Soil N Mineralization Potential on Irrigated Fields

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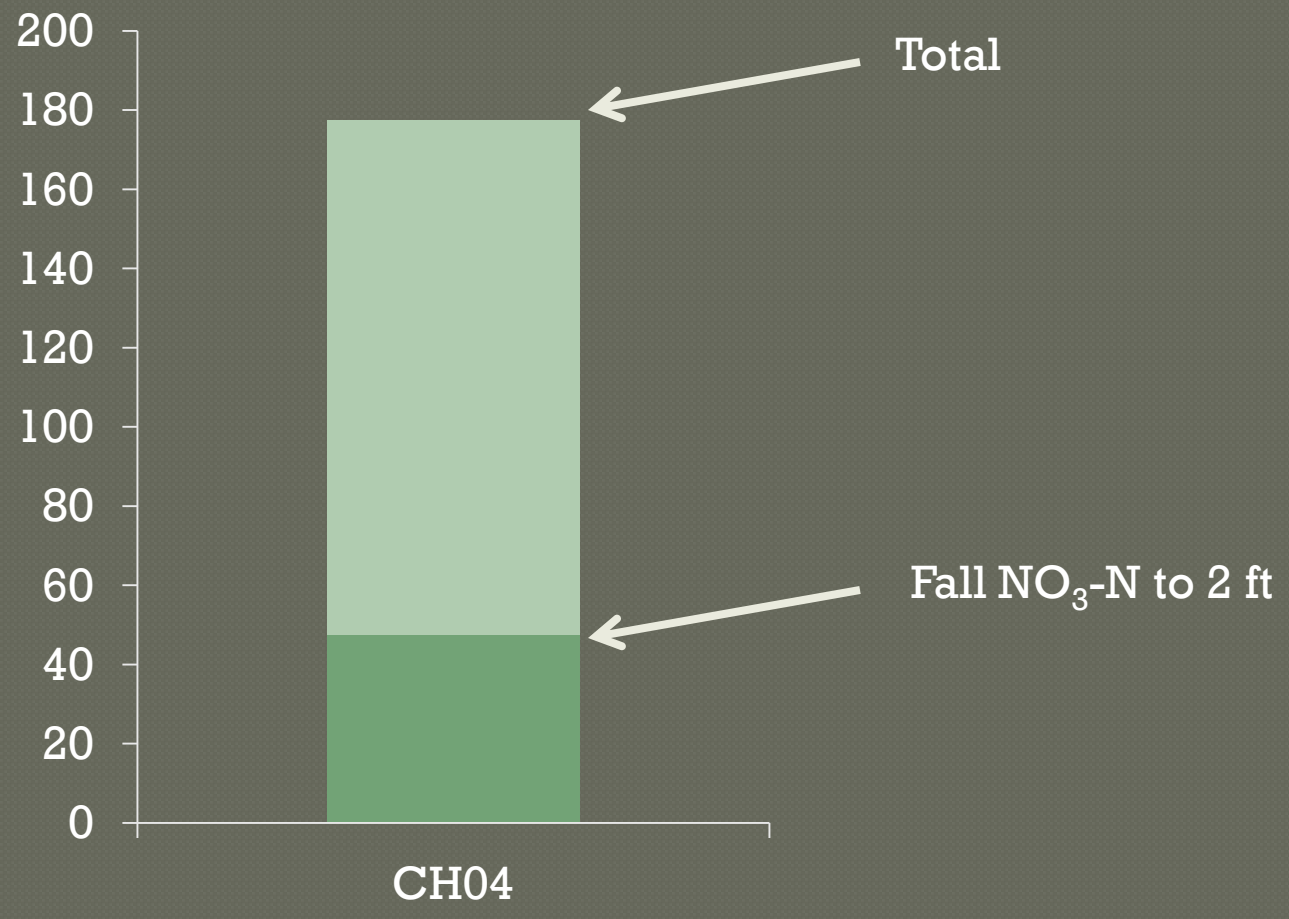
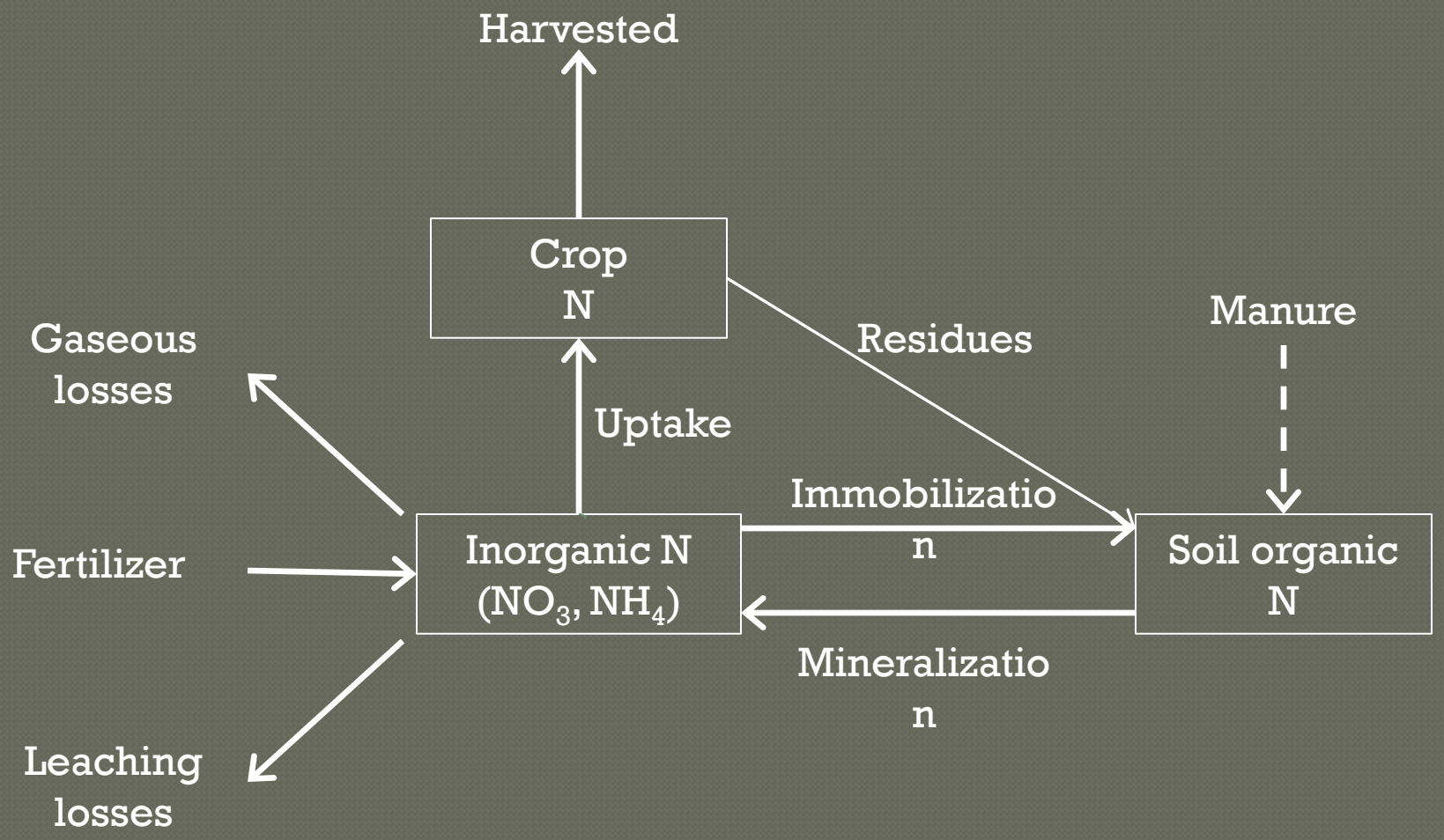
Western Ag Innovations

How Much N Can Irrigated Soils Supply in Southern Alberta?

