University of California
Agriculture and Natural Resources
Inyo and Mono Counties Cooperative Extension

Two-Day a Week Lawn Watering Guide for Independence and Lone Pine

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Irrigation scheduling is based on 4 factors:

1. How much water is used by the species
2. Sprinkler output
3. Soil infiltration
4. How much water can the soil hold in the plants' root zone

An ideal irrigation system provides the amount of water the plant needs, uniformly, with minimal loss. It applies it slow enough that soil can absorb it without runoff, but fast enough you don't have to wait an unreasonable amount of time to complete. Water applied beyond a plant's root zone is wasted. When insufficient water is applied to fill the root zone, plants cannot go as long between irrigations, and plants develop shallow roots.

This guide will help you survive twice-weekly irrigations and show what to expect.

You will need to know your sprinkler output in inches per hour.

Step 1: Uniformity

Non-uniform sprinklers require extra irrigation. This is because we have to ensure that the dry spots get enough water and in doing so, overwater the rest. Measuring and improving distribution uniformity is beyond the scope here, but there are 4 things you can do to save water. Do these before step 2.

1. Fix leaks and broken sprinkler heads.
2. If you can adjust heads, they should shoot all the way to the next sprinkler head. No more or less. This is called head-to-head coverage.
3. Make sure heads are vertical.
4. All heads on a zone should be the same type. No rotors and sprayers on the same zone. Stick with 1 brand and series and you will be fine.

Step 2: Measure output

Get a hold of 3 identical containers. Tuna cans are great. Place randomly in lawn and run your system for 20 minutes. Combine the water into 1 container and measure the depth. This is your output in inches per hour. (Those old, metal pop-up heads that are about 3" across may need something deeper than tuna cans.)

All 3 cups should be about the same level. If they are widely different then try to improve uniformity or measure the lowest can and multiply it by 3.

Step 3: Determine how much water your lawn needs each week

Normally you would need to do some math for this, but UC has a table that, based on your sprinklers' output in inches per hour, shows how many minutes per week you need to run your system in each zone. This table is for our region.

You need to decide if you have a cool-season or warm-season lawn. Bermudagrass is warm-season. Fescues and bluegrass are cool-season. If you're not sure, cool-season grass stays green in winter if watered, warm-season turns brown.

Weekly water needs of turf in minutes of application

	Warm-Season Turfgrasses				Cool-Season Turfgrasses				
	Minutes per week to irrigate if your hourly sprinkler output is:					Minutes per week to irrigate if your hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in		0.5 in	1.0 in	1.5 in	2.0 in
JAN	54	27	18	14	JAN	65	32	22	17
FEB	75	38	25	19	FEB	90	46	30	23
MAR	121	61	40	30	MAR	145	73	48	36
APR	165	83	55	41	APR	198	100	66	49
MAY	211	106	70	53	MAY	253	127	84	64
JUN	243	121	81	61	JUN	292	145	97	73
JUL	251	126	84	63	JUL	301	151	101	76
AUG	218	109	73	54	AUG	262	131	88	65
SEP	180	90	60	45	SEP	216	108	72	54
OCT	121	61	40	30	OCT	145	73	48	36
NOV	69	35	23	17	NOV	83	42	28	20
DEC	43	22	14	11	DEC	52	26	17	13

Because you are limited to watering twice a week, applying ½ the minutes listed two times a week will deliver sufficient water to trees and shrubs, but may waste water on turf, depending on your soil type, because the water will be below the root zone.

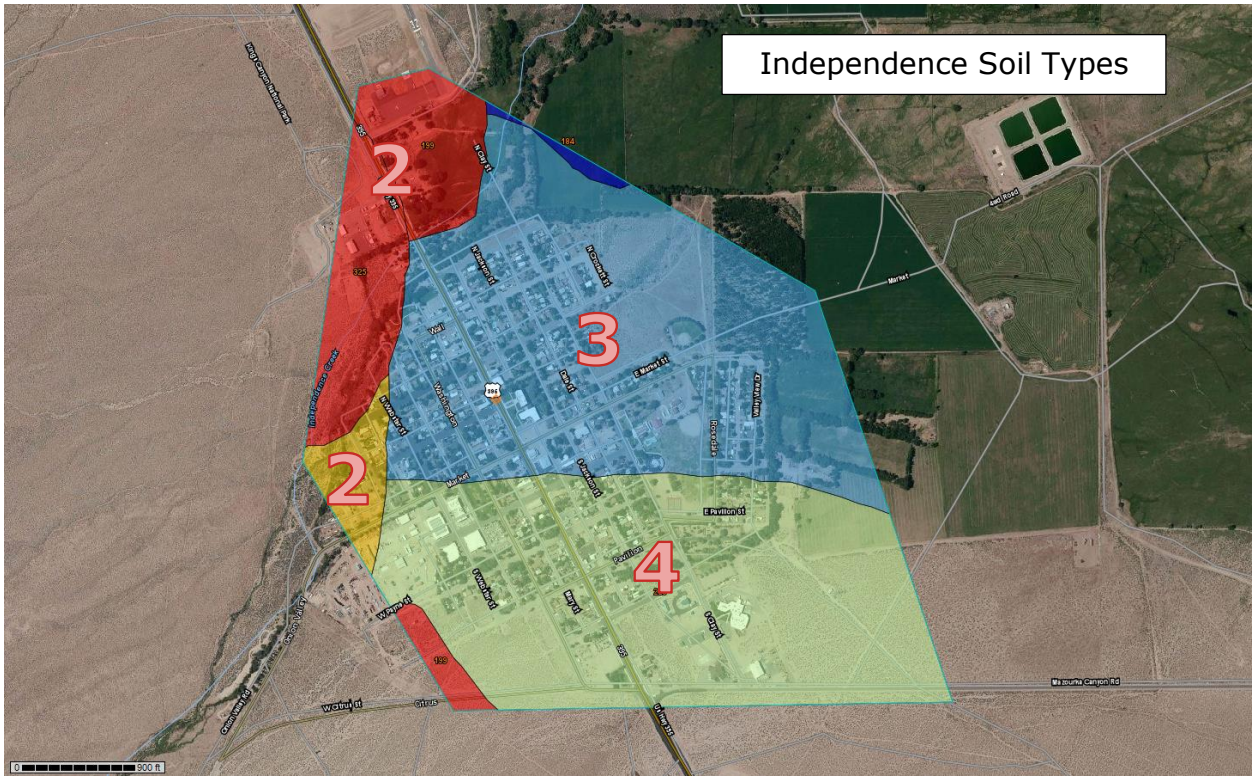
Step 4: Limit potential over-application

