

A photograph of a sunflower field. The sunflowers are in full bloom, with bright yellow petals and dark brown centers. The leaves are large and green. The sky is a clear, light blue. The text is overlaid on the top half of the image.

Fertility Management of Irrigated Sunflowers

**Joel P. Schneekloth
Regional Water Resource Specialist
Colorado State University**

Fertility Management???

- **Majority of work on rainfed sunflowers**
 - Limited yield potential as compared to irrigated
 - Potential for more residual Nitrogen
- **How does water management impact N use**
 - Limited water
 - encourage root growth
 - Limit deep percolation of N

Future Prices of Fertilizer?????



Fertility Management

A photograph of a sunflower field under a clear blue sky. The sunflowers are in various stages of bloom, with bright yellow petals and dark brown centers. The leaves are large and green. The image is used as a background for the slide.

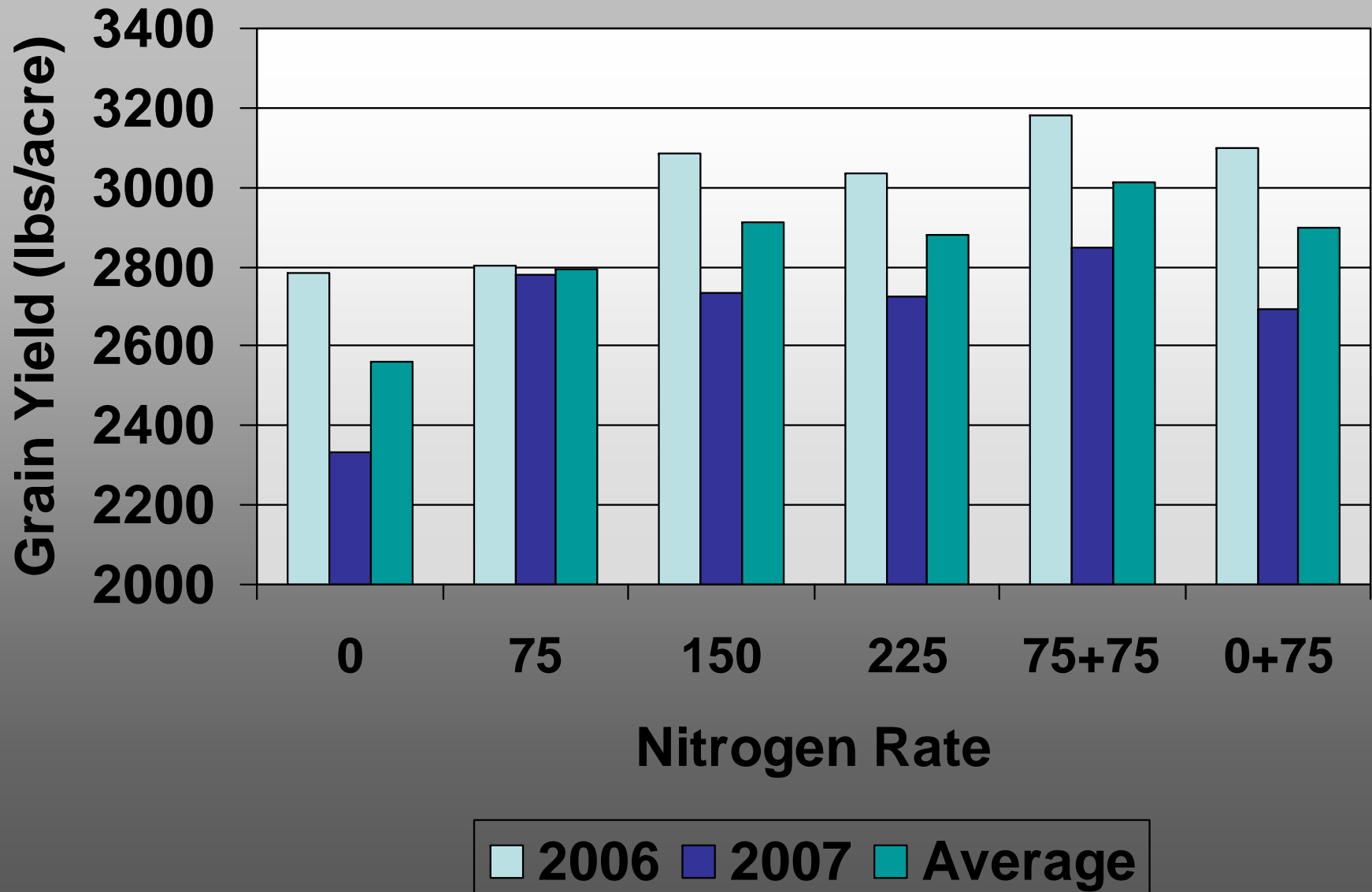
- **Project initiated at Burlington, CO**
 - Part of large scale demonstration for water conservation
- **Irrigation management**
 - Full irrigation – as needed
 - Allocation – 5 inches maximum
- **Fertilizer Management**
 - Pre-plant
 - Combination of pre-plant and fertigation

