



Utilities Department  
Water Resource Management Division  
Water Conservation Section  
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# ***FIELD TESTS***

**SUBJECT:** OUTDOOR WATER SAVING DEVICES  
**DEVICES:** GARDEN HOSE AND HOSE-END SPRINKLER  
**CONDUCTED BY:** MARK WOODWARD  
WATER CONSERVATION COORDINATOR  
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**REVISED:** OCTOBER 2015

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**1. PURPOSE:**

Conduct field test using a garden hose, hose-end sprinkler, manual garden hose timer, automatic shutoff nozzle and automatic irrigation system zone with (4) oscillating heads. Applications: hand-held garden hose with an automatic shutoff nozzle, garden hose and hose-end sprinkler and operation of automatic irrigation system zone.

Compare total water usage between applications, calculate any water savings and observe area coverage of the two applications. Verify effectiveness of outdoor watering saving devices.

**2. OVERALL OBJECTIVE:**

A more comprehensive Water Conservation Program.

A vital component of the City of Plant City's (City) Water Conservation Program is making available and disseminating educational materials and information regarding water use to the Plant City community.

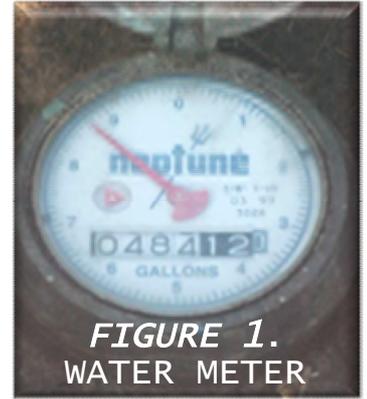
This includes information on outdoor water use. About 50% of the water consumed by the typical Florida household is through outdoor water use. Predominantly, via irrigation of lawn and landscape through the use of an automatic irrigation system.

Information on garden hoses is not as comprehensive as available information on automatic irrigations system. Most single-family, residential homes, regardless of demographic or economic status, have and utilize a garden hose. In contrast, not every resident has an automatic irrigation system on their property. This dynamic allows the outdoor water saving devices tested to be more accessible and beneficial to a vast audience.

Therefore, field tests and subsequent results have provided data which will serve as a water management tool in the area of garden hose use. Data has furthered the City's effort to promote efficient garden hose use as part of the City's Water Conservation Program. These outdoor water saving devices are provided as part of the City's Garden Hose Kit Program.

3. DESCRIPTION AND METHODOLOGY:

All tests were conducted in a controlled environment at a residential site. A standard 5/8" water meter (Figure 1), common stop watch and calculator were utilized. Applications are:



**FIGURE 1.**  
**WATER METER**

A. Hand-Held (Table 1).

- (1) Unrestricted garden hose (Figure 2).
- (2) Garden hose with automatic shutoff nozzle (Figure 3).

B. Outdoor Watering Methods:

- (1) Automatic irrigation system zone: (4) oscillating (rotor) heads (Figure 5).
- (2) Garden hose: garden hose, hose-end oscillating sprinkler and manual garden hose timer (Table 2).

4. HAND-HELD. **TABLE 1:** GARDEN HOSE AND AUTOMATIC SHUTOFF NOZZLE.

OPERATED FOR ONE MINUTE	
DEVICE(S)	GALLONS PER MINUTE (GPM)
UNRESTRICTED GARDEN HOSE	8.0 GPM
GARDEN HOSE AND AUTOMATIC SHUTOFF NOZZLE	3.2 GPM



