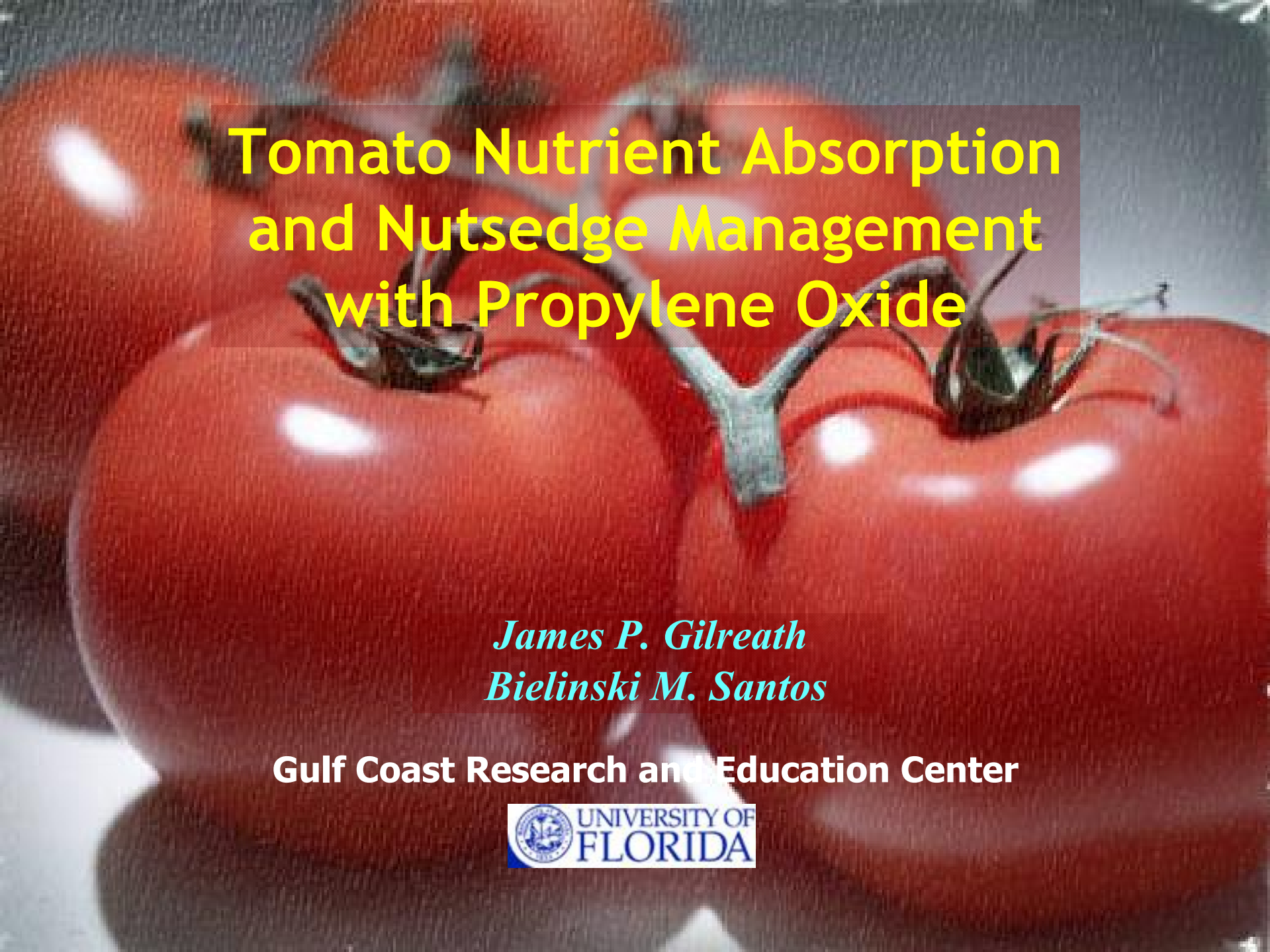

Tomato Nutrient Absorption and Nutsedge Management with Propylene Oxide

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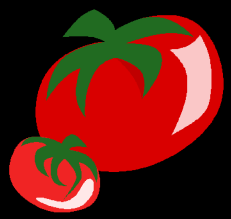
Why Tomato?

