

Avoiding Failure with Precision Ag

- What Does it Take?

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Western Ag Innovations**

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Precision Ag

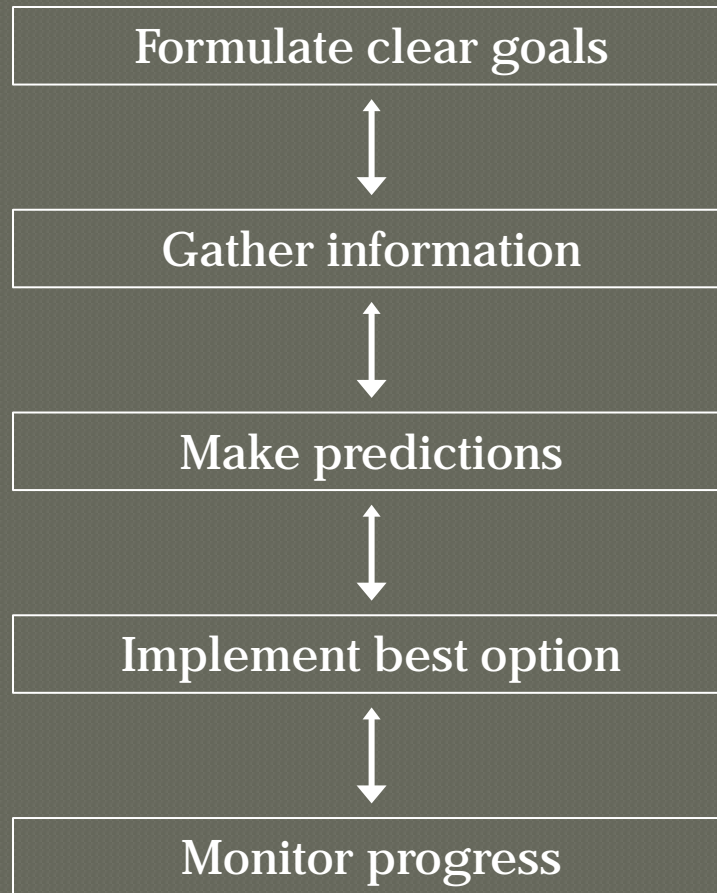
- ž Varying management within fields
- ž Challenging!
- ž Two issues:

Too much thinking without doing

Too much doing without thinking



Five Steps



Step 1: Formulate Clear Goals

Uniform ® Variable

- ž Increase net return per acre by at least __\$
- ž Other goals
 - Synergistic: uniform harvest, land quality, fun
 - Conflicting: time, other opportunities

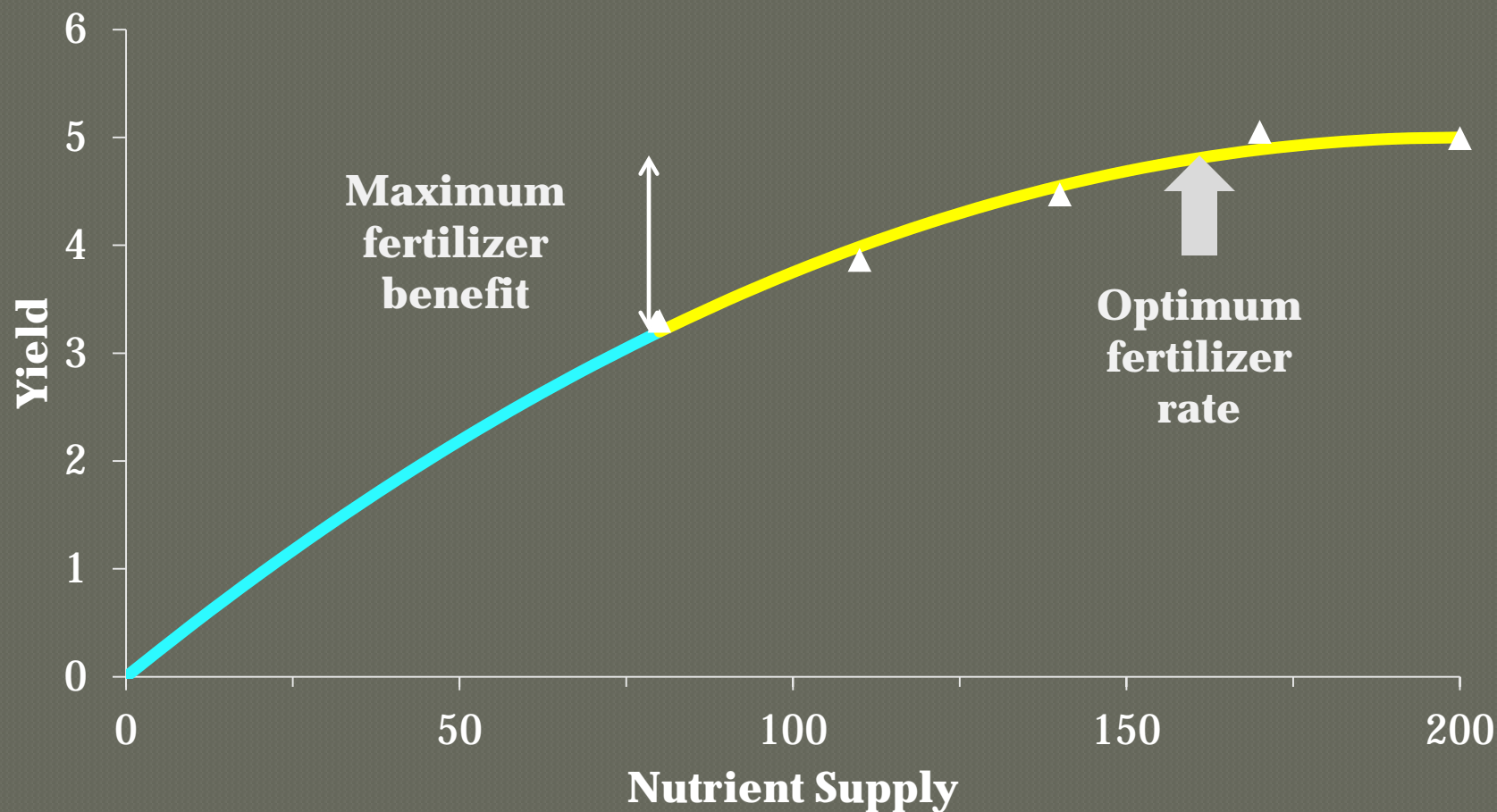


Step 2: Gather Information

- ž Why do crop responses to management vary within a field?
- ž By how much?
- ž Where?



