

# Regional Biosolids Symposium

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# Purpose

1. Explain UF/IFAS fertilizer recommendations for pastures in FL
2. Describe the differences in P availability among various P sources
3. Discuss major limitations associated with soil test P as a tool to predict environmental hazard

# UF/IFAS Fertilizer Recommendations (SL 129)



## UF/IFAS Standardized Fertilization Recommendations for Agronomic Crops<sup>1</sup>

R. Mylavarapu, D. Wright, and G. Kidder<sup>2</sup>

### Introduction

This publication presents in abbreviated form the fertilization recommendations for agronomic crops based on soil tests performed by the UF/IFAS Extension Soil Testing Laboratory (ESTL). It contains the basic information from which ESTL soil-test reports and fertilization recommendations are generated.

### General Background

Soil testing is a tool in crop fertilization management. Its successful use requires that: (1) you send the lab soil samples that best represent your field or management unit; (2) the laboratory uses legitimate methods for predicting fertility; and (3) the fertilizer recommendations are based on measured crop responses.

The ESTL extracts phosphorus (P), potassium (K), magne-

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be appropriate. In such instances, the local county agent should be consulted **before** soil samples are sent for testing. Reports contain the results of the tests (soil pH, ppm extractable P, K, Mg, and Ca), a rating of the P, K, and Mg (high to low), and the fertilization recommendation for the specified crop. The recommendation is composed of two parts: (1) the rates of N, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O fertilizer to apply; and (2) footnotes that give important information about fertilization management such as application timing, special crop requirements, etc.

CONCEPT	
The <i>Build-Up and Maintenance</i>	The goal is to build up the soil fertility level to the <i>high</i> category with additions of specific nutrients whose indexes were interpreted as <i>medium</i> or lower per the soil test. Nutrients removed with harvested crop should be replaced to maintain high nutrient status.
The <i>Basic Cation Saturation Ratio (BCSR)</i>	This concept was developed in the early 1940's and it attempts to maintain desired ratios of cations [potassium (K), magnesium (Mg), and calcium (Ca)] on the soil cation-exchange complex. Recycling of nutrients in the soils is not considered.
<b>Sufficiency Level of Available Nutrient (SLAN), also called Crop Nutrient Requirement (CNR)</b>	<b>Soil tested medium or above for a particular nutrient can supply 100% of crop nutrient requirement</b>

Last revision: April, 2015

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# Fertilizer Recommendations for Established Bahiagrass Pastures

## ❖ 1996

- State was divided into North and South designations (based on turf recommendations and USDA-NRCS thermic/hyperthermic regimens)

”In Central and South FL, recent field research has shown that **soil testing is not a reliable tool for bahiagrass fertilizer management decisions, and is not recommended.** Fertilizer decisions for bahiagrass pastures should be based on the economics of your operation”

