Seepage vs. Center Pivot for Snap Bean Production in Florida

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INTRODUCTION

- **Seepage irrigation is the predominant irrigation for snap bean production in Florida, but poses problems for water conservation and quality.**
- **Overhead irrigation has significantly greater water-use efficiency than seepage irrigation, and can be used in snap bean production.**
- **Objective: to explore the feasibility of converting seepage to central pivot irrigation for commercial snap bean production in southwest Florida.**

MATERIALS & METHODS

2014-2015 Growing Season

Irrigation	Variety	Area (ha)	Planting Date	Harvest Date
Seepage	Caprice	4	2/18/2014	4/16/2014
Center pivot	Caprice	69	2/2/2014	4/8/2014

Field Measurements

Flow meter

Level logger

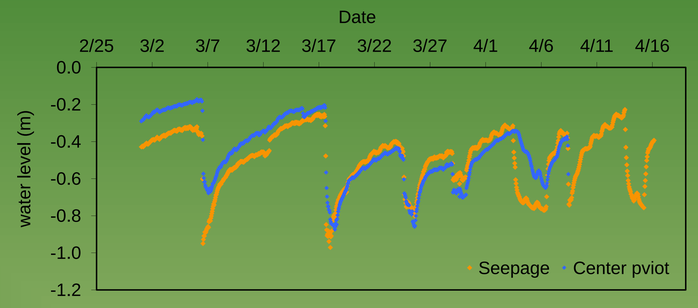
Rain gauge

Data logger

SPAD meter

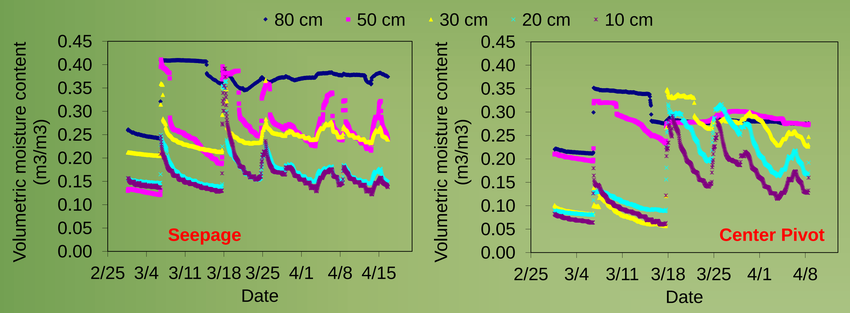
RESULTS

Water Level



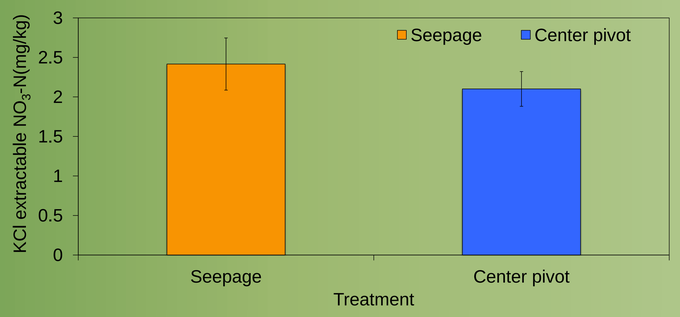
- **Seepage irrigation was 0.1-0.2 m higher than center pivot irrigation in water table.**

Soil Moisture



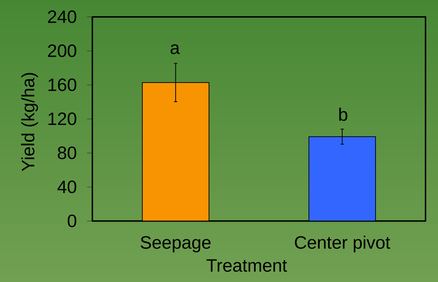
- **Soil moisture contents in the root-zone (top 12 inches) were greater for center pivot irrigation than for seepage irrigation.**

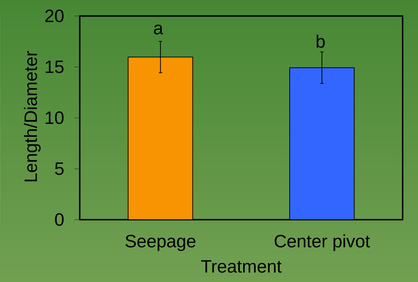
N Level in Soil at Harvest



- **No significant differences in NO_3-N concentrations in the surface soil were observed between the seepage and center pivot plots at harvest (P>0.05).**

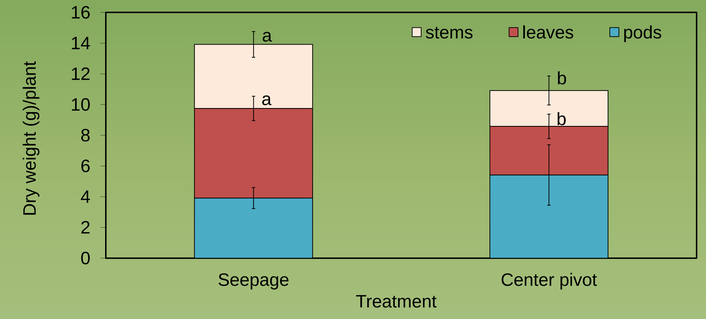
Snap Bean Yield & Quality





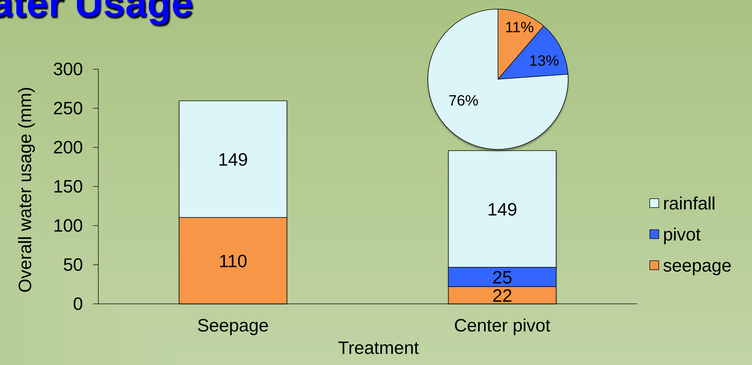
- **Seepage irrigation showed significantly greater yield and Length/Diameter ratio (P<0.05).**

Biomass at Harvest



- **At harvest, plants in seepage plots showed significantly higher dry weight of stems and leaves compared to that in center pivot irrigation plots (P<0.05).**

Water Usage



- **The irrigation water usage for seepage plots was 57% more than center pivot plots.**

CONCLUSIONS

- **Center pivot irrigation systems can save over 50% of water compared to seepage irrigation.**
- **A more suitable fertilization program is required.**

ACKNOWLEDGEMENTS

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