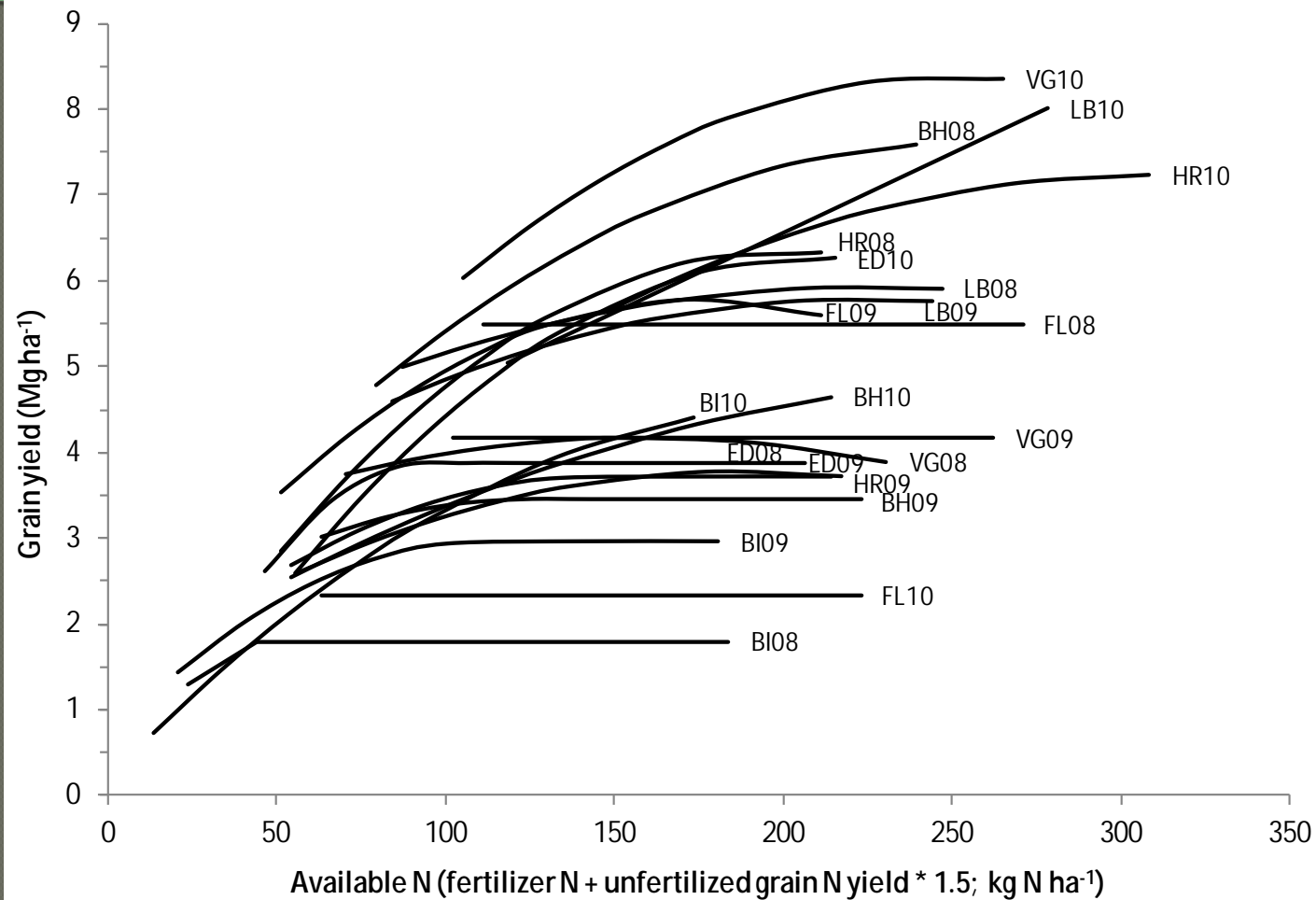
Why do Fertilizer Benefits Vary?