## ❖ 2007

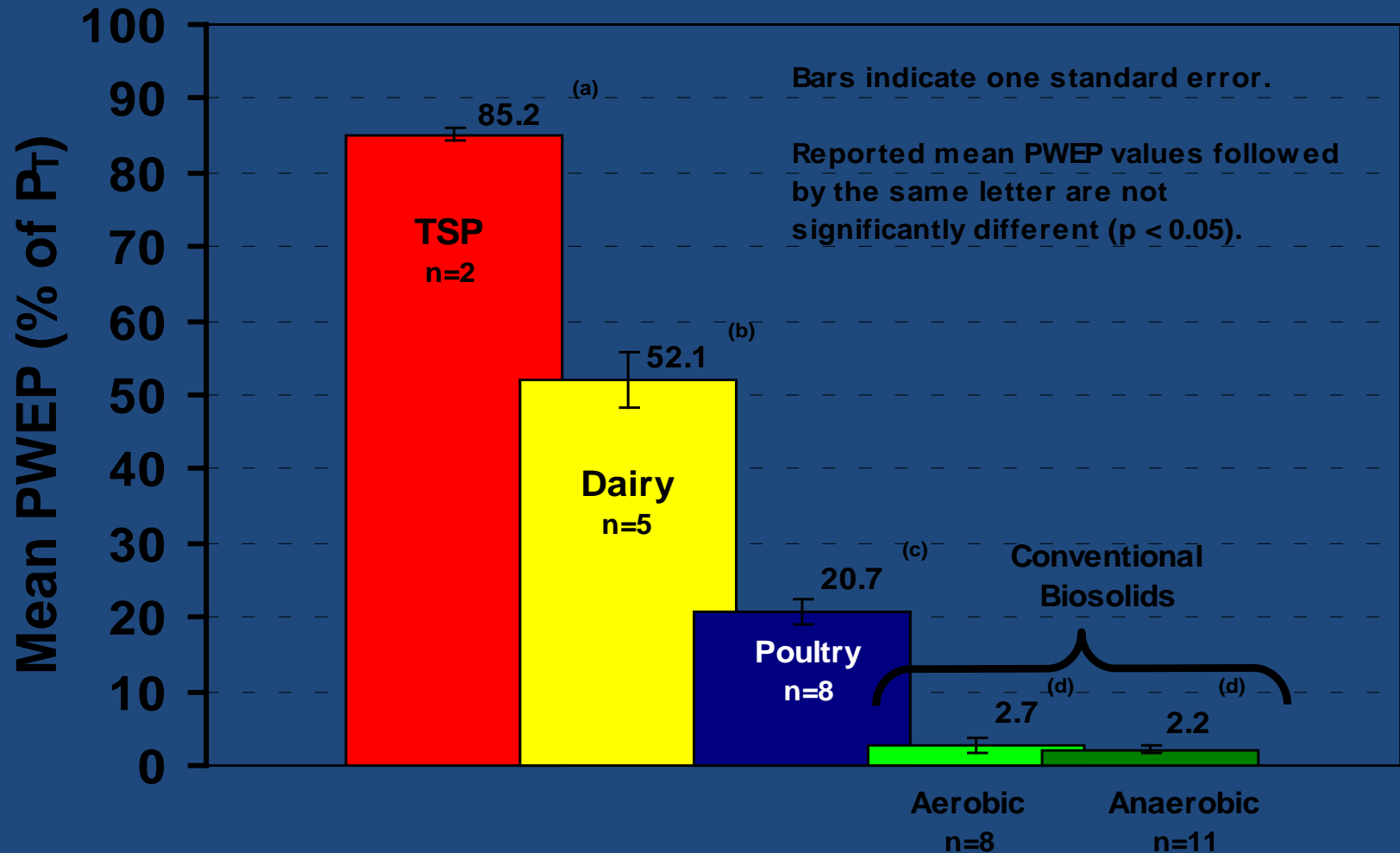
- 11 years (1996-2007) without soil test or P recommendations
- Bahiagrass decline (mole cricket, low pH, P deficiency, stand loss, weed infestation)

# Challenges

- ❖ Standard soil test results of no help in decision making for P fertilization of established/grazed bahiagrass
- ❖ Inconsistent results, high P application rates
- ❖ Key questions
  1. Can tissue plus soil testing provide a better diagnostic tool to predict bahiagrass P requirements?
  2. How much P should be used to sustain pasture productivity while avoiding water quality impact?

