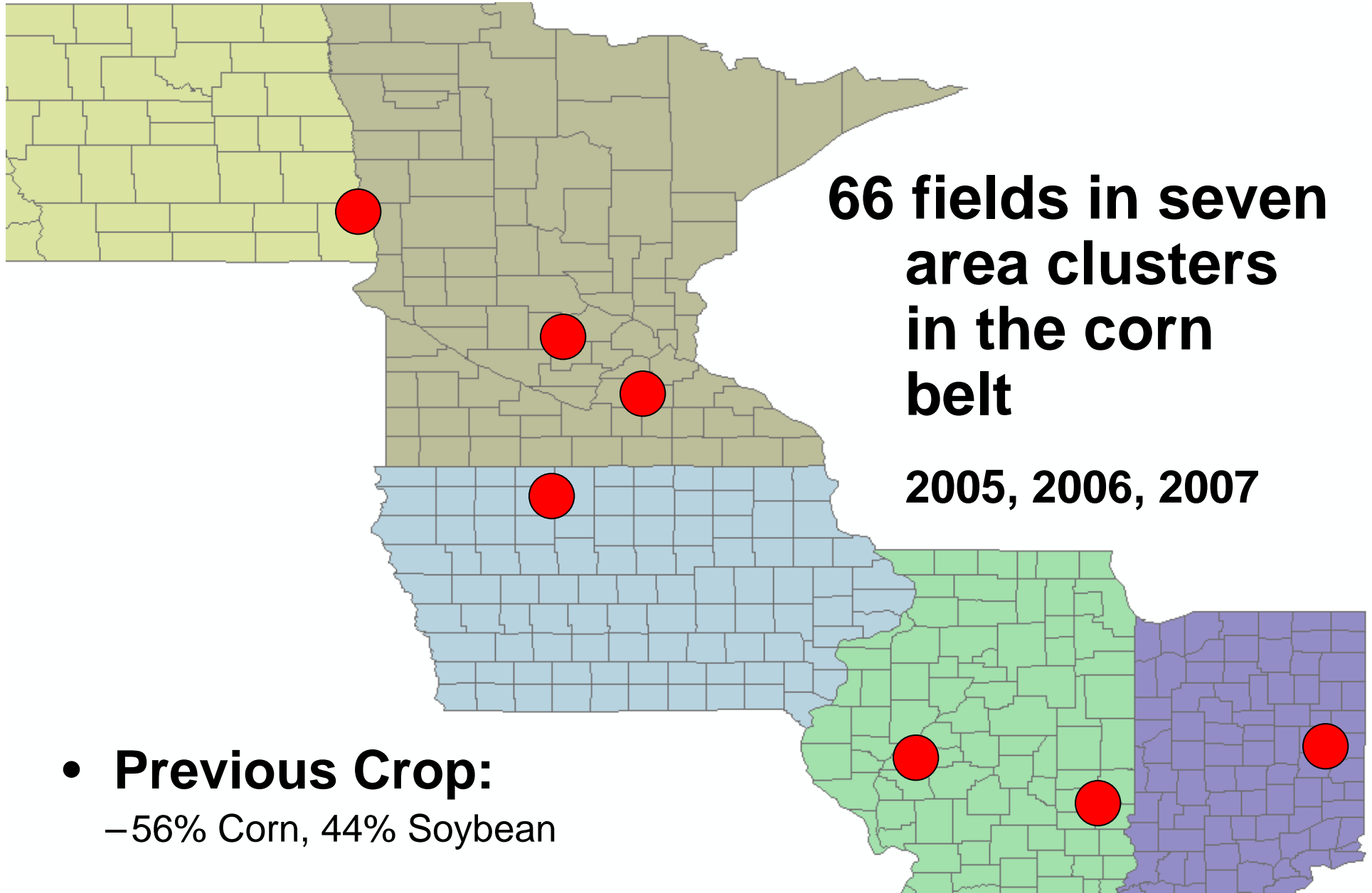
# Seven Wonders of the Corn Yield World

Rank	Factor	Value	
		bu acre <sup>-1</sup>	%
1	Weather	70+	27
2	Nitrogen	70	26
3	Hybrid	50	19
4	Previous Crop	25	10
5	Plant Population	20	8
6	Tillage	15	6
7	Chemicals	10	4
Total =		260bu	100%

# Nitrogen Use by Corn

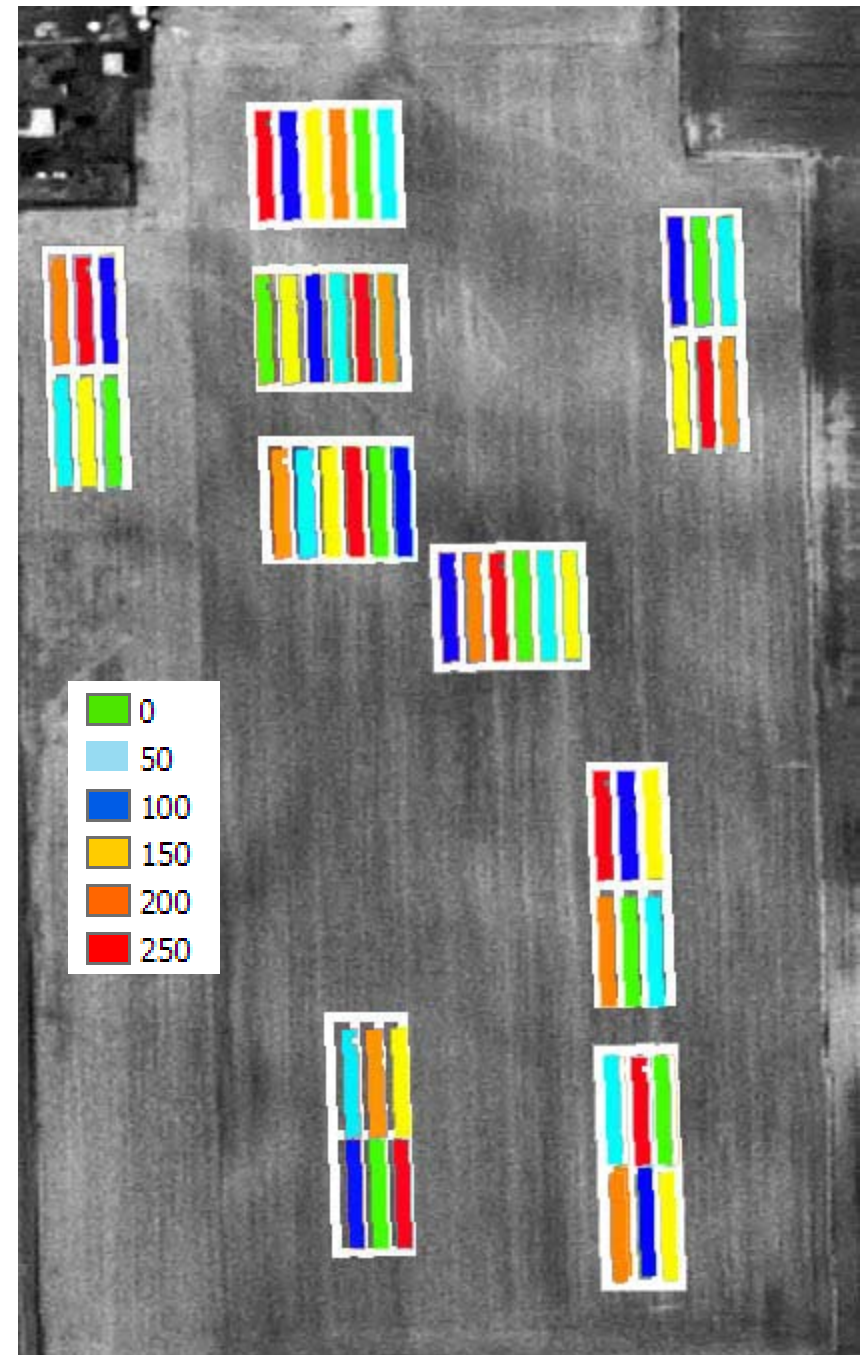
- **What is a typical response to fertilizer N for modern corn hybrids?**
- **How much variation for N use exists in farm fields?**

