

**THE EAA BEST MANAGEMENT PRACTICES
MASTER PERMIT**

RESEARCH UPDATE

**EVALUATION OF PERFORMANCE DIFFERENCES
OF EAA FARM BASINS WITH SIMILAR BMPs**

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UF | IFAS
UNIVERSITY of FLORIDA

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BMP RESEARCH PROGRAM IN THE EAA




- UF IFAS Research on Best Management Practices (BMPs) in the EAA started in 1992
- Research and Extension activities have been continuous since 1992
- Research sponsored by the EAA-EPD. Conducted in collaboration of EAA growers and the SFWMD
- Research projects investigated the efficacy and implementation of BMPs

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PERVIOUS RESEARCH FLOATING AQUATIC VEGETATION (FAV) RECOMMENDATIONS

- Use **spot spraying** with approved aquatic herbicides to **avoid FAV infestation**.
 - Spraying an FAV infestation can increase P discharges due to massive FAV death
- If infestations occur, harvest FAV mechanically and put it back in empty fields to compost.



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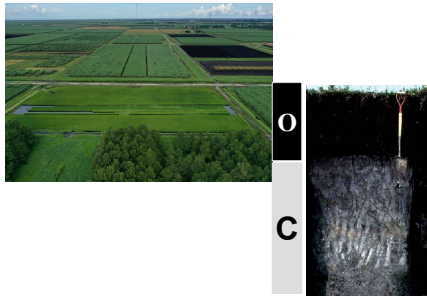
BMP MASTER PERMIT SCOPE OF WORK 2020-2025

**EVALUATION OF
PERFORMANCE
DIFFERENCES OF
EAA FARM BASINS
WITH SIMILAR
BMPs**

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OBJECTIVES

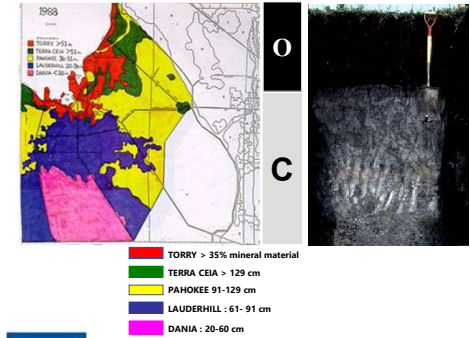
- Determine differences in performance in selected farms in the EAA basin by evaluating the **impact of soil chemistry** and **historical land use** on P concentration and loads on these farms.



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EAA SOIL PROPERTIES

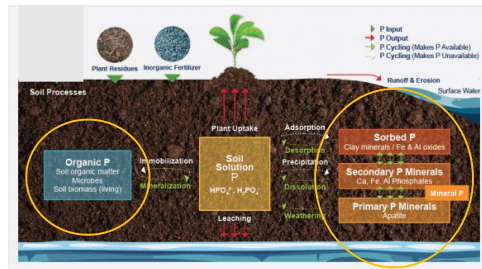
- EAA soil series: Organic layer (O) above a CaCO₃ bedrock.
- Deeper soils east the Lake: Torry, Terra Ceia and Pahokee series
- Shallower soils: south of Lake
 - Tend to have more inorganic components (Fe oxides, Al oxides and CaCO₃) that will increase P sorption capacity



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PHOSPHORUS CHEMISTRY IN EAA SOILS

- The P cycle is complex due to high soil organic matter content, organic forms of P, and Fe transformations
- The Fe and Al oxide contents of Histosols tends to increase in shallow soils with less organic matter