- **Tomato is the leading vegetable crop in Florida.**
- **More than US$600 million in 2003.**
- **More than 30% of the total vegetable value.**



Pest Pressure in Tomato

Meloidogyne incognita

Fusarium oxysporum

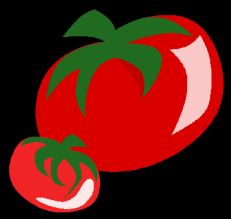
Pest Pressure in Tomato

Cyperus esculentus

Cyperus rotundus

What is Propylene Oxide?

- **Propylene oxide or Propozone® is an all-purpose fumigant.**
- **Used for over 40 years as an "insecticidal fumigant" in stored food.**
- **Soil laboratories have used propylene oxide for over 50 years to "sterilize" soil.**



What is Propylene Oxide?

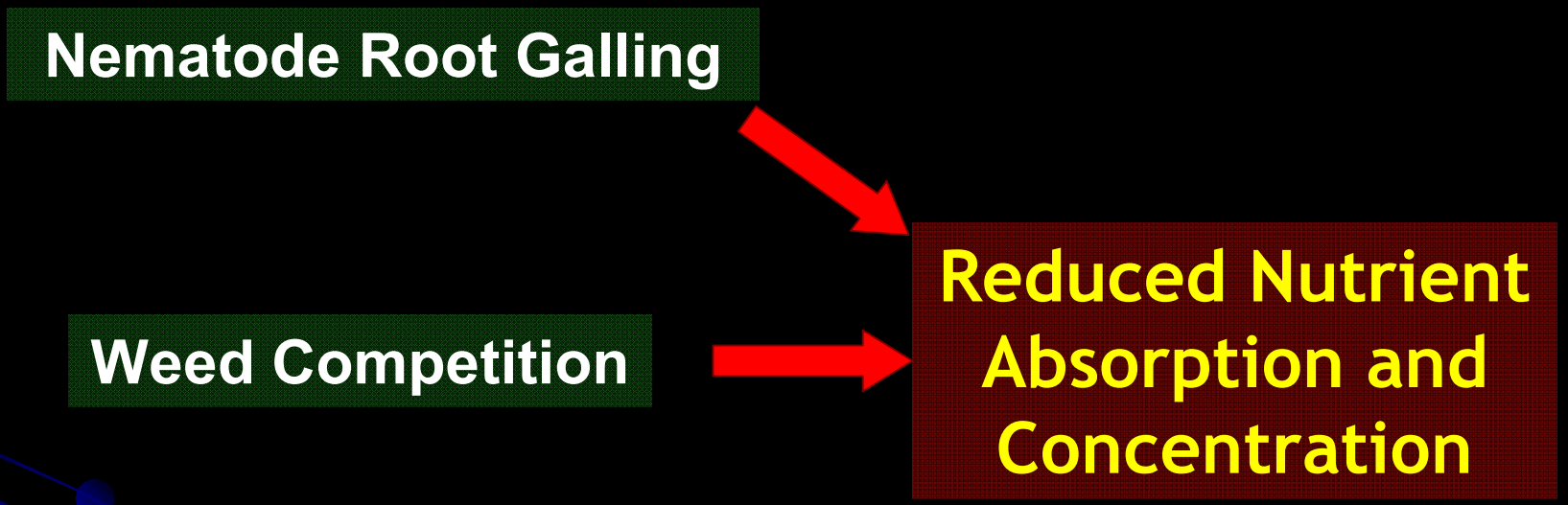
- **Preliminary tests have shown promise to replace methyl bromide.**
- **Broad-spectrum control of soilborne diseases, nematodes and weeds.**
- **Completely breaks down in the soil as propylene glycol, a food additive.**

Why Studying Nutrient Absorption?