----- Soil ----- Fertilizer -----



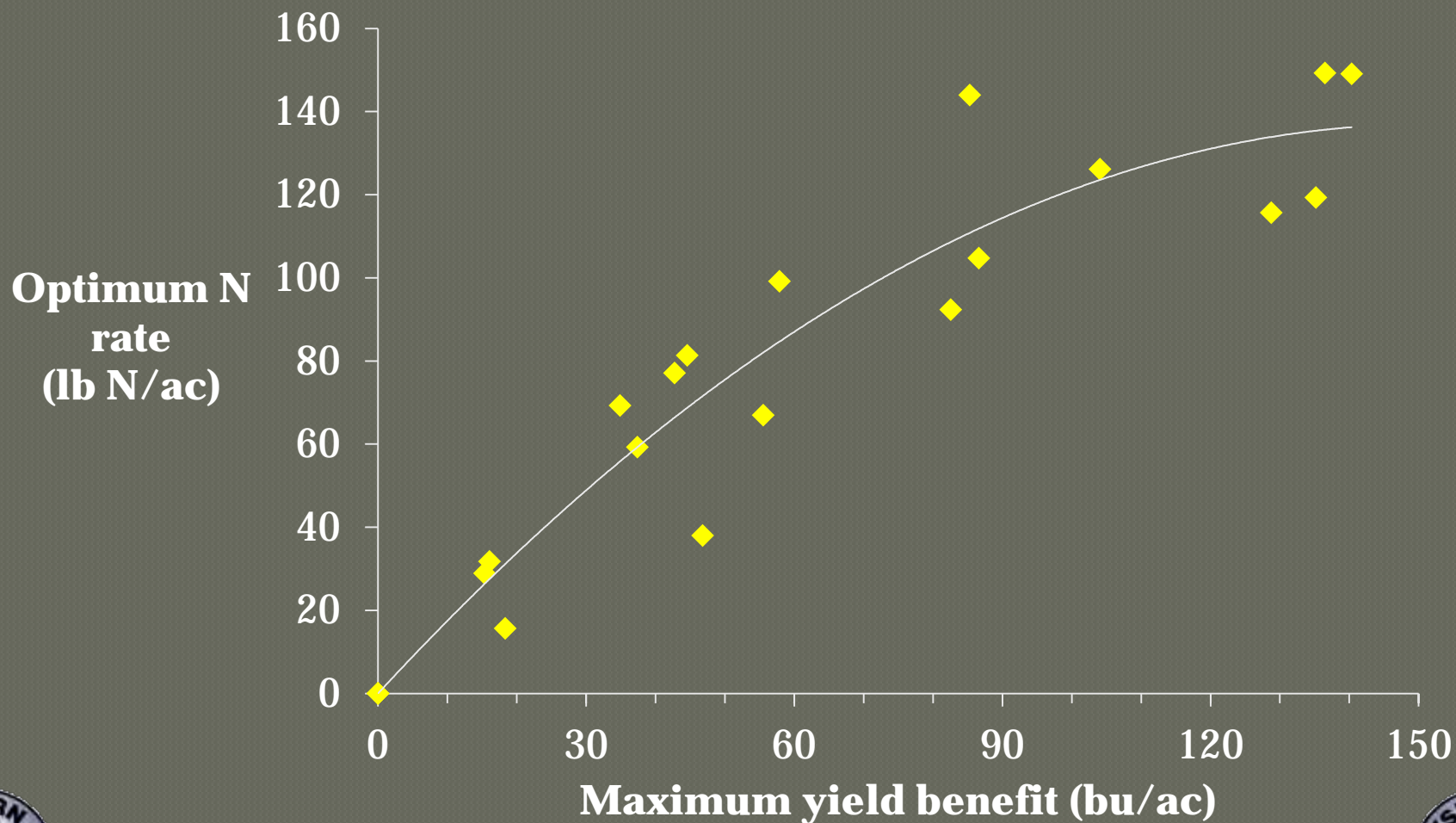
Triticale N Fertilizer Trials



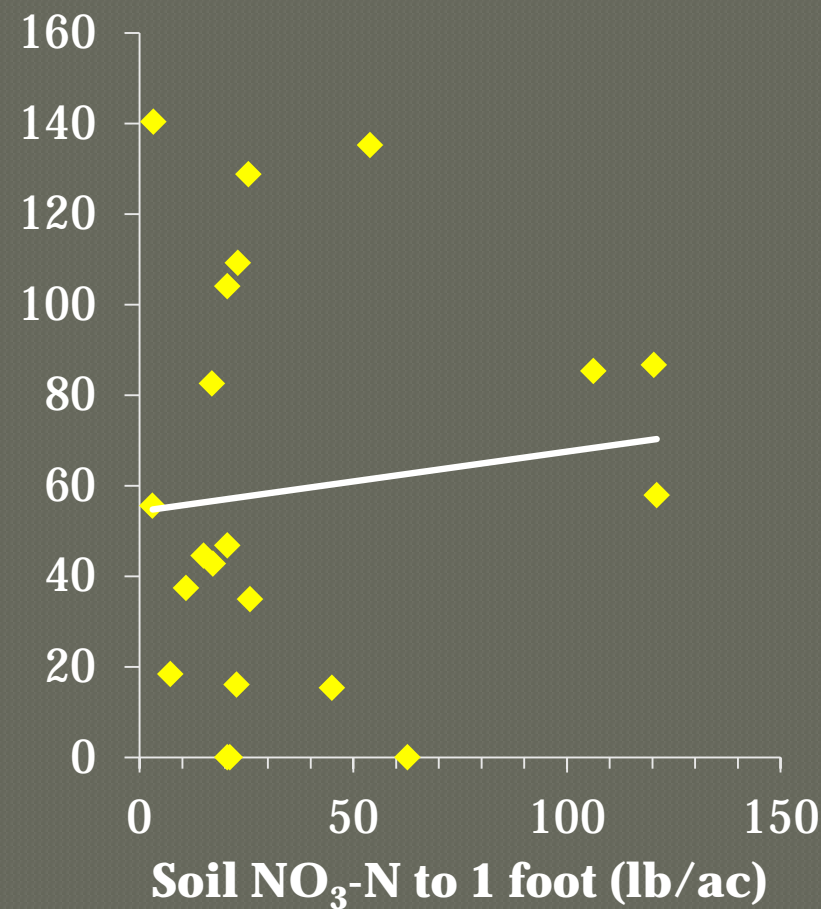
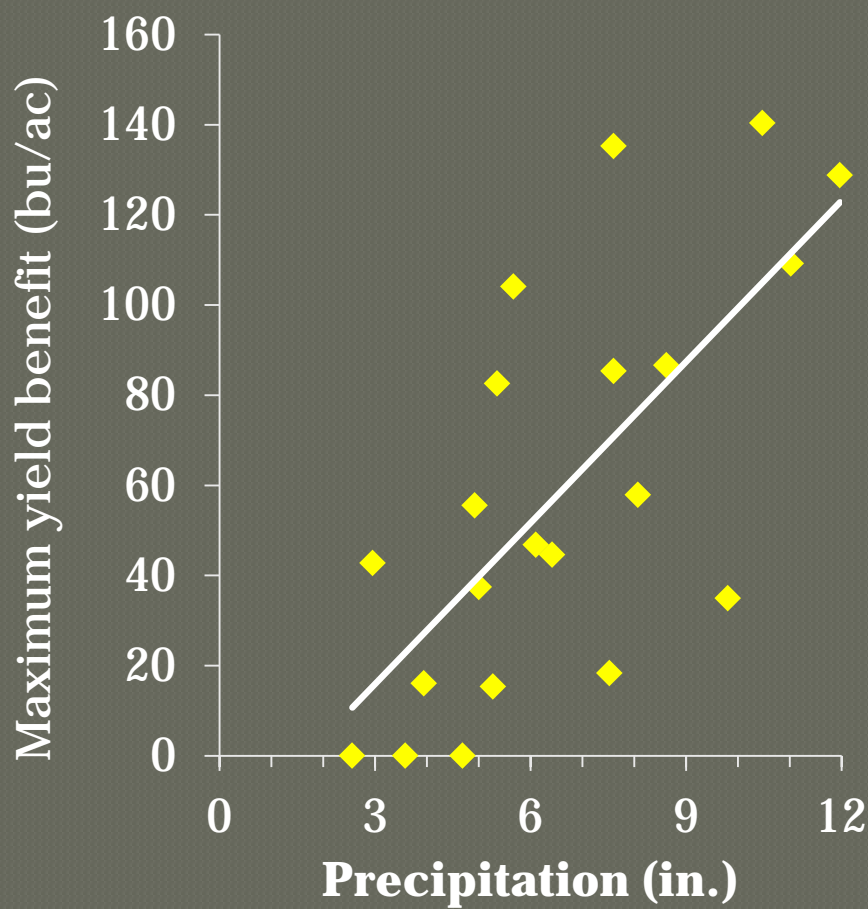
McKenzie et al., 2008 to 2010



Optimum N Rate for Triticale



Controls of Maximum Benefit



N Strip Trials (Kachanoski, 2008)