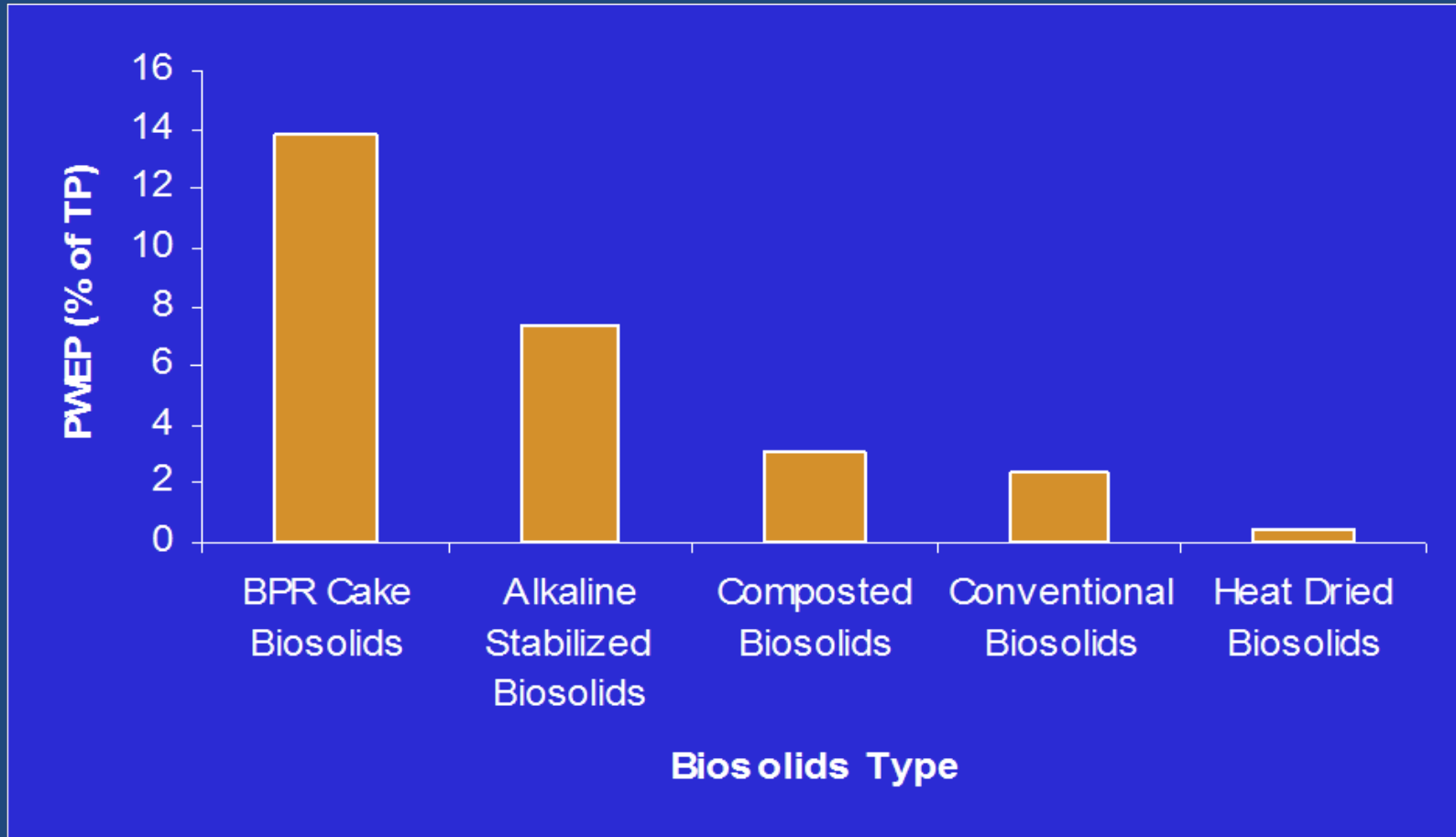
13 scientific peer-reviewed publications, 2 grad students (1 MS and 1 PhD), numerous abstracts in scientific meetings, extension publications, and other educational activities

