

# Sugarcane, Water Tables, and Best Management Practices in the Everglades Agricultural Area

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# General BMP Principles

To reduce P discharge

- Remove excess water more by evapotranspiration and seepage, and less by pumping.
- Reduce pumping rates if you must pump.

# General BMP Principles

Soil phosphorus is made available by microbial oxidation of soil. Therefore, the more we can reduce rates of microbial oxidation of soil (soil subsidence), the better we can reduce phosphorus discharge.

# General BMP Principles

Keeping fields flooded and water tables near the surface is often necessary to meet your BMPs and also controls microbial oxidation of soil, so the actions you take to meet your BMPs are often the same actions you would take to conserve your soil.

# Purpose of Presentation

- Report research results that help sugarcane growers in Florida:  
Optimize Yields  
While:

# Purpose of Presentation

Optimize Yields

While:

Meeting BMP Regulations  
and

# Purpose of Presentation

Optimize Yields

While:

Meeting BMP Regulations and

Conserving Muck Soils.

# Lysimeter Research

# 16 Fiberglass Lysimeters

6 ft x 10 ft x 3 ft deep



# Yield Response to Flooding

- Repeated cycles of 2-days flood followed by 12 days drainage to 20” moderately improved yields.

# 20'' Drainage after 14-Day Flooding

<b>Treatment</b>	<b>CP 96-1252</b>	<b>Unknown</b>
	Tons cane per acre	
Constant	68.7 A	61.3 A
14-day flooding	62.9 A	65.2 A

## 6'' vs. 20'' Water-Table Depth with no Flooding

<b>Treatment</b>	<b>6 inches</b>	<b>20 inches</b>
	Tons cane per acre	
Mean of varieties without flooding	40.5 B	65.8 A

