Strategies for Water Efficient and Cost Effective Irrigation

Save water and reduce costs with Rain Bird irrigation solutions.

Think outside.

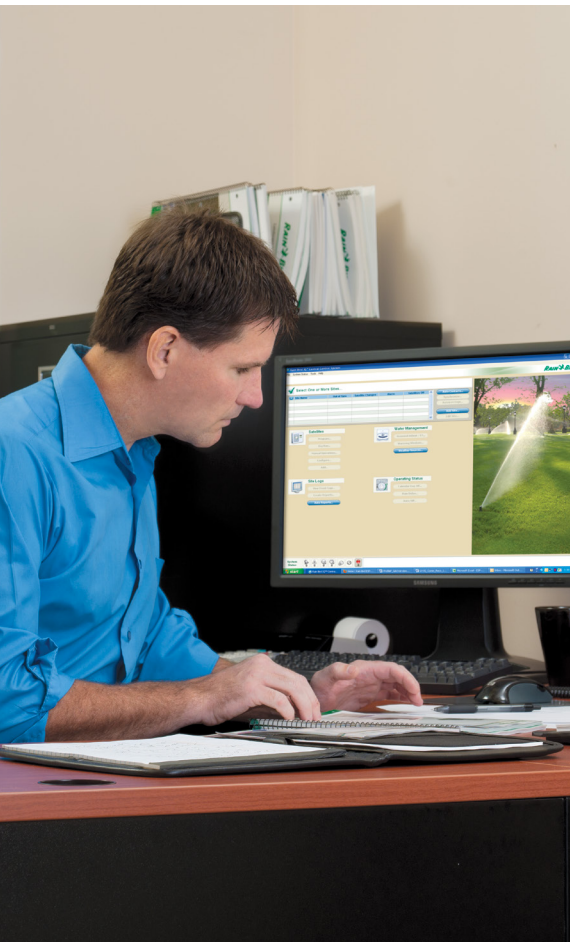
The Hard Facts on Irrigation

- Landscape irrigation uses more than seven billon gallons of water per day nationwide.
- Estimates suggest that as much as half the water applied to the landscape is wasted.
- Much of the wasted water is water that is treated for drinking.
- In "green building" projects, irrigation is often eliminated, as it is deemed unnecessary use.

How Rain Bird Can Help

- Despite obstacles, it is possible to help conserve water, keep costs low and promote landscape beauty.
- From weather-based control to high-efficiency nozzles, Rain Bird offers irrigation solutions designed to use water intelligently.
- Rain Bird has been helping corporations achieve their sustainability goals for decades and can engineer a solution that's right for you.
- By partnering with Rain Bird, sites around the country are improving their landscapes and decreasing their water bills.

Benefits of an irrigation consultant.



Why Should I Work With Them?

- During the bidding process a plan insures an "apples to apples" cost comparison as compared to the design-build process, which creates a wide range of pricing due to the different design approaches, which are not always the best solution for your landscape.
- An irrigation consultant will design an efficient irrigation system that will fulfill the project's needs for the long term as well as reduce maintenance costs.
- The consultants' goal is to design an irrigation system that incorporates water efficient products that reduce water consumption, creating a high-efficiency system which saves you money. Keep in mind that if you're using municipal water that will be the most expensive part of your irrigation system over the life of the system.
- A professional design will also provide the best watering solutions for your turf and plant material, separating them from each other. Why is this important? Turf typically requires twice the amount of water than most plants, so having them on separate watering zones is imperative to their health and longevity.
- Consider that on a consultant-designed commercial irrigation system (2-4 acres), typical operational savings might be between $2,000-$4,000 per season (half from reduced water-use, and half from fewer service/repair calls). With a payback-period of just 1-2 years, it is easy to understand how the money spent for irrigation consulting services may well turn out to be the wisest investment in the overall design/construction process, and a good guarantee that the new system will work for the long term.

Water saving irrigation products.