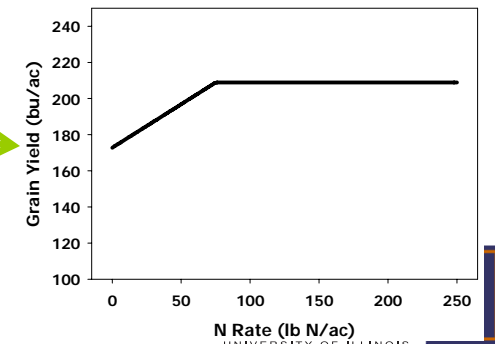
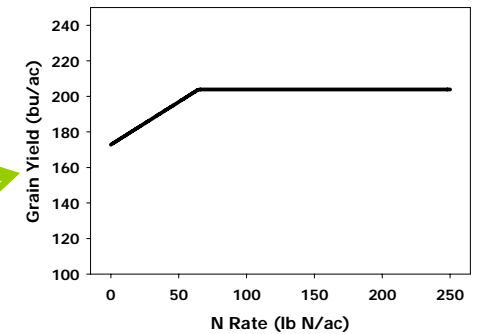
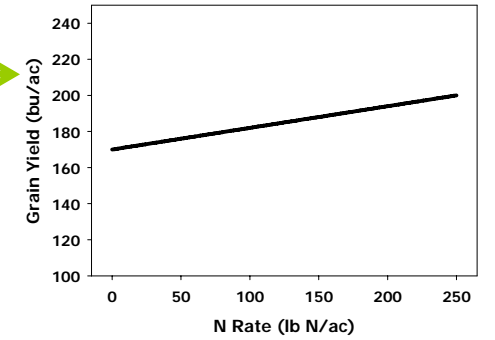
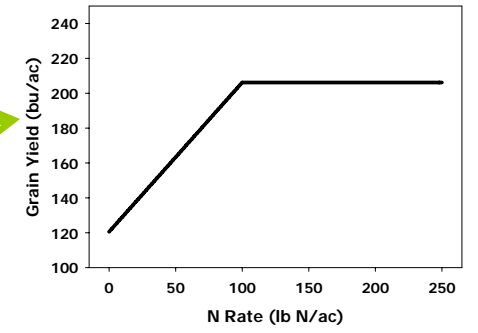
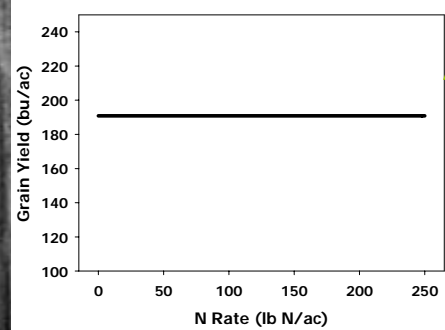
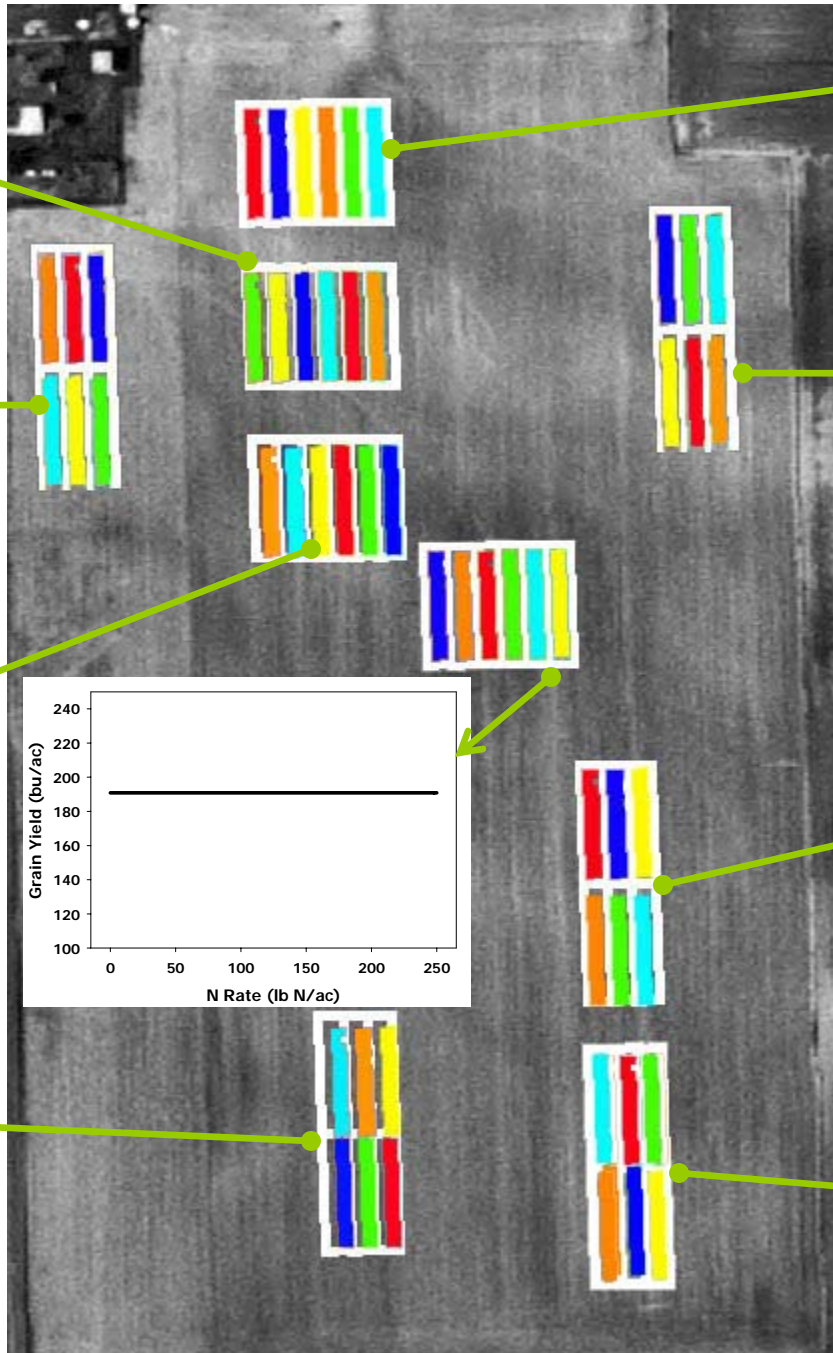
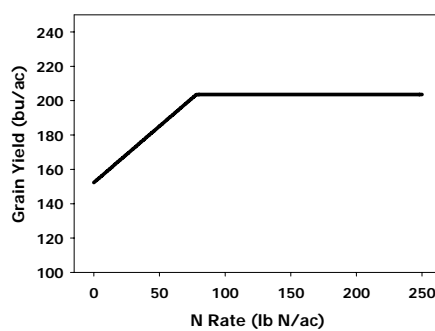
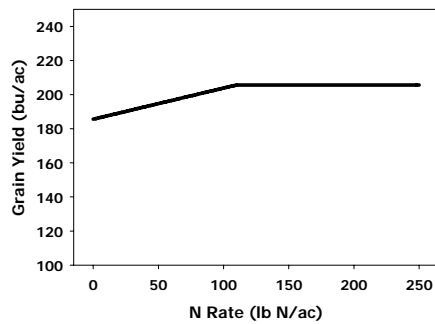
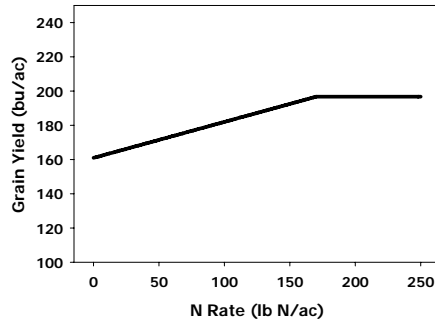
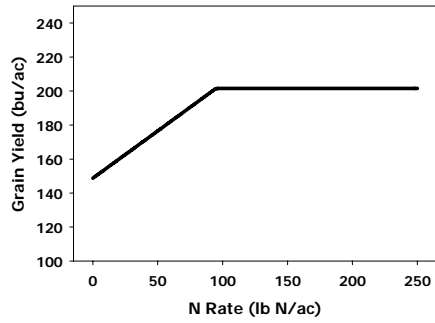
# On-Farm N Response Studies