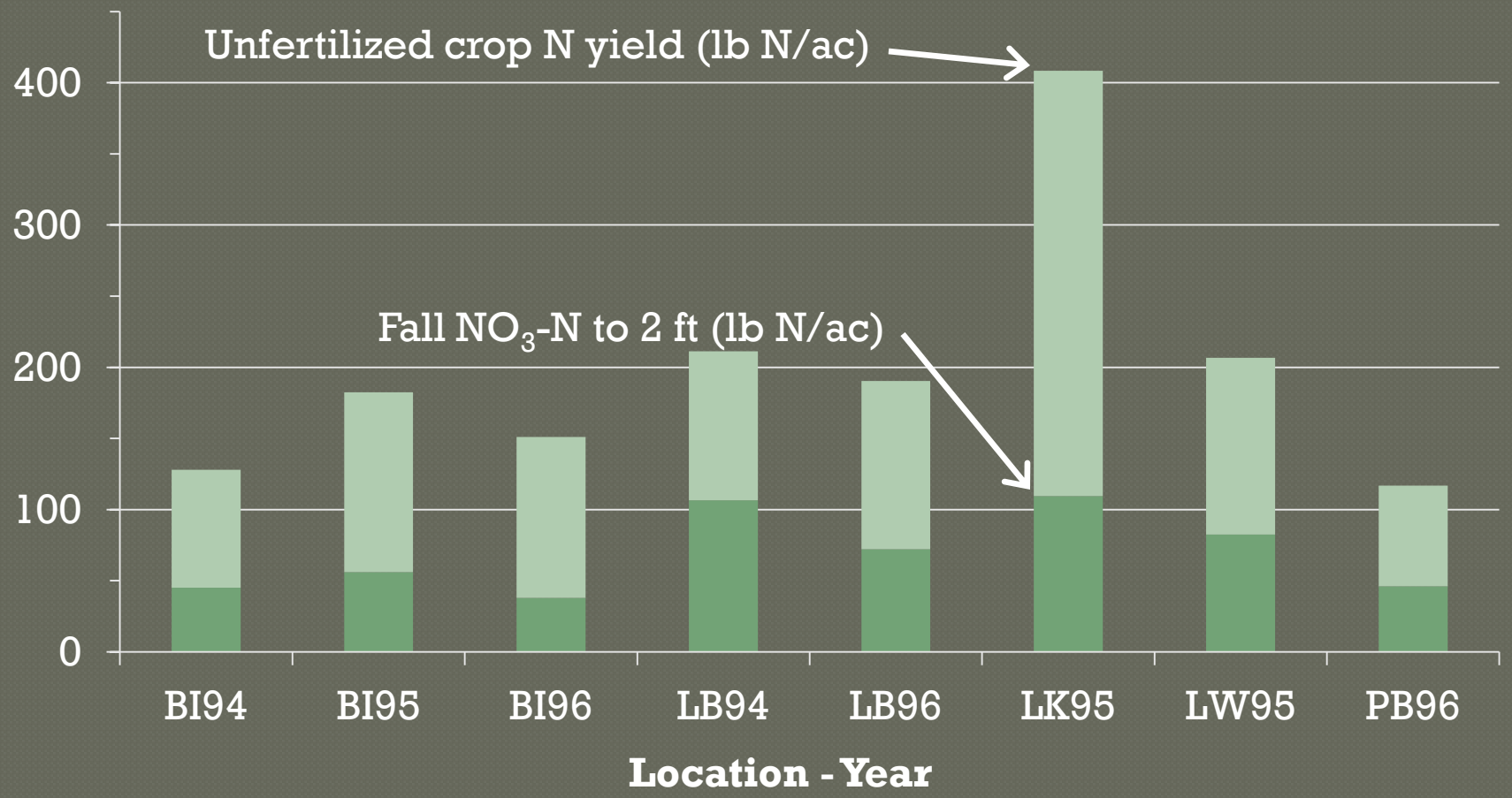
Unfertilized crop N yield (lb N/ac)