Fertility Management

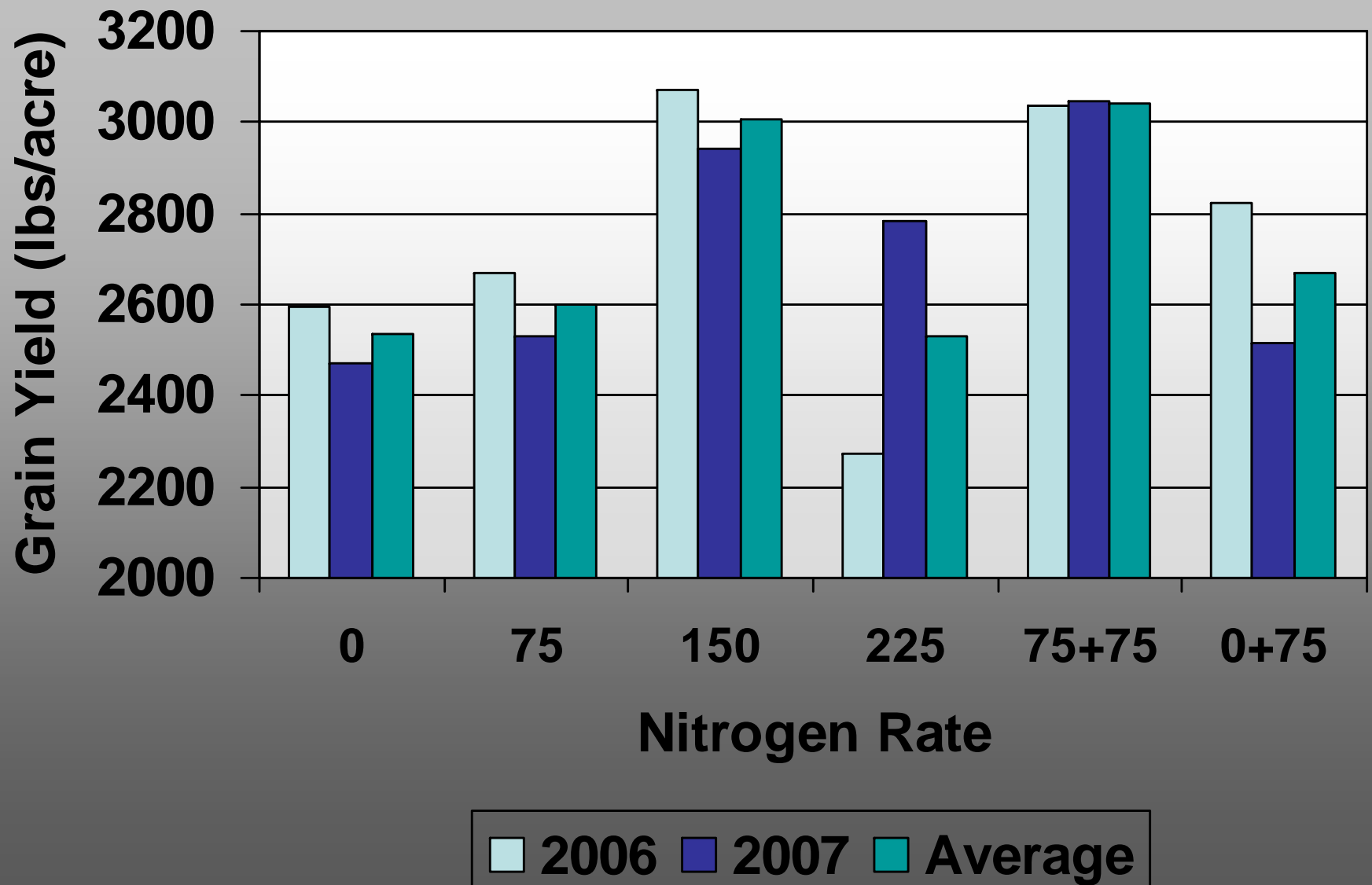
A photograph of a sunflower field under a clear blue sky. The sunflowers are in various stages of bloom, with some fully open and others just starting. The leaves are large and green.