1. Central Control

From ET Management to Cycle+Soak™ to after-the-sale support, Rain Bird provides a comprehensive line of central control products, features and services that can help maximize efficiency and increase your water savings.

www.rainbird.com/centralcontrol

2. Weather-Based Control

Unlike traditional time-based irrigation scheduling, Rain Bird weather-based control products use current weather and evapotranspiration (ET) data to irrigate only when your landscape needs it, saving precious water.

www.rainbird.com/LXSeries

3. Flow Sensing and Leak Detection

Easily monitor flow rate and water use, while adding an extra level of security and peace of mind. Flow sensors transmit flow data to central control or stand-alone control systems for a precise, real-time look at your landscape's water use and an instant alert of leaks.

www.rainbird.com/FlowSensors

4. Pressure Regulation

High water pressure equals wasted water and wasted money. By optimizing pressure, Rain Bird Pressure Regulating Systems (PRS) with Flow Optimizer™ technology help you save one gallon per minute per rotor or spray. On a large corporate campus, those savings really add up.

www.rainbird.com/PRS

5. High-Efficiency Nozzles

Rain Bird offers some of the most water-efficient nozzles in the business. Exclusive to Rain Bird rotors, Rain Curtain™ nozzle technology uses larger droplets and uniform coverage to maximize water savings. Rain Bird is also the only manufacturer to offer high-efficiency performance in fixed or variable-arc spray nozzles.

www.rainbird.com/nozzles

6. Low Volume and Direct to Root

No matter your challenge, we can help you make the most of every water drop with dripline, bubblers, emitters and a full range of accessories. These water-saving products are perfect for flower beds, plantings, trees, shrubs and even turf.

www.rainbird.com/Drip

Water Savings Potential

Smart Controller

Conventional Scheduling Controller - No Rain Sensor					
Irrigated Area	Avg. Amount Applied/Week (based on 1"/Week)	Watering Weeks/ Season	Cost of Water/1000 Gallons	Annual Cost to Irrigate	Lifetime Cost to Irrigate
43,560	**27,154**	**26**	**$2.14**	**$1,743.29**	**$22,662.73**

ET Scheduling Controller					
Irrigated Area	Avg. Amount Applied/Week (based on 30% Red.)	Watering Weeks/ Season	Cost of Water/1000 Gallons	Annual Cost to Irrigate	Lifetime Cost to Irrigate
43,560	**19,008**	**26**	**$2.14**	**$1,220.30**	**$15,863.91**

Results				
Annual Savings	ROI	Controller Upgrade	Break-even on Investment	Lifetime Savings
$522.99	**14/1**	**$2,000.00**	**3.82**	**$6,798.82**

High-efficiency (Water Conserving) Nozzles

15' - 180° Standard Spray Nozzle							
Gallons/ Minute	Run Time Minutes/Week	Watering Weeks/Season	Gallons/ Season	Cost of Water/1000 Gallons	Annual Cost to Irrigate	Lifetime Cost to Irrigate (Single Nozzle)	Lifetime Cost Hotel Site (240 Nozzles)
1.85	**60**	**26**	**2,886.00**	**$2.14**	**$6.18**	**$92.64**	**$22,233.74**

15' - 180° High Efficiency Nozzle							
Gallons/ Minute	Run Time Minutes/Week	Watering Weeks/Season	Gallons/ Season	Cost of Water/1000 Gallons	Annual Cost to Irrigate	Lifetime Cost to Irrigate (Single Nozzle)	Lifetime Cost Hotel Site (240 Nozzles)
1.85	**48**	**26**	**2,308.80**	**$2.14**	**$4.94**	**$74.11**	**$17,787.00**

Results					
Annual Savings	Lifetime Savings	Upgrade to HE Nozzle	Break-even on Investment	ROI	Lifetime Savings Hotel
1.24	**$18.53**	**$0.50**	**.11 Months**	**132/1**	**$4,446.75**

Water Savings Potential

Increased Watering Costs From Poor Pressure & Spacing

Project Details	Projected Gallons Recommended Spacing Low Pressure	Projected Gallons Stretched Spacing Low Pressure	Projected Gallons Recommended Spacing Recommended Pressure
Estimated Annual Spray Water Usage (Gal.)	1,019,304	833,976	509,652
Estimated Annual Rotor Water Usage (Gal.)	6,058,624	4,957,056	3,029,312
Estimated Annual Water Usage (Gal.)	7,077,928	5,791,032	3,538,964
Cost/1000 Gallons (example)	$2.14	$2.14	$2.14
Estimated Units (1,000's) of Water	7,077.928	5,791.032	3,528.964
Annual Watering Costs	**$15,146.77**	**$12,392.81**	**$7,573.38**
Projected Lifetime Watering Costs	**$227,201.49**	**$185,892.13**	**$113,600.74**

Exceeding manufacturer's recommended spacing, not delivering adequate pressure, and incorrect sprinkler overlap, are the main causes of higher watering costs due to the fact that the system run times need to be increased to account for these deficiencies.