# **Young Cane**

Before June

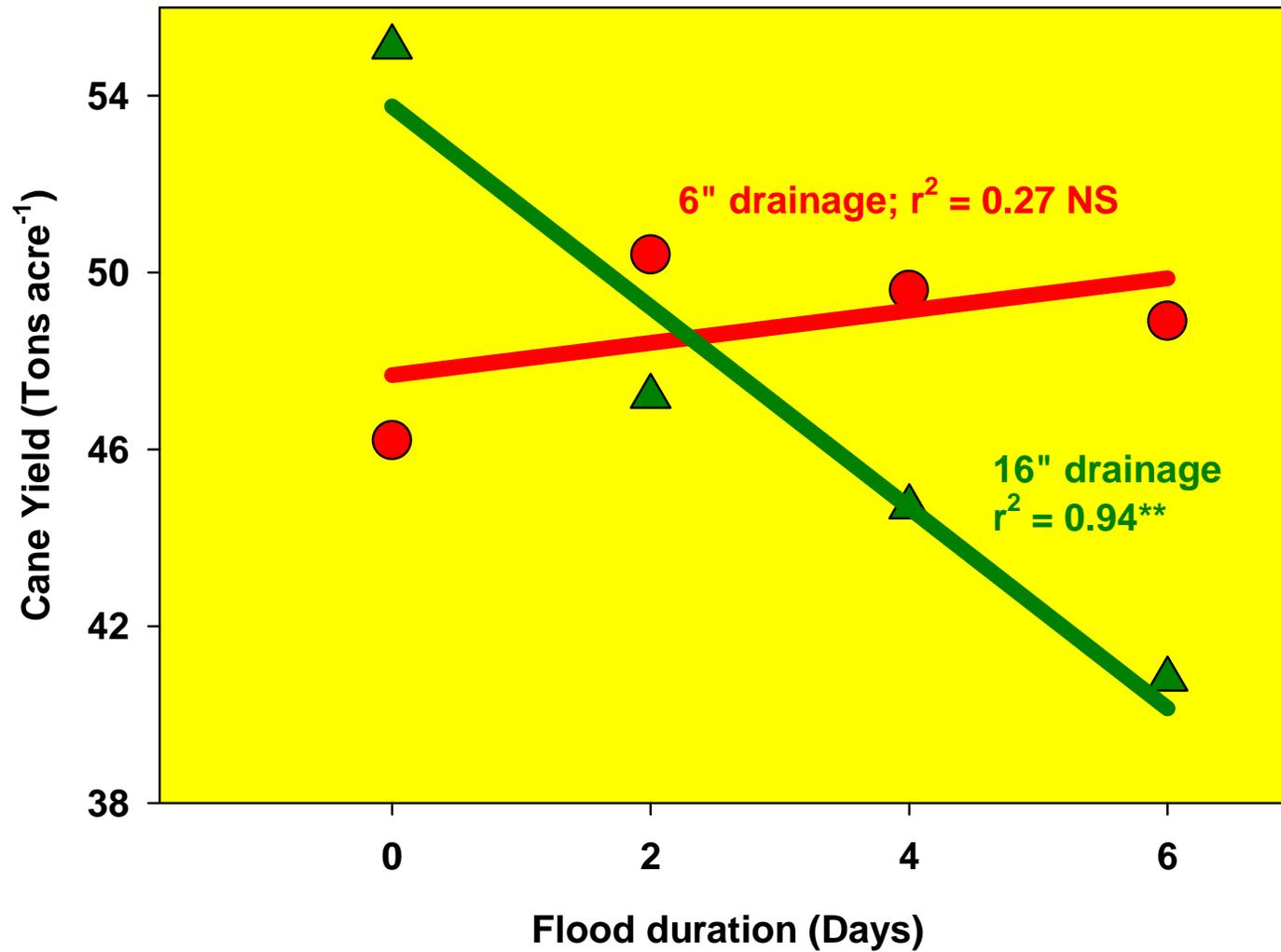


Early Flooding

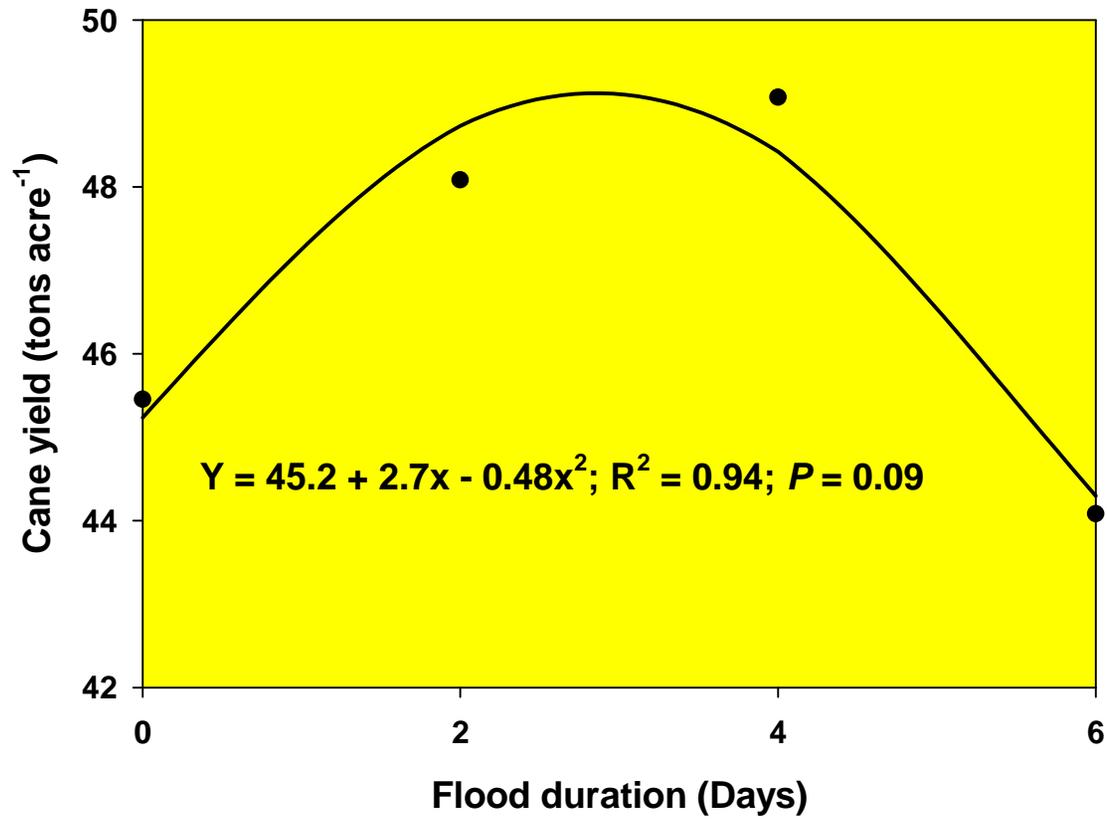


No Early Flooding

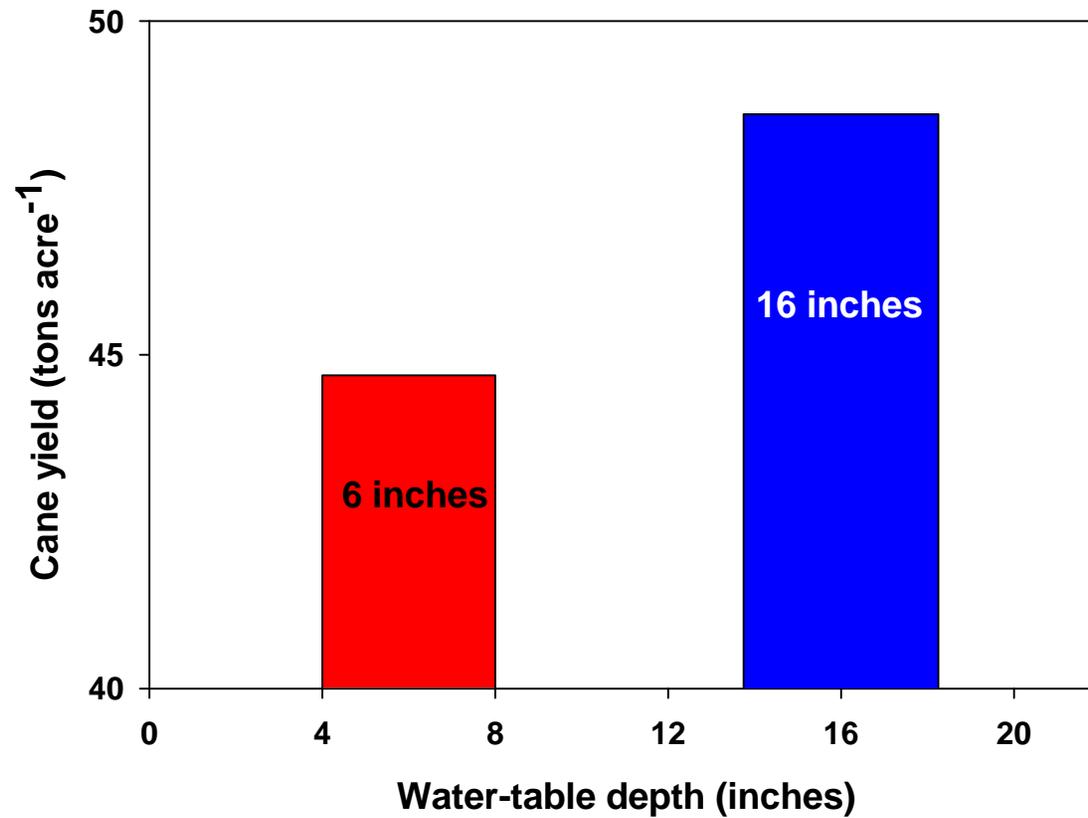
# Cane Yield Plant Cane



# Cane Yield First Ratoon



# Cane Yield First Ratoon



# Summary of Young Cane Plant- Cane Crop

Young cane (prior to June) is substantially more susceptible to flooding than well established cane (after June 1).

# Summary of Young Cane Plant- Cane Crop

Cane yields declined as flood duration increased from 0 to 6 days if drainage was to 16”.

Up to 6 days of flood prior to June did not reduce yields with drainage to 6”.