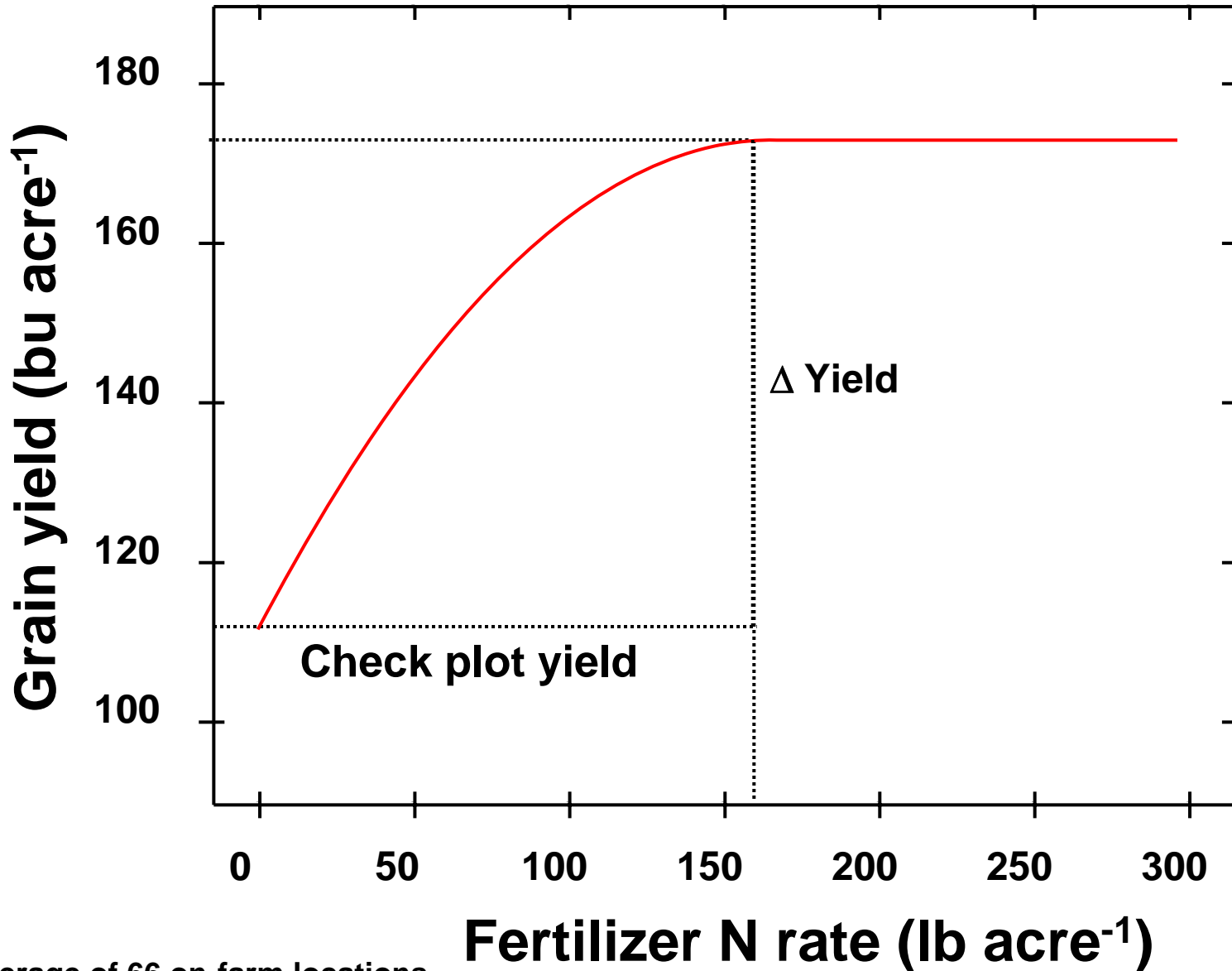
# Experimental Design

- Up to 9 strategically placed stamps per field
- 6 N Rates per stamp (0 to 250 lbs N/acre)
- Two applicator passes
- Grain yield monitor data used if the as-applied N rate was within 10% of the target rate