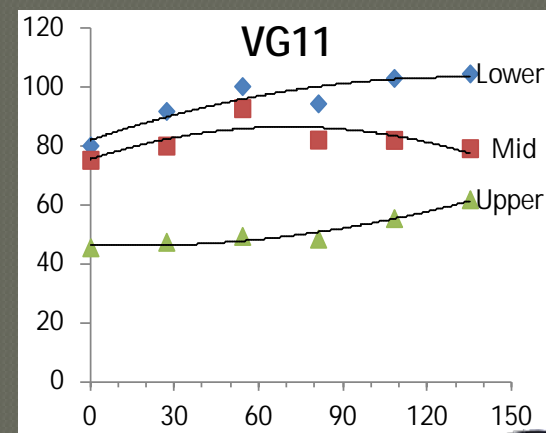
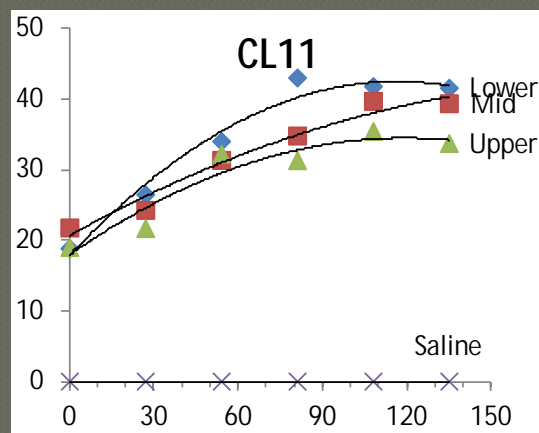
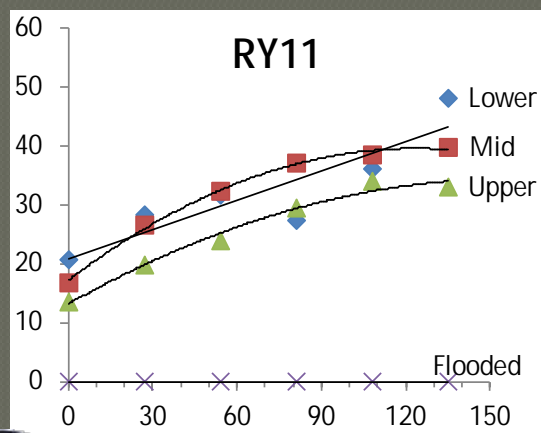
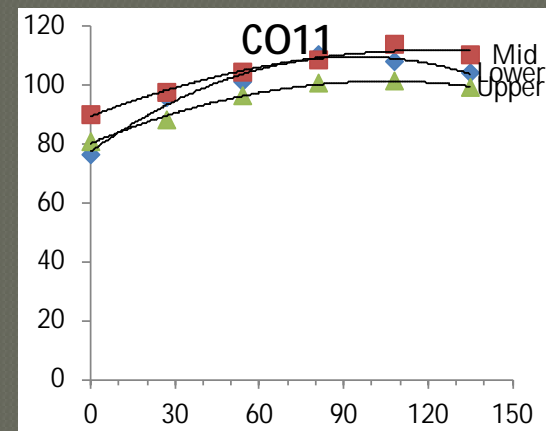
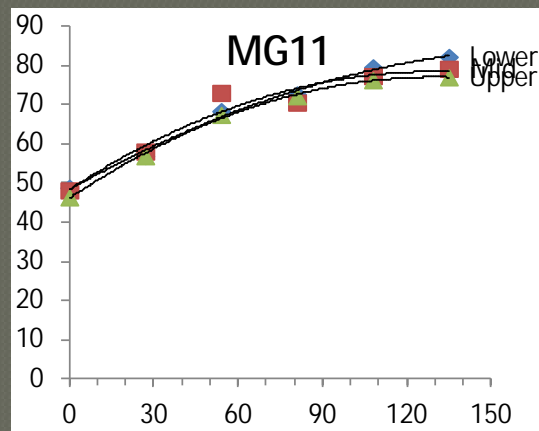
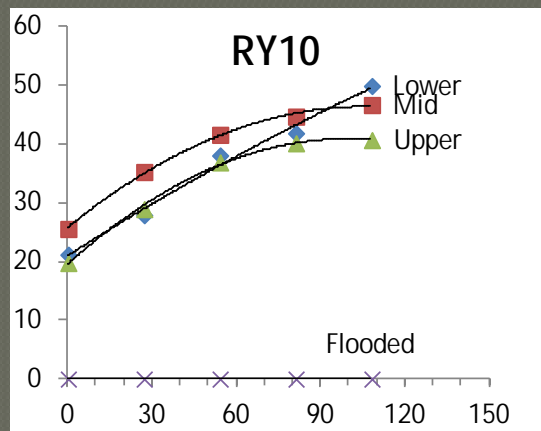


N Strip Trials (Kachanoski, 2008)

Field	Benefit (bu/ac)
Durum	19 ± 4
Mustard	17 ± 4
Malt barley	29 ± 8
Wheat	
- Saline/knoll	4 ± 3
- Rest of field	17 ± 5



AARD Trials, 2010 and 2011



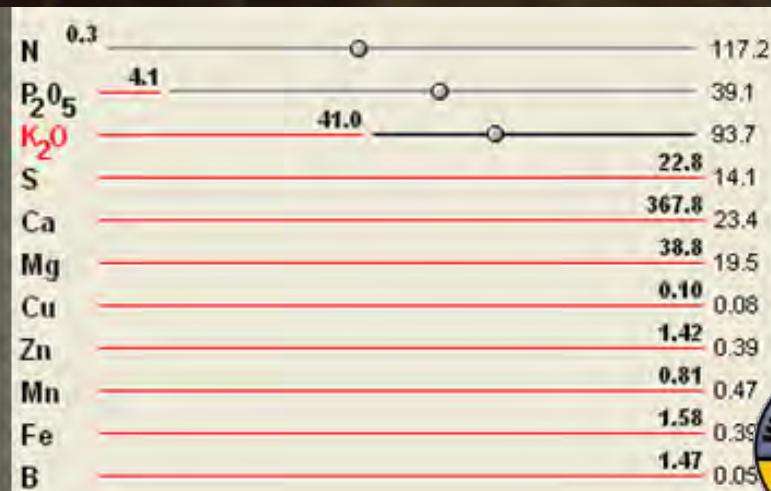
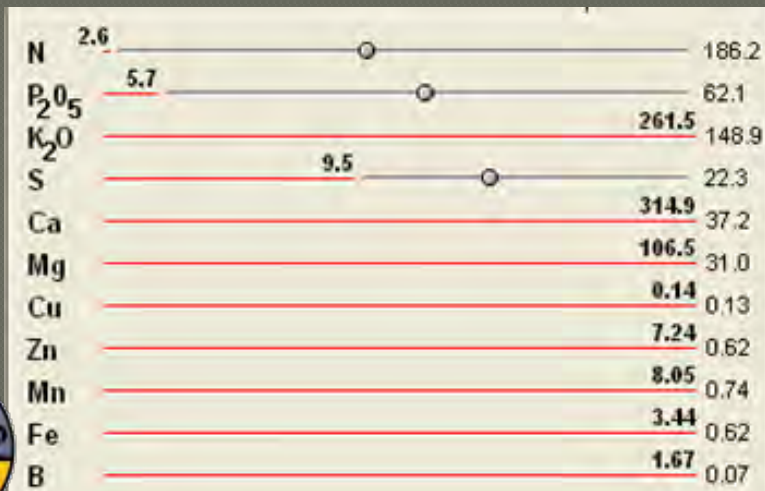
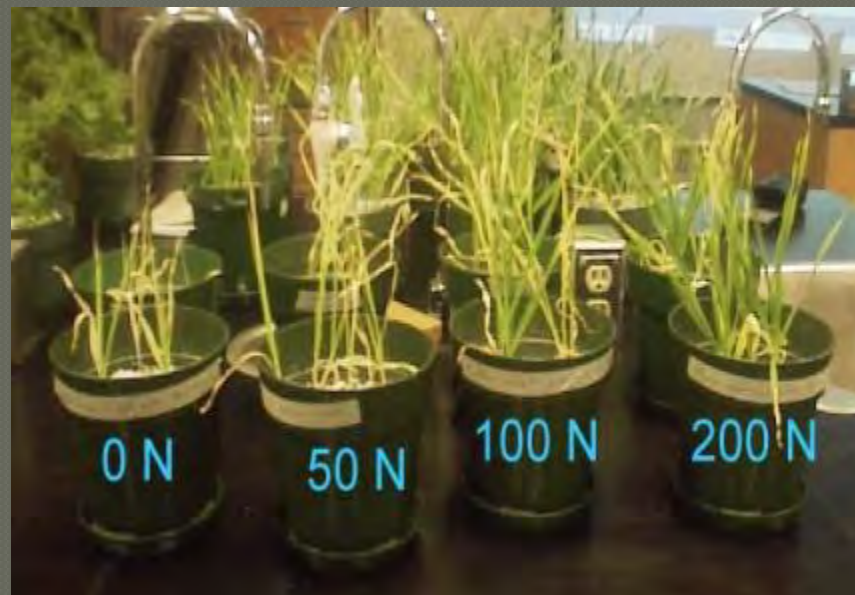
N Fertilizer Rate (kg N/ha)