- **Measurements**
 - Grain Yield
 - Soil Nitrogen
 - Chlorophyll Readings (SPAD)
 - Hand measurement
 - Relative greenness of crop
 - Indication of nitrogen stress
 - Used in corn production
- **Economics**

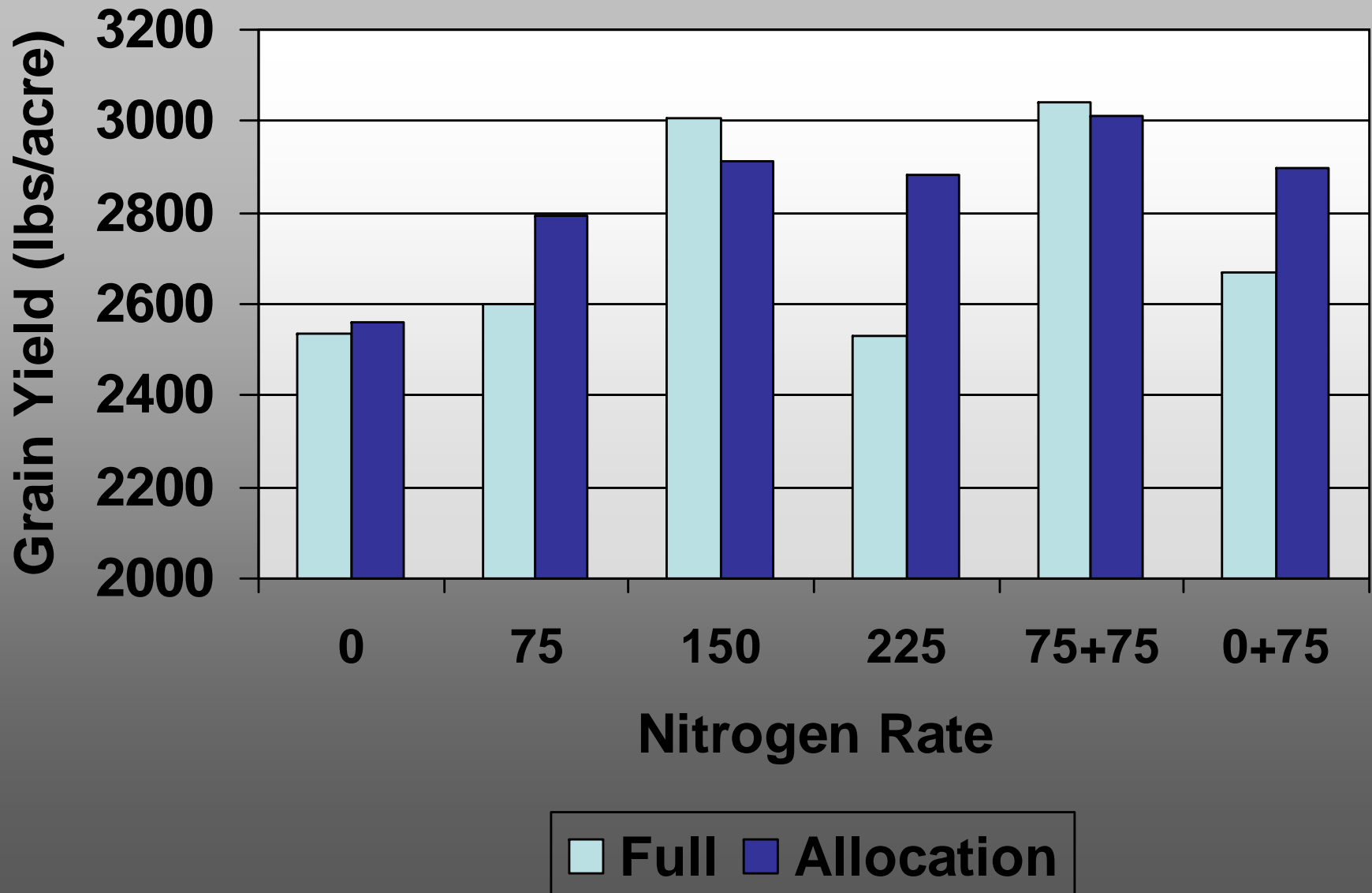
Grain Yields - Allocation



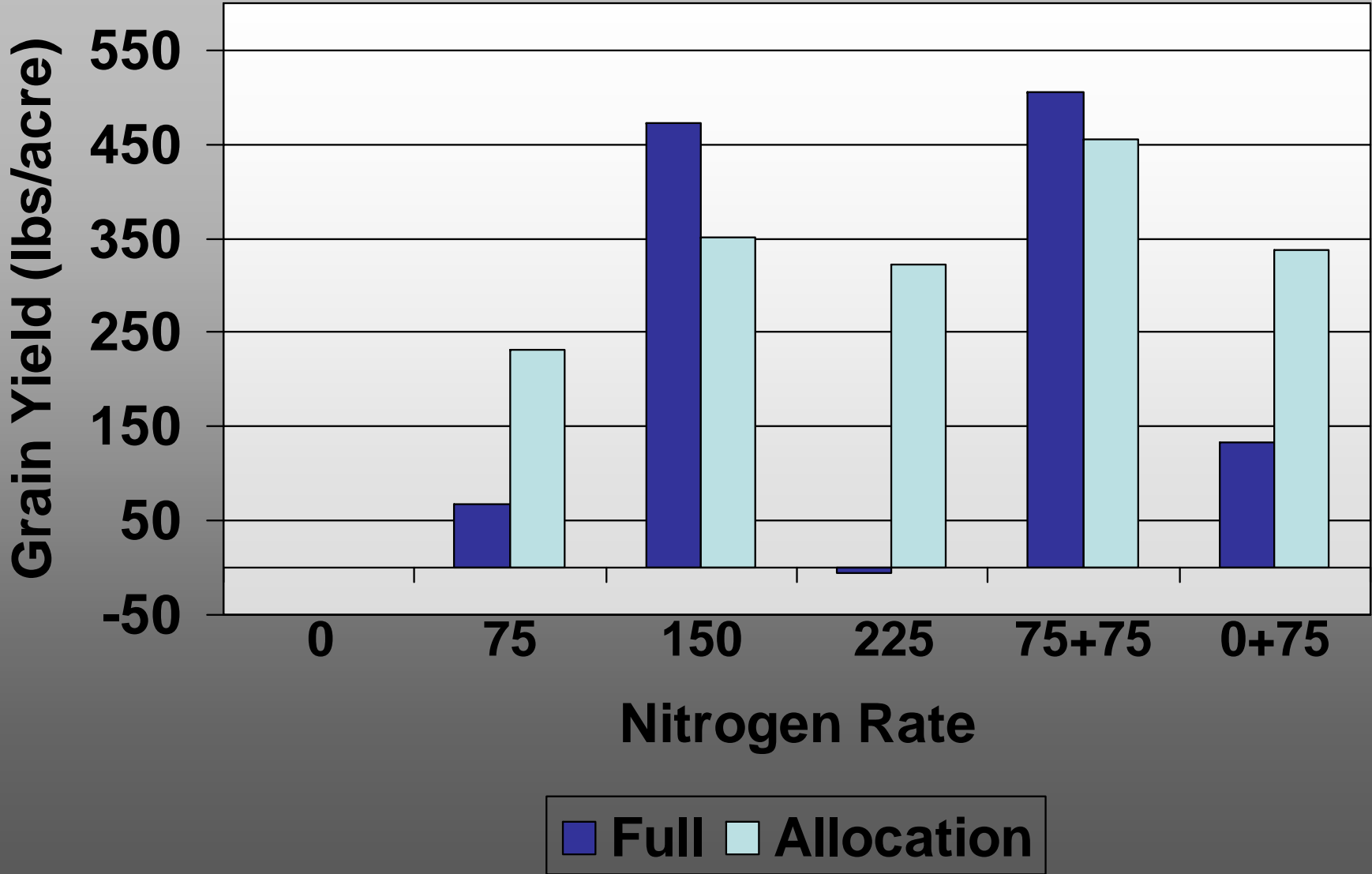
Grain Yields – Full Irrigation



Grain Yields