# Water-extractable P of various P sources



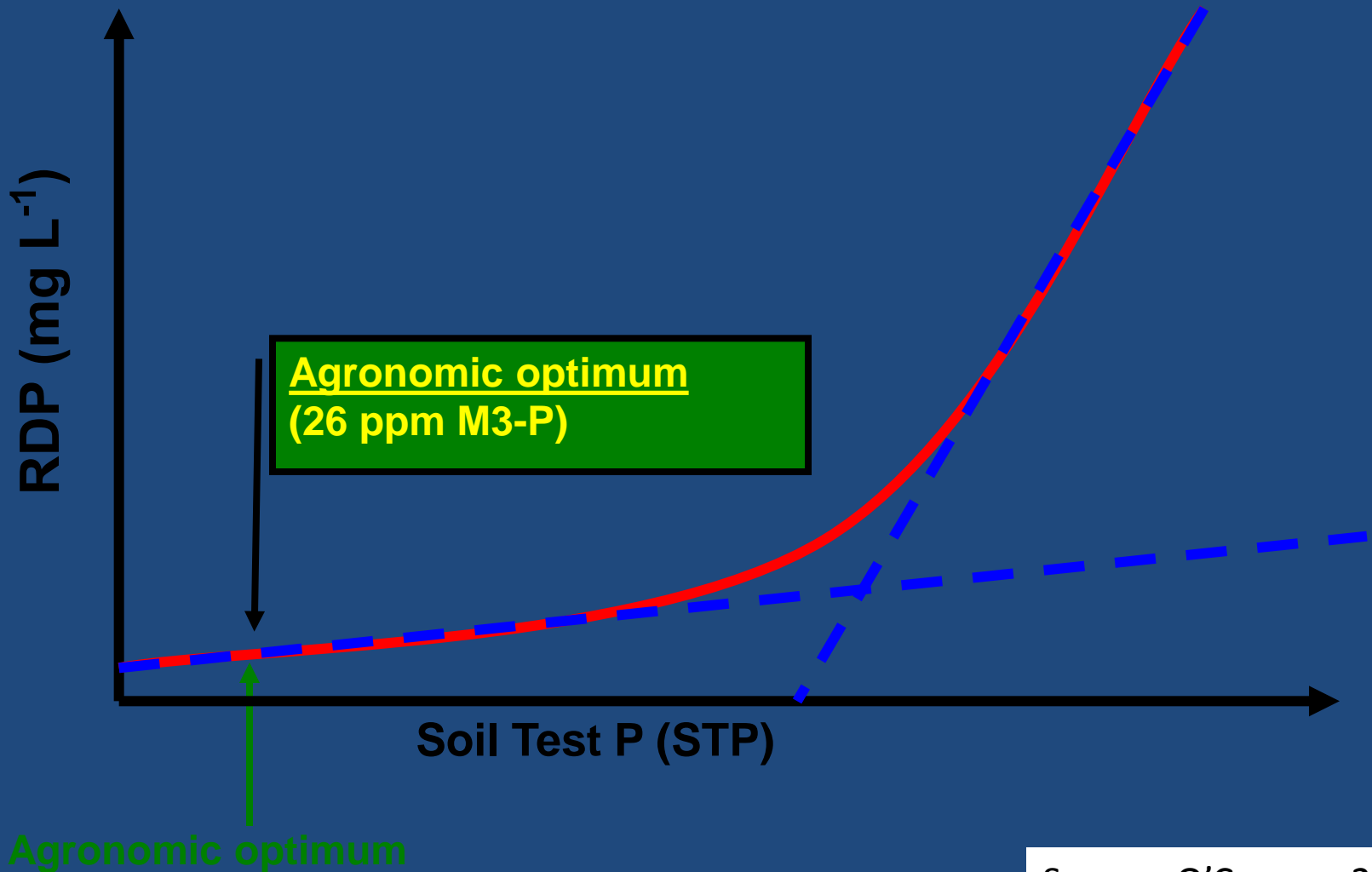
Source: O'Connor, 2013 (adapted from Brandt et al., 2004)

