



WATER REQUIREMENTS OF TURF GRASS

By Allan Schildnecht

One of the most frequently asked questions we encounter is "how often" or "how long should I water."

The frequency of irrigation is determined by several factors. These include the water holding capacity of the soil, evaporation of the water into the air and the transpiration rate of the plant material. For optimum growth, watering should begin when about one-half of the available water in the soil has been depleted. Most plant material will show the greatest growth response when the soil moisture is maintained between this level and its full capacity. By theory, maximum growth occurs at full capacity because there is a minimum stress at this level of moisture. Assuming equal depth of rooting, sandy soils will have to be watered more frequently than a loam or clay soil.

Other factors such as wind, sun, humidity and temperatures contribute to the evaporation and transpiration rates of the plant. Whenever these factors cause the evaporation/transpiration rate to exceed the rate of intake by the plant, the plant will wilt. Wilting can take place even when there is sufficient soil moisture because of high temperatures at low humidity. At such times, a "syringe water cycle" should be run in order to reduce the air and plant temperature, thereby reducing the evapotranspiration rate of the plant.

However, while trying to maintain this optimum soil moisture level, too frequent watering on poorly drained soils tend to keep the upper layers of the root zone near saturation which encourages shallow rooting and promotes weak turf. A weakened turf is not only more susceptible to weeds, disease and insects but will be more apt to be damaged by traffic and soil compaction.

In sandy soils, excess watering may not cause the problems of the heavy soils but it is not a good economical practice. Not only will you be wasting water but you will be leaching out the nutrients in the soil requiring more fertilizer and manpower to replenish them and causing excess wear and tear on

your equipment.

The amount of water to apply at any one time depends directly on the amount of moisture in the soil, the holding characteristics of the soil and its drainage. Additionally, the water requirements vary with the plant material and current weather conditions. Only through the monitoring of the inter-relationship of all of these factors can you determine the right amount of water that needs to be replenished.

Only by using evapotranspiration charts (see chart below) and comparing it to actual rainfall are you able to compile a guide to determine the amount of water that must be applied through irrigation at any given time.

RF - Average rainfall. Actual rainfall should be measured and compared to evaporation/transpiration.

EVT - Evapotranspiration rate.

DEFF - Difference (amount of water that needs to be added).

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
WISCONSIN													
Northwest (Superior)													
RF	.91	.82	1.45	2.43	3.66	4.69	3.85	4.25	3.17	2.00	1.76	.98	29.97
EVT	0.00	0.00	0.00	1.33	3.12	4.76	5.93	5.04	2.91	1.43	.29	0.00	24.81
DIFF	.91	.82	1.45	1.10	.94	-.07	-2.08	-.79	.26	.57	1.47	.98	5.16
North Central (Wausau)													
RF	1.17	1.02	1.55	2.45	3.68	4.80	4.00	4.24	3.65	2.23	2.10	1.15	32.04
EVT	0.00	0.00	0.00	1.25	3.07	4.67	5.64	4.81	2.81	1.42	0.00	0.00	23.67
DIFF	1.17	1.02	1.55	1.20	.61	.13	-1.64	-.57	.84	.81	2.10	1.15	8.37
Northeast (Marinette)													
RF	1.35	1.14	1.56	2.45	3.22	3.91	3.25	3.62	3.27	2.14	2.26	1.27	29.44
EVT	0.00	0.00	0.00	1.41	3.21	4.88	5.88	5.02	3.04	1.52	.37	0.00	25.33
DIFF	1.35	1.14	1.56	1.04	.01	-.97	-2.63	-1.40	.23	.62	1.89	1.27	4.11
West Central (LaCrosse)													
RF	.94	.89	1.75	2.61	3.86	4.64	3.57	3.71	3.27	1.96	1.78	1.02	30.00
EVT	0.00	0.00	0.00	1.61	3.67	5.42	6.47	5.54	3.30	1.68	.37	0.00	28.06
DIFF	.94	.89	1.75	1.00	.19	-.78	-2.90	-1.83	-.03	.28	1.41	1.02	1.94
Central (Stevens Point)													
RF	1.13	1.08	1.65	2.82	3.67	4.36	3.21	3.50	3.40	2.22	2.12	1.14	30.30
EVT	0.00	0.00	0.00	1.59	3.42	5.23	6.26	5.36	3.19	1.61	.37	0.00	27.03
DIFF	1.13	1.08	1.65	1.23	.25	-.87	-3.05	-1.86	.21	.61	1.75	1.14	3.27
East Central (Green Bay)													
RF	1.35	1.26	1.74	2.61	2.95	3.66	3.05	3.14	3.12	2.05	2.19	1.40	28.52
EVT	0.00	0.00	0.00	1.51	3.23	5.03	6.25	5.52	3.33	1.76	.48	0.00	27.11
DIFF	1.35	1.26	1.74	1.10	-.28	-1.37	-3.20	-2.38	-.21	.29	1.71	1.40	1.41
Southwest (Prairie du Chen)													
RF	1.14	1.05	1.94	2.86	3.72	4.08	3.87	3.90	3.46	2.21	2.01	1.21	32.25
EVT	0.00	0.00	.46	1.81	3.81	5.61	6.68	5.74	3.47	1.85	.45	0.00	29.88
DIFF	1.14	1.05	1.48	1.05	-.09	-.73	-2.81	-.84	-.01	.36	1.56	1.21	2.37
South Central (Madison)													
RF	1.45	1.16	1.88	2.76	3.34	4.07	3.63	3.60	3.51	2.24	2.20	1.42	31.26
EVT	0.00	0.00	.47	1.80	3.71	5.61	6.70	5.75	3.58	1.86	.52	0.00	30.00
DIFF	1.45	1.16	1.41	.96	-.37	-1.54	-3.07	-2.15	-.07	.38	1.68	1.42	1.26
Southeast (Milwaukee)													
RF	1.75	1.29	2.49	2.88	3.39	3.99	3.66	3.25	2.85	2.11	2.22	1.68	31.56
EVT	0.00	0.00	.47	1.71	3.52	5.39	6.49	5.74	3.58	1.88	.52	0.00	29.30
DIFF	1.75	1.29	2.02	1.17	-.13	-1.40	-2.83	-2.49	-.73	.23	1.70	1.68	2.26

