Colorado State University Extension

Colorado Master Gardener℠ Program

CMG GardenNotes #266

Converting Inches to Minutes

Outline: Calculate the precipitation rate, page 1
Convert inches to minutes, page 2
Sprinkler run time table, page 3

Most gardeners realize that temperatures affect the water needs of lawns and gardens. The difficulty 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. It's easy to make the conversion. First calculate the precipitation rate for each irrigation zone. Then convert inches to minutes using the formula or the table.

Calculate the Precipitation Rate

The following steps need to be done for each irrigation zone (or each location you placed the sprinkler if you're a "hose dragger"). To do the calculations you will need 6 identical straight-sided, flat-bottomed cans or cups such as soup, fruit or vegetable cans. (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, and paper/pen to record your findings. Many sod growers and local water providers give out small rain gauges with a ruler on the side for this measurement. You will need 6 of the same type.

Steps

1. Place six identical, straight-sided, flat-bottomed cans between sprinkler heads in the zone.
2. Turn on the sprinklers for exactly ten 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 1-5 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		

Convert Inches to Minutes

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

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

Example: You have done the above steps and calculated that this sprinkler zone has a precipitation rate of 1.5 inches per hour. You desire to apply one-half 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) – by 1/8th inch

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.
Example: Your sprinkler applies water at 1 1/2 inches per hour and you want to apply 0.5 inch, it takes 20 minutes.

Table 3. Sprinkler Run Time Table (in minutes) – by 1/10th inch

Precipitation Rate (inches per hour)	Water to Be bpplied (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**
0.20	60	90	120	150	180	210	240	270	300	330	360	390	420	450
0.30	40	60	80	100	120	140	160	180	200	220	240	260	280	300
0.40	30	45	60	75	90	105	120	135	150	165	180	195	210	225
0.50	24	36	48	60	72	84	96	108	120	132	144	156	168	180
0.60	20	30	40	50	60	70	80	90	100	110	120	130	140	150
0.70	17	26	34	43	51	60	69	77	86	94	103	111	120	129
0.80	15	22	30	37	45	52	60	67	75	82	90	97	105	113
0.90	13	20	27	33	40	47	53	60	67	73	80	87	93	100
1.00	12	18	24	30	36	72	48	54	60	66	72	78	81	90
1.10	11	16	22	27	33	38	44	49	55	60	66	71	76	82
1.20	10	15	20	25	30	35	40	45	50	55	60	65	76	75
1.30	9	14	18	23	28	32	37	42	46	51	55	60	65	69
1.40	9	12	17	21	26	30	34	39	43	47	51	56	60	64
1.50	8	12	16	**20**	24	28	32	36	40	44	48	52	56	60
1.60	8	11	15	19	22	26	30	34	37	41	45	49	52	56
1.70	7	11	14	18	21	25	28	32	35	39	42	46	49	53
1.80	7	10	13	17	20	23	27	30	33	37	40	43	47	50
1.90	7	9	13	16	19	22	25	28	32	35	38	41	44	47
2.00	6	9	12	15	18	21	24	27	30	33	36	39	42	45
2.10	6	9	11	14	17	20	23	26	29	31	34	37	40	43
2.20	6	8	11	14	16	19	22	25	27	30	33	35	38	41
2.30	5	8	10	13	16	18	21	23	26	29	31	34	37	39
2.40	5	7	10	12	15	17	20	22	25	27	30	32	35	37
2.50	5	7	10	12	14	17	19	22	24	26	29	31	34	36

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.
Example: Your sprinkler applies water at 1.5 inches per hour and you want to apply 0.5 inch, it takes 20 minutes.

Author: David Whiting, Colorado State University Extension (retired).

- Colorado Master Gardener *GardenNotes* are available online at www.cmg.colostate.edu.
- Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating.
- Extension programs are available to all without discrimination.
- Copyright 2002-14. Colorado State University Extension. All Rights Reserved. *CMG GardenNotes* may be reproduced, without change or additions, for nonprofit educational use.

Revised October 2014