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KEEPING FERTILIZERS IN THE ROOT ZONE FLORIDA AGRICULTURE'SCHALLENGE TO REMAIN A VIABLE INDUSTRY

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NEW AG INTERNATIONAL

Keeping Fertilizers in the Root Zone - Florida Agriculture's Challenge to Remain a Viable Industry

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Indian River REC
Ft. Pierce

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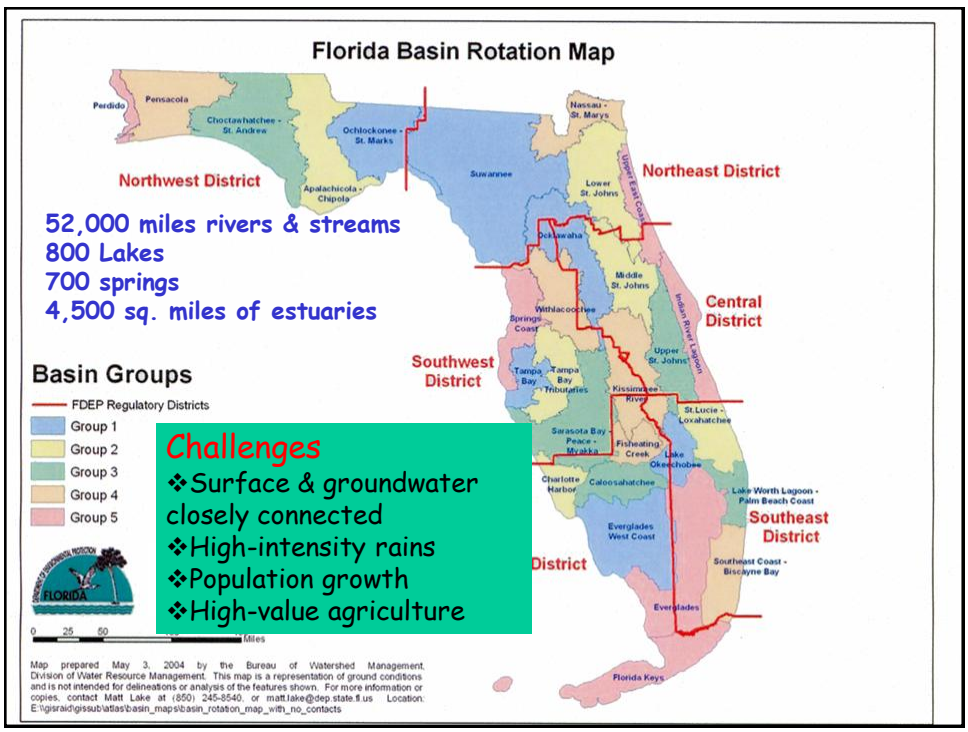


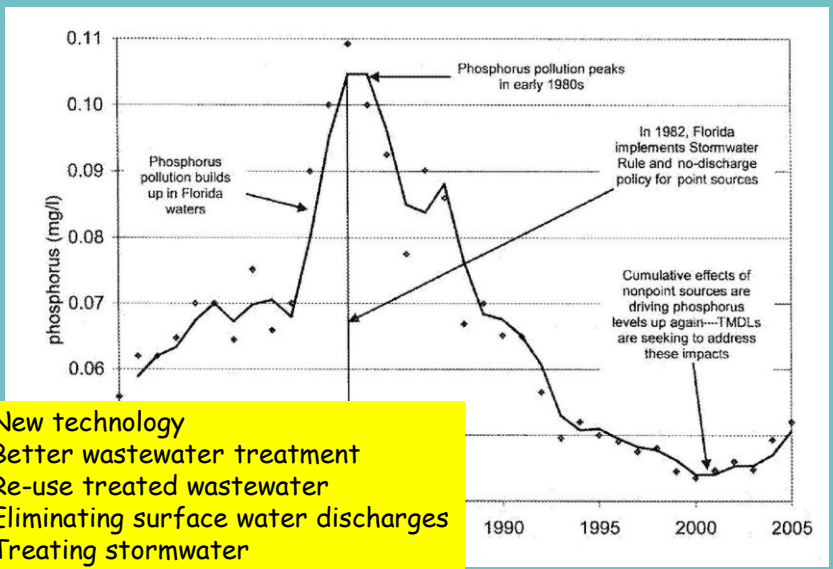
2008 Integrated WQ Assessment Report (FDEP)