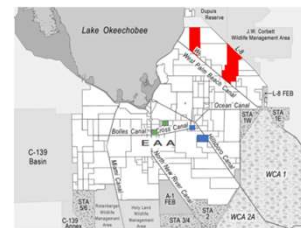
Source/aces.edu



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FARM SELECTION

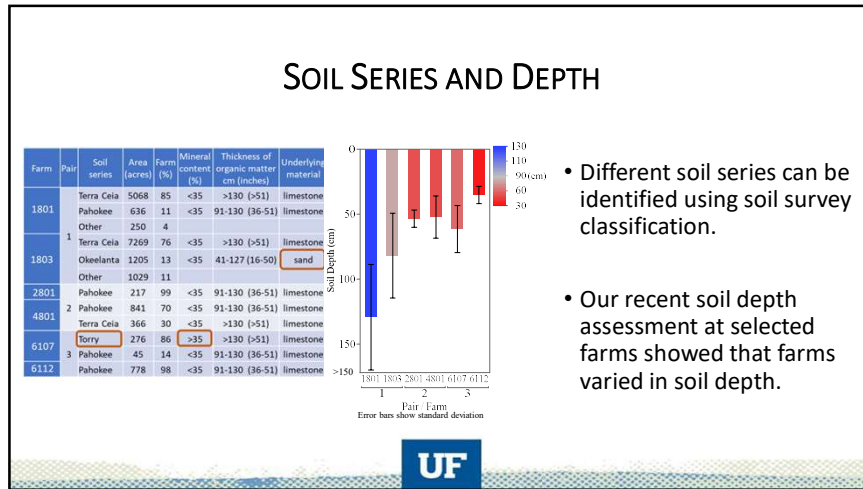
- 3 farm pairs (6 farms total) from 3 different basins
- Each pair had similar farm operator and similar BMP plan



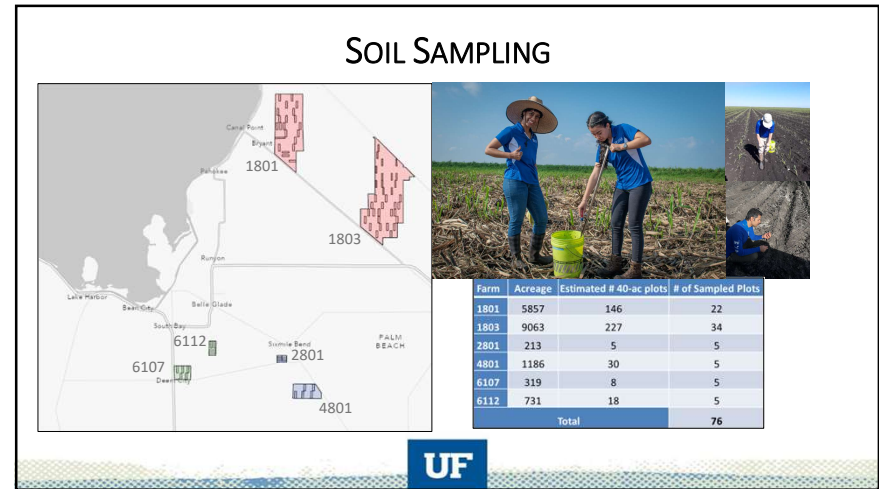
NUTRIENT CONTROL PRACTICES (Points)	1801	1803	2801	4801	6107	6112
Nutrient Application Control	2.5	2.5	2.5	2.5	2.5	2.5
Nutrient Spill Prevention	2.5	2.5	2.5	2.5	2.5	2.5
Soil Testing	5	5	5	5	5	5
PARTICULATE MATTER AND SEDIMENT CONTROLS (Points)						
Particulate Matter, Sediment Controls (4, 6)	5	5	5	5	10	10
WATER MANAGEMENT PRACTICES (Points)						
Water Management (0.5, 1.0-inch)	10	10	10	10	5	5
TOTALS (minimum 25 points)	25	25	25	25	25	25
Crops	Sugarcane, Vegetables, Corn	Sugarcane, Vegetables, Sod	Sugarcane, Vegetables, Sod	Sugarcane, Vegetables, Sod	Sugarcane, Vegetables, Sod	Sugarcane, Vegetables, Sod
Area (acres)	5857	9063	213	1186	319	731



