**JUAB COUNTY PVC DRIP IRRIGATION SYSTEM**

Contact Person:
Jeffrey E Banks
USU Extension Agent
Juab County
160 N Main
Nephi, Utah 84648
435-623-3452
jeff.banks@usu.edu

Below is a brief introduction and script that can be used to provide more details to the Juab County PVC Drip Irrigation slide presentation.

**Introduction:**

People of all ages enjoy the benefits of gardening ranging from producing high quality produce to working with the soil. Due to water demands, gardeners need to be concerned about water conservation. One effective way to conserve water is by utilizing drip irrigation. A simple, user friendly, and effective system was designed by Juab County gardeners. The system uses PVC pipe and manual control valves. In different studies, the system lowered water costs, used up to 75 percent less water, and reduced weeding and watering time by up to 90 percent. To help educate gardeners about the system, a fact sheet titled “Designing a Basic PVC Home Garden Drip Irrigation System” and a 28 minute video titled “PVC Drip Irrigation with Jeff Banks” have been produced. The fact sheet is available at [http://extension.usu.edu/htm/publications/file=14535](http://extension.usu.edu/htm/publications/file=14535). The video is available at [http://www.local10.tv/](http://www.local10.tv/).

**Slide #:**

1. **Title of Presentation:** Juab County PVC Drip Irrigation System

2. **Juab County Drip Irrigation System:** Gardeners in Juab County designed a PVC drip irrigation system that is simple, user friendly, easy to modify, and effective. The system uses 1/2, 3/4, or 1 inch PVC pipe, fittings, and manual ball valves. The size of the fittings will correspond with the size of the pipe. With proper care, the life expectancy of the materials is between 10-12 years.

3-4. **Drip Irrigation Applications:** This drip system can be used in various applications including traditional gardens, raised beds, greenhouses, and fruit trees.

5-6. **Drip System Design:** The system can be designed a number of different ways. This will depend on the application. Users should plan out their system before actual assembly. The system is designed to accommodate nearly every type of garden design. Lateral lines can be changed and moved quite easily depending on
the type of plants grown. All lines and fittings before the manual valves are glued to handle high water pressure. Laterals lines are not glued to make the system flexible in the row placement.

7. **Manual Ball Valves:** One problem many gardeners experience with their irrigation source is high water pressure. Some type of pressure reducer is often needed. With this system, manual ball valves are used to control flow rate and assist in reducing pressure.

8. **Flow Rate:** Determining flow rate will depend on different factors including irrigation source flow rate, length of lateral and main lines, and the actual desired per hole water output. As gardeners use the system for their own application, they will learn how to manage their system to maximize water output.

9. **Plugs and End Caps:** Plugs are used to eliminate the water flow in non-irrigated row areas. End caps are used on the end of each lateral line to force the water through irrigation holes. The caps are not glued for the ease of cleaning the system.

10. **Equipment Needs:** To drill holes in the lateral irrigation lines, you will need the following equipment: drill, tape measure, marking pen, and 1/16 inch drill bit. Using some type of table to place the pipe on while drilling the holes will make the job more convenient.

11. **Hole Size and Spacing:** Hole size (1/16 inch) and spacing are some of the keys to the success of the system. For plants such as corn, carrots, and peas, the holes are spaced every 6 inches. For plants such as watermelons, tomatoes, and pumpkins, the holes are spaced in groups of three, 2-3 inches apart. The spacing for each plant group can vary between 3-5 feet. This will depend on the suggested plant spacing requirements.

12. **Fertilizer Injector:** One of the keys to a successful garden is being able to meet the nutrient requirements of the plants during the season. This can be accomplished by using a fertilizer injector at different times during the year. This type of injector can use either dry or liquid water-soluble fertilizers.

13. **Leveling Stakes:** For the best results in using this system, the ground should be level. To help compensate for non-level ground, using items like leveling stakes at different heights and intervals will help level the lateral lines.

14. **Testing the System:** Before planting, the entire system should be laid out and tested. Testing the system involves flushing out the main line and laterals with water with the end caps removed. Next install all end caps and with the holes facing up, turn on the water and clean out any plugged hole with a small piece of wire. After testing the system, the holes can be turned up or down. For lateral lines with holes facing up, drill a drainage hole on the bottom every 2-3 feet.
15. **Beginning of Season:** As the plants start to grow, users will notice that they will only need to irrigate for a short time because of the shallow root zone of the plants.

16. **Mid Season:** Users will need to adjust the amount of water used during times like mid-season to meet the growing demands of the plants.