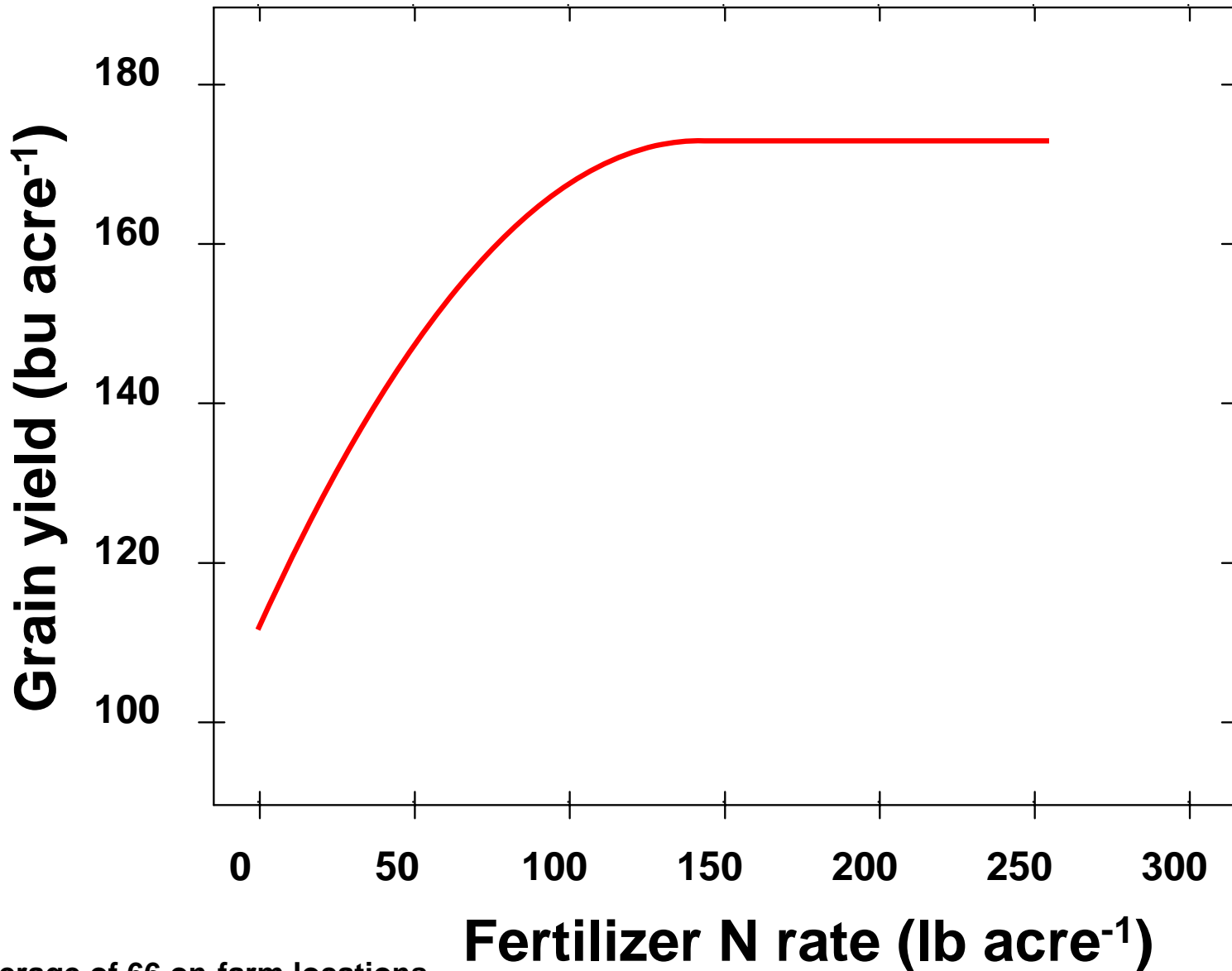


# Typical Corn Response to Fertilizer N



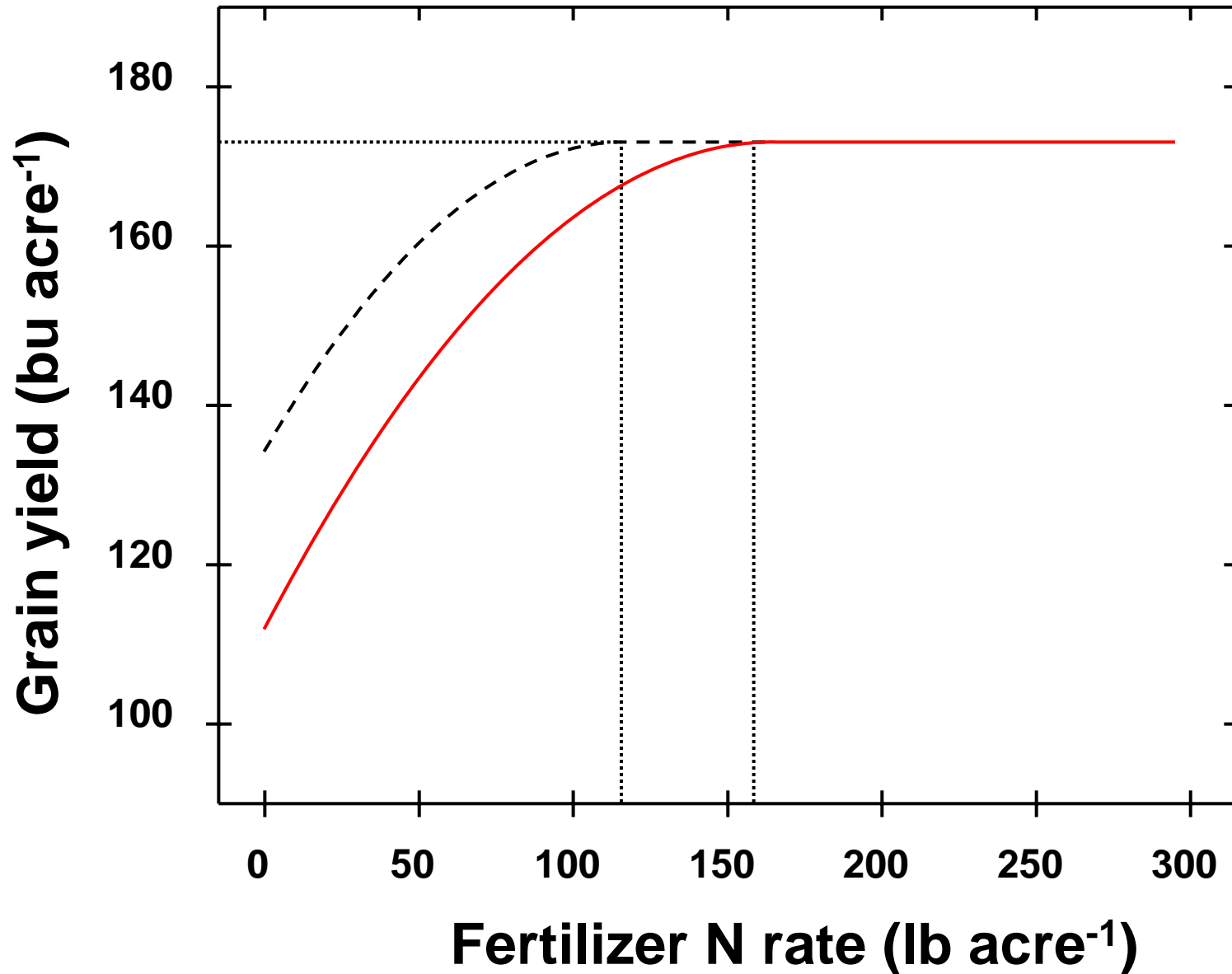
Average of 66 on-farm locations

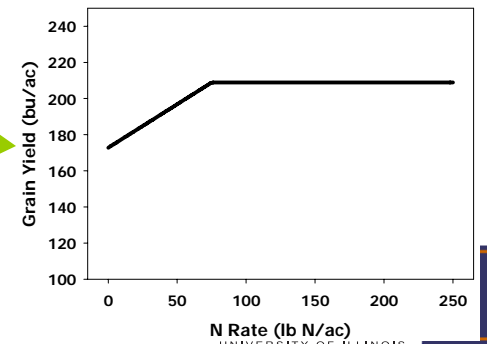
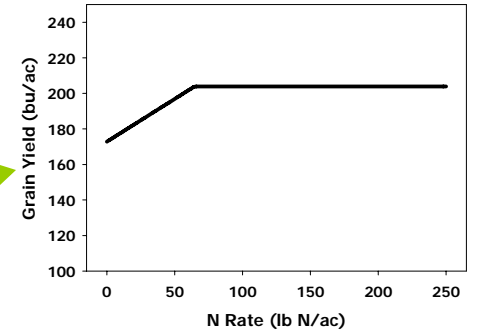
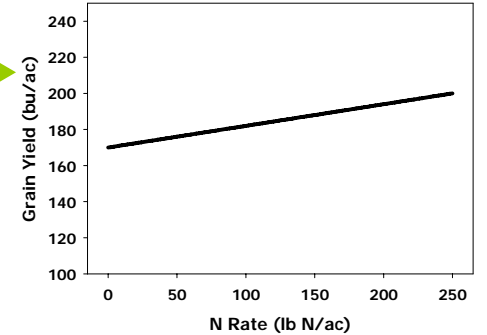
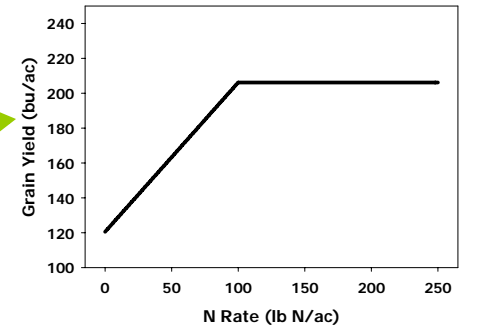