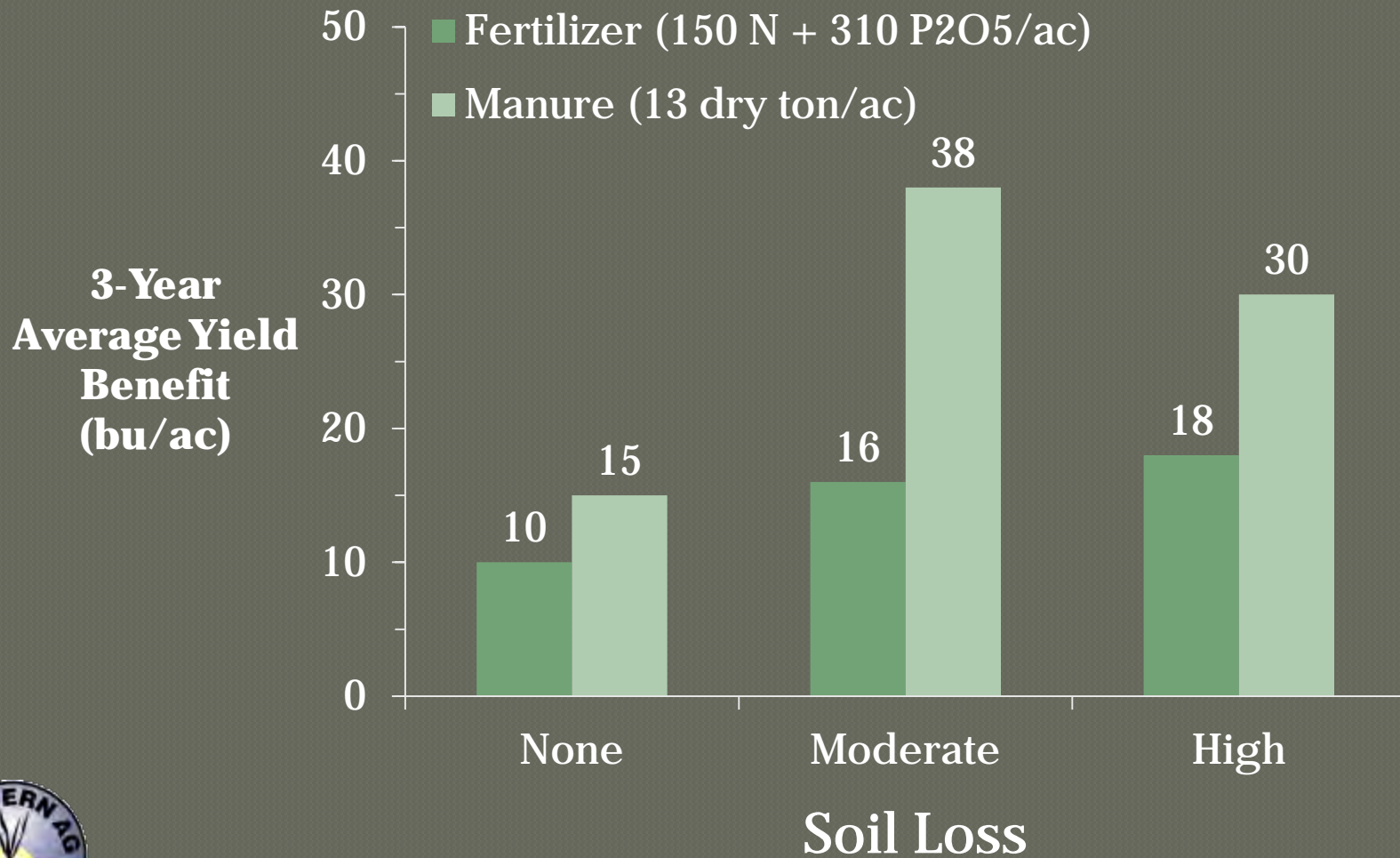
Greenhouse trial (U of S)