Zone	Type	GPM
1	R	42
2A	S	14
2B	S	15
3	R	31
4	R	45
5	S	43
6	R	14
7	S	49
8	R	39
9	R	39
10	R	48
11	R	40
12	S	31
13	R	45
14	R	45
15	S	49
16	R	42
17	R	44
18	R	48
19	S	48
20	R	47
21	R	48
22	R	45
23	S	48

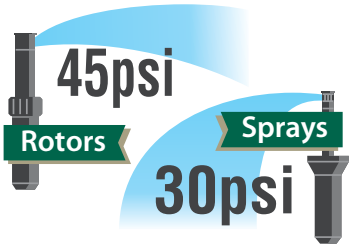
Runtime Calculations (minutes)			
Run Time/Spray Zone	33	27	16.5
Run Time/Rotor Zone	88	72	44
Cycles/Week	4	4	4
Weeks/Season	26	26	26

Pressure regulating system: Savings that add up.

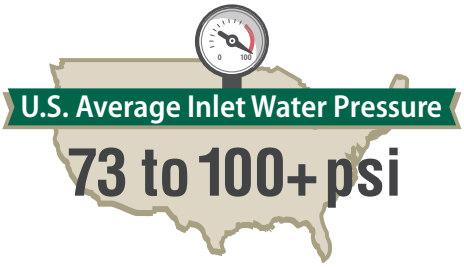
THE CHALLENGE

One of the ongoing challenges that traditional in-ground irrigation systems face is variable level of water pressure from location to location, city to city and state to state.

Most rotors and sprays are designed to function best at a recommended inlet pressure.



Most rotors and sprays are designed to function best at a recommended inlet pressure.



- When pressure exceeds the recommended level, precipitation rates (PR), application efficiency (AE) and distribution uniformity (DU) all suffer. The result is less than optimal performance and wasted water.
- Rain Bird offers a patented pressure regulating technology called Pressure Regulating Stem (PRS), designed specifically to keep performance at optimal levels regardless of varying inlet pressure.

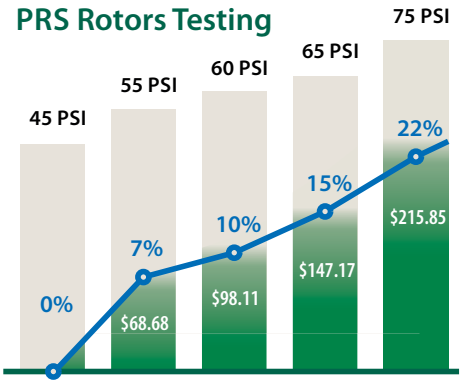
THE STUDY

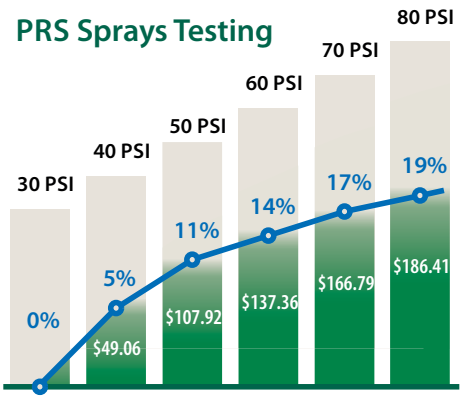
To prove the viability of Rain Bird's PRS technology, an independent comparative study was commissioned, utilizing the University of Arizona's Department of Soil, Water and Environmental Science at the Karsten Turf Research Facility. The study was designed to compare the performance characteristics of rotors and sprays with PRS technology vs. similar products without. The study was led by Dr. Paul Brown, with assistance by Jeff Gilbert.

- For the purposes of comparison, eight different turf plots were evaluated (4 with PRS and 4 without) at different inlet pressure levels.
- In each case, 10 different tests were conducted measuring precipitation rate (PR), application efficiency (AE) and distribution uniformity (DU).
- Industry standard tests for DU included the use of "catch cans" with calculations made for low quarter distribution uniformity (DULQ) and low half distribution uniformity (DUHL).

