



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Soak or Flow?

Choosing the Right Water Path for Potatoes

Authors: Hope Nelson, Judyson de Matos Oliveira, John Lai, Lincoln Zotarelli

IMPORTANCE OF IRRIGATION



Potato crops are especially sensitive to over and under-watering¹.



Potatoes require precise moisture levels for optimal growth, tuber development, and to prevent diseases².



Specialized irrigation management is needed for potato farms to ensure uniform soil moisture and avoid water stress at critical growth stages³.

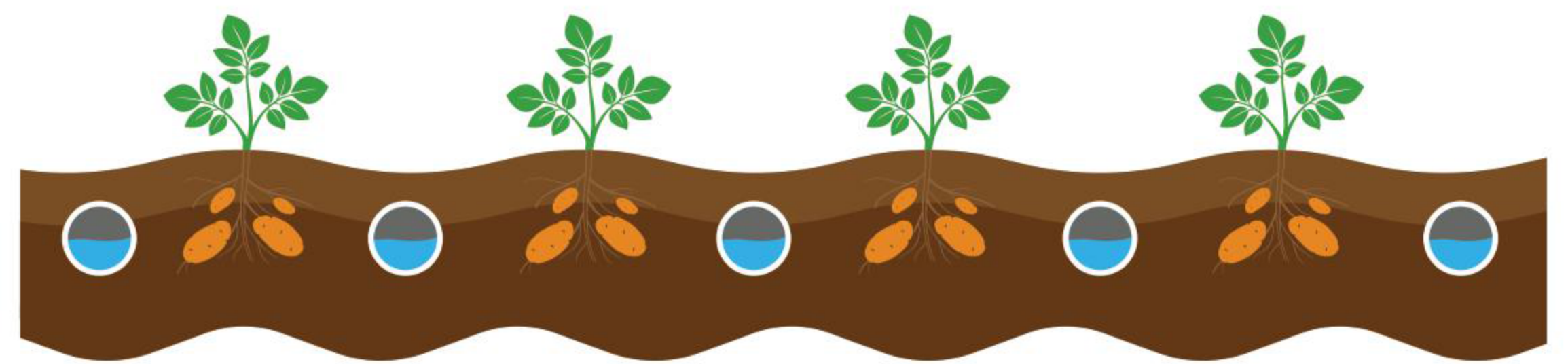
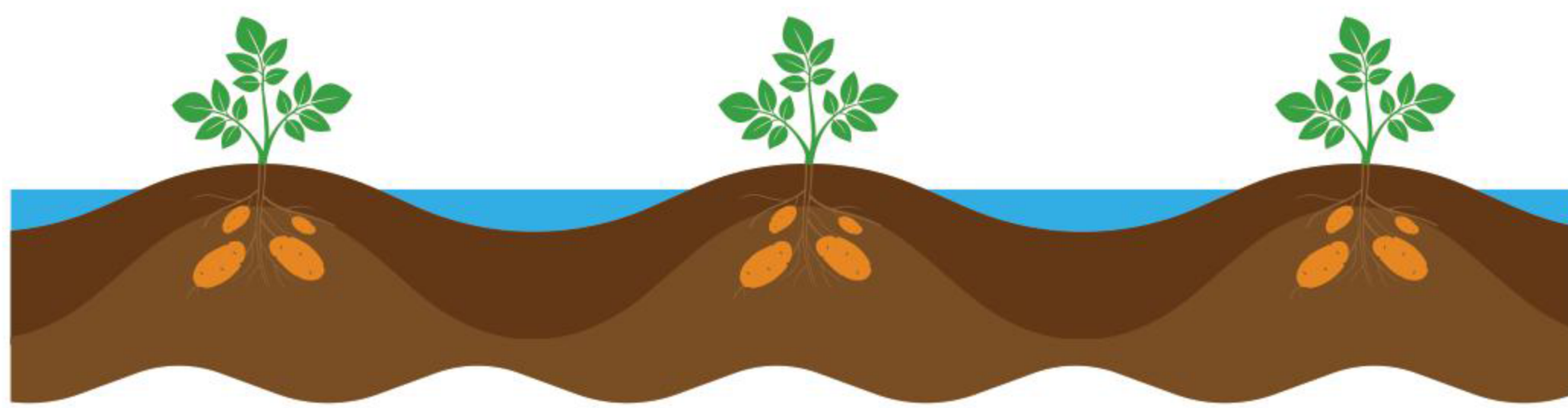


This illustrated guide summarizes some of the important production and economic factors that potato farmers should take into consideration when deciding to update their irrigation system.



