Soak or Flow?

Choosing the Right Water Path for Potatoes

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FOOD AND RESOURCE ECONOMICS

HORTICULTURAL SCIENCES

IMPORTANCE OF IRRIGATION

Potato crops are especially sensitive to over and under-watering[1].

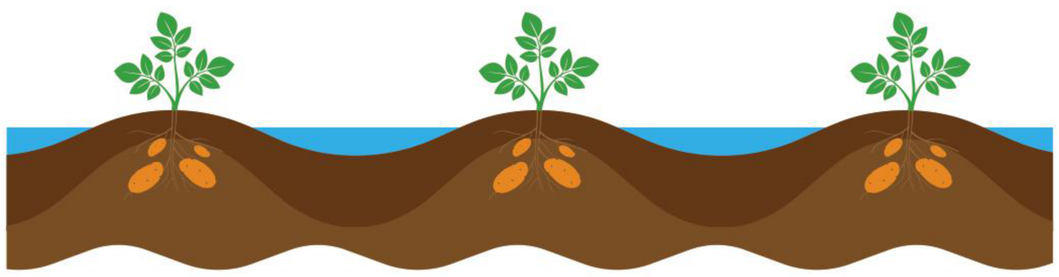
Potatoes require precise moisture levels for optimal growth, tuber development, and to prevent diseases[2].

Specialized irrigation management is needed for potato farms to ensure uniform soil moisture and avoid water stress at critical growth stages[3].

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.

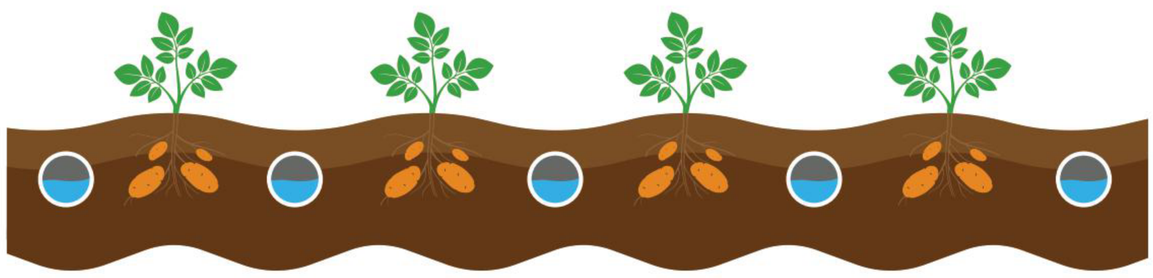
STRUCTURE



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 seepage[4]

Additional automation can help to hold water in the field year-round.

COST

Average installation cost of $207/acre[5]

Water costs per irrigation season of $60/acre[5]

Profit margin of 11%[5]

Average Net Present Value (NPV) of $6,911/acre[4]

Total irrigation cost per irrigation season of $79/acre[5]

Approximate installation cost of $3500 without cost share. Cost share can cover ~75% of installation cost[4]

Water costs per irrigation season of $35/acre[5]

Profit margin of 16%[5]

Average Net Present Value (NPV) of $9,209/acre[4]

Total irrigation per irrigation season cost of $250/acre[5]

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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.** Mwatuwa, 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.

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