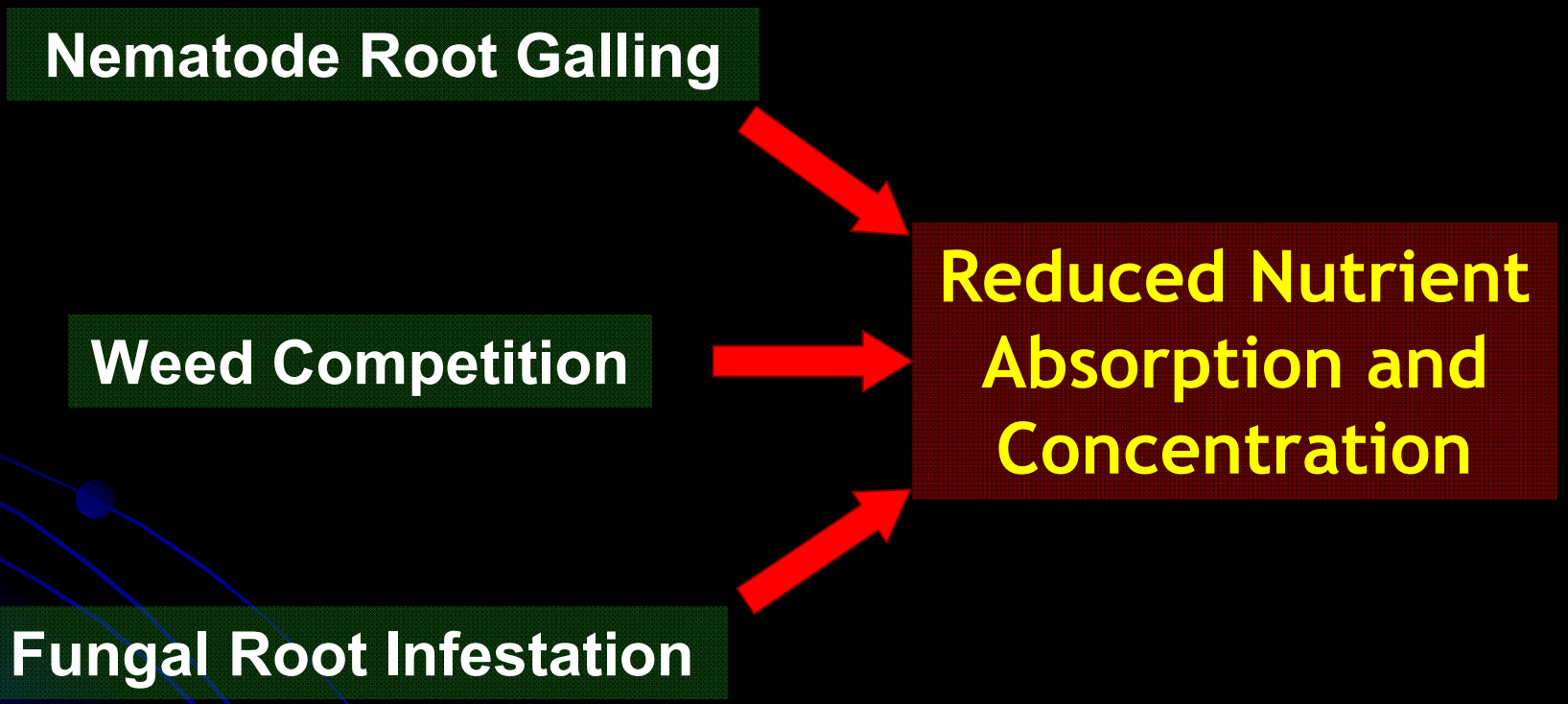
Nematode Root Galling

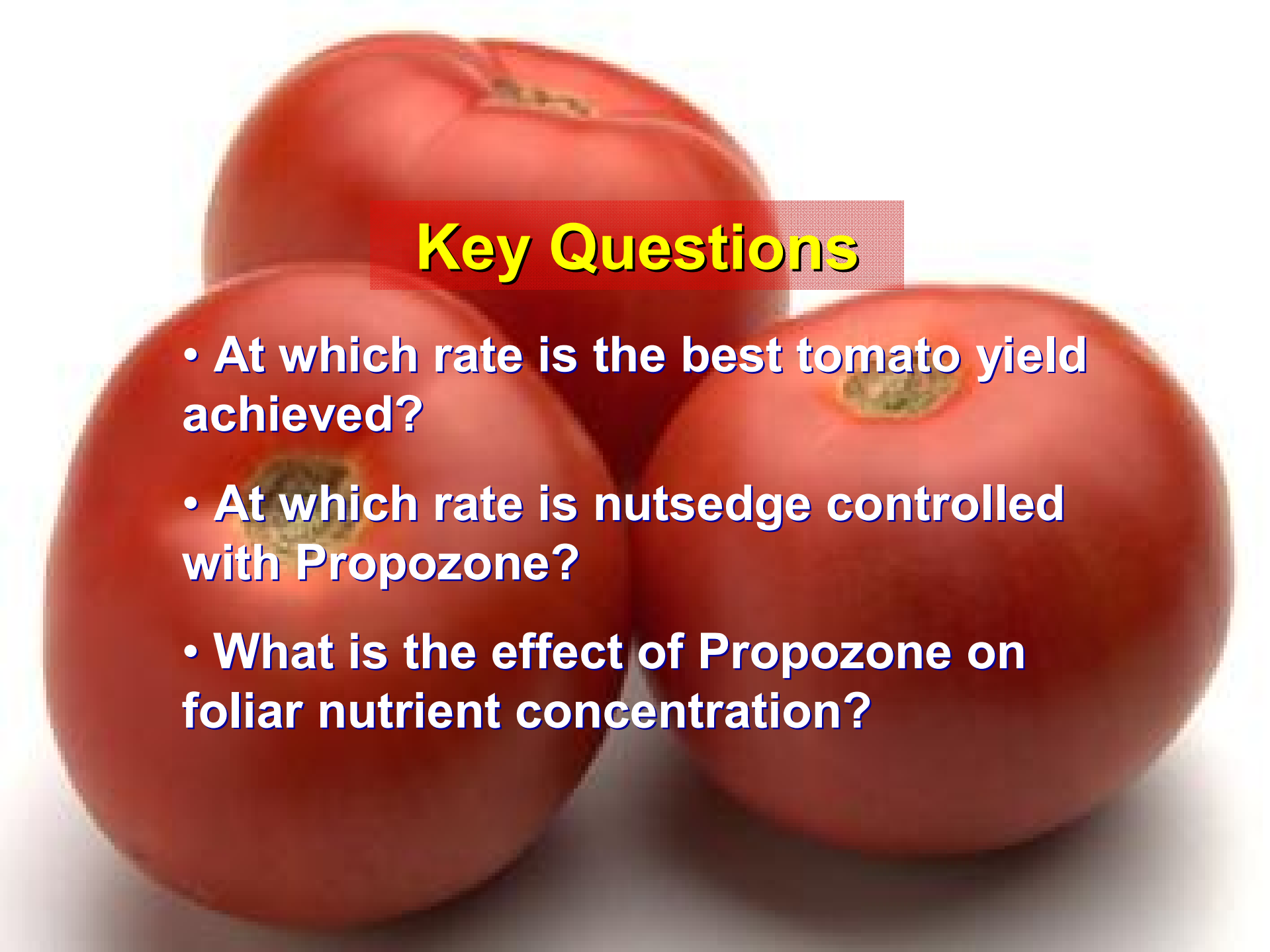
Reduced Nutrient Absorption and Concentration

Why Studying Nutrient Absorption?



Why Studying Nutrient Absorption?



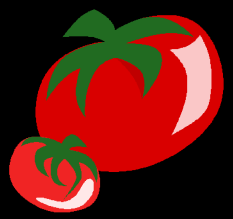


Key Questions

- At which rate is the best tomato yield achieved?
- At which rate is nutsedge controlled with Propozone?
- What is the effect of Propozone on foliar nutrient concentration?