THE RESULTS

The proprietary Rain Bird Pressure Regulating Stem (PRS) system showed marked improvements in the three key performance characteristics across the body of tests, particularly at inlet pressure levels that exceed the manufacturer recommended level. Specifically:





PSI

% Water Savings

Theoretical Lifetime Savings

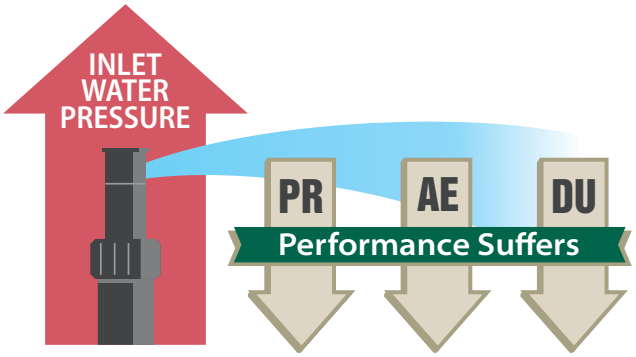
Theoretical Lifetime Savings is normalized water savings based on EPA WaterSense estimate of average US household/outdoor water use, an average cost/1,000 gallons of water in the US and an average product lifespan of 7 years. The totals are theoretical. Actual water savings will vary based on conditions.

Pressure regulating system: Savings that add up.

CONCLUSION

The use of Rain Bird's patented Pressure Regulating Stem (PRS) technology can provide significant water savings, cost savings, and improved performance vs. non-PRS systems. The savings reaped per rotor or spray can be multiplied across an entire system, resulting in significant differences financially and in gallons of water used.

Pressure / Performance Connection



For more information on Rain Bird® PRS technology, visit www.rainbird.com/ProjectPRS.

PRS REBATES

Leading organizations such as the Irrigation Association (IA) and the American Society of Agricultural and Biological Engineers (ASABE) recommend pressure regulation in sprays and rotors. Many municipalities and water agencies offer substantial rebates and incentives to offset the cost of upgrading. Check with your local agencies to see what incentives are available.

RAIN BIRD PROJECT PRS TAKE PRESSURE HEAD ON.

Project PRS challenges contractors to save more water by using PRS rotors and sprays on their installations. Test data shows that PRS rotors and sprays can save each property up to 50,000 gallons or more every year.

Savings: PRS Rotors

PSI	Weekly Savings	Monthly Savings	Yearly Savings
Low (45 – 50)	250	1,083	13,000
Medium (50 – 70)	385	1,667	20,020
High (70 – 90)	946	4,097	49,205

gal x 10 heads

Savings: PRS Sprays

PSI	Weekly Savings	Monthly Savings	Yearly Savings
Low (30– 50)	38	54	1,994
Medium (50 – 70)	54	234	2,808
High (70 – 90)	77	333	3,996

gal x 10 heads

Based on run time of 25 minutes for rotors and 10 minutes for sprays, 1 cycle per day, for 5 days. Savings is for 10 rotors or 10 spray heads. Take (# of heads /10 x savings above) to achieve site savings.

Water Savings Potential

20 Zone Residential System

Water Savings Options	Rain Bird High-efficiency Products	Water Savings Potential			
		Total Annual Water Savings* (Gallons)	Annual Cost Savings*	Lifetime System Savings*	Cost To Upgrade To High Efficiency Products
1. Add PRS Spray Heads	1800 Series with PRS	113,330	$242.53	$3,637.88	$759.92
2. Add PRS Rotors	5000 Series with PRS	-	$ -	$ -	
3. Upgrade MPR Nozzles to High-efficiency	R-VAN, R-Series, HE-VAN or U-Series	-	$ -	$ -	$227.77
4. Upgrade VAN Nozzles to High-efficiency	R-VAN, R-Series, HE-VAN or U-Series	-	$ -	$ -	
5. Add Pressure Regulation to 3500, Falcon 6504 and 8005 Series Rotor zones.		-	$ -	$ -	
Total Water Savings Potential		**113,330**	**$242.53**	**$3,637.88**	**$987.69**

Annual water usage (Gallons)* CURRENT	483,337
Annual water usage (Gallons)* NEW	370,007
Total Water Savings	**113,330**

Annual water cost - CURRENT	$1,034.34
Annual water cost - NEW	$791.82
Total Cost Savings	**$242.52**

