St. Augustinegrass Response to Fe, Mn and Mg

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Research

- Field Study
  - Turf Response to Fe, Mn and Mg
- Laboratory Study
  - Solubility of Fe, Mn and Mg in soils

Background

- Fe, Mn and Mg are common components of granular and liquid fertilizers
- Major components of micronutrient packages
- Can be deficient in turfgrasses
- Role in turfgrass greening

Field Study
St. Augustinegrass Response

- Objective:
  - To determine the influence of various Fe, Mn and Mg sources on 'Palmetto' St. Augustinegrass response
- Location
  - Citra, Jay
- Nutrients
  - Applied NPK in May. No N June, July, Aug. or Sep.
  - Applied treatments June, July, Aug. and Sep.

Plant Dynamics

Fe
- 100-500 ppm
- Immobile
- Chlorosis – youngest leaves, intervenal
- Biosynthesis of chlorophyll pigment
- Ferrodoxin – PS e^- transfer

Mn
- 20-500 ppm
- Immobile
- Chlorosis – youngest leaves
- Thyalkoid membrane degrades when deficient - rapidly decreasing PS

Mg
- 1,500-5,000 ppm
- Mobile
- Loss of green color - oldest leaves
- Central atom in chlorophyll

Materials and Methods

- Treatments
  - Granular 20 lbs. / A / 30 d
    - Fe
      - Sulfate
      - Sucrate
    - Mn
      - Sulfate
      - Sucrate
    - Mg
      - Sulfate
      - Sucrate
  - Foliar 2 lbs. / A / 30 d
    - Fe
      - Sulfate
      - Glucoheptonate
    - Mn
      - Sulfate
      - Glucoheptonate
    - Mg
      - Sulfate
      - Glucoheptonate

Variables Analyzed

- Turf Quality
  - 1 to 9
- Yield
  - grams per sq. meter per day

Results

Field Study

Laboratory Study
Soil Incubation

Objective

- To determine the solubility of Fe, Mn and Mg applied as sulfate or glucoheptonate in 2 Florida Soils

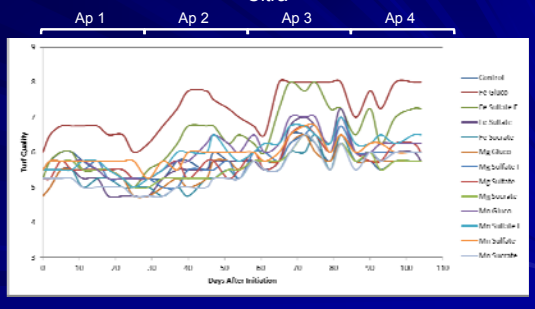
Aerial Photo
(9/10/15)

Laboratory Study
Soil Incubation

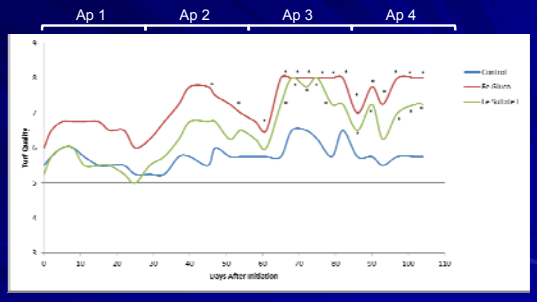
Methodology

- 2 soils
  - Citra
  - Jay
- Fe, Mn and Mg
  - Sulfate
  - Glucoheptonate
- Extractions
  - 1h, 4h, 1d, 1wk, 2wk, 3wk