The data used was collected from existing literature examining irrigation systems in Florida potato production over the past 10 years.

STRUCTURE



SEEPAGE

- 60** Shallow ditches called furrows are spaced ~60 feet apart.⁴
- Furrows irrigate and drain the field to maintain the water table.⁴

DRAIN-TILE

- 25** 3-4 inch high-density polyethylene pipes are buried 3 feet deep, spaced 25-35 feet apart.⁴
- Underground pipes irrigate and drain the field to maintain the water table.⁴

EFFICIENCY

- ↓\$** Low cost of operation.⁴
- ↓** Low irrigation efficiency (20-80% of pumped water used by plant)⁴

- ↑** Increased yield per acre due to lack of furrows (11-12% more plantable ground).⁴
- ↓\$** 50% reduction in pumping cost compared to seepage⁴
- ↑** Additional automation can help to hold water in the field year-round.

COST

- ↓\$** Average installation cost of \$207/acre⁵
- 💧\$** Water costs per irrigation season of \$60/acre⁵
- ↗** Profit margin of 11%⁵
- 📊** Average Net Present Value (NPV) of \$6,911/acre⁴
- 💰** Total irrigation cost per irrigation season of \$79/acre⁵

- ↑\$** Approximate installation cost of \$3500 without cost share. Cost share can cover ~75% of installation cost⁴
- 💧\$** Water costs per irrigation season of \$35/acre⁵
- ↗** Profit margin of 16%⁵
- 📊** Average Net Present Value (NPV) of \$9,209/acre⁴
- 💰** Total irrigation per irrigation season cost of \$250/acre⁵

An Equal Opportunity Institution.

1. Rens, Libby R., Lincoln Zotarelli, Andre Luiz Biscaia Ribeiro da Silva, Camila JB Ferreira, Cássio A. Tormena, Diane L. Rowland, and Kelly T. Morgan. "Managing water table depth thresholds for potato subirrigation." *Agricultural Water Management* 259 (2022): 107236. 2. Christ, Barbara J. Identifying potato diseases in Pennsylvania. PennState, College of Agricultural Sciences, 1998. 3. Van Loon, C. D. "The effect of water stress on potato growth, development, and yield." *American potato journal* 58 (1981): 51-69. 4. Mwatwa, R. "Economic Feasibility of Irrigation Methods and Nitrogen Fertilizer Strategies for Chip Potato Production in Florida". University of Florida. 2020. 5. Rogers, Jenna, Tatiana Borisova, Lincoln Zotarelli, Kelly Grogan, Jeffrey Ullman, Jessica Bertine, and Kelly Morgan. "Costs and Benefits of More Efficient Irrigation Systems for Florida Chipping Potato Production". EDIS document FE953. 2014.

Author Information: Hope Nelson (hope.nelson@ufl.edu), is an M.A.B. student in the Food and Resource Economics Department at the University of Florida. Judyson de Matos Oliveira (judyson.dematoso@ufl.edu), is a Ph.D. student in the Horticultural Sciences Department at the University of Florida. John Lai (johnlai@ufl.edu), is an assistant professor in the Food and Resource Economics Department at the University of Florida. Lincoln Zotarelli (lzota@ufl.edu), a professor in the Horticultural Sciences Department at the University of Florida.

Acknowledgement: This work was generously supported by the Florida Department of Agricultural and Consumer Services Office of Agricultural Water Policy [#28720].