Materials and Methods

- **Two field trials.**
  - *Gulf Coast REC, University of Florida.*
  - *Spring and Fall 2004.*
  - *EauGallie fine sand (Alfic Haplaquods, sandy, siliceous, hyperthermic).*
  - *1.0% organic matter and pH 7.3.*
- **Fields heavily infested by nutsedge (≈150 plants/m^2).**



Field tillage

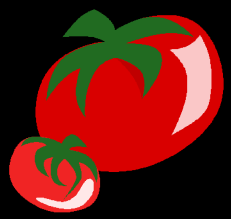
Fumigant injection and bed pressing

Mulched tomato with drip irrigation

Materials and Methods

- **Propozone rates:**
  - *0, 190, 380, 570, 760, and 950 L/ha.*
  - *0, 20, 40, 60, 80, and 100 gl/acre.*
  - *Shank injected.*

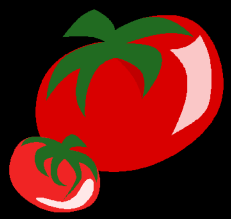
- **'Florida 47' tomato.**
- **Management according to local practices.**



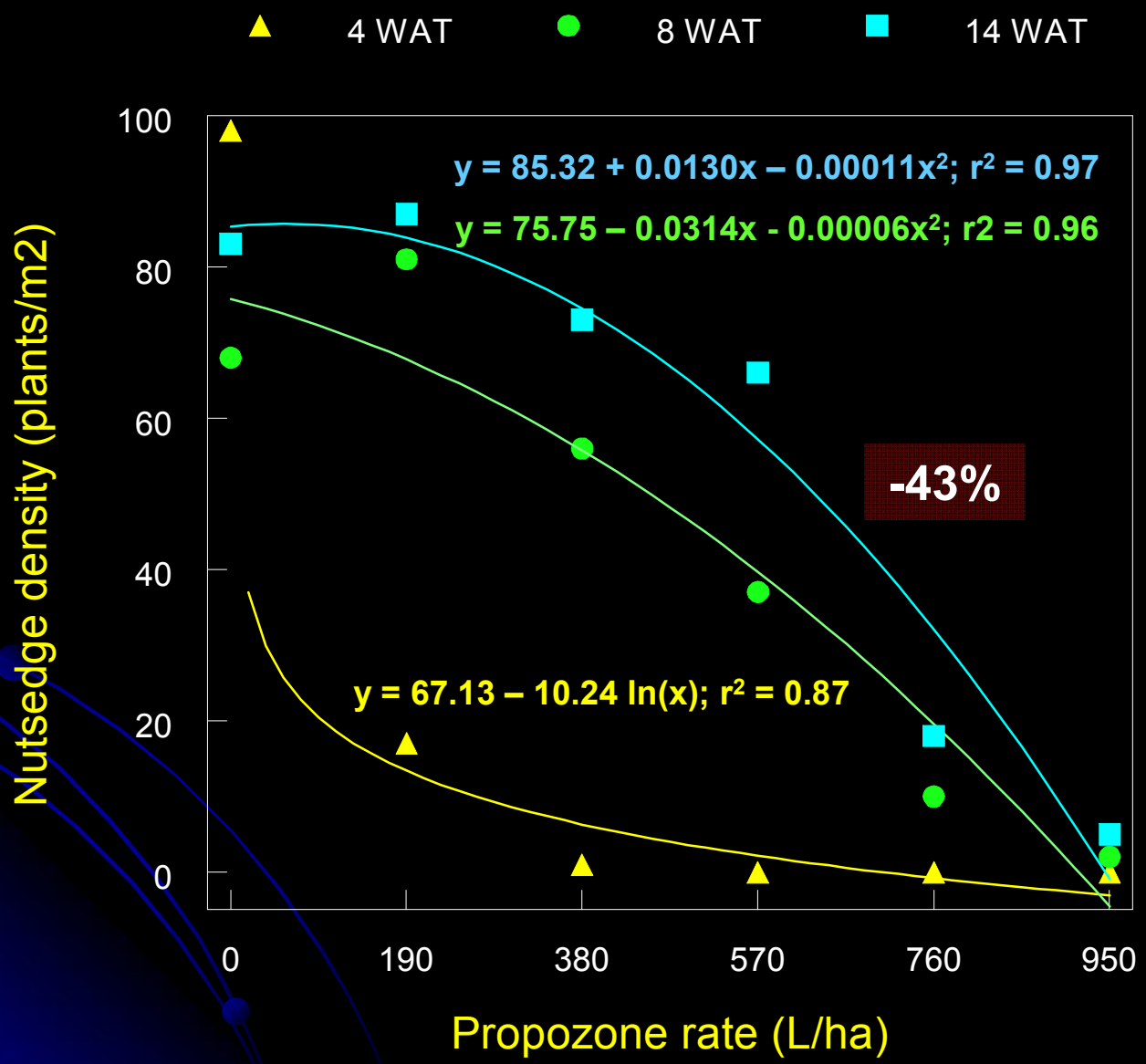
Materials and Methods

- **Variables:**
  - *Nutsedge densities (4, 8 and 14 WAT).*
  - *Marketable tomato yield (12 and 14 WAT).*
  - *Foliar nutrient concentration (14 WAT).*

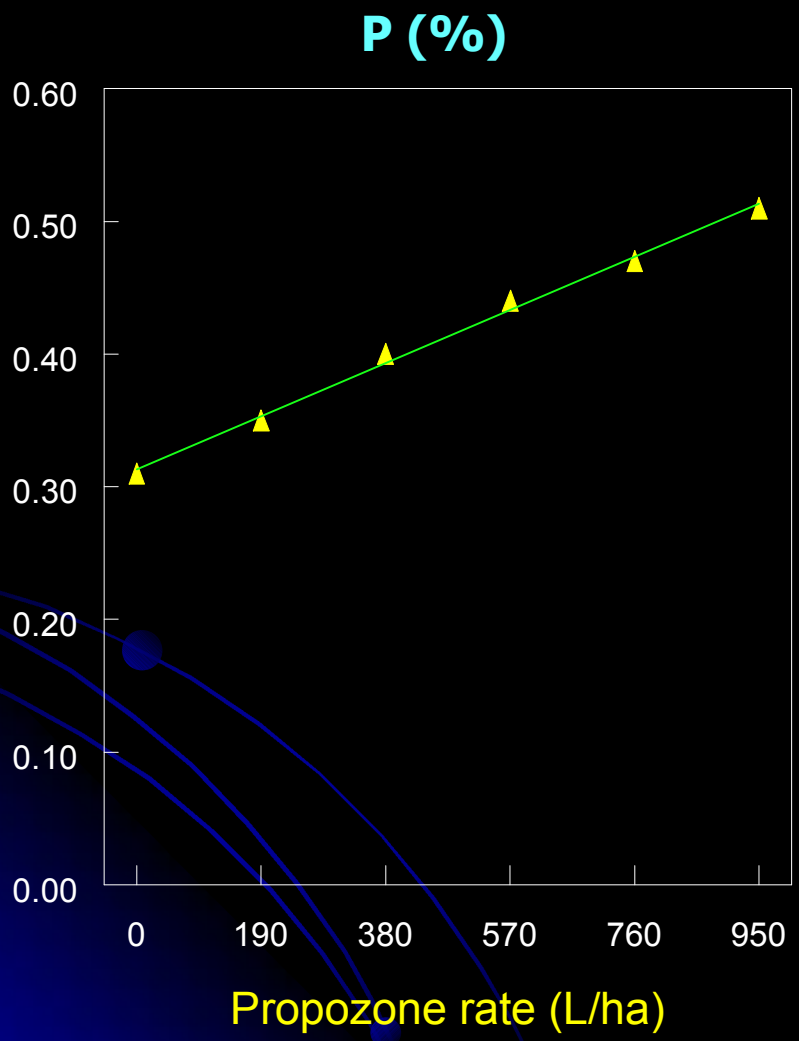
- **Statistics:**
  - *Randomized complete block design with 6 replications.*
  - *Regression analysis.*
  - *Orthogonal contrasts.*