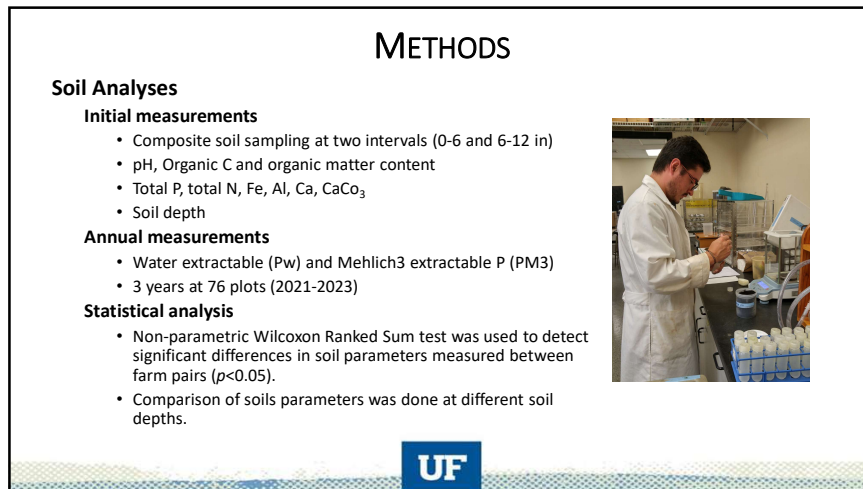
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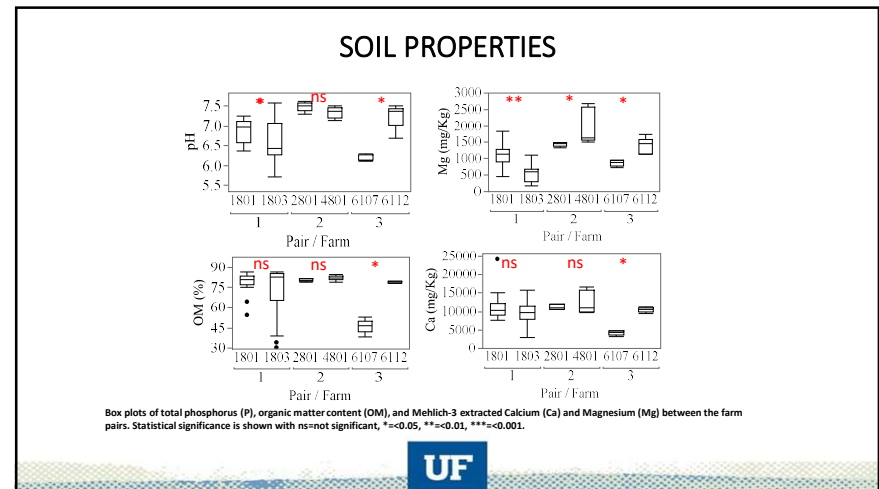
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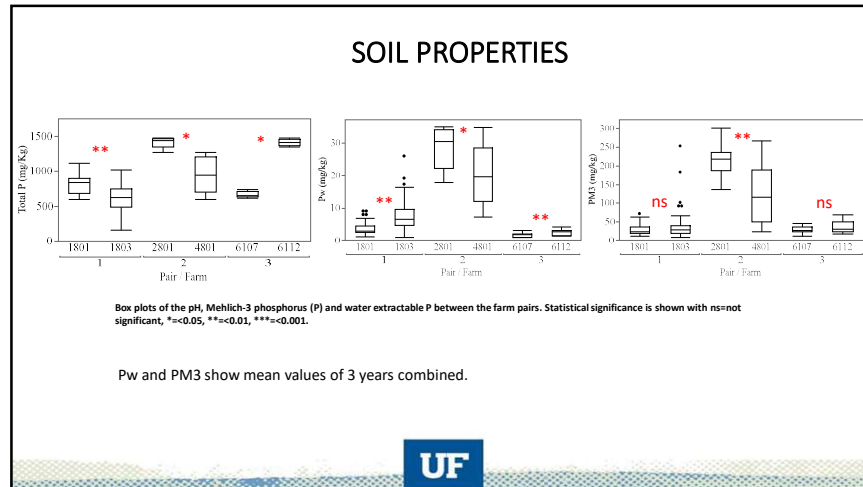
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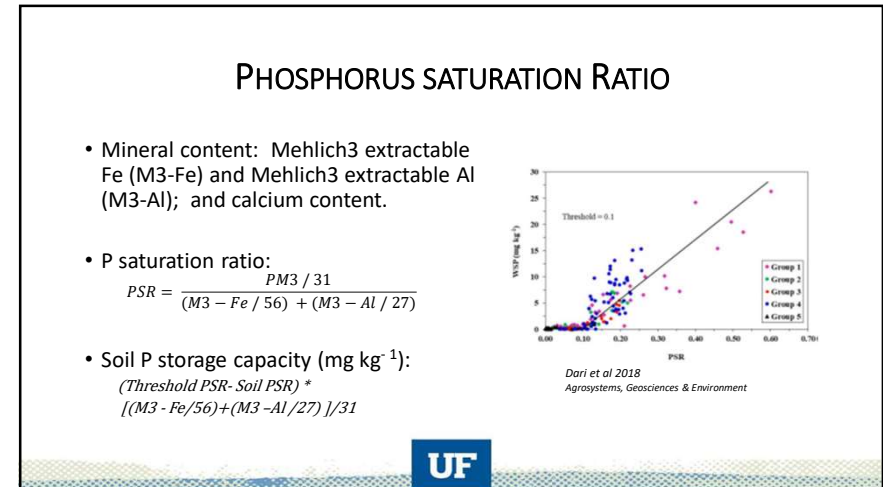