**FIGURE 2.**  
**UNRESTRICTED GARDEN HOSE**



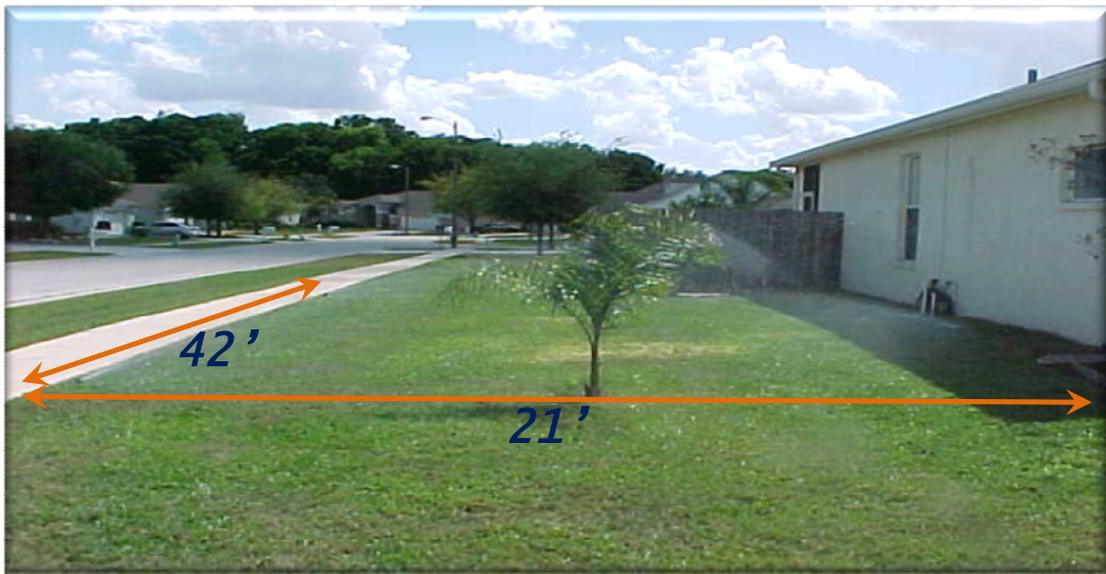
**FIGURE 3.**  
**AUTOMATIC SHUTOFF NOZZLE**

5. OUTDOOR WATERING METHODS: Figures 5 and 6.

**TABLE 2.** AUTOMATIC IRRIGATION SYSTEM ZONE AND GARDEN HOSE, HOSE-END OSCILLATING SPRINKLER, MANUAL GARDEN HOSE TIMER.

OPERATED FOR ONE MINUTE			
APPLICATION METHODS / DEVICE(S) USED	GALLONS USED		
	PER MINUTE (GPM)	PER 15 MINUTE CYCLE (TWICE WEEKLY)	AVERAGE (12) BILLING CYCLES
AUTOMATIC IRRIGATION ZONE (4) ROTOR HEADS	11.5 GPM	345	1,495
GARDEN HOSE-HOSE-END OSCILLATING SPRINKLER - MANUAL GARDEN HOSE TIMER	4.5 GPM	135	585

**FIGURE 5.** AUTOMATIC IRRIGATION ZONE: (4) ROTORS



**FIGURE 6.** GARDEN HOSE, HOSE-END OSCILLATING SPRINKLER, MANUAL GARDEN HOSE TIMER



**AREA DIMENSIONS: 42 FEET X 21 FEET = 882 SQUARE FEET**

6. FIELD TESTS RESULTS:

**COST, FUNCTION, EASE OF USE:** These inexpensive outdoor water saving items, when used properly, were user-friendly, highly functional and an effective way to save water.

**OUTDOOR WATERING METHODS (15 MINUTE CYCLES):** Field tests for this irrigation zone indicated a garden hose, hose-end oscillating sprinkler and manual garden hose timer, *used seven less gallons per minute.* This data was extrapolated to acquire usage for two 15 minute cycles. When this methodology was used, the result was *210 fewer gallons would potentially be used during two 15 minute cycles.*

**BILLING CYCLES:** The same methodology was used to acquire usage over 12 billing cycles. The result was an *estimated 61% or 10,920 fewer gallons* used with the Garden hose and hose-end sprinkler method when compared to the automatic irrigation zone with four rotors.

