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Steinegger, Don; Gaussoin, Roch E.; and Horse, Garald L., "G93-1181 Evaluating Your Landscape Irrigation System" (1993). *Historical Materials from University of Nebraska-Lincoln Extension*. 1059.
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G93-1181-A

Evaluating Your Landscape Irrigation System

This NebGuide addresses irrigation techniques and methods that can improve water usage.

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In the summer months, most water used in residential areas is applied to landscapes. By learning how much water to apply to your landscape and when to apply it, you simultaneously support four landscape irrigation goals: reducing costs, conserving water, reducing non-point pollution (contamination from a broad geographical area such as fertilizer, run off from urban landscapes), and maintaining an attractive landscape.

Does your irrigation system apply water uniformly? Uniformity means every plant or soil surface receives the same amount of water. For example, one area should not receive 1/2" of water while another area receives 1 1/2". Non-uniform irrigation application results in over-watering one area to assure another won't dry out.

Irrigation uniformity is achieved through proper spacing and placement of sprinkler heads. By spacing sprinkler heads closer together than design specifications require, you can reduce water use and enhanced plant quality.

Another factor to adjust in your irrigation system is water pressure. Proper pressure helps minimize wind effects. Excessive water pressure creates small particles of water which are easily moved away from the planned application pattern by wind. Distorted patterns mean some landscape area will require additional watering, even after sufficient water has gone through your system.

By watering just after sunrise when wind is minimal, you can reduce the effect of wind. However, your system should be designed for the highest wind speeds expected during the growing season.

Efficient irrigation systems also include a way to reduce runoff. It is important to understand your soil's characteristics. Much of Nebraska has "heavy soils." That is, they include a high percentage of silt and clay particles. These types of soils often have infiltration rates of less than 1/2" per hour. You should adjust your system accordingly: usually not more than 1/2" per hour. If your landscape needs more water, add another 1/2" the next day.

Annual maintenance is an important part of any irrigation system. You can do this with the help of a do-it-yourself manual, or you can arrange for the installation company to do regular checkups. Irrigation systems,

like any other equipment, eventually wear out and must be replaced.

The final factor in efficient irrigation is one that is most often forgotten: your landscape may have changed since installation. Increased size of plant material may now block or distort the spray pattern. You may have to modify either the plants or the irrigation system.

If you use a hose and portable sprinklers rather than an underground system, you still must aim toward distribution that is uniform and appropriate to your soil's infiltration rate.

Do the following "catch-can" tests with both types of irrigation systems, to determine the proper application rate and uniformity of your system.

Test 1

Select flat-bottomed, straight-sided containers, such as coffee cans. Space the cans uniformly 10 to 15 feet apart (do not exceed 15 feet apart). Irrigate, i.e., run your system, for at least 15 minutes and then measure the depth of the water in each can. You can either use a ruler or you can mark the inside of the cans in 1/2" increments.

Table I contains the water depth values obtained when six cans were placed on a lawn and the irrigation system was run for 15 minutes. With the information from *Table I*, you can determine the time your system needs to run to apply an average of 1 inch to the turf area.

Use the information in *Table II* to determine the number of minutes to run your irrigation system to apply the proper amount of water.

For example, assume your irrigation system applies an average of 3/8" in 15 minutes. Go to the 3/8" value to determine the time for your system to apply one inch of water. Below the 3/8" value is the number 40. This is the number of minutes your system needs to apply an average of 1 inch of water.

Table I. Water depths obtained from the Catch-Can Test run for 15 minutes in order to determine the system's watering rate.

Can Number						
1	2	3	4	5	6	WATER TOTAL (Inches)
3/8"	7/16"	5/16"	5/16"	3/8"	7/16"	36/16"
AVERAGE DEPTH (Inches)						
Divided by 6 cans equals 6/16" or 3/8"						
Average depth of water measured is 3/8" in 15 minutes.						

Table II. Operation time needed for a system to apply an average of one inch of water, after you have measured the water delivered in 15 minutes.

Average Depth of Water in Cans (Inches)											
	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4
Time (min.)	120	80	60	48	40	34	30	27	24	22	20

Test 2

The next information you need is the infiltration rate for the soil in your landscape. Use the same kind of can as for the previous test, but cut out the bottom. Mark the inside of the can in 1 inch increments. Insert one end of the can into the soil. Be sure it goes through both turf and thatch. Check that water does not seep laterally from the can. Fill the can with water and allow time for all of it to drain into the soil. Then add water to the two inch mark on the can. Now measure the time for this water to sink into the soil. Divide this elapsed time by 2. The number you get will be the infiltration rate for your lawn, i.e., the rate for one inch of water to enter your soil. Adjust your irrigation system to apply water at this rate.

To further increase water efficiency, learn the needs of various plants and then group together the plants with similar water, soil, light, and nutrient requirements. By grouping plants with similar needs, you can zone their water area with one set and arrangement of sprinkler heads. That is, one valve and one clock station on the controller will serve all the plants within each zone.

By zone watering, you do not over-water one plant or site while under-watering another plant or site. For example, Buffalograss or zinnias require less frequent irrigation than Kentucky bluegrass or hybrid tea roses. Also, a windy, sunny site generally requires more water than a shady, protected area. Zone watering allows you to divide your landscape into specific water needs areas.

The initial cost for a water-conserving system may be larger than that of other systems. However, use of the system will help you save water, reduce pollution, and grow healthier, more attractive plants. You will conserve even more water when you learn how to modify soil, use mulches, and wisely select and maintain plants to increase water holding capacity and oxygen level.

Conclusion

The above information will help you create a landscape that is both attractive and low input. Furthermore, your conservation efforts will help reduce non-point source pollution because you will eliminate most runoff.

We wish to acknowledge the U.S. Environmental Protection Agency through the Nebraska Department of Environmental Quality for partial funding of this publication.

File G1181 under: HORTICULTURE
E-14, Miscellaneous
Issued December 1993; 5,000 printed.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Elbert C. Dickey, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

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