Depression

Knoll

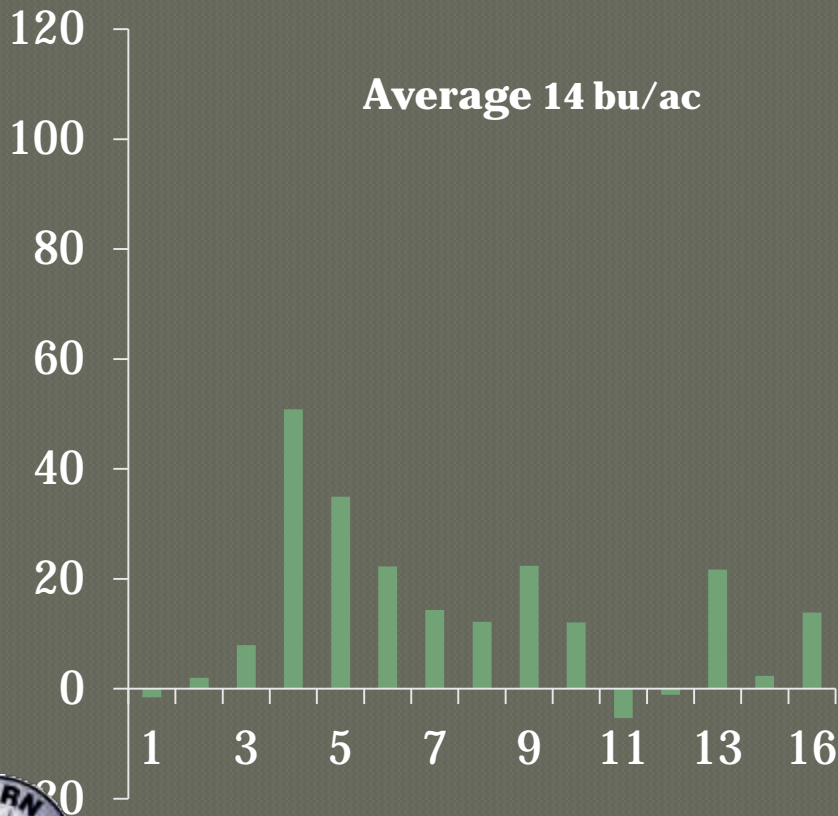


Yield Benefit under Variable Soil Loss (Dormaar et al. 1988)

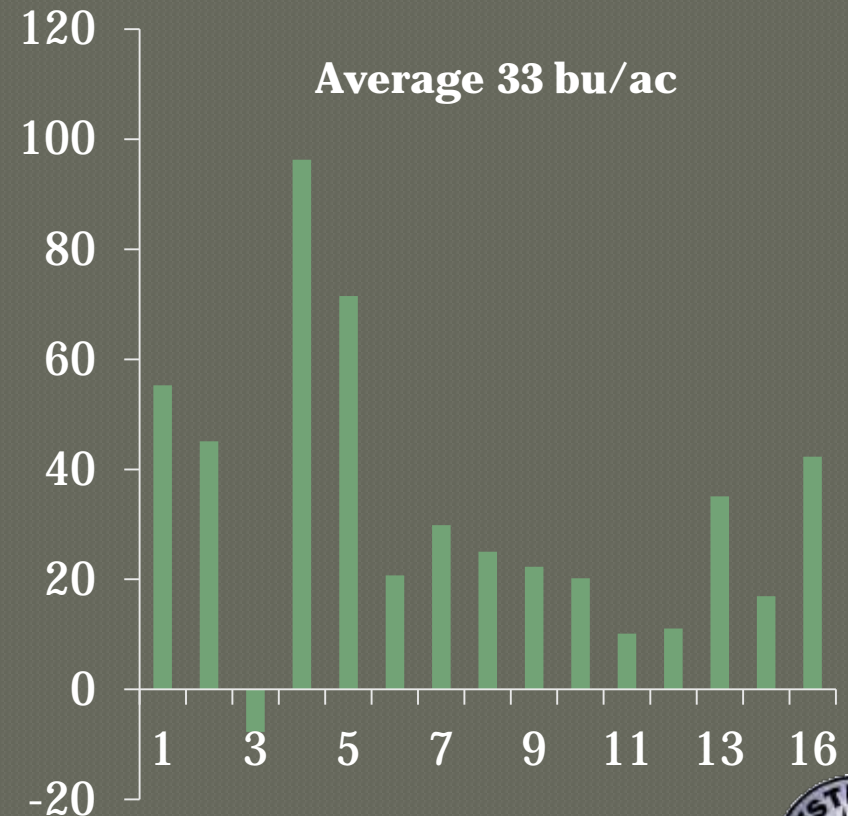


16-Year Yield Manure Benefit (Larney et al. 2009)