Good water management requires that enough water be applied to insure that the entire root zone will be wetted thereby maintaining a constant level of soil moisture throughout the root zone. This way you will avoid any dry layers which roots will not penetrate.

In heavier soils, which are poorly drained, aerification and the addi-

tion of soil amendments such as "turf" can improve the soils drainage and will provide you with a healthier growth medium. In cases of more severe drainage problems, the areas should be tilled in order to remove excess water quicker.

However, under no circumstances should water be applied any faster than it can be absorbed

by the soil. Sprinklers that do not adequately disperse water or deliver a large volume of water within a concentrated area will cause run off. Whenever this occurs, water and energy are being wasted and the soils are being compacted. A good irrigation program will apply the moisture slowly enough to permit the soil to absorb all of the water being applied. In heavier soils where run off exists, several short cycles will be more advantageous than one long cycle that would cause run off.

In any case, once run off occurs, the irrigation cycle should be turned off. By taking a soil probe sample, you can determine if the soil has been watered to the desired depth. If not, the irrigation cycle should be repeated after about one hour's time. Taking soil samples, adjusting your irrigation frequency and length of cycle should be a routine management function which we recommend be accomplished at least weekly, if not more often.

Good water management requires a good knowledge of the plant material, physical soil properties, how they affect the moisture levels of the soil and the rate and manner in which water must be applied. Proper water use means correlating this basic information with the requirements of play, mowing and other management practices and programming an irrigation cycle to fit the requirements so as to make the most efficient use of your irrigation system and labor force.

In conclusion, we have no simple answer to the question "how often" or "how long should I water." It requires a judgement decision by the turf manager after he has studied the existing conditions and the water needs at that time.

Editor's Note: Mr. Schildknecht has been associated with Reinders Brothers, Inc., since 1967. For the past 14 years, he has been active as an irrigation designer and equipment distributor serving the turf, ag., and wastewater disposal irrigation markets.

Educated at M.A.T.C. — Horticultural College and U.W.-Milw. Mr. Schildknecht additionally taught irrigation design to undergraduates at several local schools and trade associations.

Mr. Schildknecht currently is a member of "The Irrigation Association" (I.A.), "American Society of Landscape Architects" (A.S.L.A.), "The American Society of Irrigation Consultants" (A.S.I.C.).

UNBEATABLE COMBO RESULTS IN SUCCESSFUL MEETING

Put together good weather, good golf course conditions, a good speaker and a good evening dinner and the result is a great WGCSA meeting. All ingredients were present for our May meeting at Riverside in Janesville, and it was the kind of meeting we would like every month. Host Bruce Schweiger had his golf course in great shape and nearly 60 players participated in the afternoon game. Following are the winners of the golf event:

Bill Sell	
Greg Sell	57
Myron Seavers	
Andy Kronwall	58
Ed Witowski	
Dale Panske	60
Joe Fryman	
Gary Monfre	60
Bruce Schweiger	
Ray Johnson	60
Ron Shara	
Don Steinmetz	61
Jim Knapp	
Bob Allen	61
Ray Merten	
Bill Fox	61

Bruce Williams, Golf Course Superintendent at the Bob O'Link Golf Club in Chicago, made the trip to Janesville to share his thoughts and his experiences with wetting agents and surfactants. Not only did Bruce give some solid results from his golf course operation, but he made some real strong points about careful and objective testing in the field before wholesale use of any new materials.

Refreshments before the dinner meal at the Elks Club were courtesy of Wisconsin Turf of Janesville. H.P. Goodall provided refreshments at the golf course.

A local appliance dealer donated a clock radio for a raffle. Proceeds from the raffle and a donation from Ray Johnson resulted in a fund-raising effort that netted over \$400 for the Wisconsin Turfgrass Association. Nice going, Bruce!

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