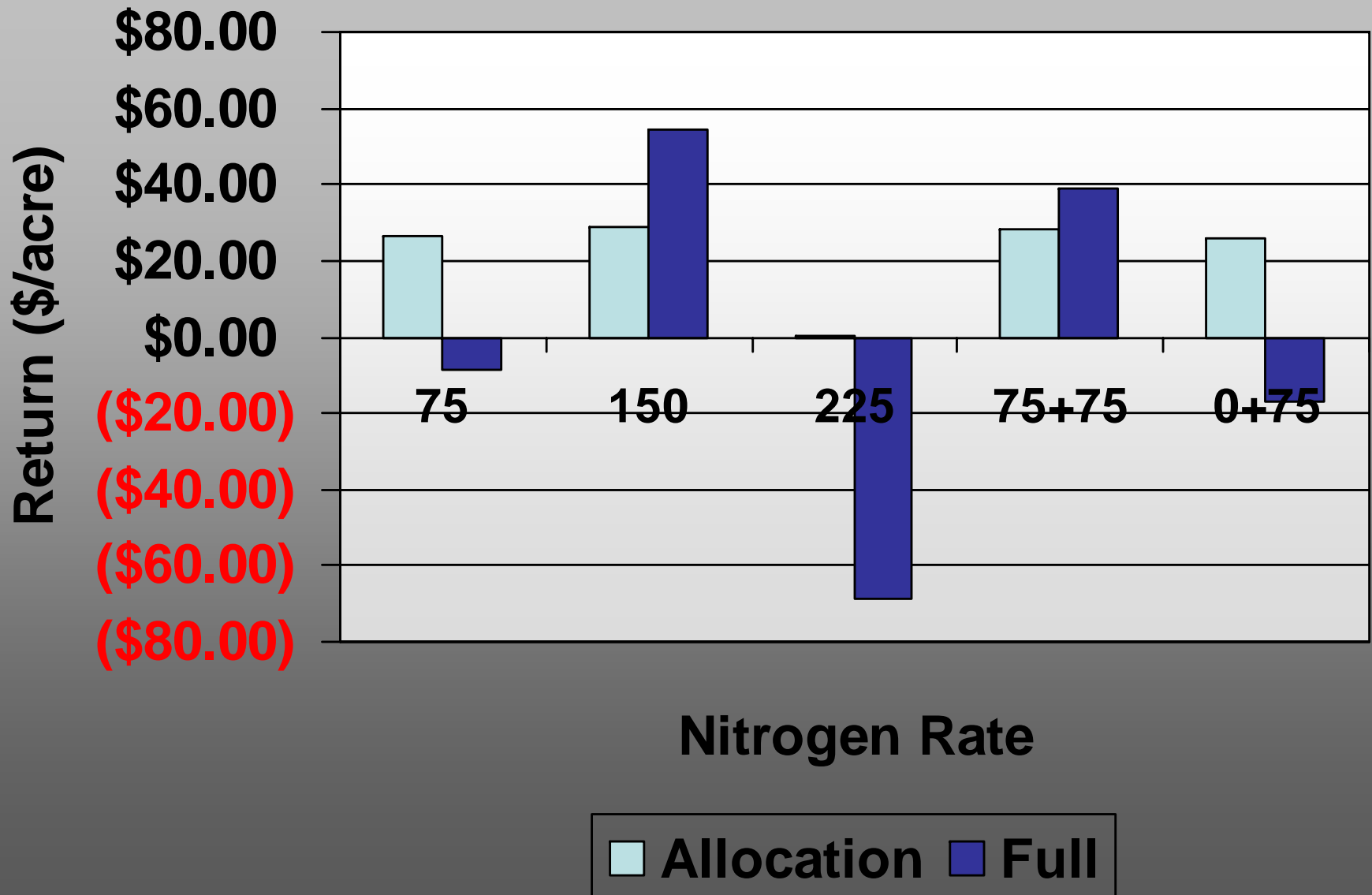


Increase in Grain Yields

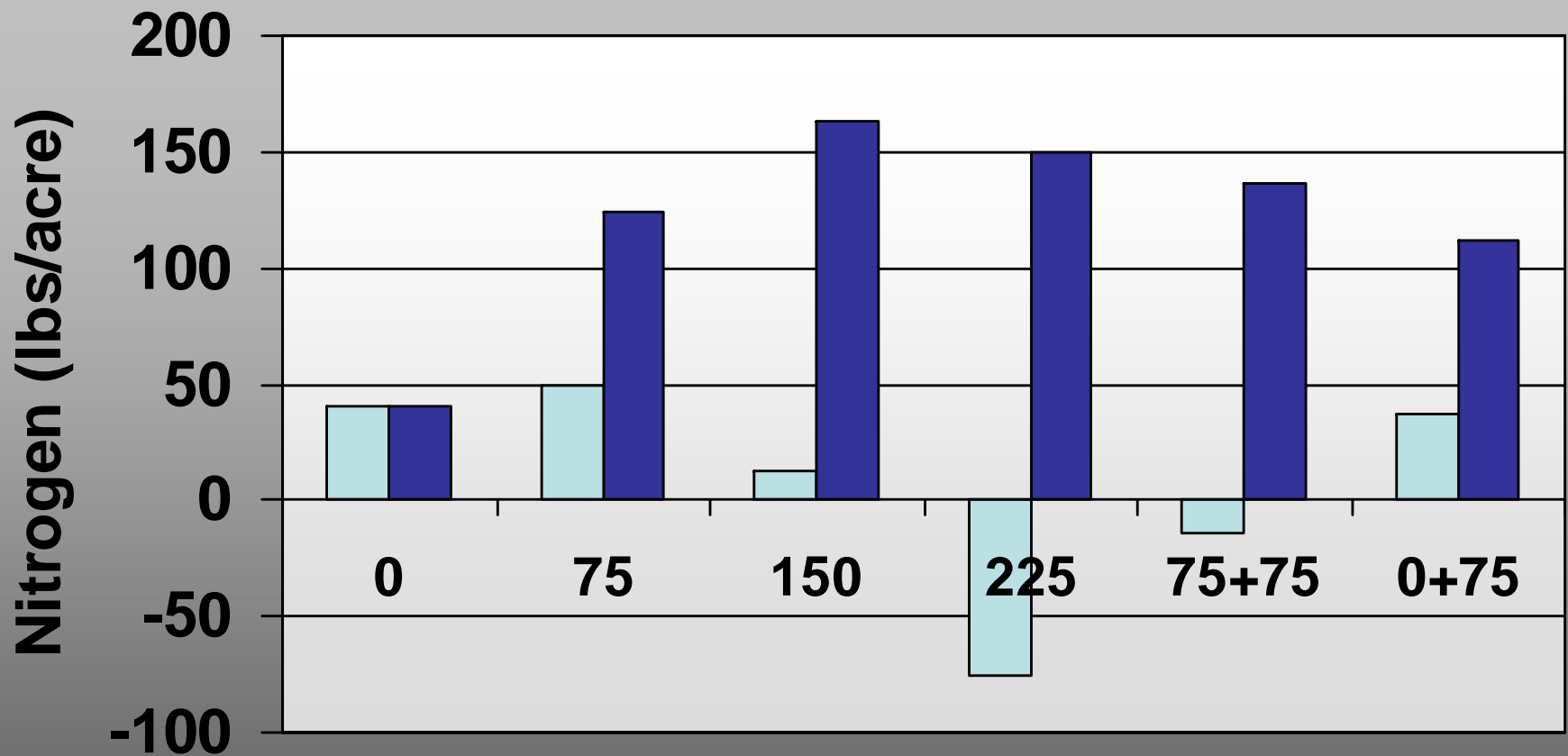


Return to Fertilizer

\$21 per cwt



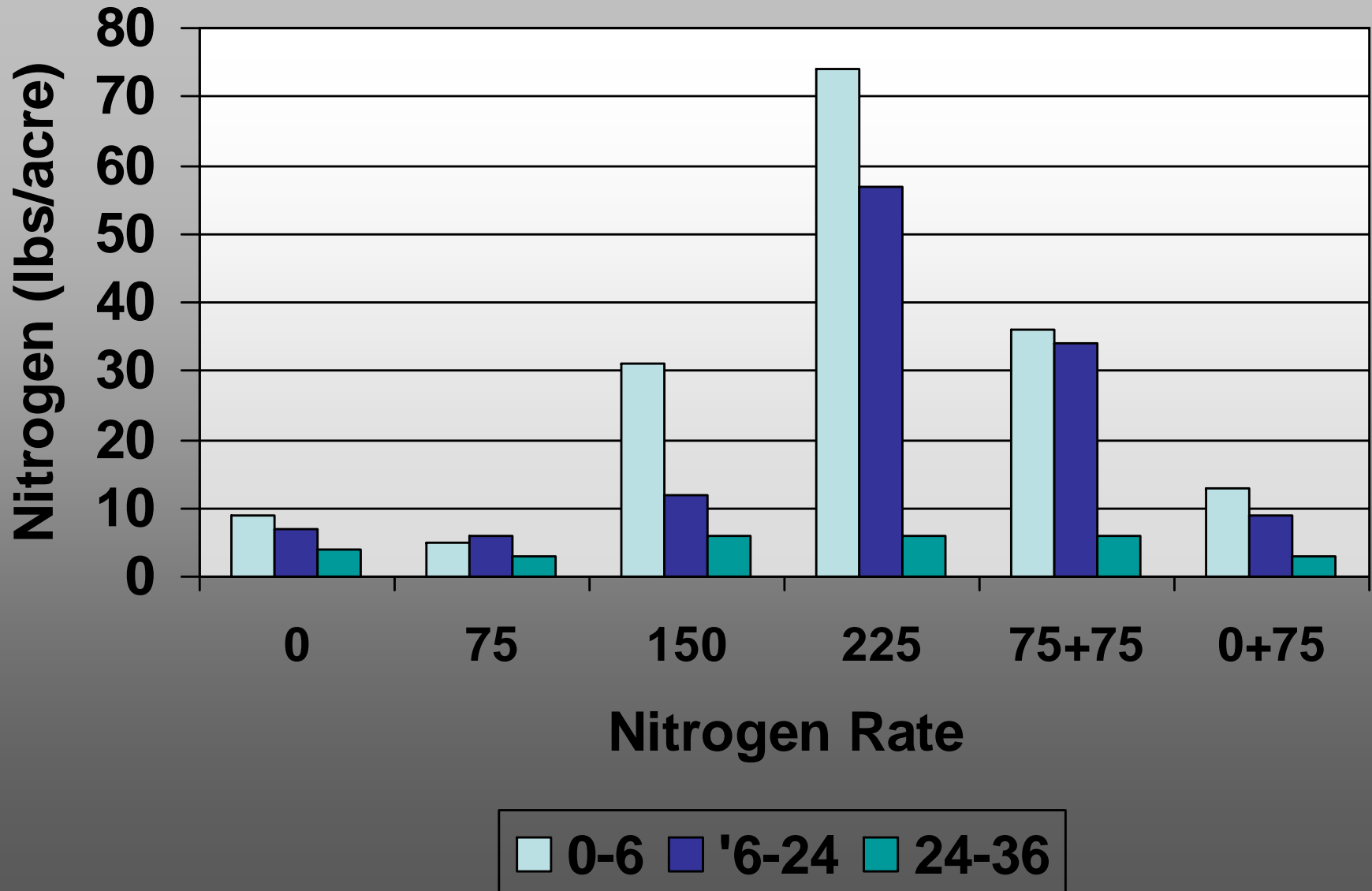