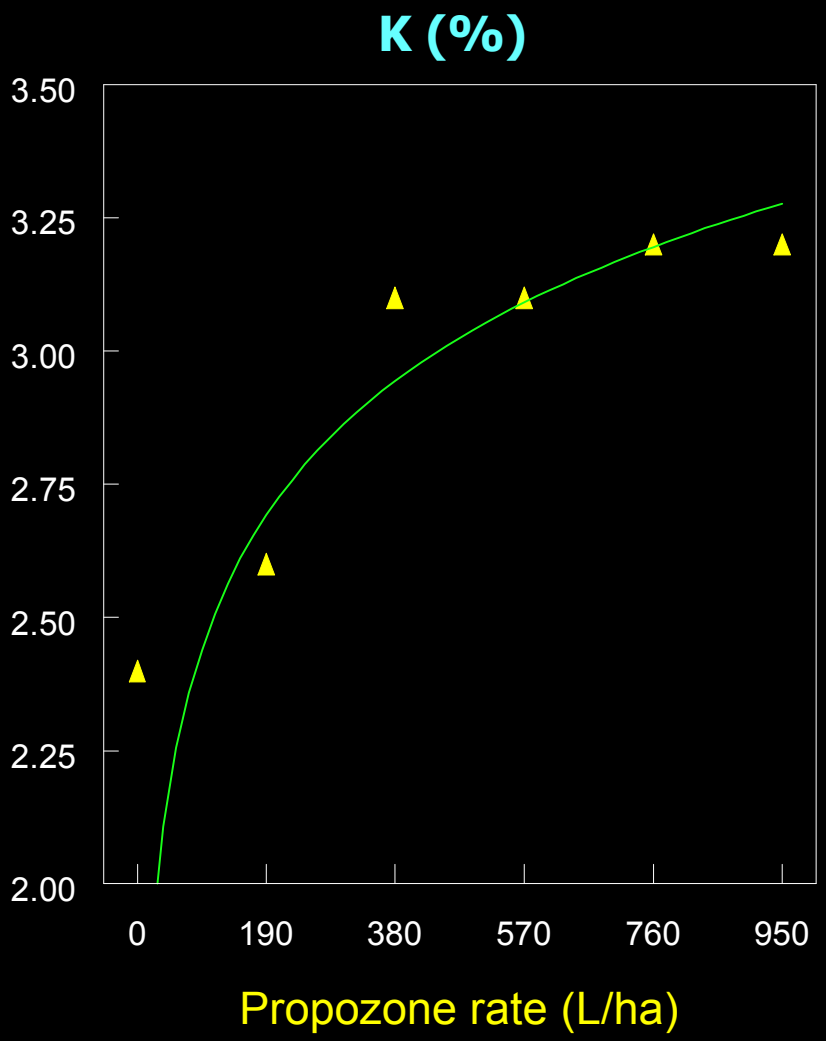


At which rate is nutsedge controlled with Propozone?