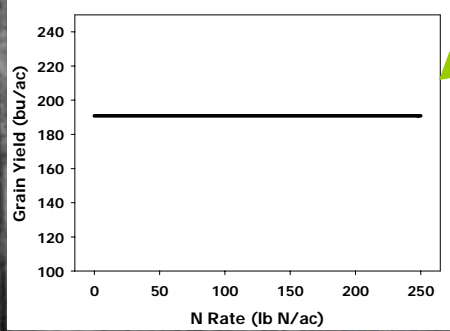
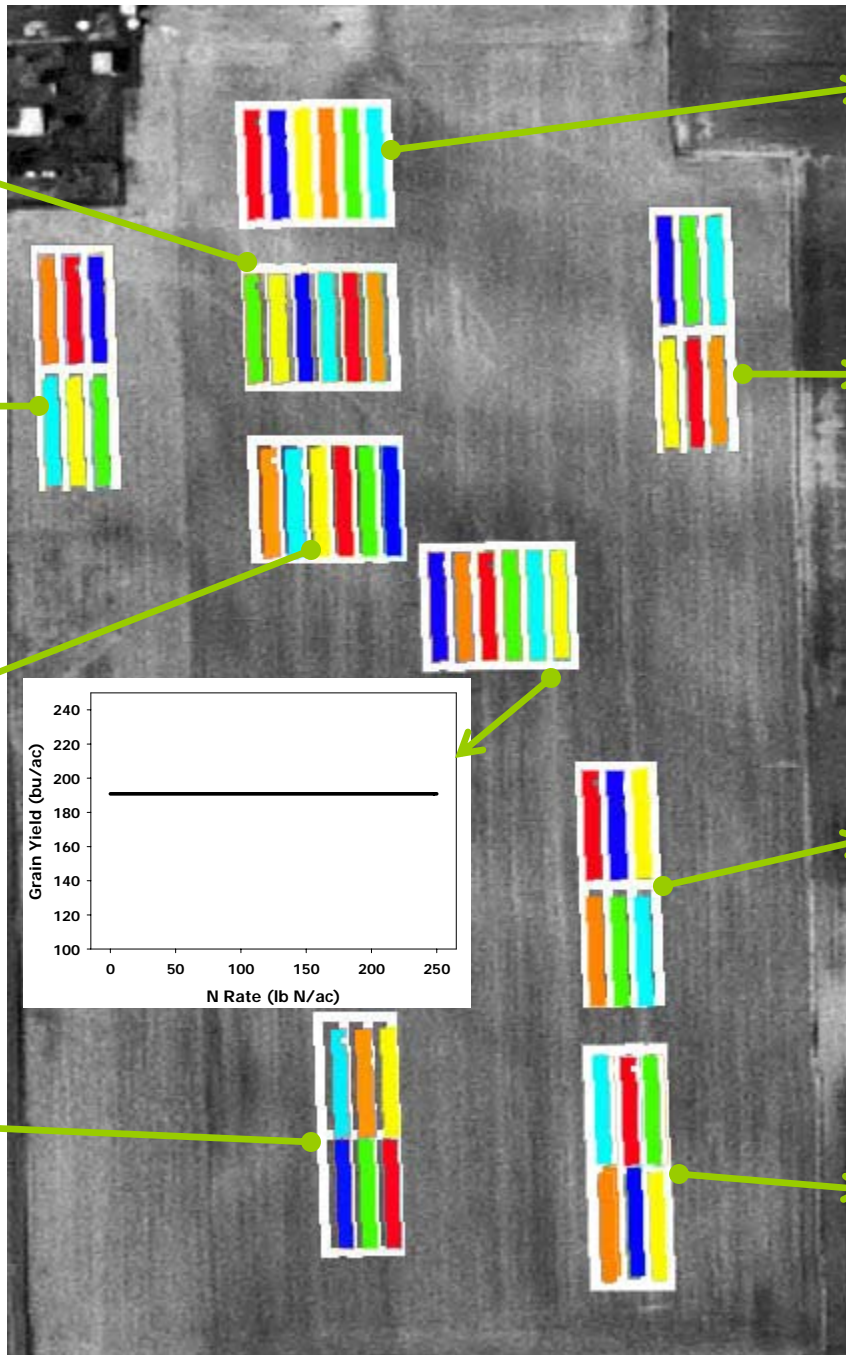
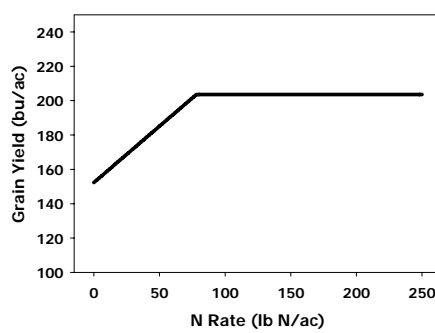
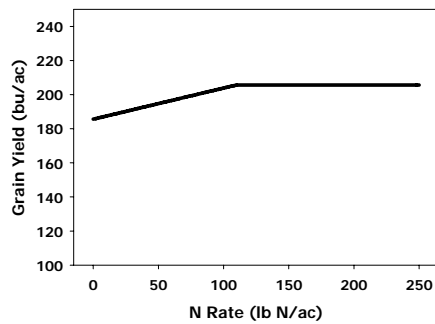
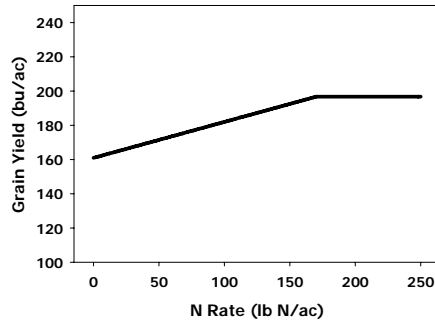
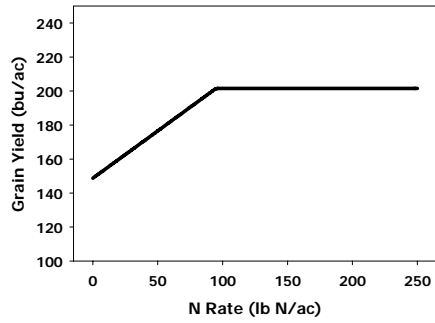
# Typical Corn Response to Fertilizer N