# Water-extractable P of various biosolids



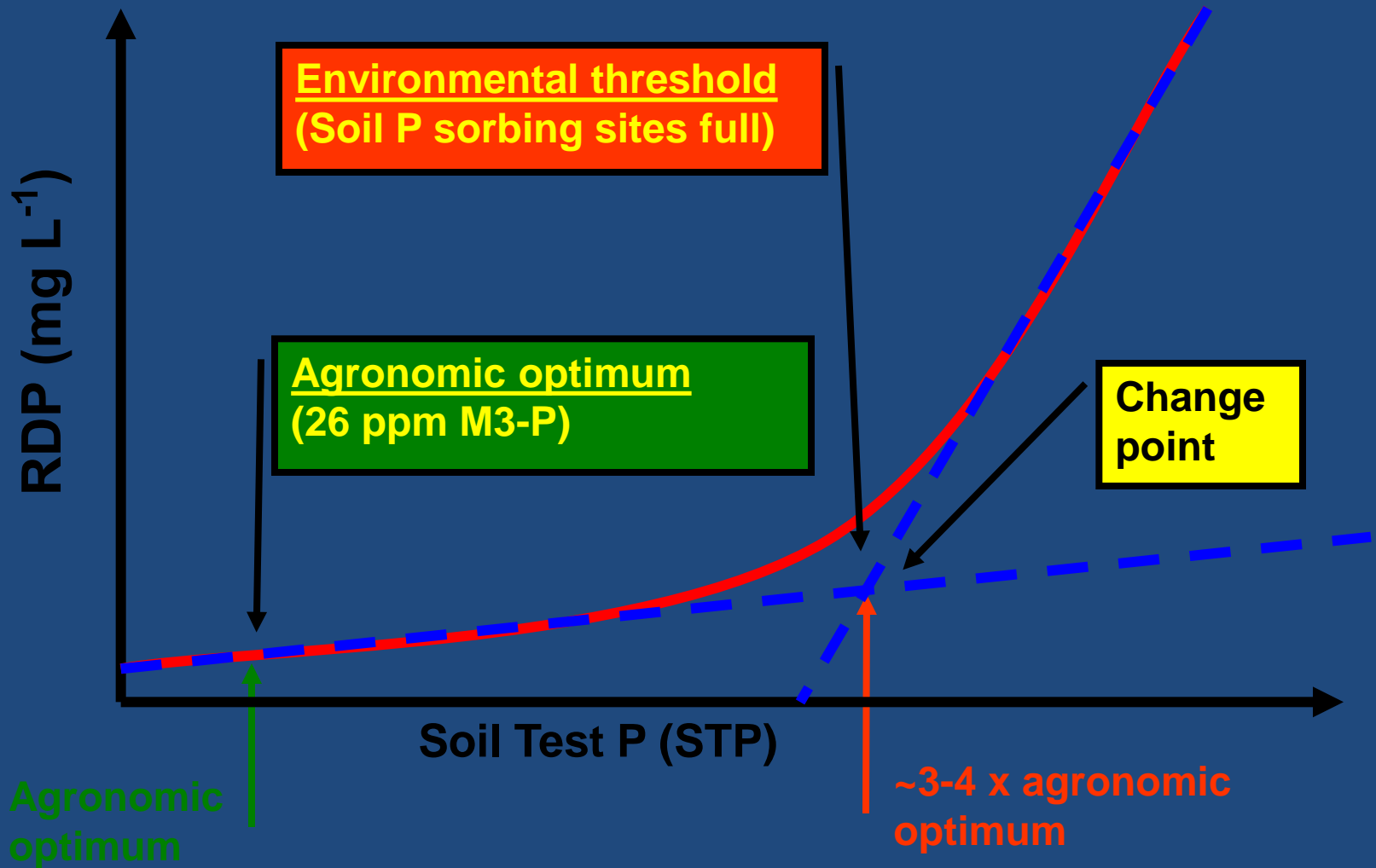
Source: O'Connor, 2013

# Soil test P: Agronomic vs. environmental interpretations