**COVERAGE:** Coverage of the entire area was maintained when using the garden hose and hose-end oscillating sprinkler.

**HAND-HELD USAGE:** Results from hand-held application tests utilizing an automatic shutoff nozzle and garden hose, consistently indicated *an estimated 60% fewer gallons of water were used as opposed the unrestricted garden hose.* Tests were conducted using two different flow-patterns on an adjustable automatic shutoff nozzle. These settings had a negligible effect on results.

**NOTE:** Field test results are specific to the irrigation zone tested.

Water consumption savings at a homeowner's residence may differ due to: size of irrigation zone, number and type of sprinkler heads, condition and type of hose-end sprinkler, condition and type of automatic shutoff nozzle and water pressure.

**TABLE 3. AUTOMATIC IRRIGATION SYSTEM ZONE AND OSCILLATING HOSE-END SPRINKLER**

FIELD TESTS RESULTS				
APPLICATION METHODS / DEVICE(S) USED	GALLONS USED			
	PER MINUTE (GPM)	PER 15 MINUTE CYCLE (TWICE WEEKLY)	AVERAGE (12) BILLING CYCLES	ANNUAL
AUTOMATIC IRRIGATION ZONE (4) ROTOR HEADS	11.5	345	1,495	17,940
GARDEN HOSE-HOSE-END OSCILLATING SPRINKLER-MANUAL GARDEN HOSE TIMER	4.5	135	585	7,020
<b>GALLONS DIFFERENCE</b>	<b>7</b>	<b>210</b>	<b>910</b>	<b>10,920</b>
<b>HOSE-END OSCILLATING SPRINKLER-MANUAL GARDEN HOSE TIMER USED AN ESTIMATED 61% LESS WATER</b>				

**TABLE 4. HAND-HELD APPLICATION**

FIELD TESTS RESULTS	
DEVICE(S) USED	GALLONS PER MINUTE (GPM)
UNRESTRICTED GARDEN HOSE	8.0 GPM
GARDEN HOSE - AUTOMATIC SHUTOFF NOZZLE	3.2 GPM
<b>GALLONS PER MINUTE DIFFERENCE</b>	<b>4.8 GPM</b>
<b>GARDEN HOSE-AUTOMATIC SHUTOFF NOZZLE USE AN ESTIMATED 60% LESS WATER</b>	

## 7. WATER CONSERVATION VALUE:

**GARDEN HOSE USE:** Quantifying actual water consumption through use of a garden hose is not feasible due to potential infrequency of use. *Also, outdoor water faucets used for garden hoses are not individually metered and are connected to the domestic water supply.* However, as field tests indicated, these items can save water when properly used with a garden hose.

**OUTDOOR WATERING ALTERNATIVE METHOD:** Field tests data indicates utilizing a garden hose, hose-end oscillating sprinkler, and manual garden hose timer, may be an alternative to save water when watering lawn and landscape. This alternative method of watering is more applicable to *small lawns and landscape areas.*

**MANUAL GARDEN HOSE TIMER:** Also, using the manual garden hose timer in conjunction with the garden hose and hose-end oscillating sprinkler creates a mini, manual operation irrigation system. A specific run-time can be set by turning the dial on the manual garden hose timer. Once the specified pre-set time has expired, the flow of water stops. The hose-end oscillating sprinkler can be moved to another location on the lawn and the process repeated, if needed. When all watering is complete, the homeowner/resident simply turns off the water at the faucet.

**COVERAGE:** Field tests also showed coverage of the entire area was maintained when using a garden hose and hose-end, oscillating sprinkler. Appropriate area coverage is a factor when considering the amount of water per application needed to maintain the health of lawn and landscape.

**WATER PER APPLICATION:** The [University of Florida Institute of Food and Agriculture Science \(IFAS\)](#), provides guidance on the amount of water to apply to a Florida lawn per watering session.

Also, the [Southwest Florida Water Management District](#) (District) recommends an average of  $\frac{1}{2}$ " to  $\frac{3}{4}$ " of water per application.

Field tested results demonstrated a garden hose and hose-end, oscillating sprinkler may be considered a viable outdoor watering option to achieve the amount of water per application.