- **1,600 km of rivers & streams, 150,000 ha of lakes, and 2300 square km of estuaries are impaired by nutrients**
- 1,565 TMDSs for 1,688 waterbodies
- Nutrients: Lakes 1st, Estuaries 2nd, Rivers 4th
  - 5% of the assessed rivers and streams
  - 23% of the assessed lake area
  - 24% of the assessed estuary area

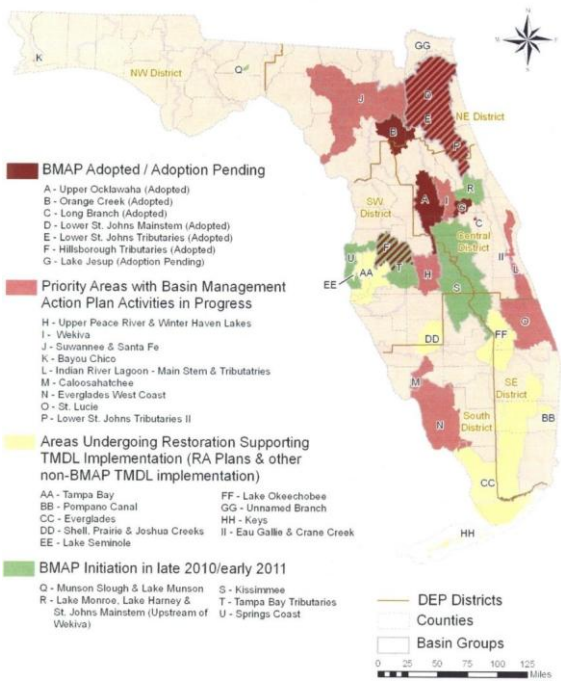
Causes & Trends

- Impairment Causes
  - Hg in fish
  - Dissolved Oxygen
  - Fecal coliform bacteria
  - Nutrients
- WQ Trends for 823 waterbodies
  - 54% stable
  - 22% improving – urban stormwater treatment
  - 24% degrading – ag & high urban growth

P Trends in Florida Waters Based on 733,000 Measurements from 3,330 Waterbodies

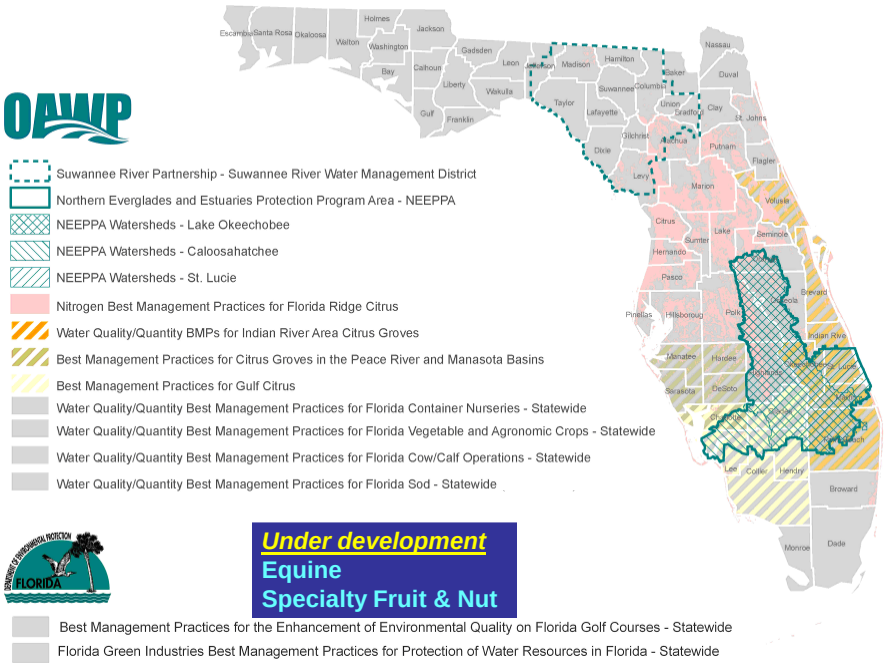


- New technology
- Better wastewater treatment
- Re-use treated wastewater
- Eliminating surface water discharges
- Treating stormwater