Lifetime Water Savings	**1,699,950**

Lifetime Cost Savings	**$3,637.88**

* Water costs are based on $2.14/1000 gallons (national U.S. average)
* Cost to upgrade to pressure regulating sprinkler heads & high efficiency nozzles: $987.69
* Cost to upgrade to ET based watering: $125.00
* Breakeven on investment of high efficiency products: .80 years

Water Savings Potential

.63 Acre Hotel Clubhouse

Water Savings Options	Rain Bird High-efficiency Products	Water Savings Potential			
		Total Annual Water Savings* (Gallons)	Annual Cost Savings*	Lifetime System Savings*	Cost To Upgrade To High Efficiency Products
1. Add PRS Spray Heads	1800 Series with PRS	99,178	$212.24	$3,183.61	$382.32
2. Add PRS Rotors	5000 Series with PRS	87,638	$187.54	$2,813.17	$312.50
3. Upgrade MPR Nozzles to High-efficiency	R-VAN, R-Series, HE-VAN or U-Series	23,203	$49.66	$744.83	$34.78
4. Upgrade VAN Nozzles to High-efficiency	R-VAN, R-Series, HE-VAN or U-Series	1,115	$ 2.39	$35.80	$3.76
5. Add Pressure Regulation to 3500, Falcon 6504 and 8005 Series Rotor zones.		-	$ -	$ -	
Total Water Savings Potential		**211,135**	**$451.83**	**$6,777.42**	**$733.36**

Annual water usage (Gallons)* CURRENT	805,881
Annual water usage (Gallons)* NEW	594,746
Total Water Savings	**211,135**

Annual water cost - CURRENT	$1,724.59
Annual water cost - NEW	$1,272.76
Total Cost Savings	**$451.83**

Lifetime Water Savings	**3,167,025**

Lifetime Cost Savings	**$6,777.45**

* Water costs are based on $2.14/1000 gallons (national U.S. average)
* Cost to upgrade to pressure regulating sprinkler heads & high efficiency nozzles: $733.36
* Cost to upgrade to ET based watering: $125.00
* Breakeven on investment of high efficiency products: .58 years

Water Savings Potential

6.5 Acre Site

Water Savings Options	Rain Bird High-efficiency Products	Water Savings Potential			
		Total Annual Water Savings* (Gallons)	Annual Cost Savings*	Lifetime System Savings*	Cost To Upgrade To High Efficiency Products
1. Add PRS Spray Heads	1800 Series with PRS	842,232	$1,802.38	$21,628.53	$3,256.80
2. Add PRS Rotors	5000 Series with PRS	759,700	$1,625.76	$19,509.09	$2,250.00
3. Upgrade MPR Nozzles to High-efficiency	R-VAN, R-Series, HE-VAN or U-Series	316,883	$678.13	$8,137.55	$345.00
4. Upgrade VAN Nozzles to High-efficiency	R-VAN, R-Series, HE-VAN or U-Series	-	$ -	$ -	
5. Add Pressure Regulation to 3500, Falcon 6504 and 8005 Series Rotor zones.		-	$ -	$ -	
Total Water Savings Potential		**1,918,815**	**$4,106.26**	**$49,275.17**	**$5,851.80**

Annual water usage (Gallons)* CURRENT	6,227,985
Annual water usage (Gallons)* NEW	4,359,170
Total Water Savings	**1,868,815**

Annual water cost - CURRENT	$13,434.89
Annual water cost - NEW	$9,328.62
Total Cost Savings	**$4,106.27**

Lifetime Water Savings	**28,032,225**

Lifetime Cost Savings	**$61,594.05**

* Water costs are based on $2.14/1000 gallons (national U.S. average)
* Cost to upgrade to pressure regulating sprinkler heads: $5,851.80
* Cost to upgrade to Central Control/ET based watering: $3,000.00
* Breakeven on investment of high efficiency products: 1.44 years

The Intelligent Use of Water.™

LEADERSHIP • EDUCATION • PARTNERSHIPS • PRODUCTS

At Rain Bird, we believe it is our responsibility to develop products and technologies that use water efficiently. Our commitment also extends to education, training and services for our industry and our communities.

The need to conserve water has never been greater. We want to do even more, and with your help, we can. Visit www.rainbird.com for more information about The Intelligent Use of Water.™

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