17. **End of Season:** As plants start maturing, water demands will need to be adjusted to meet the lower demands of most plants.

18. **Drip System Benefits:** In different studies, system users noticed several major benefits from using the drip system. These include, water savings up to 75 percent, time saved in watering and weeding the garden up to 90 percent, higher production, and higher quality produce.

19. **User Observations:** Gardeners are using the basic drip system concepts for use in their own gardening irrigation system. Many users are using the system as outlined and others have made minor modifications. Because of the user’s success, several have made comments about their experiences with the drip irrigation system.

20. **Irrigation Outcomes:** Because of the interest in this drip irrigation system, a four page fact sheet, a 28 minute video, and presentation have been produced. All three items are available at the listed internet site. The system is being used by individuals in most counties in Utah, numerous states, and several foreign countries.

21. **Photo and User Comments Credits:** The following is a list of individuals who have supplied photos or written observations for use with this presentation.

22. **Summary:** The Juab County Drip Irrigation System is a simple, user-friendly, easy to modify, and highly efficient system. For more information about this drip system, contact: Jeffrey E Banks, USU Extension Agent in Juab County, 160 N Main, Nephi, UT 84648. Phone 435-623-3452. Email: jeff.banks@usu.edu
Juab County PVC Drip Irrigation System

The system uses $\frac{1}{2}$, $\frac{3}{4}$, or 1 inch PVC pipe, fittings and ball valves.
Juab County Drip Irrigation Applications

Traditional Garden

Raised Beds
More Drip Applications

Greenhouse

Fruit Trees
Drip System Designs

All lines and fittings before the manual valves are glued to handle high water pressure.
More Drip System Designs

Lateral lines are not glued.
Manual valves control flow rate and assist in reducing pressure.
Flow Rate

Users flow rate will depend on several factors including irrigation source flow rate, length of lateral lines and the desired per hole water output. As gardeners use the system, they will learn how to manage their system to maximize water output.
Plugs are used to eliminate watering non-irrigated rows.

End caps are not glued for ease of cleaning the system.
Equipment needed to drill holes:

- drill
- tape
- marker
- 1/16 drill bit
For squash, tomatoes etc.,
3 1/16 inch holes drilled
3 inches apart & every 3-5 ft.

For corn, peas, carrots etc.,
1/16 inch hole
drilled every 6 inches.
Fertilizer Injector

Water Soluble Fertilizer
For even flow rate, the system should be used on level ground. To help compensate for non-level ground, using items like leveling stakes at different heights and intervals will help level the lateral lines.
Testing the System

Before planting, the system should be laid out and tested. Flush out the main and lateral lines with water with the end caps removed.

Next install end caps and with the holes facing up, turn on the water and clean out plugged holes with a piece of wire. After testing, the holes can be turned up or down.
Beginning of Season
Mid Season
End of Season
Major Benefits of Drip System

- Water Savings: up to 75%
- Weeding time saved: up to 90%
- Time saved watering: up to 90%
- Healthier plants
- Higher production
- Higher quality produce
User Observations of the Juab County PVC Drip Irrigation System

- “My garden is the best that it has ever been. The drip system works beautifully.”
- “The system is working well. I have loved it and it has kept water usage and weeding down.”
- “We have never, I repeat NEVER had a garden this nice.”
- “One of the big advantages of the system is that it is so simple.”
- “The drip irrigation worked fantastic.”
- “My husband used your ideas for my four above ground gardens. I love it.”
- “My wife and I raised over 7,000 lbs of produce for the local food bank and domestic violence shelter. With the help of the drip irrigation system it was a great success.”
Juab County Drip Irrigation Outcomes


- Local Channel 10 Home and Garden Show: PVC Drip Irrigation 28 minute broadcast available at http://www.local10.tv/

- “Juab County PVC Drip Irrigation System”: presentation available at http://extension.usu.edu/juab/htm/horticulture

- Drip system is being used in numerous states and several foreign countries.
Photos and User Observations

Courtesy of:

Jeff Banks
Scott Brady
John Darrington
EZ-FLO
Tony Gaddis
Tim Kee

Dale Lisby
Dan Roscigno
Chris Rosenkrantz
Brent Taylor
Tootie
Richard and Kathy Walter
Summary

The Juab County Drip Irrigation system is a simple, user-friendly, easy to modify, and highly efficient system. For more information about this drip system, contact:

Jeffrey E Banks, USU Extension Agent in Juab County, 160 North Main, Nephi, UT 84648
Phone: 435-623-3452
email: jeff.banks@usu.edu