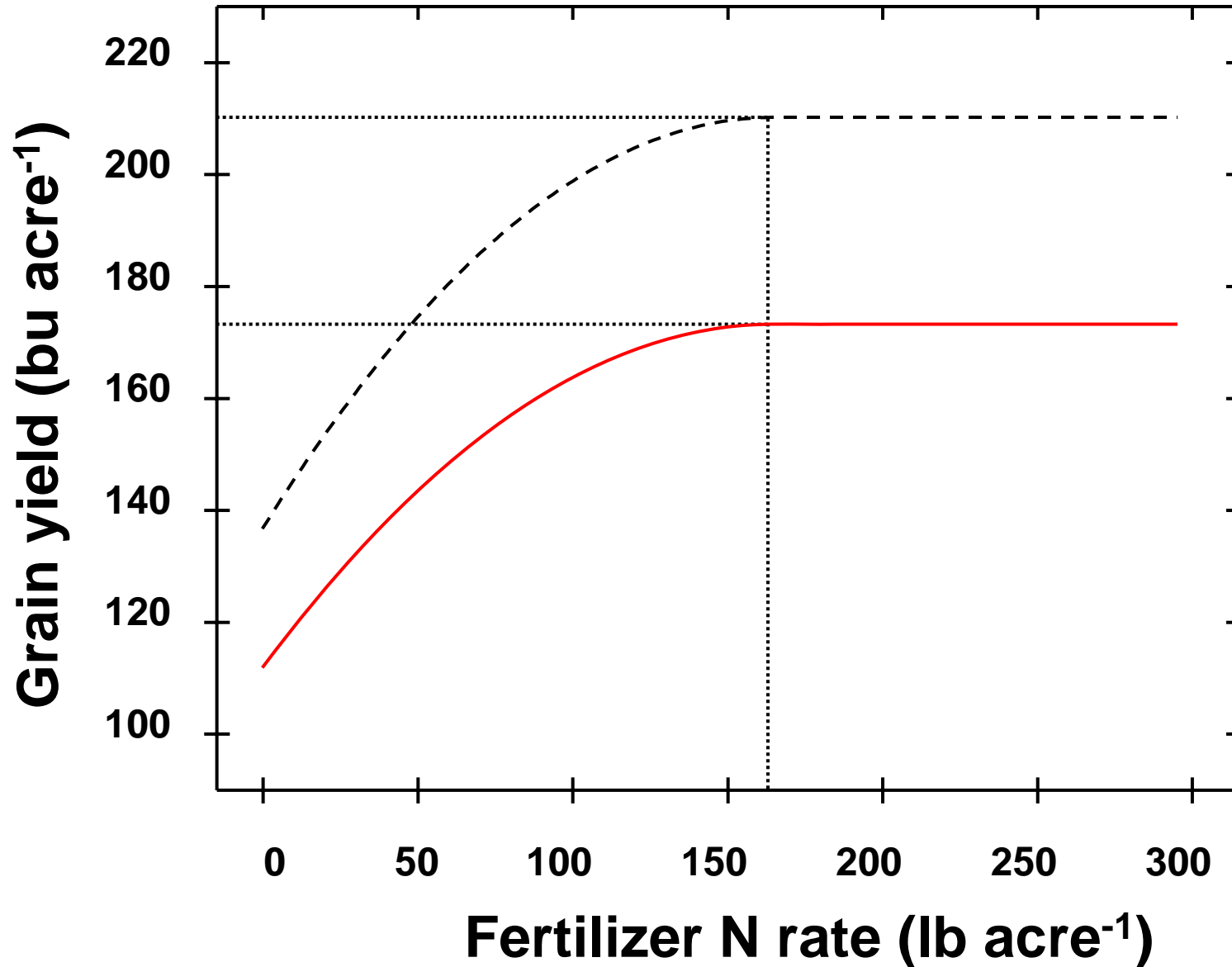
Average of 66 on-farm locations

# Same yield with lower N requirement

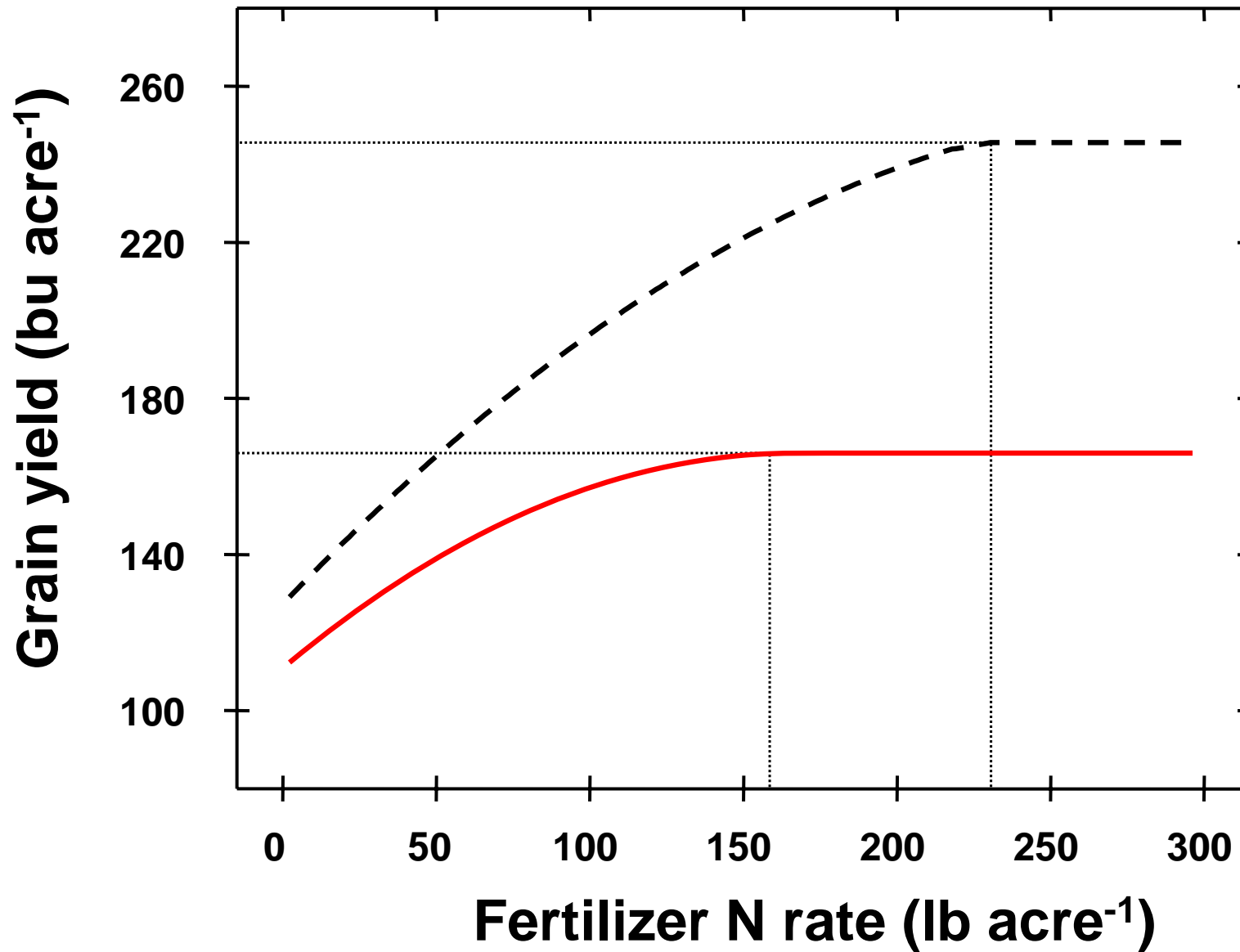




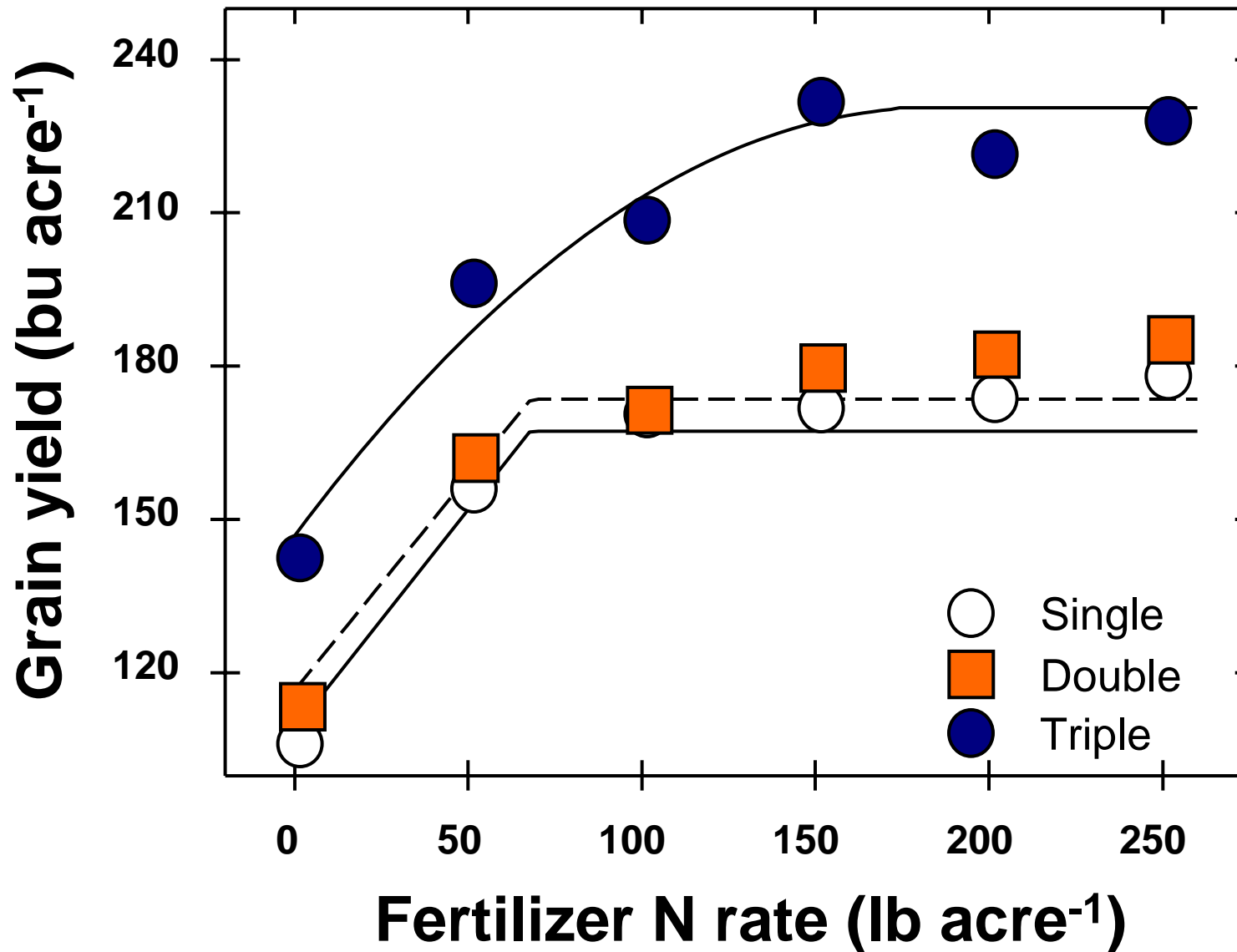
# Higher yield with same N requirement



# High yield at low N, even higher with N

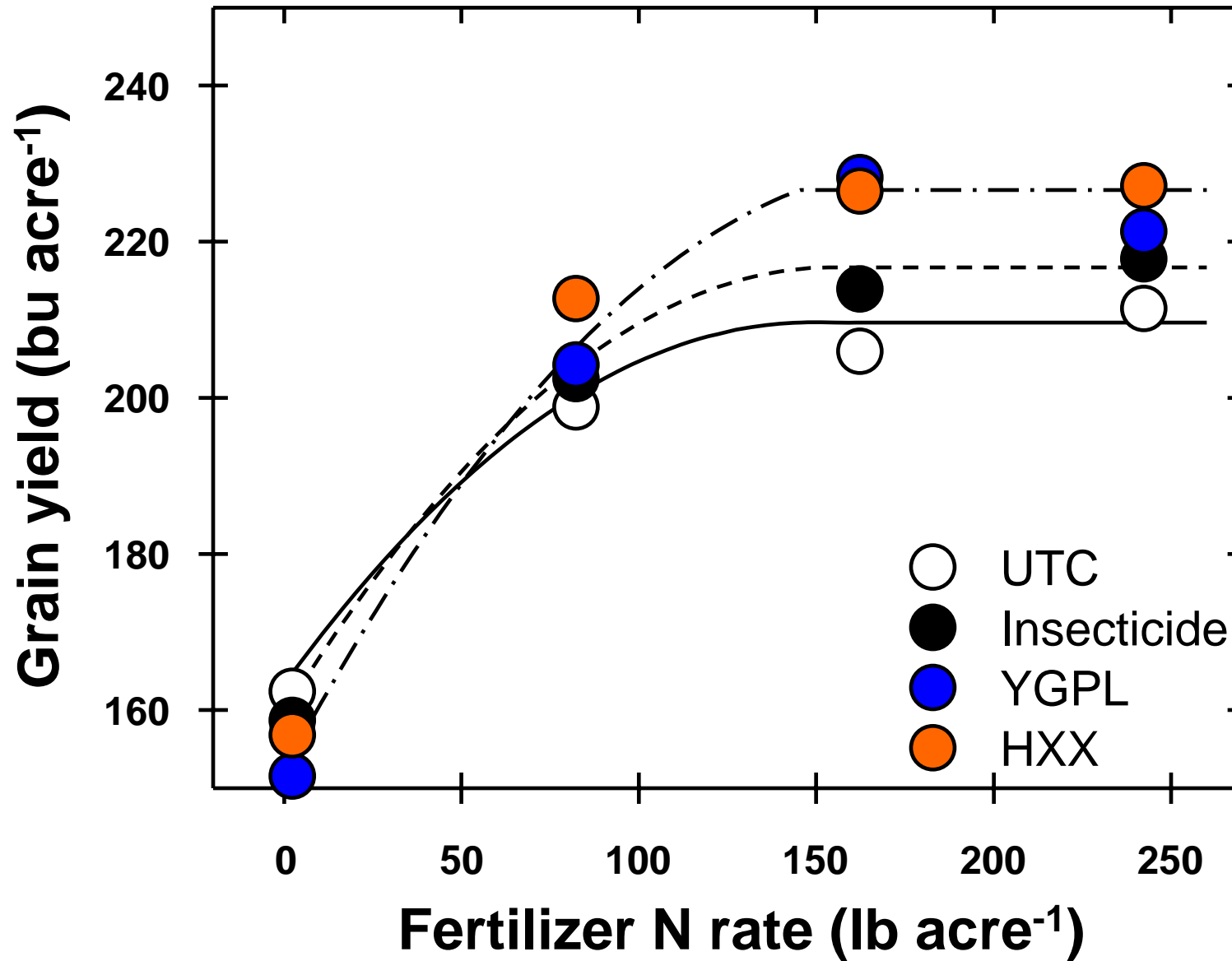


# Better N use from Biotechnology Traits?



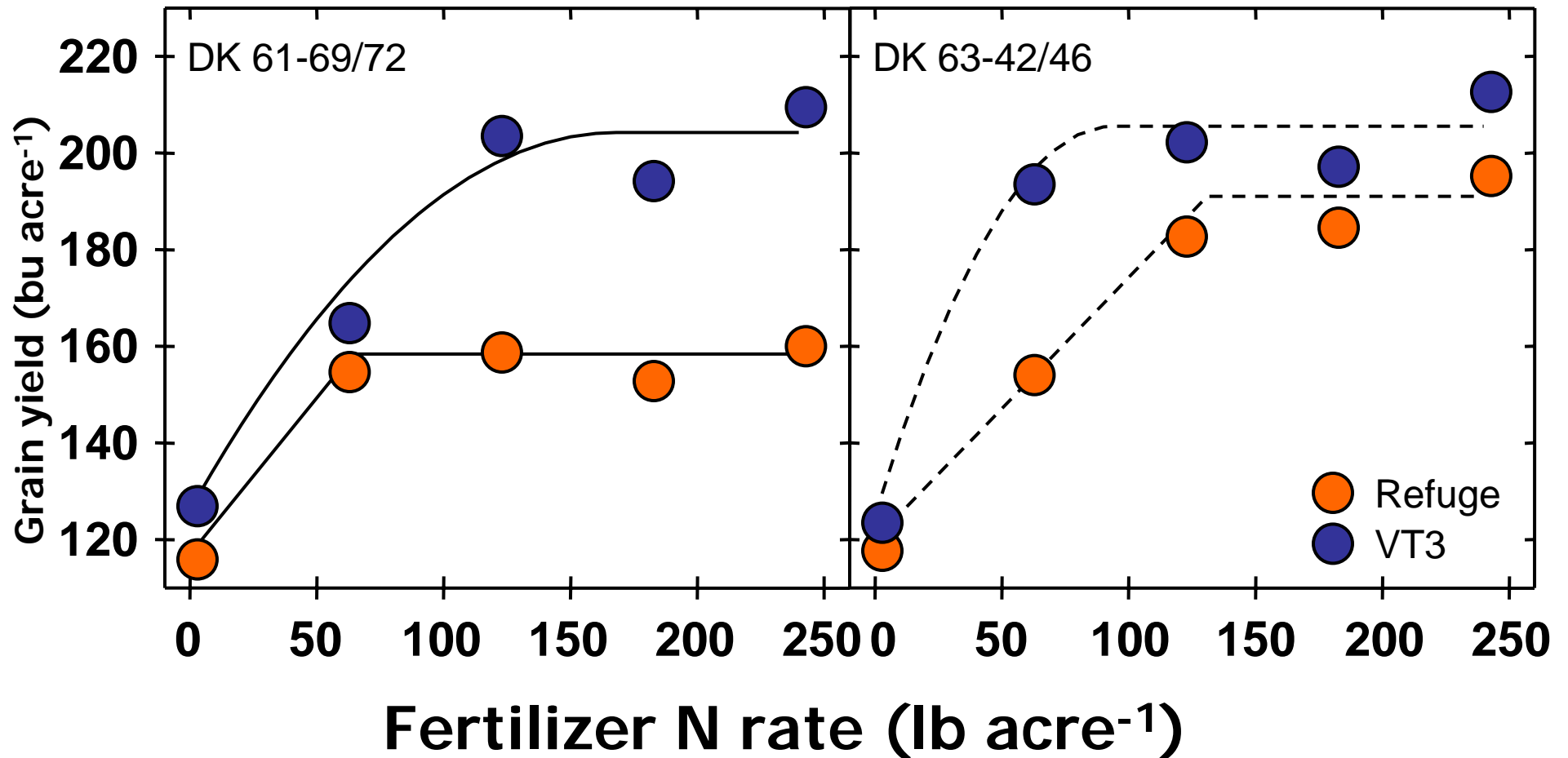
Champaign, IL 2006

# Better N use from Biotechnology Traits?



Champaign, IL 2007

# Better N use from Biotechnology Traits?



Champaign, IL 2008

# Better N use from Biotechnology Traits?

<b>Hybrid</b>	<b>NUE</b>	<b>Uptake</b>	<b>Utilization</b>
	<b>kg/kg N</b>	<b>%</b>	<b>kg/kg N</b>
<b>DK 61-69</b>	<b>25.9*</b>	<b>71*</b>	<b>38.4</b>
<b>DK 61-72</b>	<b>17.0</b>	<b>53</b>	<b>33.1</b>
<b>DK 63-42</b>	<b>31.7*</b>	<b>71*</b>	<b>46.4</b>
<b>DK 63-46</b>	<b>22.4</b>	<b>56</b>	<b>44.1</b>

**Champaign, IL 2008**

# Conclusions

- **Better uptake of N from biotechnology, and it will get even better?**
- **Biotech N traits will help to minimize field spatial variability to N?**

# Acknowledgements

## Personnel

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