# Summary of Young Cane First-Ratoon Crop

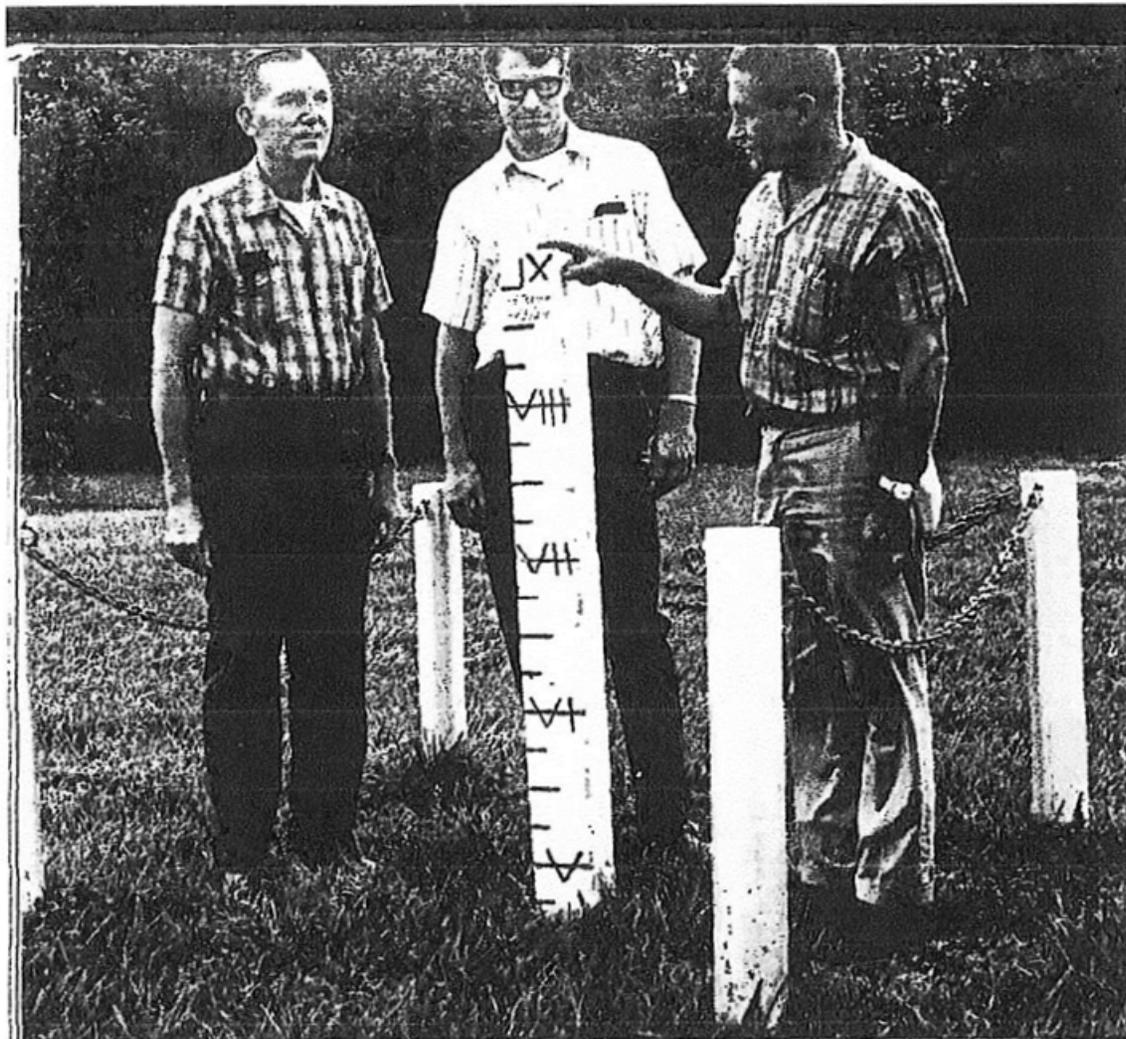
For both varieties, and for both drainage depths, flooding for 2 or 4 days gave a cane yield increase compared with no flooding or flooding for 6 days.

# Summary of Young Cane Plant Cane and First-Ratoon Crop

When comparing water-table depth with no flooding, the 16" depth resulted in higher yields than the 6" depth for both varieties.

# Summary of Young Cane

All results between plant cane and first ratoon ARE NOT consistent. Managing for high yields, BMPs, and soil conservation will be challenging and complex, but working together, with more research and feedback between growers and researchers, we can develop practical solutions.

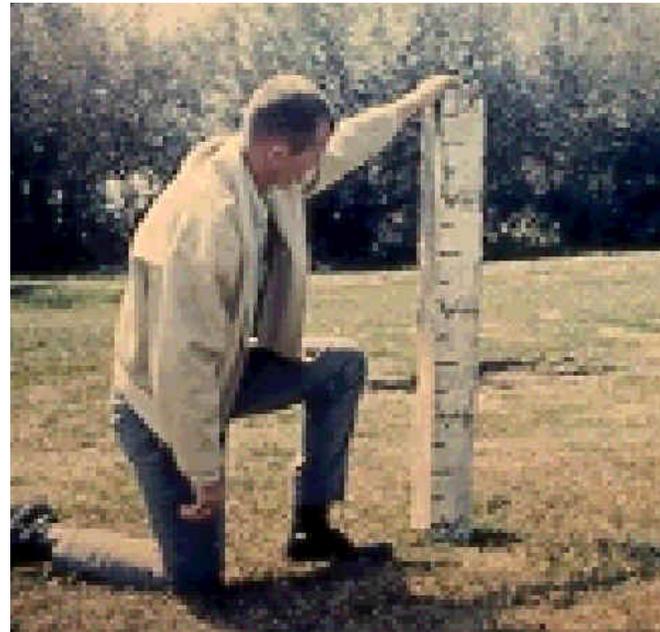


In 1924 when the Agricultural Research and Education Center was opened at Belle Glade, a nine-foot concrete post was placed in the ground down to bedrock. The level of the soil was then flush with the top of the post. Here Dr. Dan Beardsley, Dr. Robert G. Volk and Theron W. Casselman examine the post which indicates the soil has dropped almost  $4\frac{1}{2}$  feet during the 47-year period.