**NOTE:** The City follows the  $\frac{1}{2}$ " to  $\frac{3}{4}$ " of water per application recommendation for watering City properties and rights-of-way (ROW).

City water use restrictions, water conservation measures and initiatives are established by adopting and utilizing District rules.

## 8. POTENTIAL MONETARY SAVINGS (*ESTIMATED*).

Further analysis of field tests results, suggest there may be long-term monetary benefit when using these outdoor water saving devices.

Table 5 and 6 below are the current City of Plant City Water Rates for residential and irrigation water usage. The residential rates apply to single-family residential units only. Irrigation rates apply to separately metered irrigation.

*These rates were effective 1 October 2015.*

**Please note.** All charges shall increase annually on 1 October of each successive year based on the U.S. Gross Domestic Product (GDP) Deflator in effect on said date. (Ordinance No. 13-2004).

**Rates increase every year.**

Water and sewer rates are available by request and are also on the City's web site, [plantcitygov.com](http://plantcitygov.com). Click GOVERNMENT then Utility Billing.

**TABLE 5. WATER CONSUMPTION CHARGE – RESIDENTIAL**

Range (Gallons)	Charge
1,000 – 5,000	\$ 1.70
5,001 – 15,000	\$ 2.24
15,001 – 30,000	\$ 3.08
30,001 +	\$ 6.00

**TABLE 6. IRRIGATION CONSUMPTION CHARGE.**

The below charges **ONLY** apply to separately metered irrigation usage.

Range (Gallons)	Charge
1,000 – 7,000	\$ 2.24
7,001 – 22,000	\$ 3.08
22,001 +	\$ 6.00

Charges are per 1,000 gallons of water consumed within a specific range. Below **estimated** monetary savings apply **solely** to the irrigation zone tested.

Water consumed in field tests was through one meter which facilitated both domestic (internal) and irrigation usage. Standard water meter was not separately metered for irrigation use. Residential (single-family) water consumption charges apply.

**TABLE 7. POTENTIAL MONETARY SAVINGS.**

<b>AUTOMATIC IRRIGATION SYSTEM ZONE: (4) ROTOR HEADS</b>		
<b>GALLONS USED: (12) BILLING CYCLES</b>		<b>WATER CONSUMPTION RANGE &amp; CHARGE (RESIDENTIAL)</b>
<b>BILLING CYCLE AVERAGE</b>	<b>TOTAL</b>	
1,495	17,940	RANGE: 1,000 – 5,000 RATE: \$ 1.70 PER 1,000 GALLONS
<b>BILLING CYCLE</b>		<b>1.70 x 1.495 = \$ 2.54</b>
<b>(12) BILLING CYCLES</b>		<b>2.54 x 12 = \$ 30.48</b>
<b>GARDEN HOSE-HOSE-END OSCILLATING SPRINKLER-MANUAL GARDEN HOSE TIMER</b>		
585	7,020	RANGE: 1,000 – 5,000 CHARGE: \$ 1.70 PER 1,000 GALLONS
<b>BILLING CYCLE</b>		<b>1.70 x .585 = \$ 0.99</b>
<b>(12) BILLING CYCLES</b>		<b>0.99 x 12 = \$ 11.88</b>

**There is an estimated 61% savings on the water consumption charge when using the garden hose and hose-end oscillating sprinkler.**

**9. CONCLUSION:**

The goal of the water Conservation Program is to ensure our water resources are utilized in a conscientious and efficient manner. One of the methods utilized to accomplish this are community education and water conservation measures and initiatives.

Research and subsequent field tests provided valuable information and insight for our water conservation program. Specifically, the City's Garden Hose Kit Program. Through this basic, water saving program, we are able to more thoroughly assist the residents of Plant City with their water saving efforts.

The Garden Hose Kit Program is an integral component of the City's Water Conservation Program. This water conservation initiative provides another avenue for the City to emphasize the importance of saving water through education and community involvement. The City's Garden Hose Kit Program has proven to be an effective way to for us to enhance our positive presence in the Plant City community.