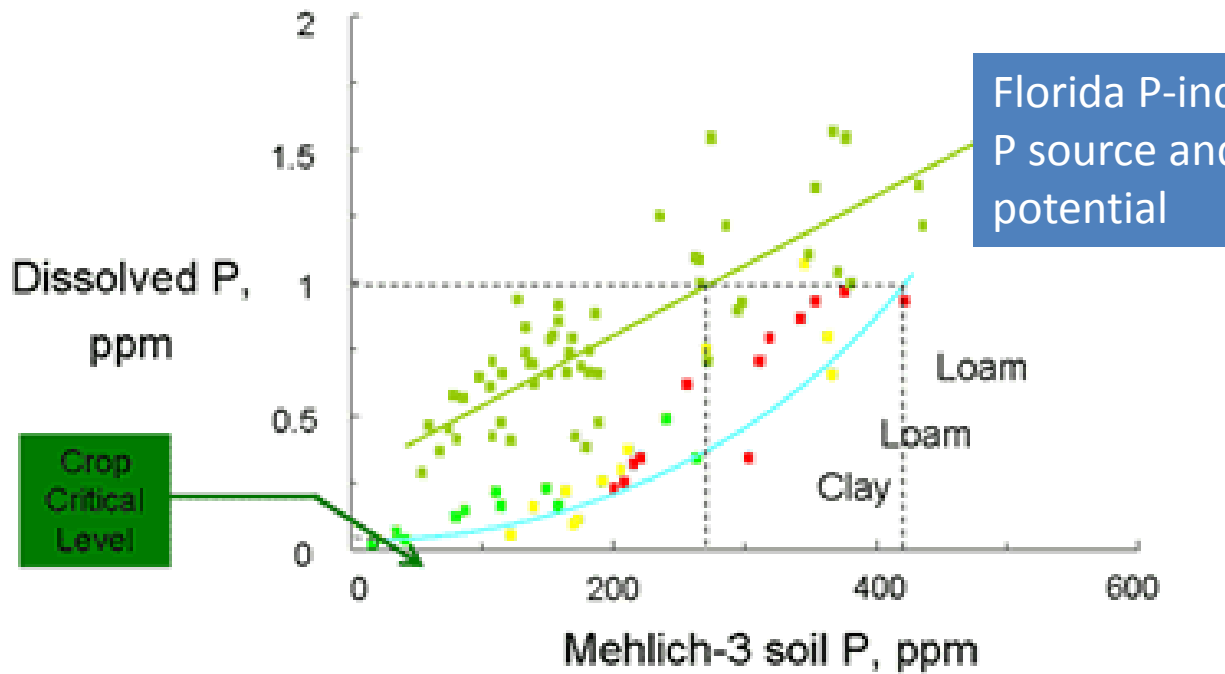


# Soil test P: Agronomic vs. environmental interpretations



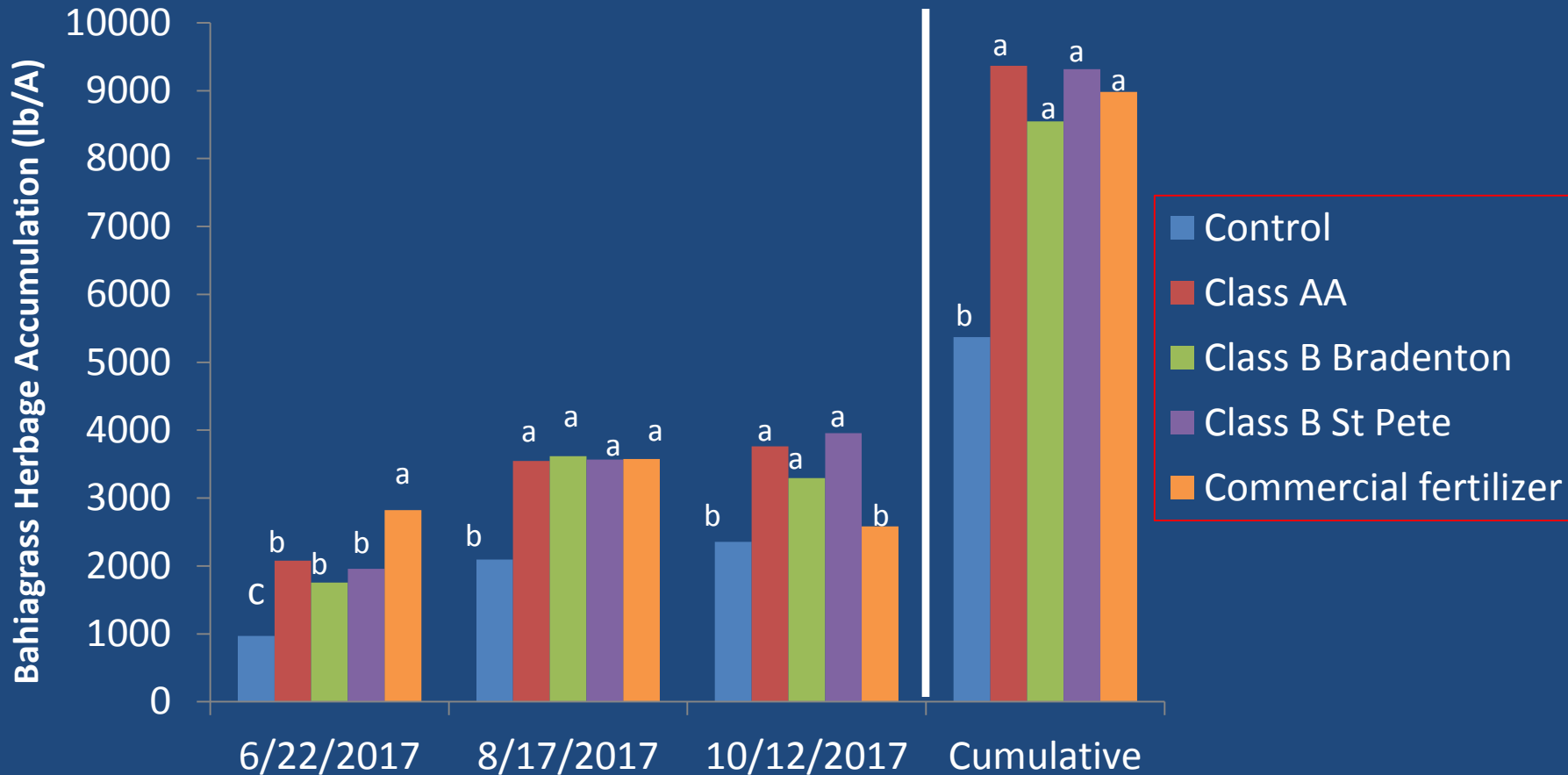
# Differences in soil P retention capacity