# Thoughts for the Future

1968

Historically we have not emphasized research on conserving our muck soils, perhaps because we thought it was research that ultimately would not be successful. Also, sustainability research usually has lower priority to profit-driven research.



# Thoughts for the Future

1978

Take advantage of the similarities in practices that are needed to meet BMPs and conserve our muck soils.



# Thoughts for the Future

1988

Consider much of the optimistic results of research that suggest we can have productive sugarcane and conserve our muck soils.

- Results of Dolen Morris
- Results discussed today



# Thoughts for the Future

1999

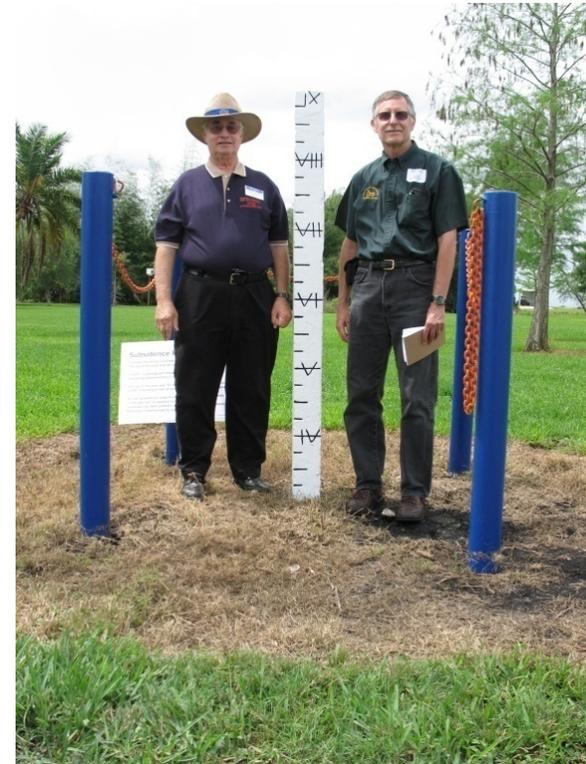
There are exciting opportunities for merging research on soil sustainability with the environmental sustainability (BMP) research.



# Thoughts for the Future

2008

In the current structure of how research receives support, growers rather than researchers will determine the priority of this research.



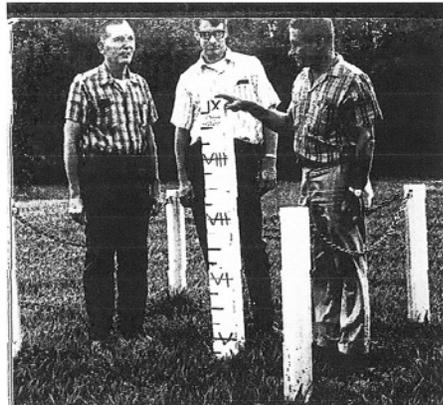
“It is difficult to put a dollar value on the soil, but one measure is the value of the products which can be produced. The present agricultural area produces around \$250 million worth of agricultural products each year. If all the area set aside for agriculture were used, in another 10 years the products could have a value of \$1 billion.

By this yardstick an inch of soil in the area set aside for agricultural purposes is worth a billion dollars. With stakes as high as this, there should be no hesitation in our efforts to attack the problem of subsidence with all the resources we can muster.”

Dr. Dan Beardsley, Dr. Robert G. Volk, and Theron W. Casselman. *Citrus & Vegetable Magazine*. 1972

# Thank You

## What Questions Do You Have?



In 1924 when the Agricultural Research and Education Center was opened at Belle Glade, a nine-foot concrete post was placed in the ground down to bedrock. The level of the soil was then flush with the top of the post. Here Dr. Don Reardon, Dr. Robert G. Volk and Theron W. Casselman examine the post which indicates the soil has dropped almost 4½ feet during the 47-year period.