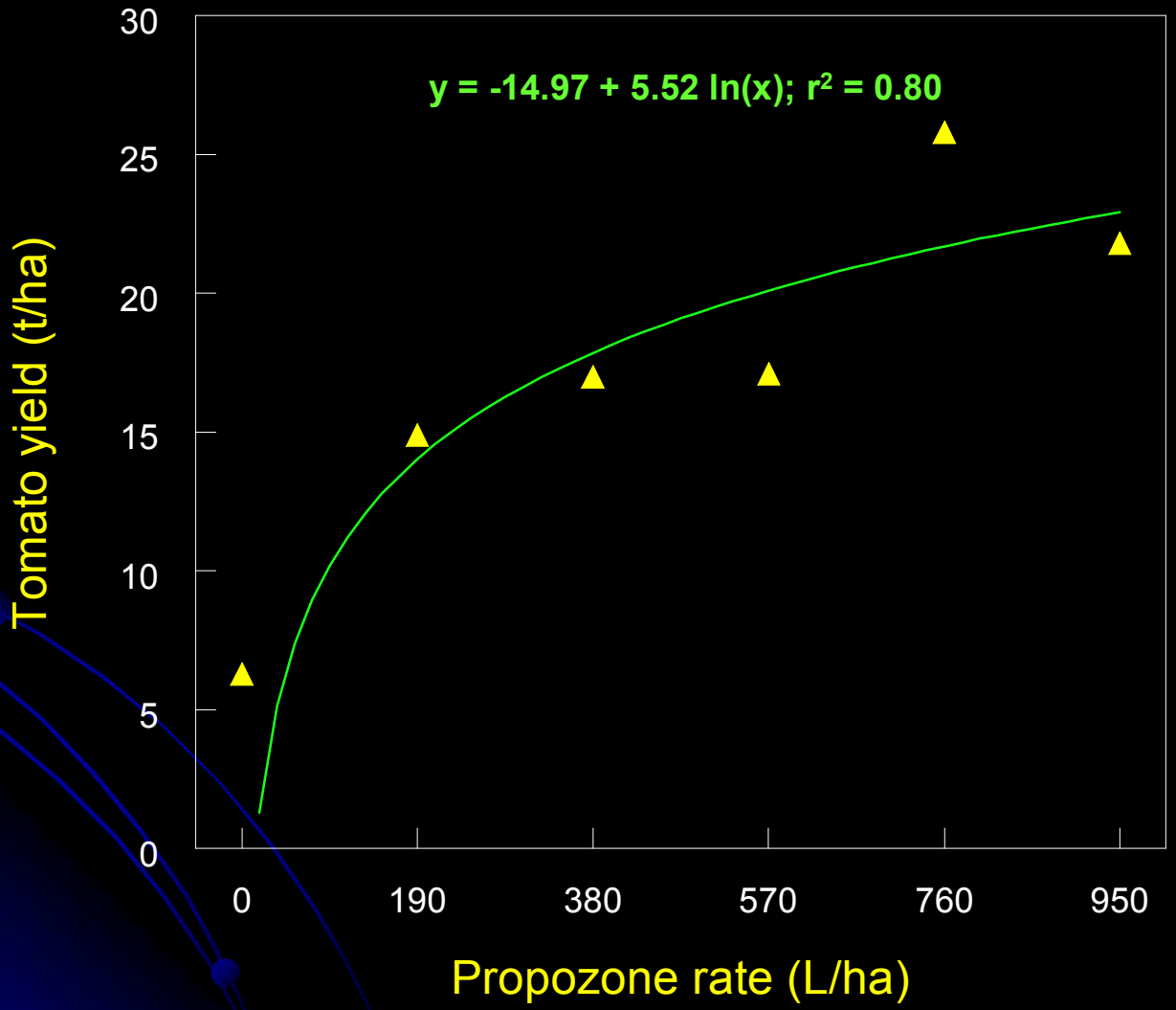


What is the Propozone effect on foliar nutrient concentration?



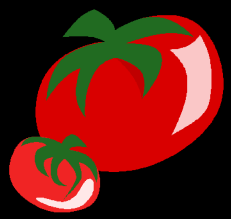


At which rate is the best tomato yield achieved?



Summary

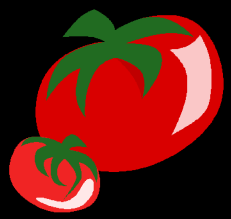
- **Nutsedge densities:**
  - *Rapid decrease with 570 L/ha (60 gl/acre).*
- **P and K foliar concentration:**
  - *P increased linearly with rate.*
  - *K increased rapidly after 190 L/ha (20 gl/acre).*



Summary

- **Tomato yield:**
  - *Excellent yields with 80 and 100 gl/acre.*
  - *These rates could be expensive.*

- **Further research:**
  - *Propozone in other crops.*
  - *Propozone combined with other alternatives.*



Acknowledgements

Morris Warren, ABERCO

Thank you!!!