No loss of topsoil



Loss of 6" of topsoil



*33 ton manure (wet) / ac in year 0



Step 3: Make Predictions

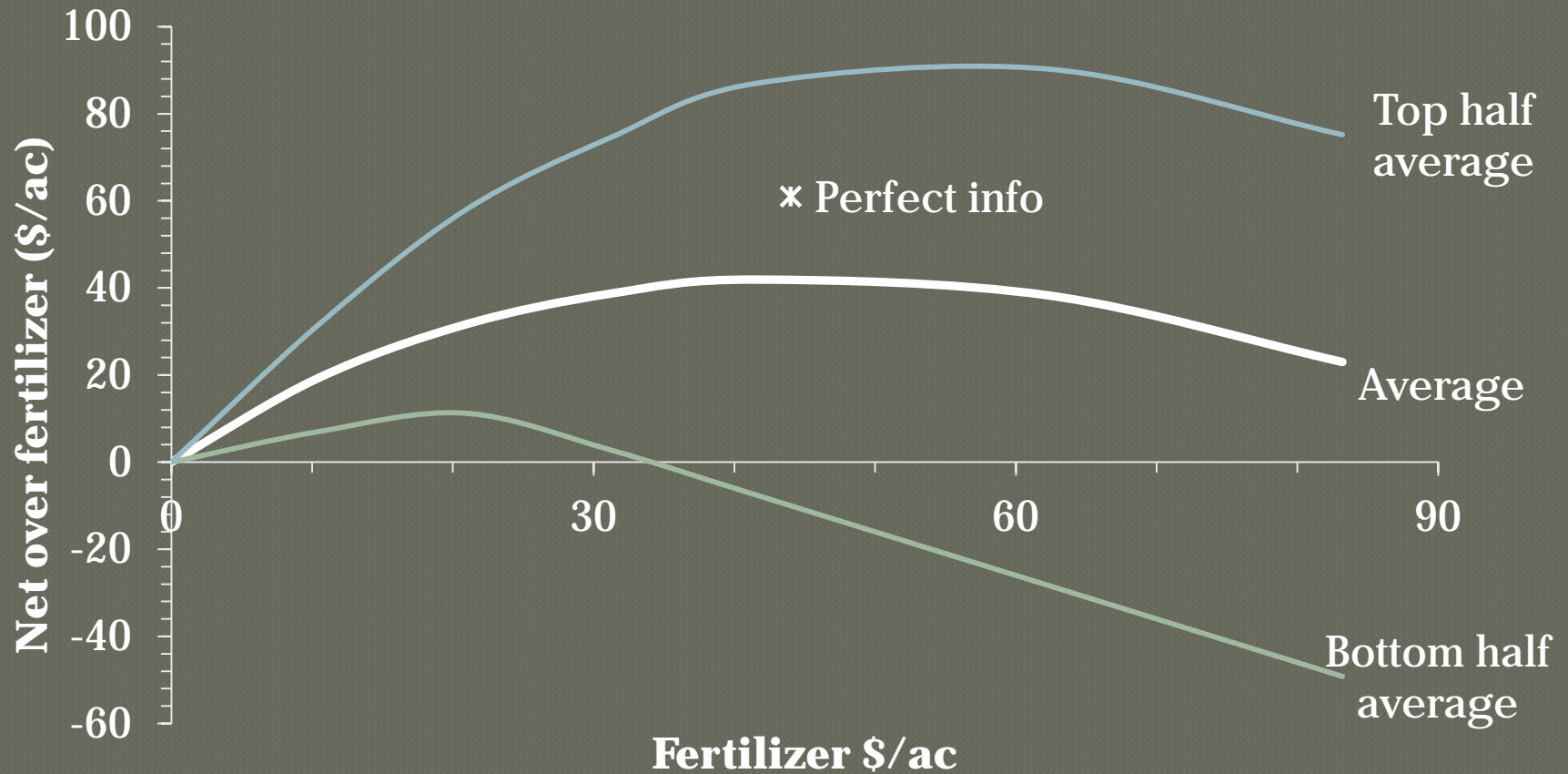
ž What-if scenarios

ž For example

- Average manure benefit of 30 bu/ac for 5 years
- 10 percent of field
- Manure cost \$60/ac
- Meet objectives?



