

## **1.INTRODUCTION**

Installing an underground wick irrigation/turf bubbler sprinkler system is done to conserve water for environmental and financial reasons. This procedure demonstrates how to install such a system.

## **2.REFERENCES**

Ralph, Steven. (2004, July 26) (Interview)

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Center for Irrigation Technology (1997) Turf bubblers. Retrieved July 23, 2004, from <http://cati.csufresno.edu/cit/upda/97/spring/story1.html>

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## **3.SAFETY**

Though not a very dangerous task, any laborious project entails risk of injury. Eye protection should be used when cutting the PVC. Great care should always be taken during the summer to avoid heat stroke and exhaustion. Anyone feeling of nauseous and faint should seek medical attention immediately.

## **4.DEFINITIONS**

Irrigation - Applying water to plants in a controlled manner.

Wick irrigation - A method of irrigation where small areas of turf are flooded with water, which

spreads across the thatch like fuel on the wick of a oil lantern.

Turf bubbler – A type of emitter (sprinkler) used for wick irrigation.

Anti-siphon valve – A valve designed to prevent water from being sucked back into the water supply due to a drop in water pressure.

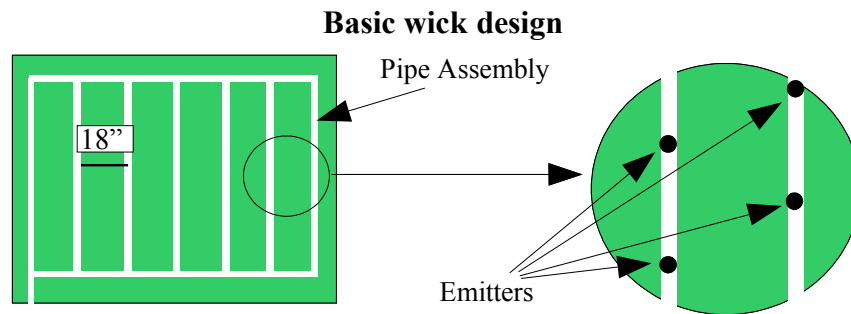
## **5.TOOLS AND EQUIPMENT**

- Graph paper
- Pencils
- Felt pen
- Wrench
- Iron T-fitting
- Iron or steel close nipple
- Teflon plumbers tape
- PVC or CPVC male adapters
- PVC or CPVC pipe
- Cutting instrument (hacksaw / tube cutter)
- Solvent glue and primer
- Anti-siphoning valve
- Gate valve
- Shovel
- Gravel
- PVC or CPVC ring fittings
- PVC or CPVC elbows
- PVC or CPVC T-fittings
- Turf bubbler emitters

- Automatic drain valves
- Plastic solvent cement
- String
- Stakes

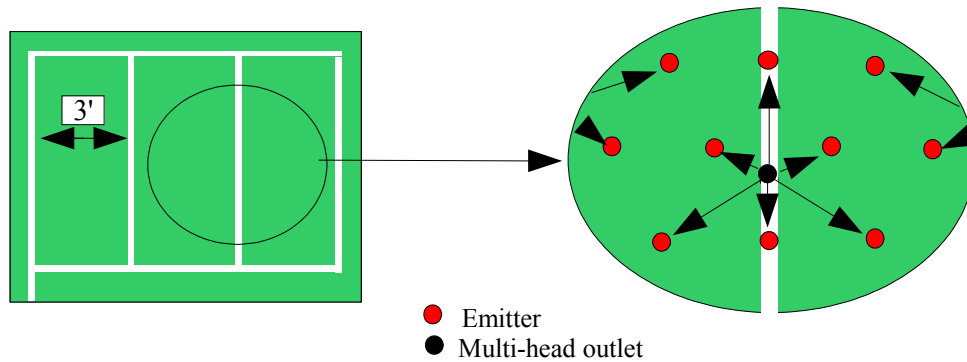
## 6.PROCEDURE

1. Determine water pressure. To do this, go to your outside faucet and note the number of seconds it takes to fill a gallon container. Divide this number by sixty to determine your water pressure in gallons per minute (GPM).
2. Design the layout of your pipes. Using graph paper, draw to scale the layout of your lawn. The layout of a turf bubbler system is different than a traditional sprinkler system, as shown in figure 1. In a turf bubbler design, each zone is a circuit instead of a branching structure. The emitters are placed along the pipes forming triangular patterns. For the sandy soil of the Columbia Basin, the bubbler heads are placed 18 inches apart.