Basin Management Action Plans (BMAPs)

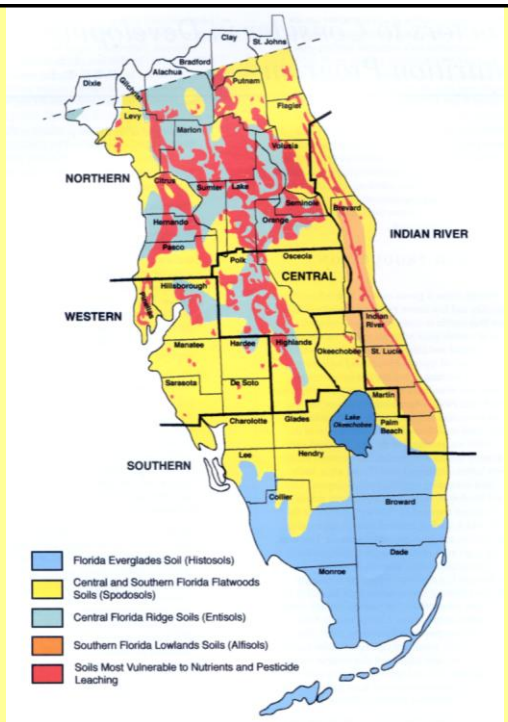
DACS and DEP BMP Programs in Florida



Challenges

Highly-leachable soils

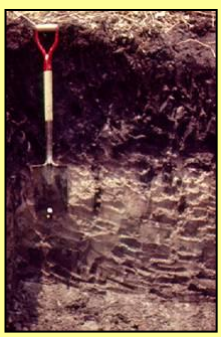
Adamsville
Archbold
Astatula
Bahiahonda
Broward
Canaveral
Candler
Cocoa
Dade
Florahome
Fort Meade
Gainesville
Lake
Lakewood
Neilhurst
Orlando
Orsino
Palm Beach
Paola
Satellite
St. Augustine
St. Lucie
Tavares



