



Designing a Drip Irrigation System at Berggren Demonstration Farm

2015 ELP Sustainable Farms Team

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Who we are

We are a group of undergraduate students pursuing the modification and improvement of our current food system through participation in the Environmental Leadership Program's Sustainable Farms project. Working with Berggren Demonstration Farm teaches us about current environmentally-conscious agricultural methods such as rotational grazing, native plant management, small-scale animal processing, and cover-cropping.

Abstract

Our Sustainable Farms Team is working with the Berggren Demonstration Farm to develop an active understanding of sustainable agricultural practices. We are investigating the implementation of a drip irrigation system at Berggren as a potential replacement for their current overhead sprinkler irrigation system. By collecting data on-site, we are researching potential water and electricity savings. We plan on compiling an instructional resource that provides other small farmers with information regarding the benefits, costs, and implementation options of a drip irrigation system.



Figure 1 : Map of the Berggren Watershed Conservation Area courtesy of Berggren Demonstration Farm

About Berggren Demonstration Farm

Berggren Demonstration Farm is a 30-acre farm located on a side channel of the McKenzie River near Waltherville, Oregon. Berggren Farm raises and manages small livestock, poultry, pastures, and vegetable crops. The McKenzie River Trust purchased this property in 2010 to explore and demonstrate the integration of sustainable agriculture and habitat restoration efforts along the McKenzie River. The farm now operates with additional support from several organizations including Cascade Pacific Conservation & Development and Eugene Water & Electricity Board. The mission of Berggren Demonstration Farm is to “promote the connections between healthy farms and clean water by employing ecologically appropriate farming techniques, educating young and beginning farmers, and partnering with our community to support a strong local food system.”

What is Drip Irrigation?

Drip irrigation ensures that farms conserve clean water, a vital resource, for future generations. Water conservation occurs through the efficient watering of crops. Drip irrigation allows water to slowly and constantly permeate the soil surface, targeting the roots directly. Therefore, drip irrigation prevents excessive soil erosion and nutrient leaching, which in turn, maintain the purity of the water and the fertility of the soil. Both healthy soil and clean water are needed for the future of agriculture.

Drip Irrigation Plan

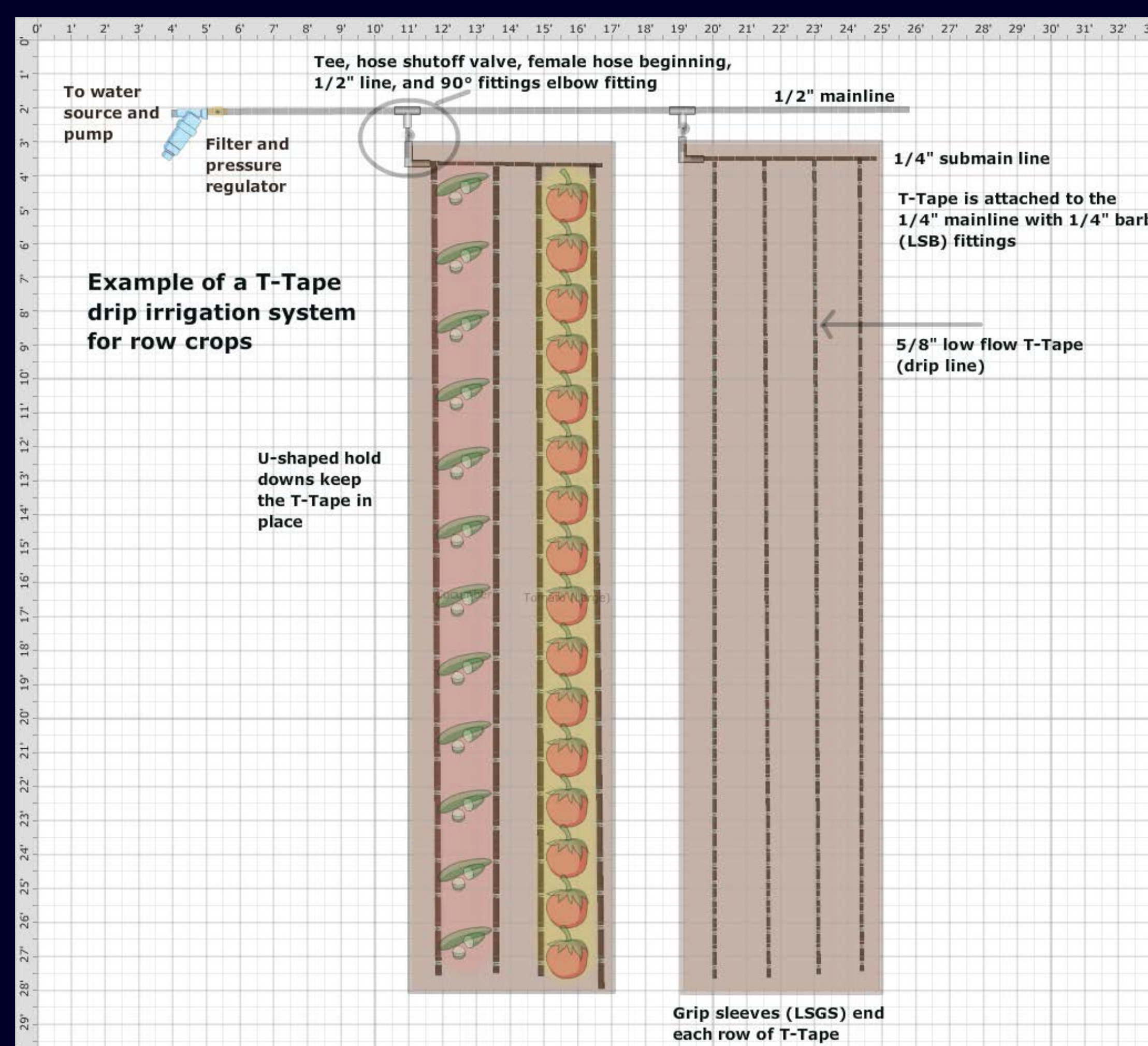


Figure 2: Components needed for a row crop T-Tape drip irrigation designed on Dripworks Garden Planner

Advantages: Disadvantages:

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| <ul style="list-style-type: none"> • Potentially less water and energy intensive than overhead irrigation • Direct root hydration <ul style="list-style-type: none"> ○ Improved plant growth through ○ Minimal erosion ○ Reduction in nutrient leaching • Reduction in weed growth <ul style="list-style-type: none"> ○ Drier surface allows less weed germination | <ul style="list-style-type: none"> • Short lifetime of T-Tape caused by sunlight exposure • Improper water filtration can cause potential blockage of T-Tape due to sediment or organic. • High initial material cost with many small parts |
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Importance of Sustainable Practices

The mission statement of Berggren Demonstration Farm is “Farming for the Seventh Generation” meaning that the current generation should always be conserving our resources for at least seven generations to the future. This mentality ensures that we maintain our environment and allow for future generations to be fruitful and prosperous.

Sustainable Practices at Berggren

Although Berggren is not considered certified organic, they implement ecologically conscious farming practices such as:

- Rotational grazing
- Supporting and planting native riparian plants and pollinator hedgerows
- Organic produce production



Figure 3: Project site- Lower production field photo by Wilson Hui

Desired Results

We hope to reduce energy input and water usage by replacing an overhead irrigation system with a drip irrigation system. We intend to continue Berggren's reputation as a model in demonstrating holistic farm practices in order to influence farmers within the Willamette Valley to adopt more sustainable agricultural methods.

Acknowledgement

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