Simple N Budget

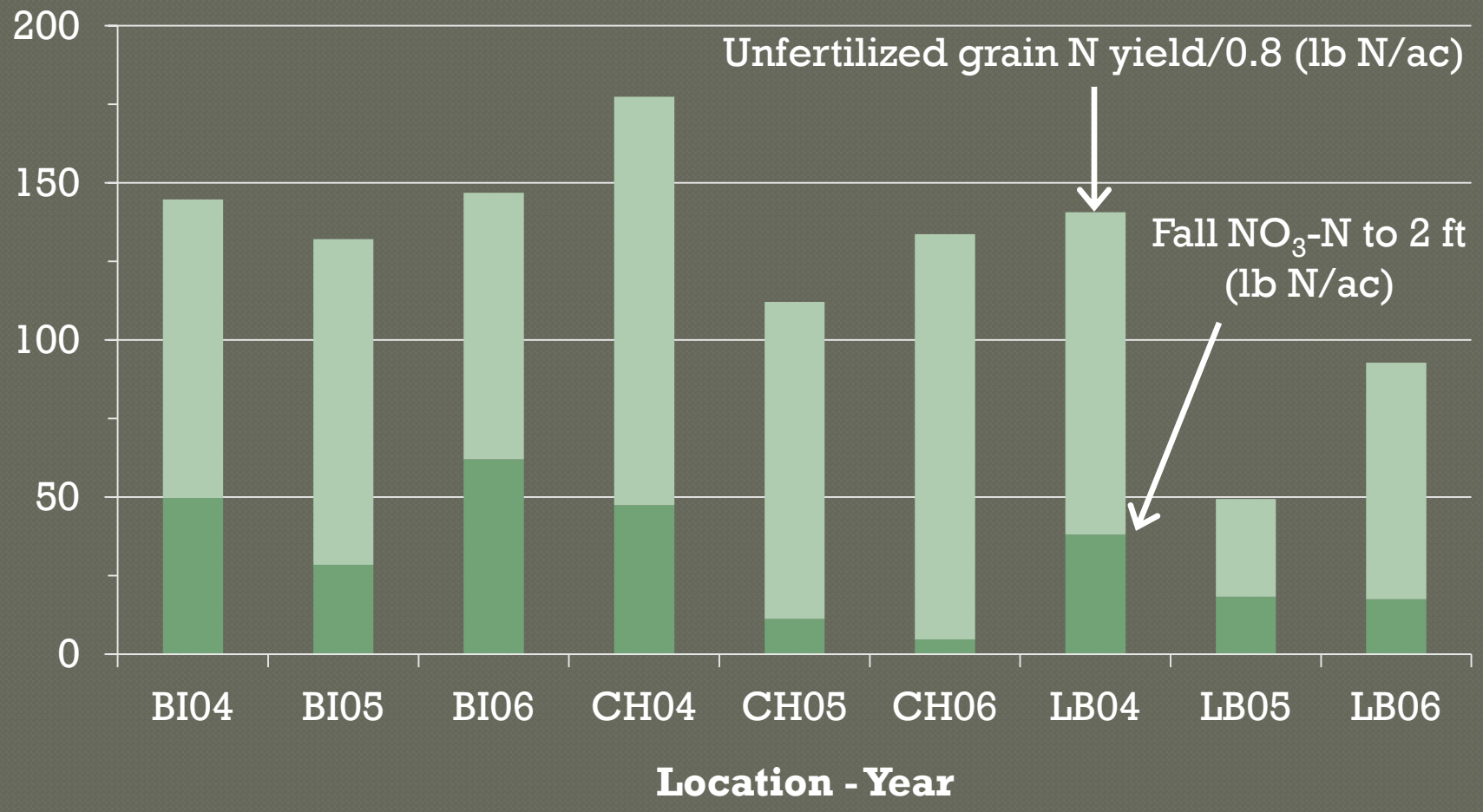


Barley Silage (1994-1996)



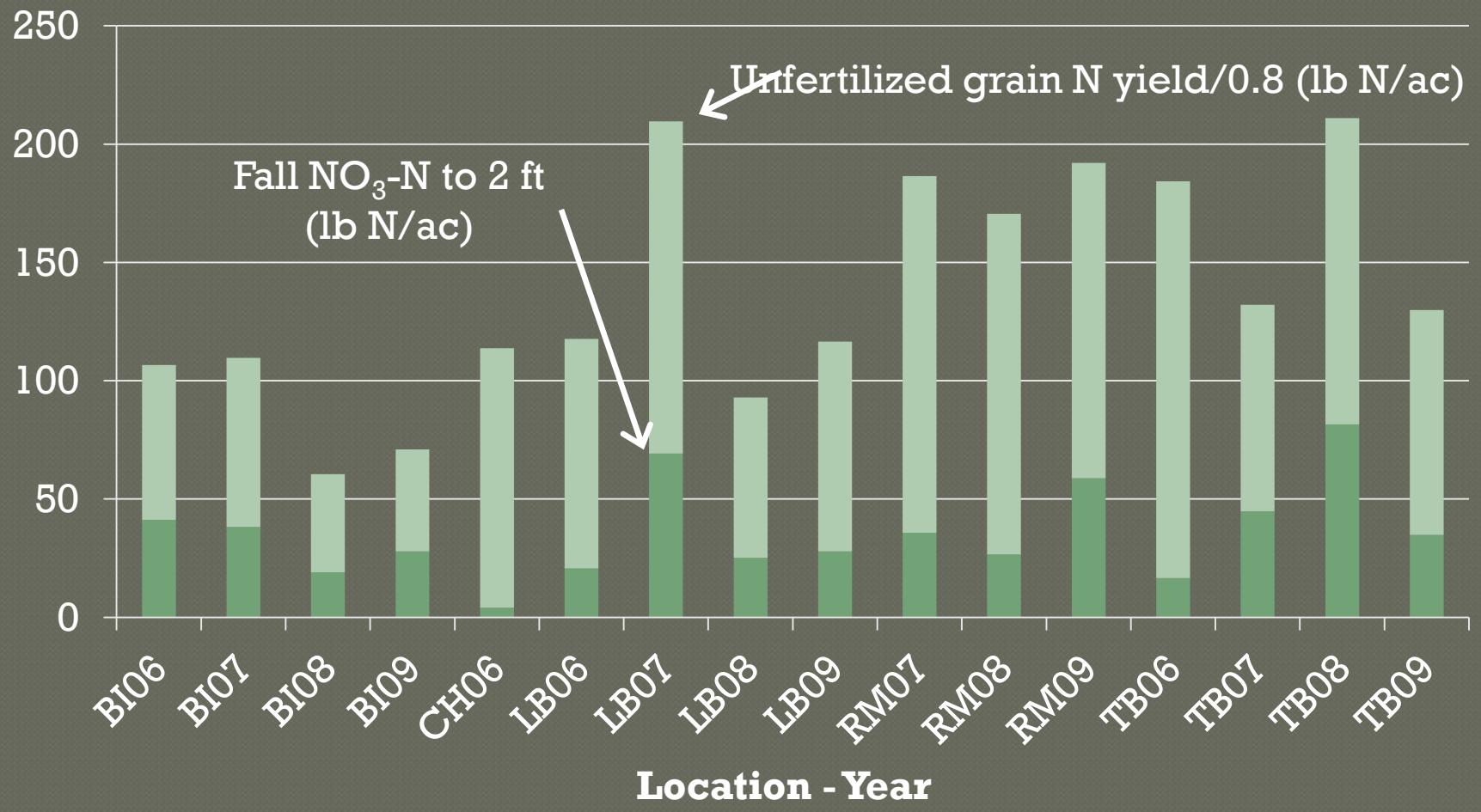
McKenzie et al. 2004, CJSS 84:133-147

Soft White Spring Wheat (2004-06)