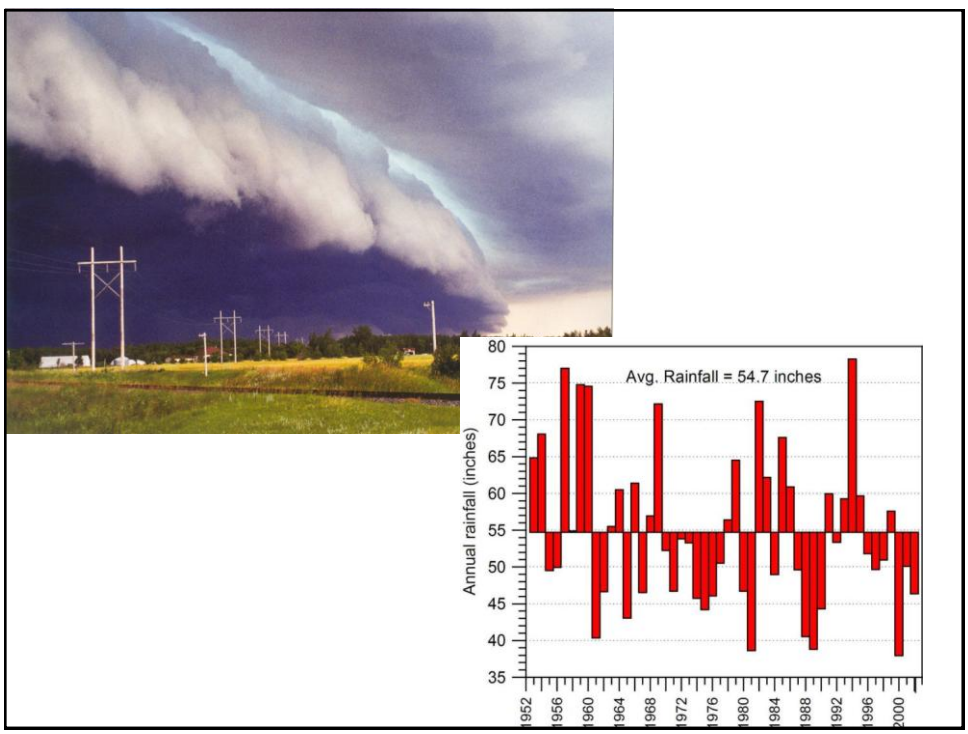
Entisol
Candler sand

Spodosol
Immokalee fine sand

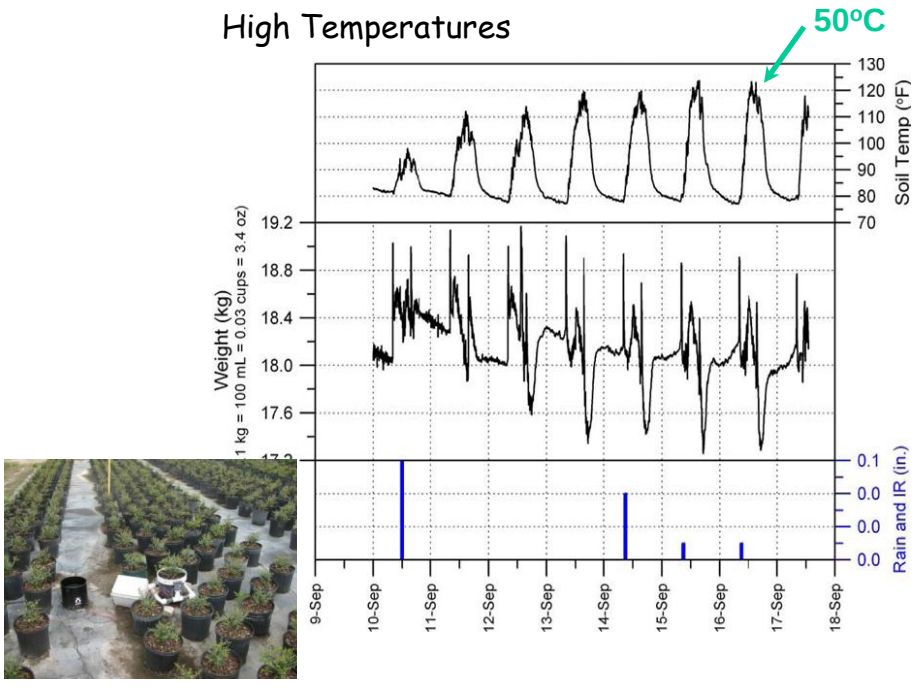
Alfisol
Riviera sand



Mollisol
Chobee loamy fine sand


Avg. Rainfall = 54.7 inches
Annual rainfall (inches)
80
75
70
65
60
55
50
45
40
35
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000