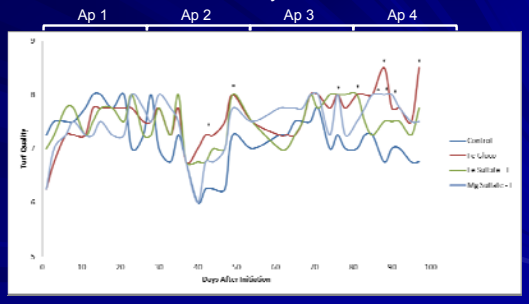
Turf Quality
Citra



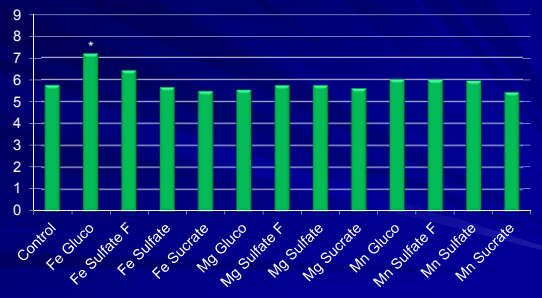
Turf Quality
Citra



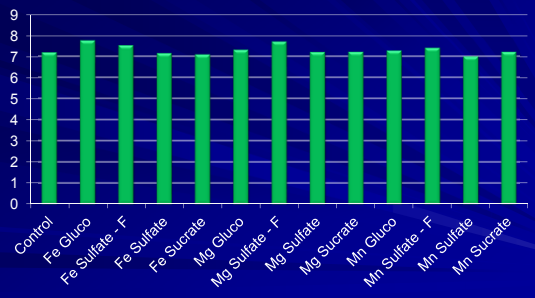
Turf Quality
Jay



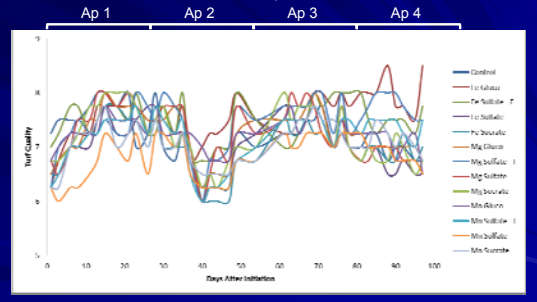
Citra - Average Turf Quality
* differs from control



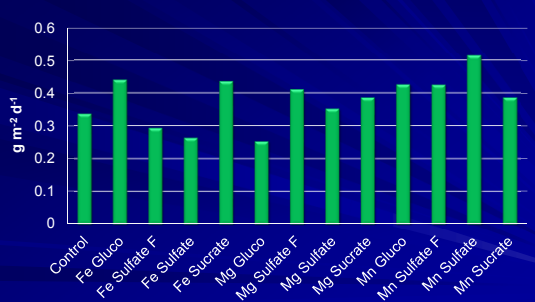
Jay - Average Turf Quality
(No Differences)



Turf Quality
Jay

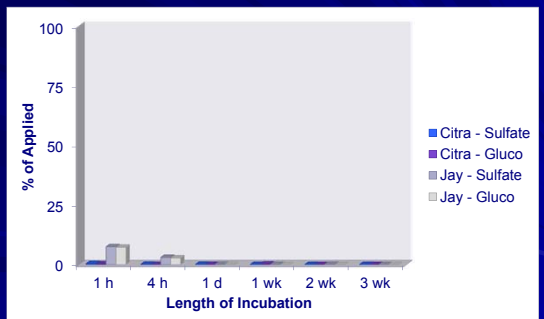


Citra - Average Yield
(no differences)



WHY IS TURFGRASS RESPONDING ONLY TO FOLIAR NUTRITION?

Soluble Fe

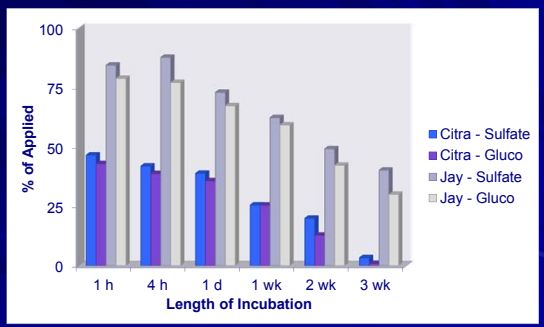


Study 2 - Soil Incubation

Objective

- To determine the solubility of Fe, Mn and Mg applied as sulfate or glucoheptonate in 2 Florida Soils

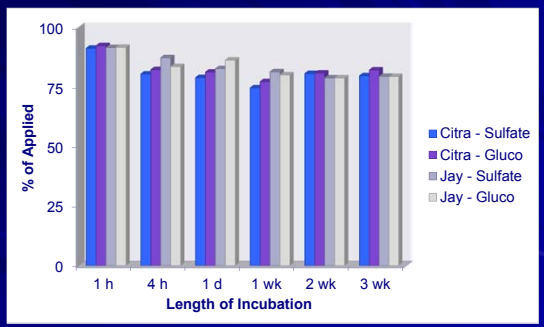
Soluble Mn



Results

Laboratory Study

Soluble Mg



Summary

- Citra
  - Foliar applied Fe increased turf quality
  - No other product influenced turf quality
- Jay
  - Foliar Fe and foliar Mg sulfate influenced quality
  - No other product influenced turf quality
- No product influenced yield
- >95% of applied Fe and 50% of applied Mn may become insoluble within 1 hour of soil contact
- Mg remains soluble for at least 3 weeks

Importance

- Granular Fe, Mn or Mg increase cost of granular fertilizer but do not increase St. Augustinegrass quality.
- Foliar applications are the only method we have observed to induce a response.
- Mn does not increase turf quality. ***
- Only 1 year of results over 2 locations. We need to confirm results over additional years.

Contact Info

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