## Runoff P vs Soil Test P



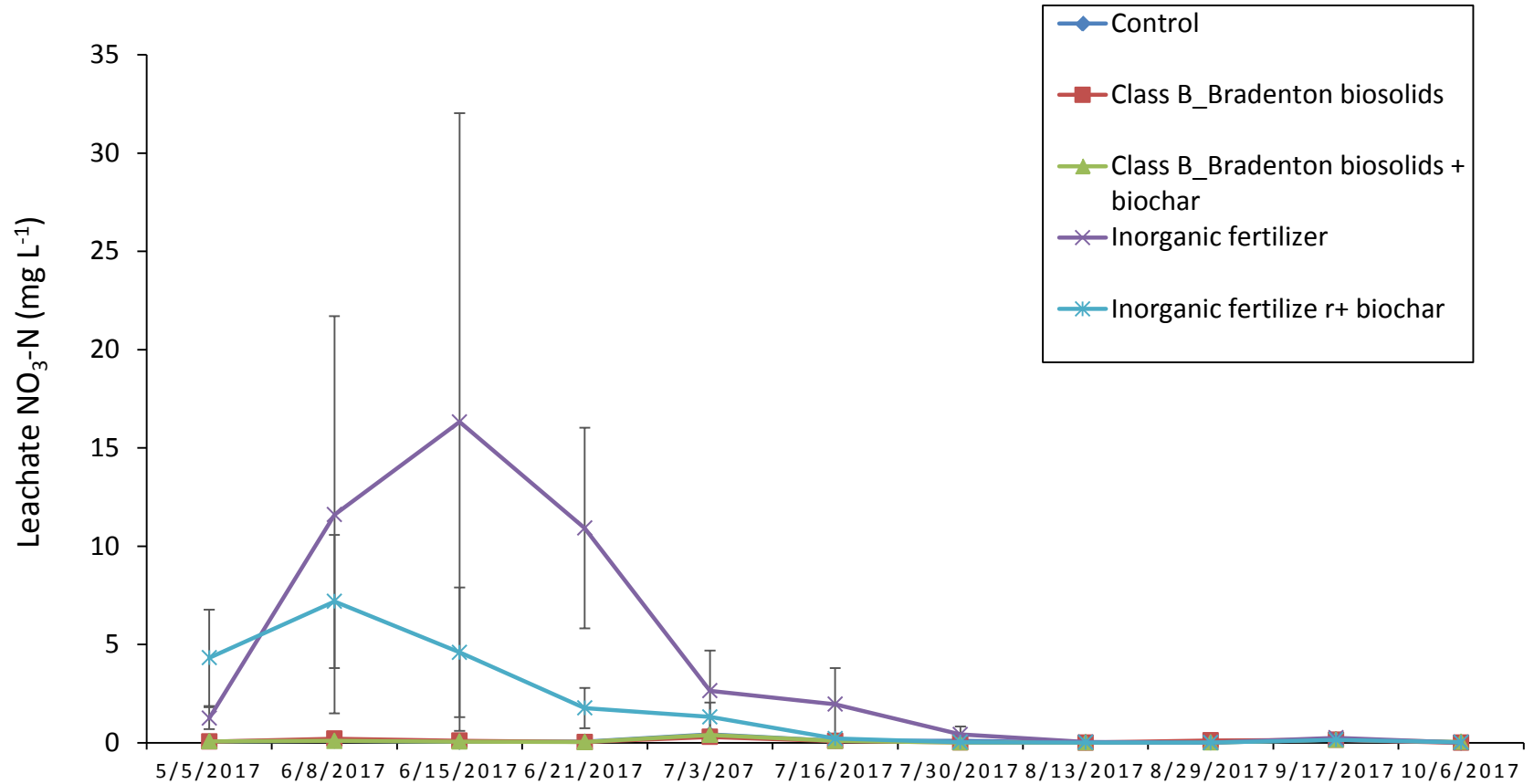
Florida P-index : risk-based, P source and transport potential

# Biosolids project at Ona



Source: Silveira et al. (unpublished data)

# Biosolids project at Ona



Source: Silveira et al. (unpublished data)

# THANK YOU!

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