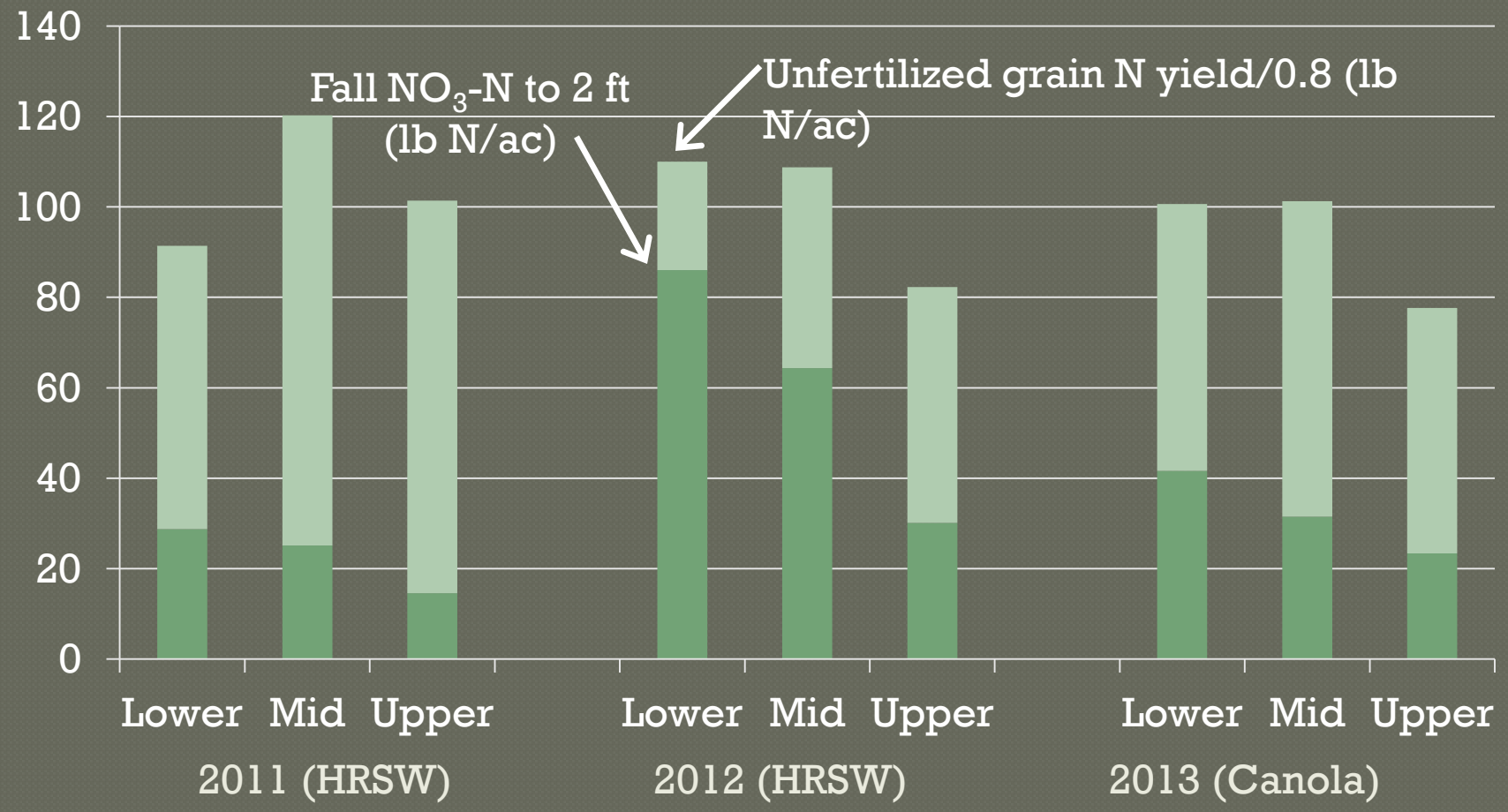
McKenzie et al. 2008, CJPS 88:291-298

Irrigated Cereal Crops (2006-09)



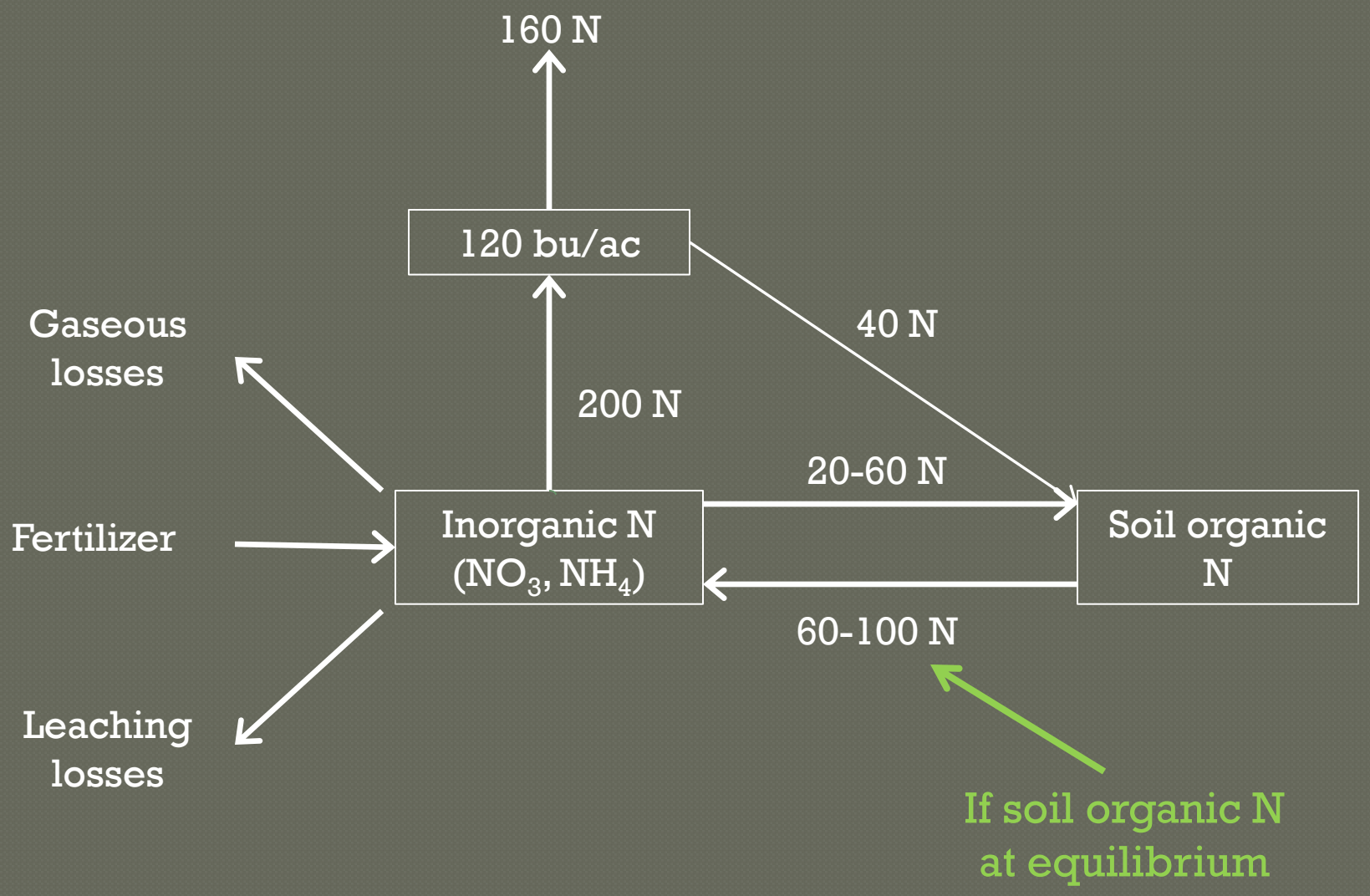
ARD, 2006 to 2009

Field Variability (2011-13)