Make Predictions



*Based on data from triticale experiments

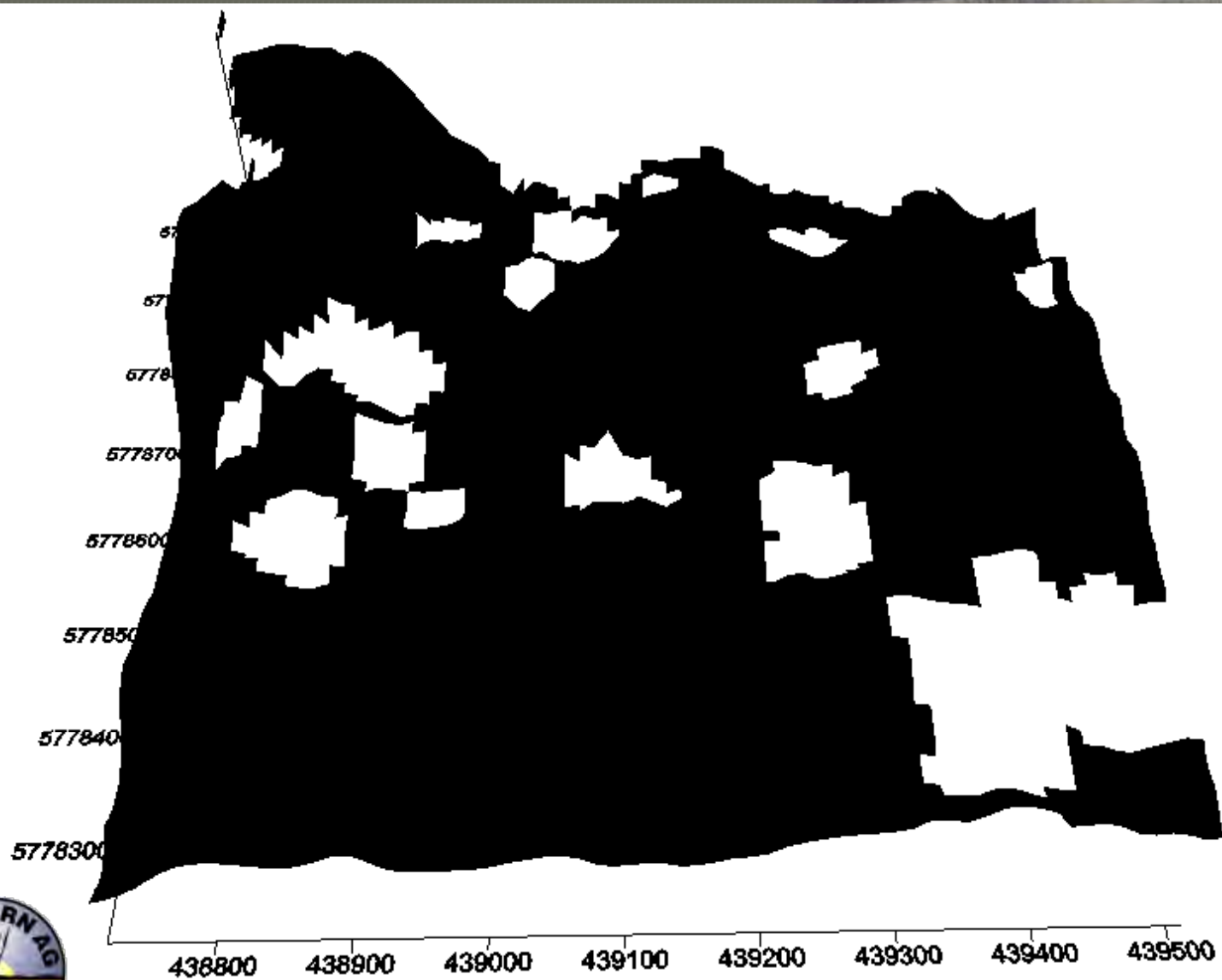


Step 4: Implement Best Option

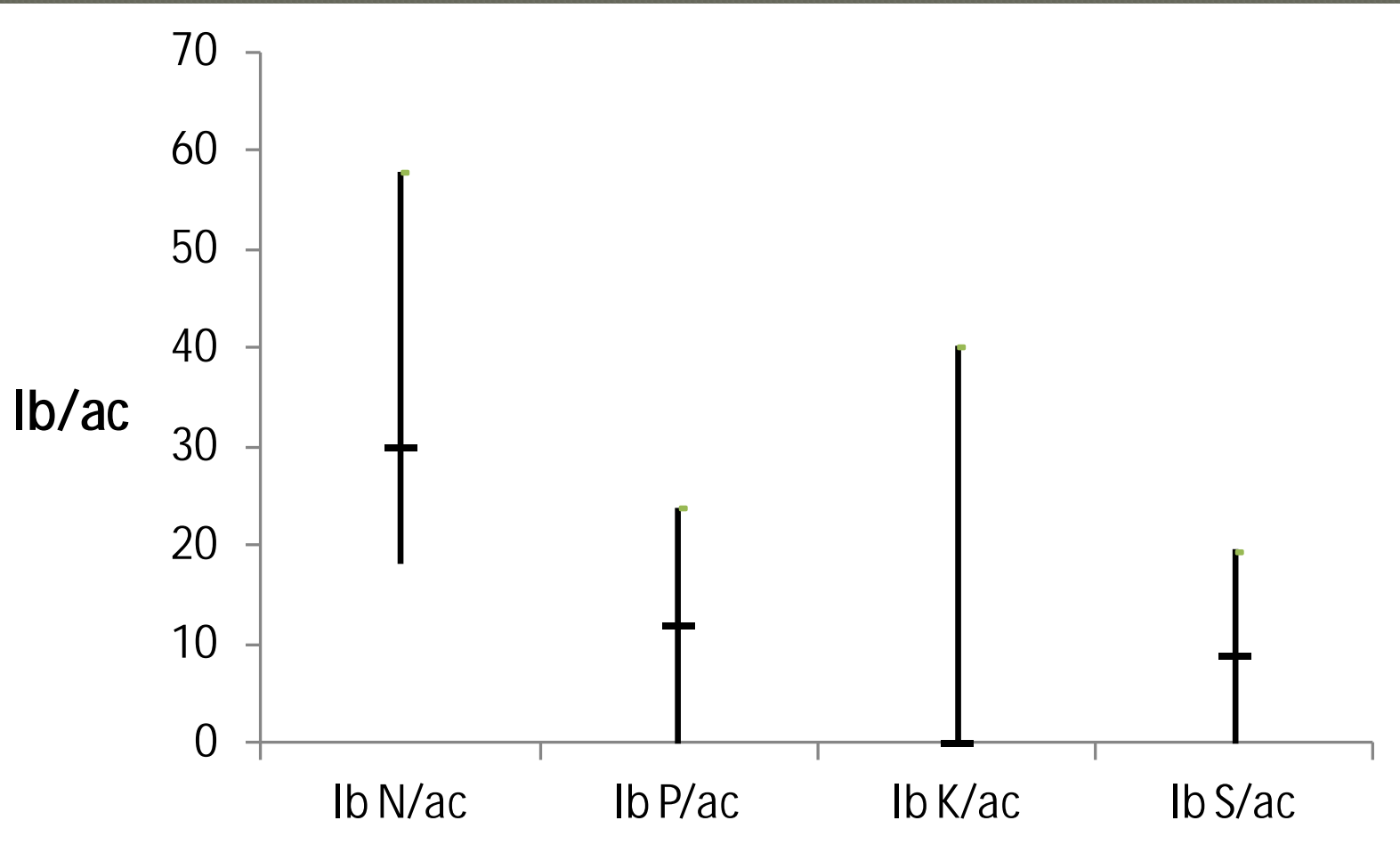
- ž Maximize expected net return
- ž Logistics...



St. Denis, 2004



Range in Optimum Fertilizer Rates at St. Denis, SK



Logistical Optimization



Computer optimization of two blends

31 – 13 – 0 – 10

12 – 5 – 38 – 4



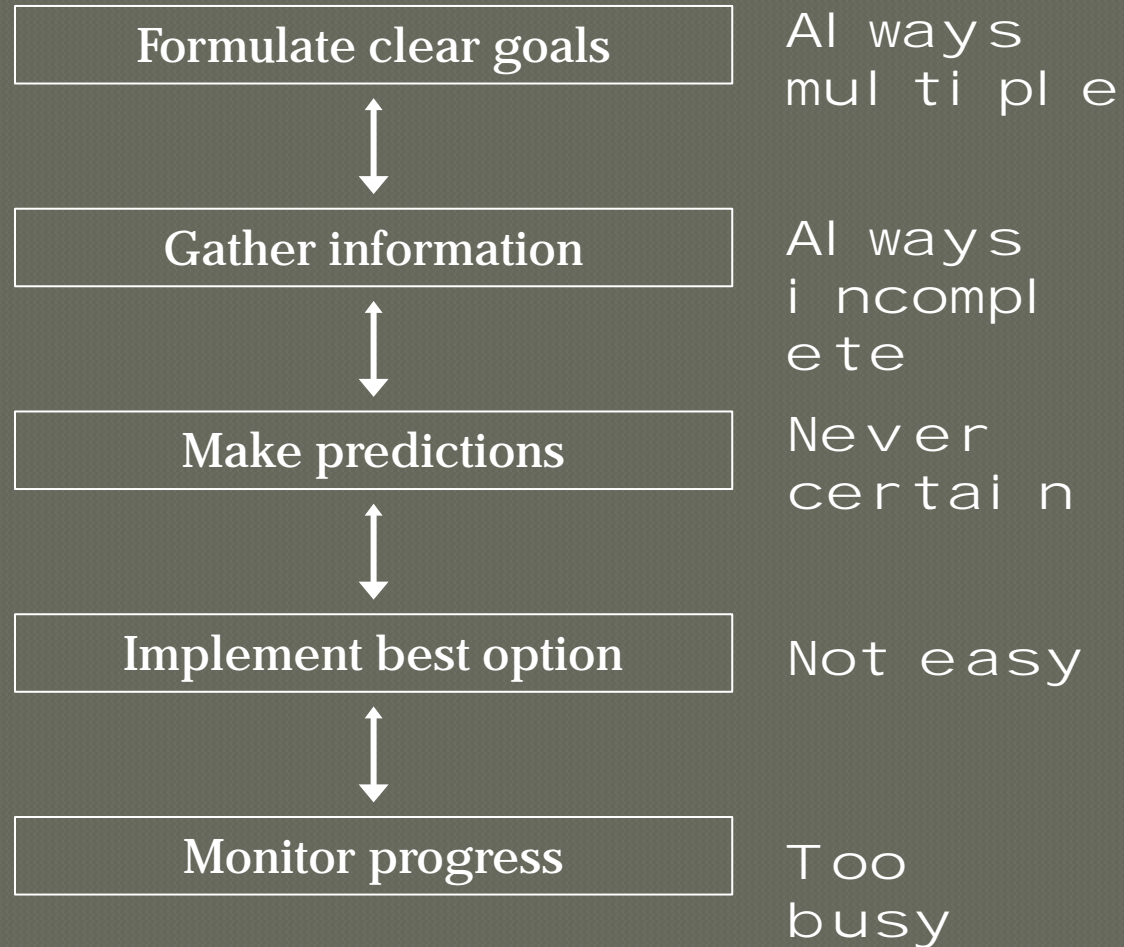
Step 5: Monitor Progress



**Keep it simple
Repeat until
confident**



How To Succeed



Questions?

Acknowledgement and thanks to:

- ž Ross McKenzie, Doon Pauly and their excellent crew with AARD, Lethbridge
- ž Gary Kachanoski, U of A, now at Memorial University
- ž Edgar Hammermeister and Ken Greer, Western Ag Innovations
- ž Farmers and agronomists who question and try things out