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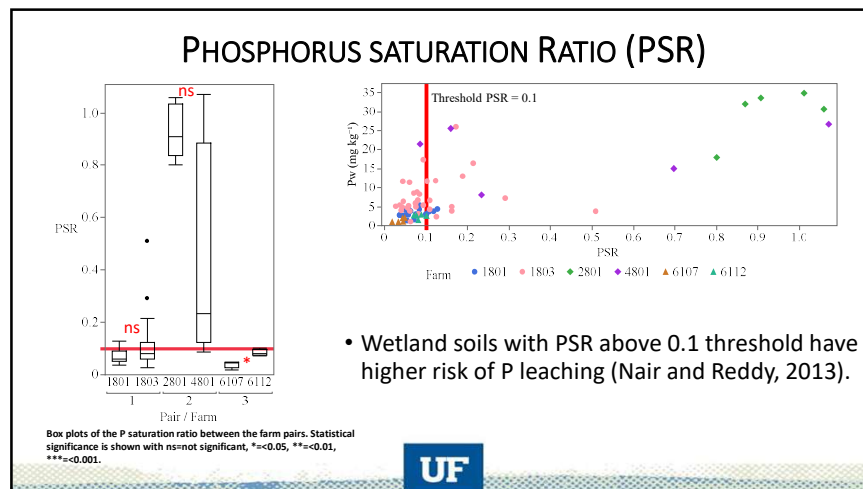
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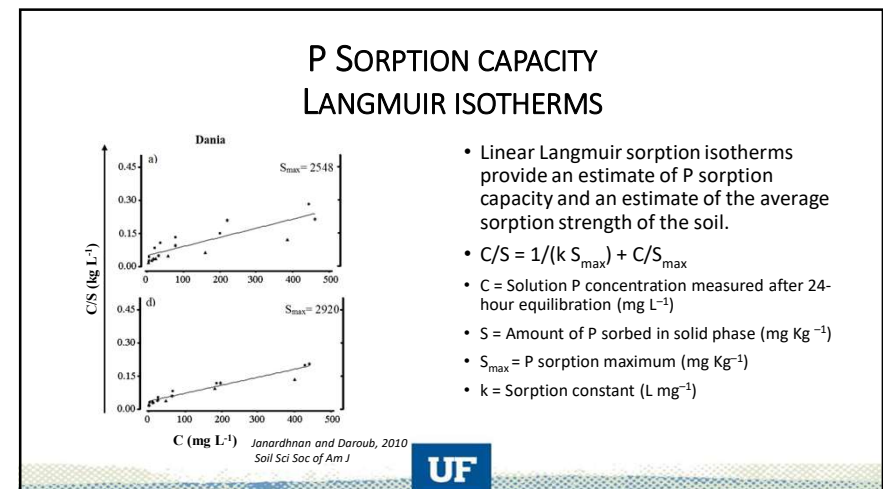
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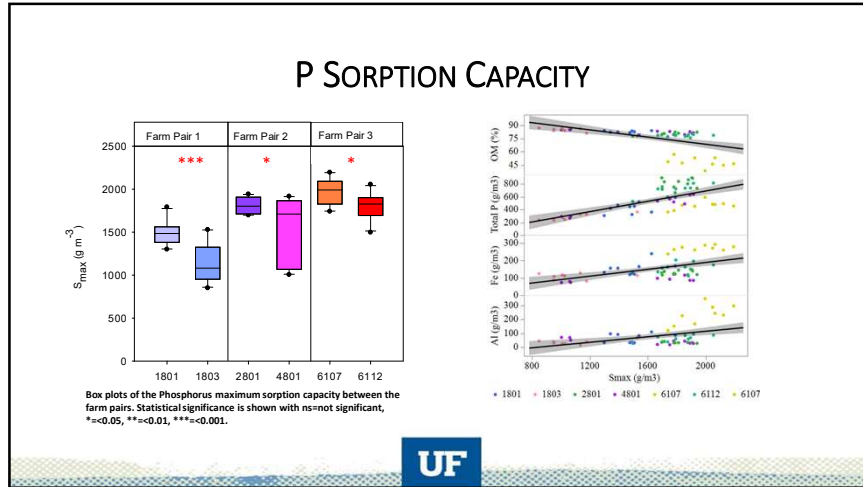
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WATER QUALITY WY 2022-23