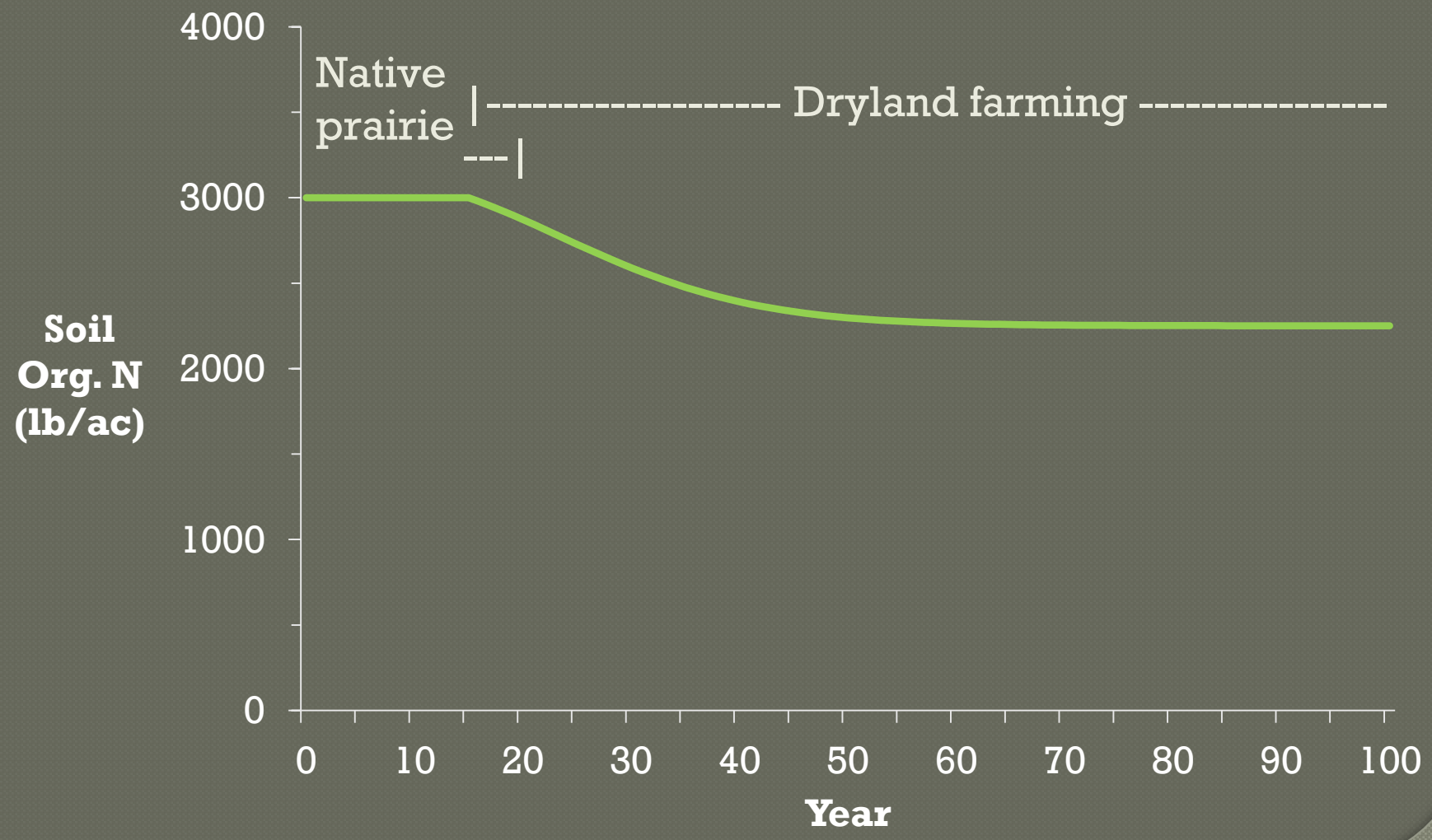


ARD, 2011 to 2013

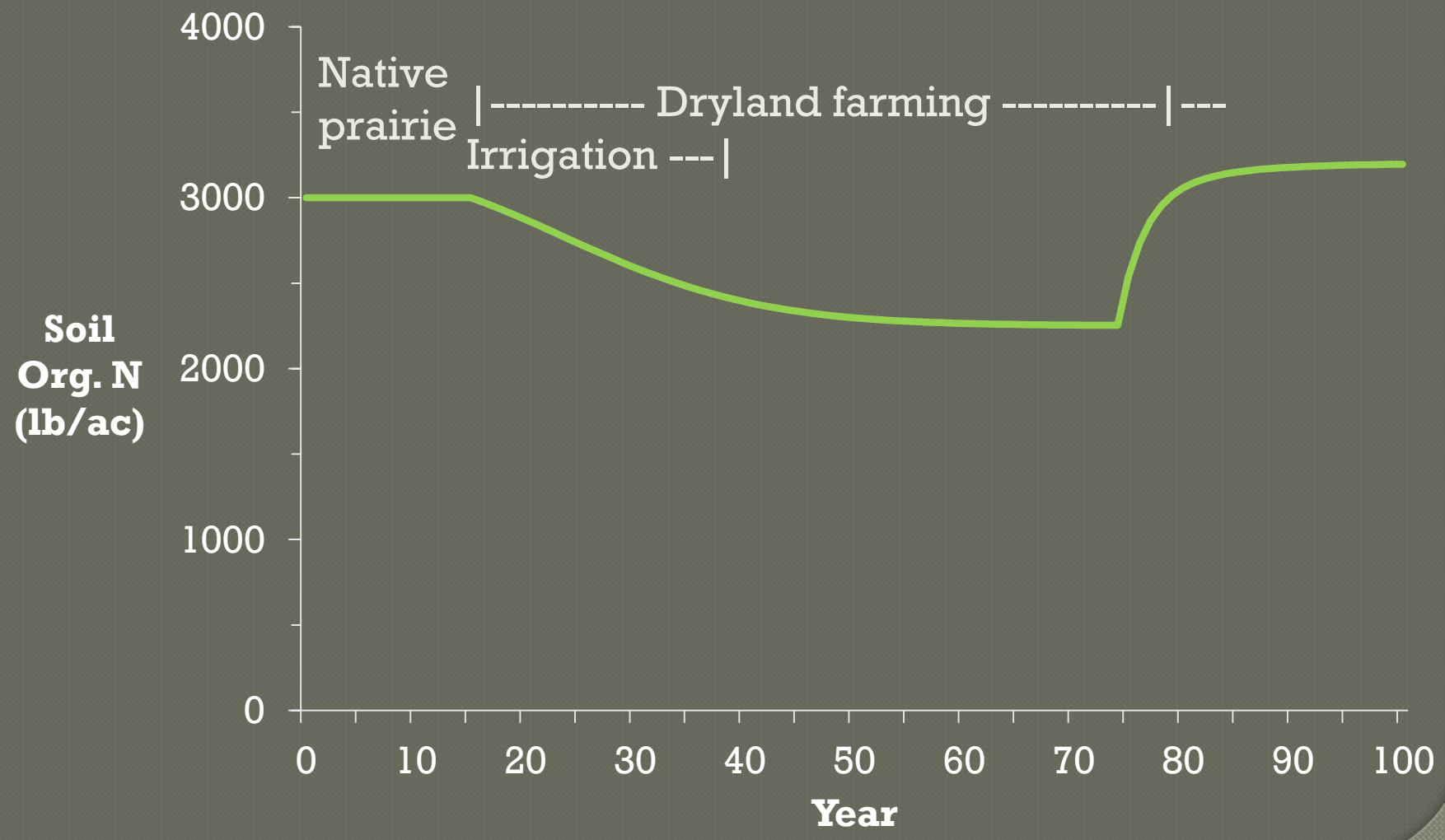
Irrigated Cereal Fields - N Budget



Soil Organic N – Pre-irrigation



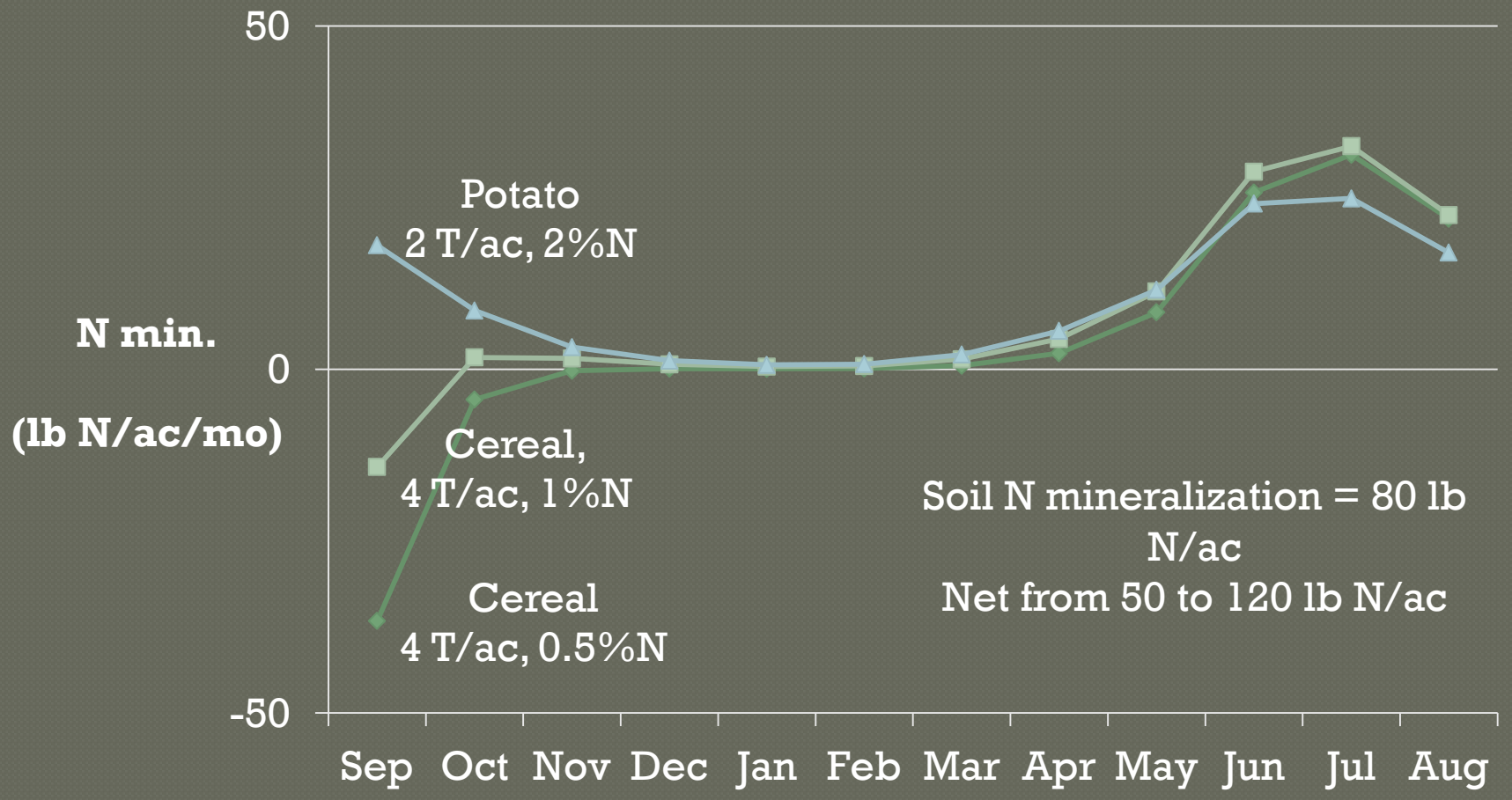
Soil Organic N – Irrigated



