



Colorado MASTER GARDENER

Irrigation Management: Converting Inches to Minutes no. 7.757

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Most gardeners realize that temperatures affect the water needs of lawns and gardens. The difficult aspect is that water is usually measured in inches while the irrigation controller (timer) works in minutes. The challenge is to make minutes equal to inches so that the correct amount of water is applied to the lawn or garden. First calculate the precipitation rate for each irrigation zone. Then convert inches to minutes using the formula or the table.

Calculate the Precipitation Rate

Follow these steps for each irrigation zone (or each location you placed the sprinkler if you're a hose dragger). To do the calculations you will need six identical straitsided, flat bottom cans or cups such as soup cans, fruit or vegetable cans, or coffee mugs. (Do not use short cans like tuna cans as they are too shallow and water will splash out.) You will need a ruler, a watch, paper, and a pen to record your findings.

Steps

1. Place six identical, straitsided, flat bottom cans between sprinkler heads in the zone.
2. Turn on the sprinklers for exactly 10 minutes.
3. Pour all the water into one can.
4. With a ruler, measure the depth of the water in the can. This is your precipitation rate in inches per hour.
5. Write down the number near your controller for future reference.
6. Repeat steps 1 through 5 for each irrigation zone.

Table 1. Conversion of fractions to decimals.

$1/16 = .06$	$9/16 = .56$
$1/8 = .13$	$5/8 = .63$
$3/16 = .19$	$11/16 = .69$
$1/4 = .25$	$3/4 = .75$
$5/16 = .31$	$13/16 = .81$
$3/8 = .38$	$7/8 = .88$
$7/16 = .44$	$15/16 = .94$
$1/2 = .50$	



Putting Knowledge to Work

Convert Inches to Minutes

Once you know the precipitation rate for each zone, you can look up run times in the table or calculate it by using the following formula:

$$\text{Run Time (minutes)} = \frac{\text{Water to apply (inches)}}{\text{Precipitation rate (inches/hour)}} \times 60 \text{ minutes/hr}$$

Example: You have completed the above steps and calculated that this sprinkler zone has a precipitation rate of 1.5 inches per hour. You desire to apply 0.5 inch of water.

$$\text{Run Time} = \frac{0.5 \text{ inches}}{1.5 \text{ inches/hr}} \times 60 \text{ minutes/hr} = 20 \text{ minutes}$$

You need to calculate this for each zone. Don't make the common mistake of assuming that all zones are the same. In the typical yard, they are not!

Table 2. Sprinkler run time table (in minutes).

Precipitation Rate (inches per hour)	Water To Be Applied (inches)													
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
1/4	48	72	96	120	144	168	192	216	240	264	288	312	336	360
3/8	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1/2	24	36	48	60	72	84	96	108	120	132	144	156	168	180
5/8	19	29	38	48	58	67	77	86	96	106	115	125	134	144
3/4	16	24	32	40	48	56	64	72	80	88	96	104	112	120
7/8	14	21	27	34	41	48	55	62	69	75	82	89	96	103
1	12	18	24	30	36	42	48	54	60	66	72	78	84	90
1 1/8	11	16	21	27	32	37	43	48	53	59	64	69	75	80
1 1/4	10	14	19	24	29	34	38	43	48	53	58	62	67	72
1 3/8	9	13	17	22	26	31	35	39	44	48	52	57	61	65
1 1/2	8	12	16	20	24	28	32	36	40	44	48	52	56	60
1 5/8	7	11	15	18	22	26	30	33	37	41	44	48	52	55
1 3/4	7	10	14	17	21	24	27	31	34	38	41	45	48	51
1 7/8	6	10	13	16	19	22	26	29	32	35	38	42	45	48
2	6	9	12	15	18	21	24	27	30	33	36	39	42	45
2 1/8	6	8	11	14	17	20	23	25	28	31	34	37	40	42
2 1/4	5	8	11	13	16	19	21	24	27	29	32	35	37	40
2 3/8	5	8	10	13	15	18	20	23	25	28	30	33	35	38
2 1/2	5	7	10	12	14	17	19	22	24	26	29	31	34	36
2 5/8	5	7	9	11	14	16	18	21	23	25	27	30	32	34
2 3/4	4	7	9	11	13	15	17	20	22	24	26	28	31	33
2 7/8	4	6	8	10	13	15	17	19	21	23	25	27	29	31
3	4	6	8	10	12	14	16	18	20	22	24	26	28	30

Select the precipitation rate of your sprinkler zone along the left column and move right until you are in the column of the amount of water to be applied. This is the number of minutes to run your sprinkler.

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