Water Analyses

- pH
- Total P (TP),
- Total dissolved P (TDP)
- Particulate P (PP) = TP – TDP
- Soluble reactive P (SRP)
- Dissolved organic P (DOP)= TDP – SRP
- Total suspended solids (TSS)

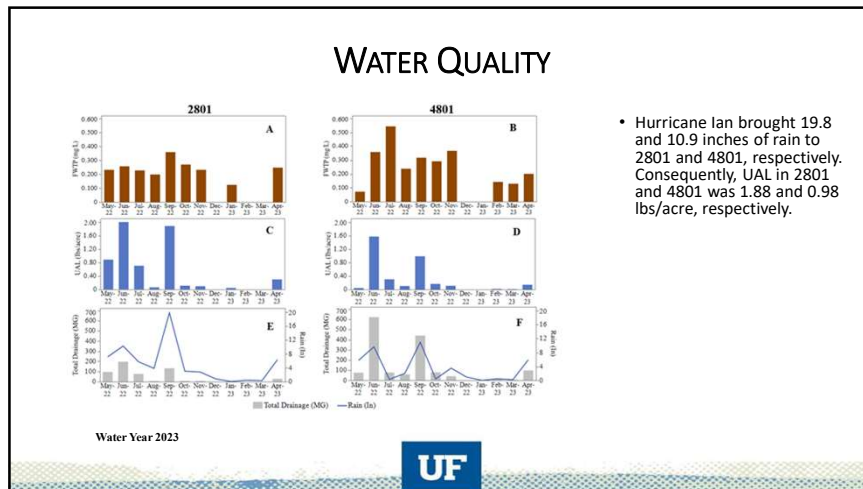
✓ Pump station inspection and maintenance (Monthly)