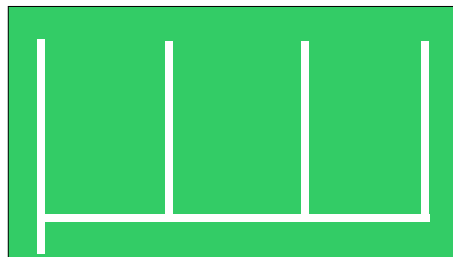
**figure 1a:** The basic wick irrigation design places emitters at regular intervals along the length of the pipe in an staggered pattern forming 'triangles' between the heads.

### Alternate layout



**figure 1b:** An alternate wick layout uses less PVC than the standard method.

### Standard irrigation layout

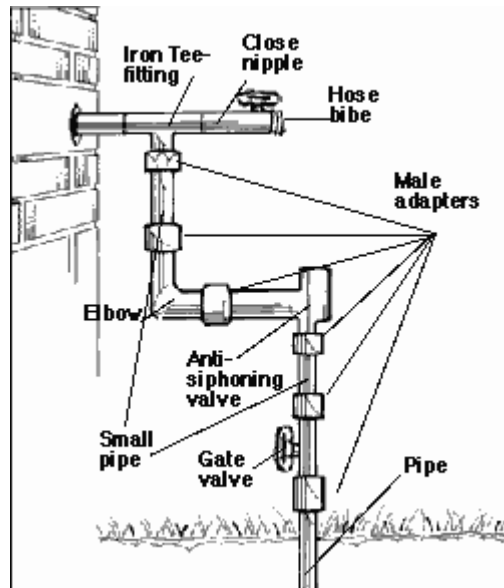


**figure 1c:** The standard sprinkler pipe layout resembles a tree.

3. Using the vice and pipe cutting instrument, cut pipe into appropriate sections. Each section should be cut so that when inserted into a T-fitting, the assembly is approximately 18" in length. Make sure to make straight vertical cuts.  
CAUTION: Care and eye protection should be used when using any cutting equipment.
4. Check for a proper drain and stop valve, and install them if necessary. The stop valve and drain should be located between the water meter and the external faucet. This can be inside or outside the house. These should be in place to stop outside water from entering the home water supply, as well as enable maintenance on the sprinkler system such as winterizations. Close the stop valve.
5. Using a wrench, remove the external faucet and install the iron T-fitting so the base of the

T is pointing down, as in figure 2.

### External Assembly

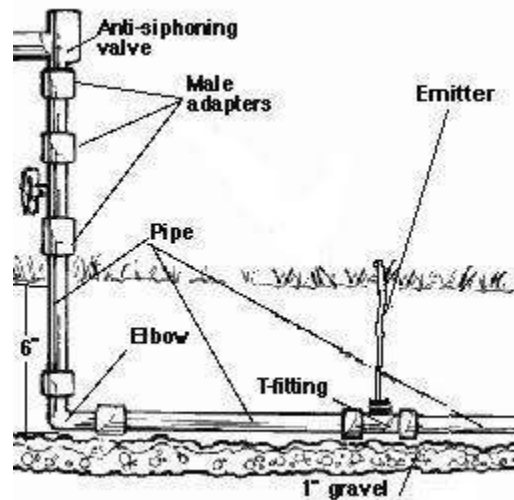


**figure 2:** The external assembly joins the sprinkler system to the water supply.

6. Insert the iron close nipple into the lateral end of the iron T-fitting and re-attach the faucet..
7. Assemble the elbow, anti-siphoning valve, and gate valve and attach to the iron T-fitting as in figure 2. Cut sections of pipe to accommodate the distance from the faucet to the ground. Use solvent glue to attach male PVC adapters to the pieces of pipe when needed. Apply plumbers tape to the threads of the male adapters.  
**CAUTION:** Assemble in a well ventilated area to avoid harmful vapors.
8. Dig the pipe trenches. To survive frost heaves in the Pacific Northwest, trenches should be at least 6" deep, with a downward slant of 1/4" per 5 foot section of trench. Using string and stakes, map out the pattern of your trenches. This will help keep the trenches as straight as possible as you dig. Line the bottom of the trenches with 1" of gravel for proper drainage.

9. Assemble the pipe structure and attach the emitters. Start at the valve assembly as shown in figure 3 and construct backwards from there,. As noted above, line the threads of the male adapters with plumbers tape. The drain valve should be installed at the lowest point in the assembly.

### Joining the assembly to the greater piping



**figure 3:** Join the valve assembly to the underground piping using the standard methods and materials.

10. Allow 12 hours for the glue to dry then test the system.
11. Carefully fill in the trenches. Trim the ends of the emitters to the desired length in order to protect them from lawnmower damage.

## 7. CONCLUSION

A turf bubbler system is fairly straight forward to deploy, and can result in a substantial savings to the homeowner.

INSTALLING AN UNDERGROUND WICK-IRRIGATION  
TURF-BUBBLING SPRINKLER SYSTEM



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