High Temperatures

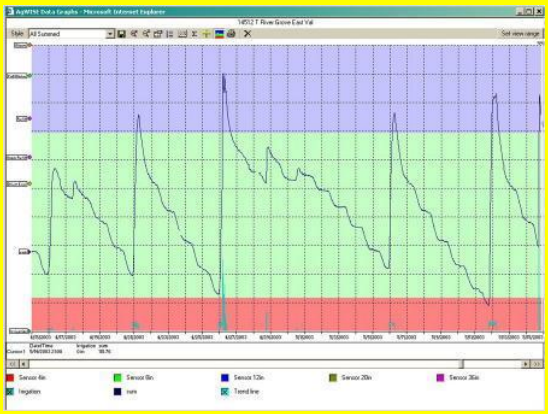


Citrus Irrigation

Freeze Protection

Management

Irrigation Scheduling



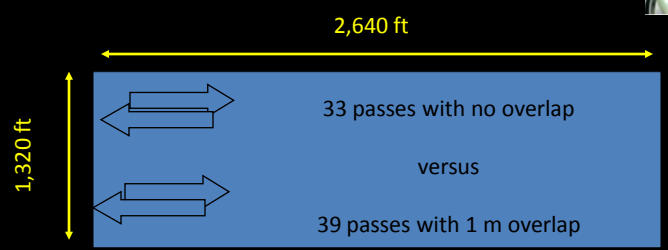
Irrigation Management

- A strawberry farm was using three times the IFAS recommended fertilizer rates (about 1.4 kg/ha/day)
- Irrigation practices were leaching much of the applied nutrients.
- After implementing an ET based irrigation schedule and using BMP irrigation tools, fertilizer use is below IFAS rates (<0.5 kg/ha/day).

- Soil moisture equipment
- More efficient water applications
- Reduced potential for N leaching

Blue Dye in Potato

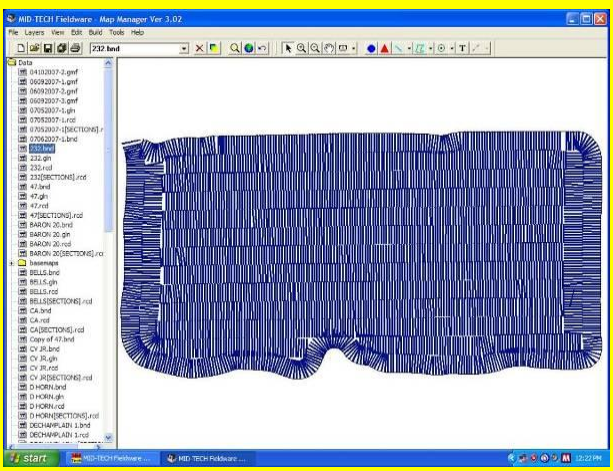
- Farmer using equipment with Zero Overlap
- Previous practices was 1 m overlap each pass
- For the average 32 ha hay field (12.1 m applicator)



6 extra passes X 12.1 m wide X 805 m ft long X 71 kg/ha = 522 kg of wasted Nitrogen per fertilization

5 Fertilizations per year= 2614kg **N per year (32 ha)**

As-applied nitrogen fertilizer map



- accurate nitrogen calibration equipment and a GPS system
- Overlap eliminated.

Variable Rate Technology

- A citrus operation conducted a test on 90 ha of grove using a traditional fertilizer spreader versus a variable rate fertilizer spreader with eyes.
  - Traditional: 43.6 tonnes/app. (3 app. per year).
  - VRT: 33.6 tonnes/app.
  - Annual basis - reduction of 30 tonnes applied to the 222 acres (23%).

Nursery – Capillary Mats & Drip

Documented water and fertilizer savings of 70 to 90% over traditional watering methods.

Use nu-peat (composted yard waste) in potting mix

Drip Tape Irrigation instead of overhead

Reuse and compost unsold plants and potting medium.

Use of Capillary mats saves water and fungicides

EC Monitoring

Fertigation allows nutrients to be "spoon-fed" through the center pivot irrigation system.

Tailwater Recovery & Retention or Detention

Grass Filter Strip

Grassed Waterway

Needs

❖Controlled release fertilizers that are economic and have correct release pattern for crop, soil, rainfall patterns, and temperatures.

❖Diagnostic tools to assess plant and soil nutrient status quickly and accurately.

❖Economic production systems that can capture nutrients that are leached or run off during storm events.

❖Soil amendments to help retain water and nutrients yet allow for adequate drainage to preserve plant health.

Needs

- Economical equipment/techniques to apply supplemental fertilizer to plastic mulch, seep irrigated crops.
- Advanced irrigation management tools.
- Cost share programs to assist growers in implementing new technologies.
- Education programs for all ag sectors (regulators, growers, manufacturers, sales, service, dealers, etc.) on irrigation, drainage, nutrition programs, farming system effects on water quality.