Nitrogen Uptake Allocation



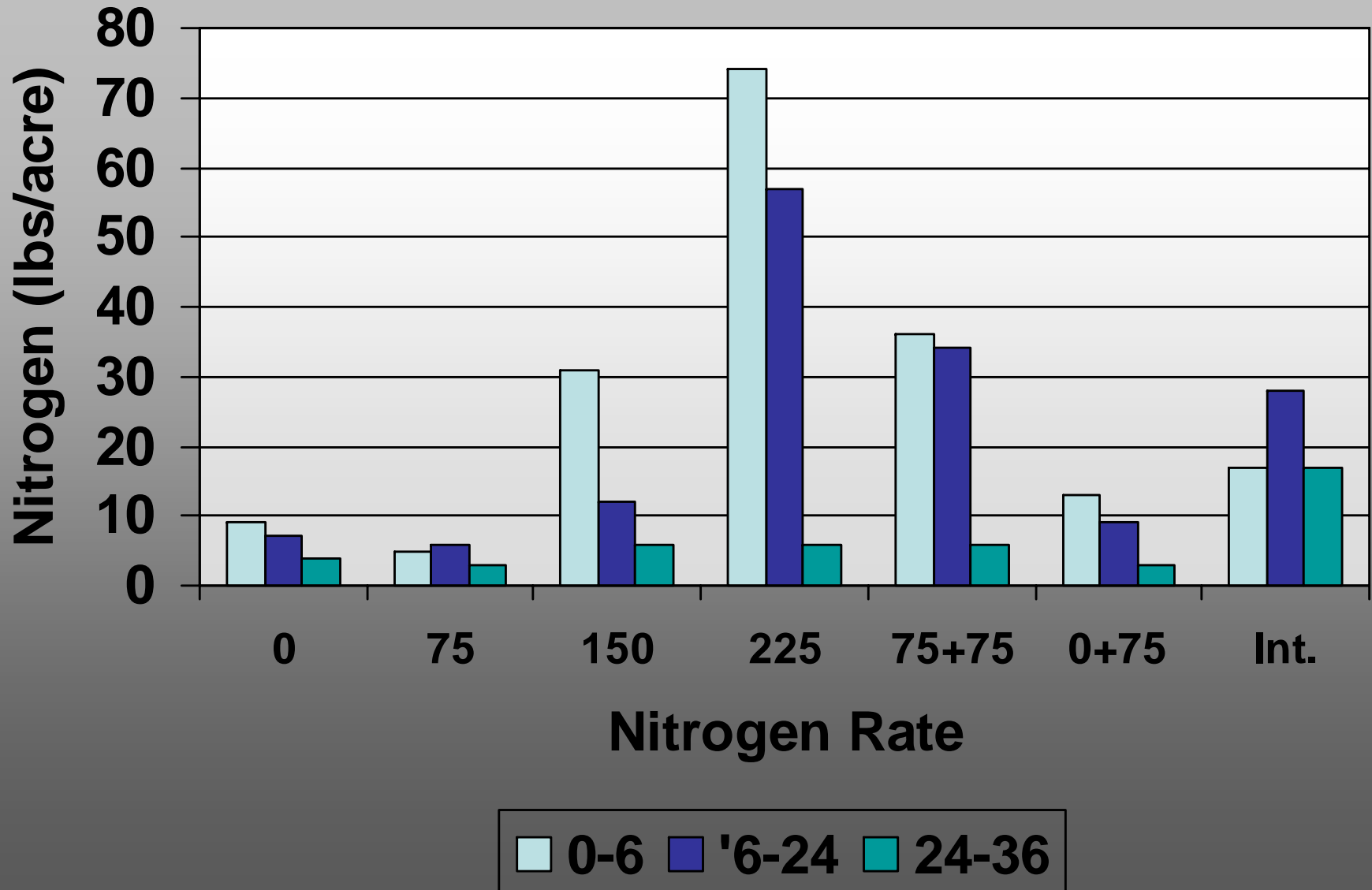
Nitrogen Rate

Soil Uptake N Fert + Soil

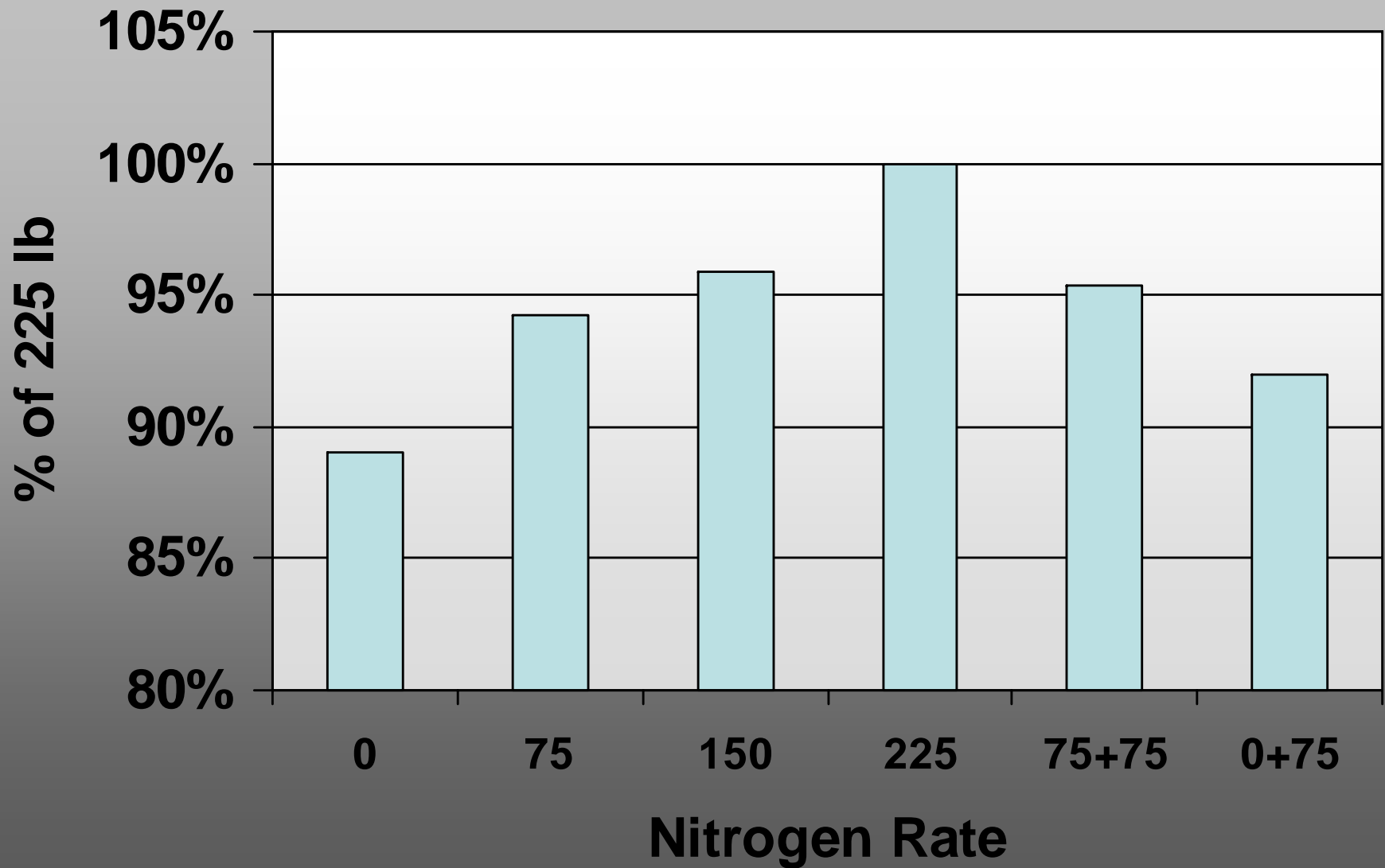
Nitrogen Residual Allocation



Nitrogen Residual Allocation



Chlorophyll Reading 2006



Conclusions

- Irrigation management influences fertility needs
 - Greater yields with limited water and 0 nitrogen applied
 - Full irrigation – 210 lbs/acre available
 - Limited irrigation – 140 lbs/acre available
- Sunflowers with less than 150 lbs/acre N applied reduced soil N residual to 3 feet