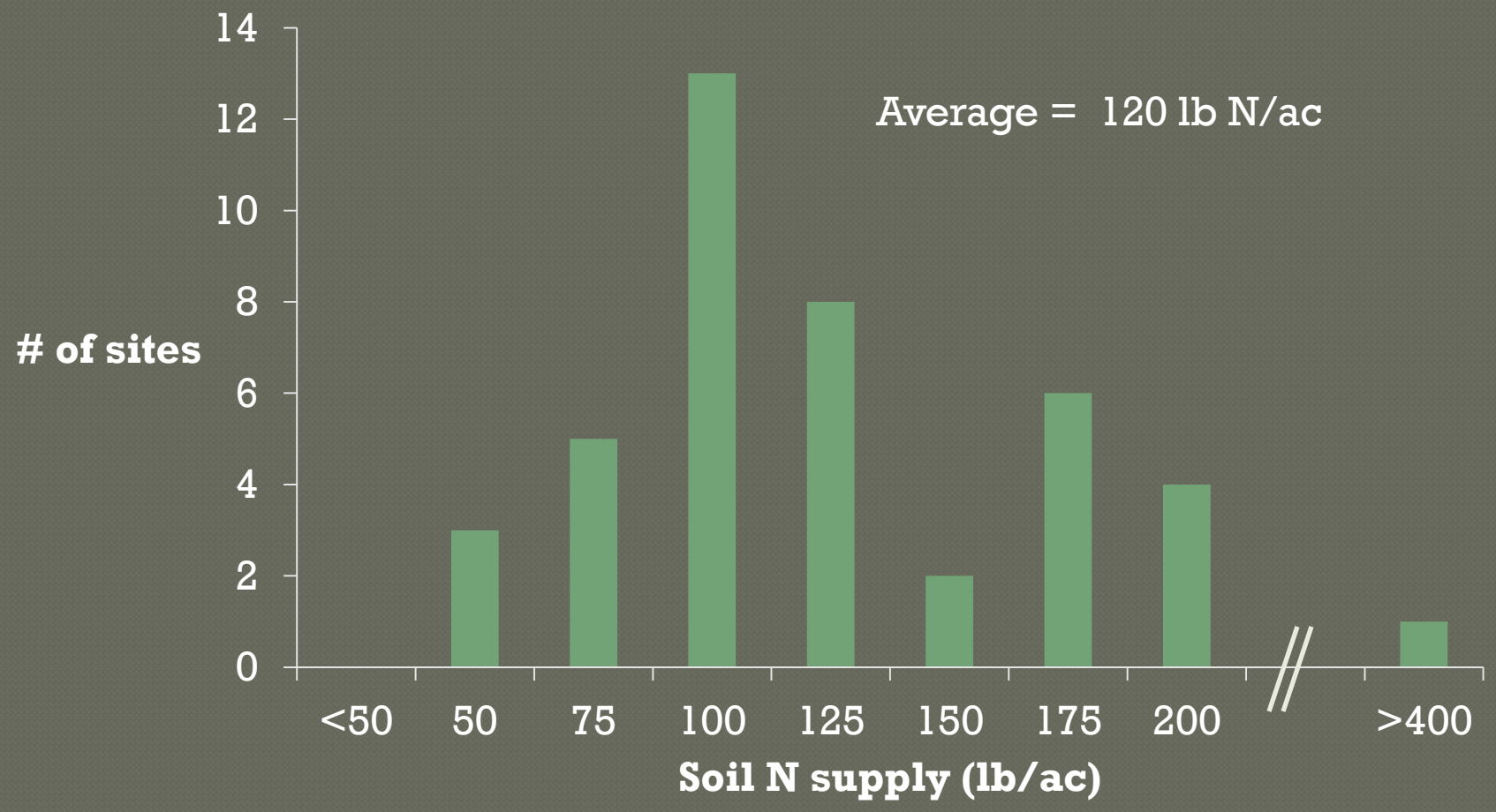
Long-term Factors

- Irrigation
- Forages
- Residue Management
- Manure
- Topography

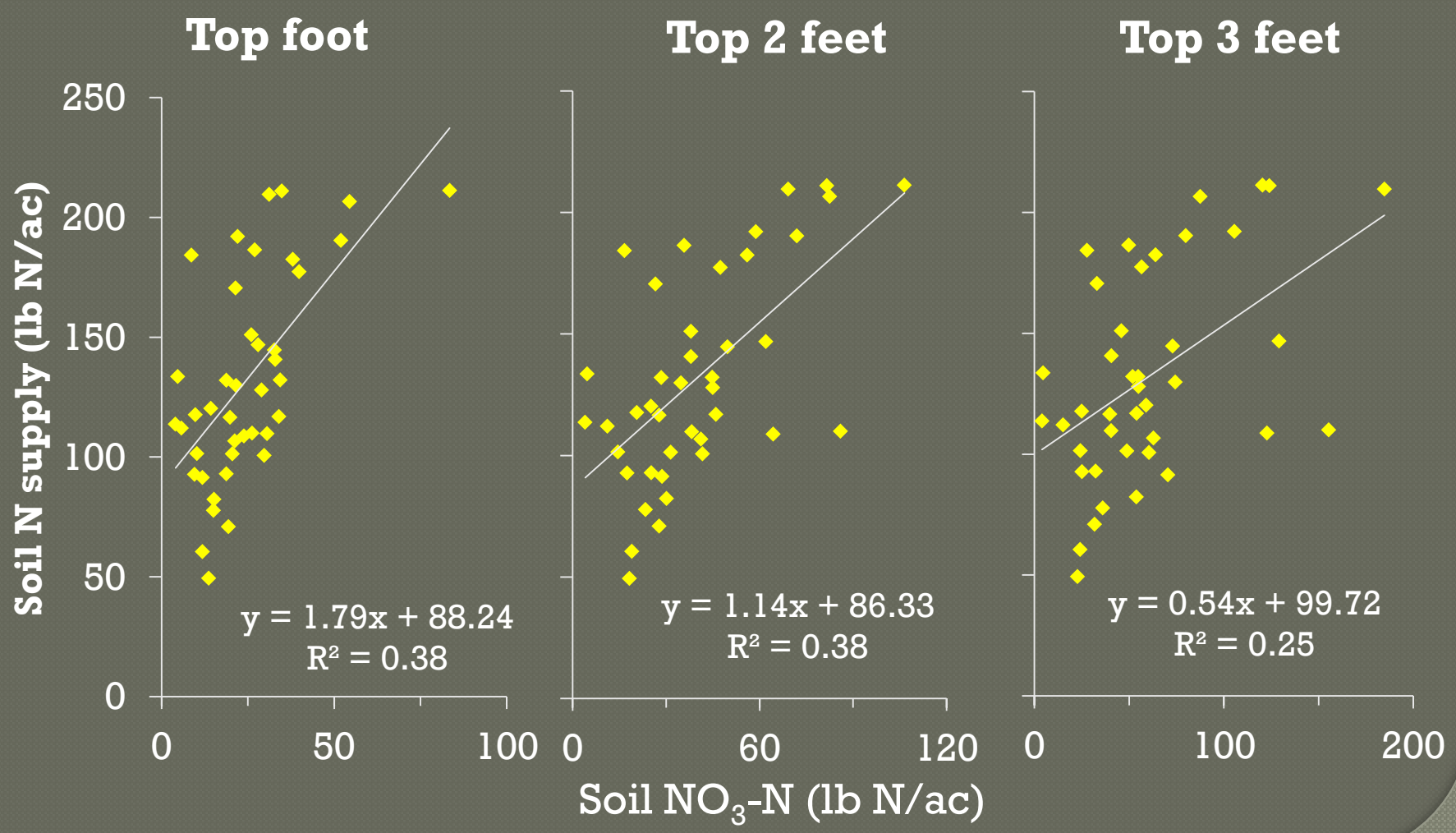
Short-term Factors



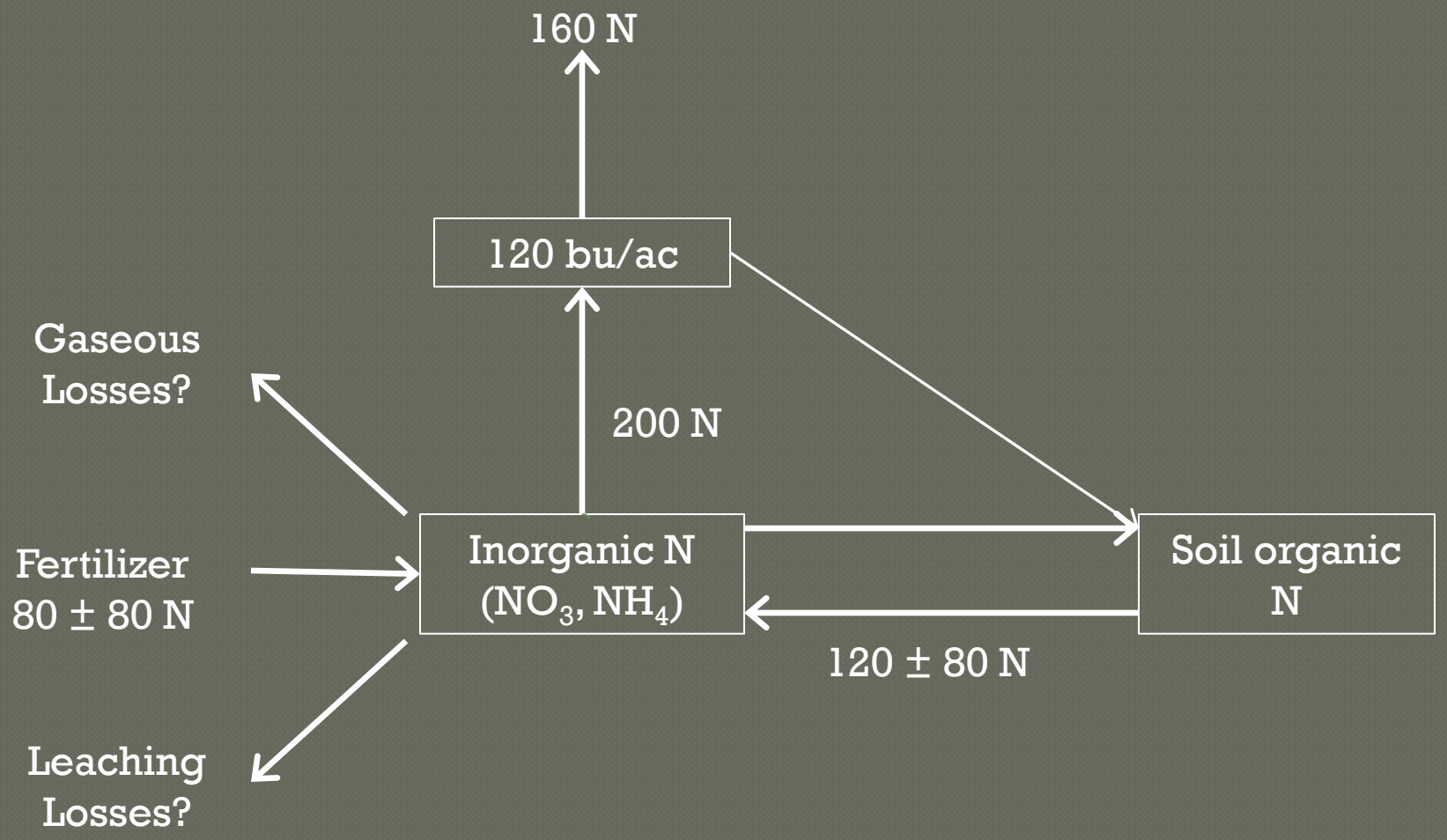
Soil N Supply



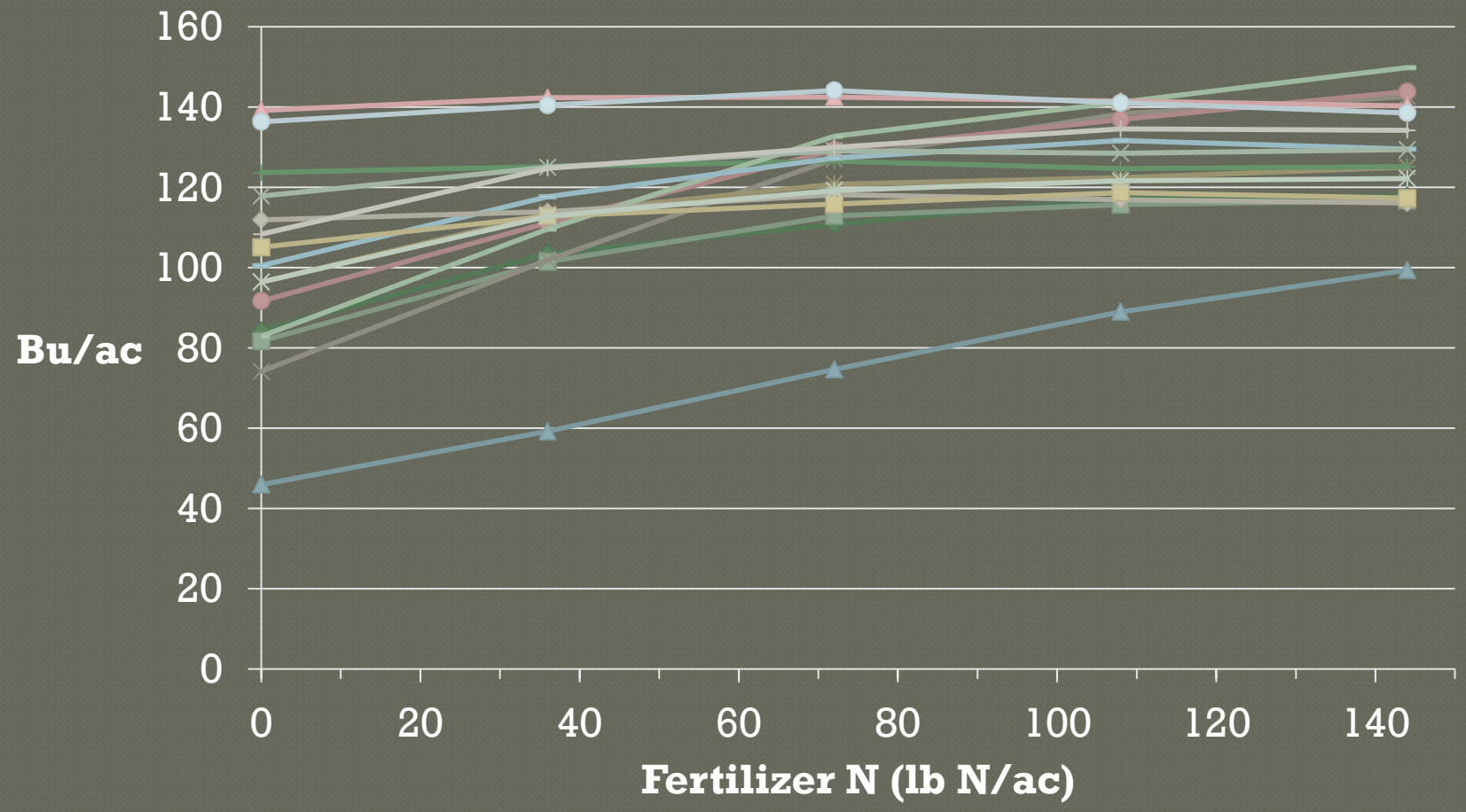
Relation to Soil NO_3-N



Irrigated Cereal Fields - N Budget



Irrigated Cereal Crops (2006-09) Fertilizer Response



Conclusions

- Irrigated fields in southern Alberta supplied 50 to 200 lb N/ac to cereal crops
- Depends on:
  - Long-term history
  - Previous crop
  - Manure application
- Potential for loss

Accounting for N Mineralization

- Adjust based on field history
- Zero N test plots
- In-season monitoring
  - Early June soil sampling
  - (*In situ* PRS probes)
  - (Vegetation)
- (Lab tests)