Statistical analysis

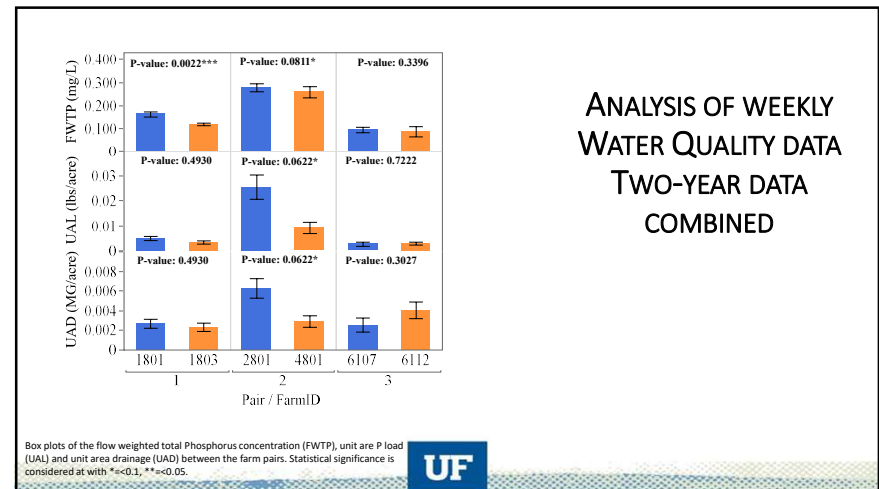
- Nonparametric Kolmogorov-Smirnov statistical test was performed on the combined weekly dataset for WY 2022 and WY 2023 to detect differences between farm pairs (P-value < 0.1).

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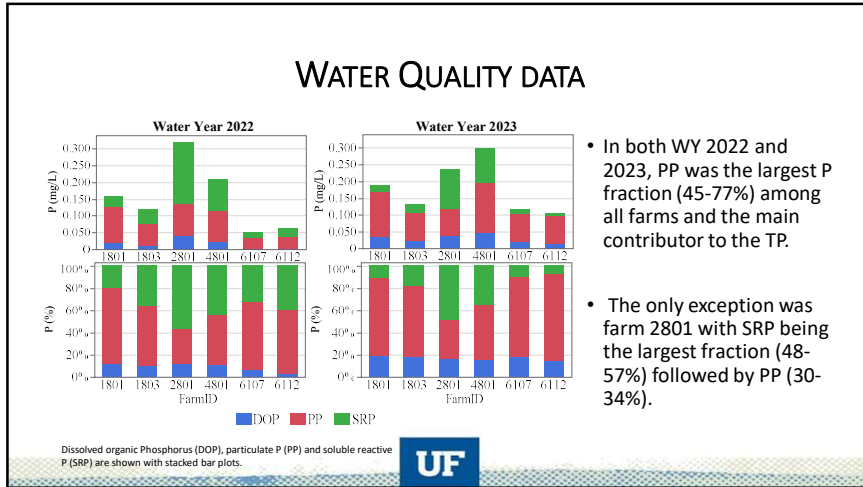
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- In both WY 2022 and 2023, PP was the largest P fraction (45-77%) among all farms and the main contributor to the TP.
- The only exception was farm 2801 with SRP being the largest fraction (48-57%) followed by PP (30-34%).

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SUMMARY

- Current results revealed differences in soil properties between farm pairs.
- PSR is high in some soils & P sorption increases with mineral content which may have an impact on water quality.
- Two-year water quality data (WY 2022-23) is variable due to extreme events like hurricanes.
- Longer-term data may provide stronger evidence to compare water quality parameters between farms.

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Online BMP training

UF IFAS Extension Online Learning:
<https://ifas.catalog.instructure.com/>

6 modules covering BMP program-
Short quizzes

Certificate of completion issued as well as pesticide CEUs & Certified Crop Advisor (CCA)

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 Available through Dec 24, 2024

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