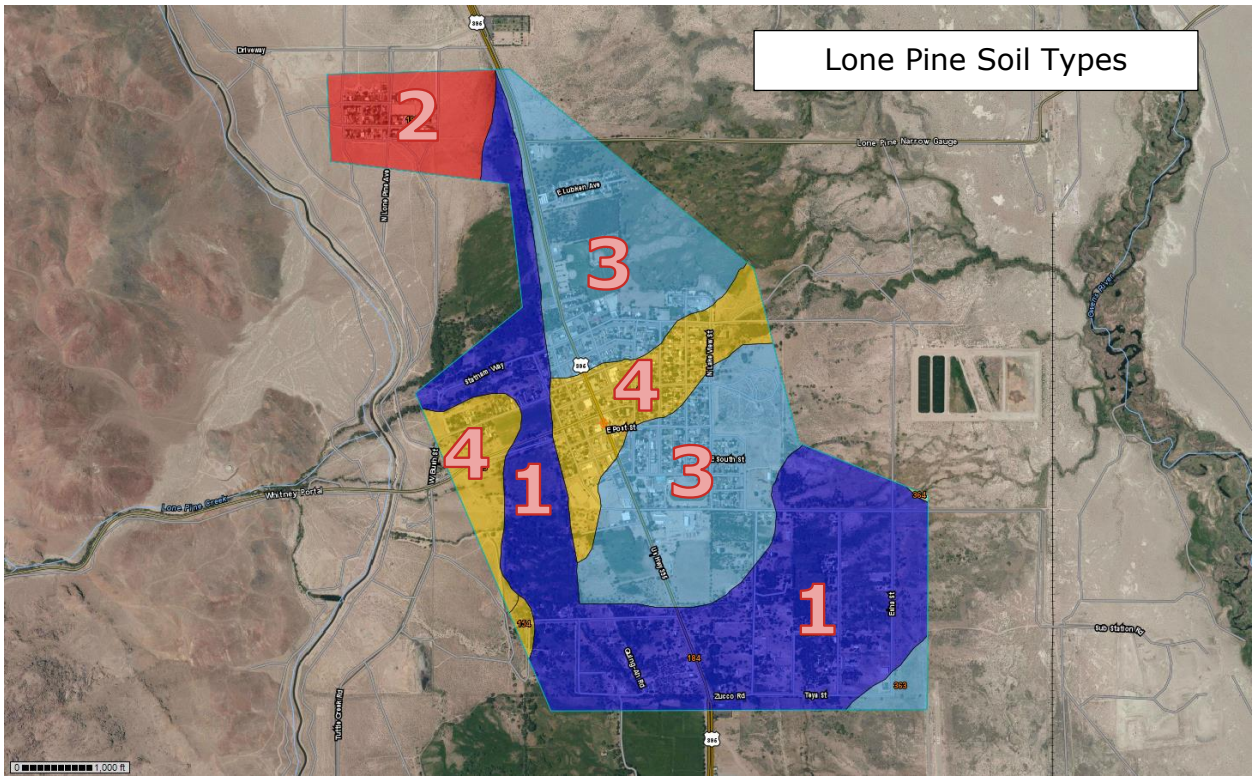
Because we have well-drained soil in these towns, some soils cannot hold enough water to accommodate the turf between irrigations. The soil will have no problem collecting the water, but it will be below the plants' roots. You will be applying water that the lawn cannot use. Trees and shrubs will have roots deep enough to access this water, but *if you are only watering a lawn it will be wasted*.

Find your soil number on the maps on the next page and consult the table to determine maximum times you should run your sprinklers for turf on a single day.

Without restrictions, you should apply enough applications per week to provide the total minutes per week needed, but not exceed the maximum amount of time shown on a single day. Depending on soil type and time of year, this can be 2 to 4 times per week.

Local Soil Type Maps





Maximum duration an irrigation system should run for each soil type on the preceding maps for turf. (Warm-season turf value in parentheses.)

		Maximum time to run sprinklers on turf on a single day to account for water holding capacity of soil in minutes			
Map Number	Inches water held in root zone	0.5 in	1.0 in	1.5 in	2.0 in
1	1.6 in	192 (220) min	96 (110) min	64 (73) min	48 (55) min
2	0.5 in	60 (70) min	30 (35) min	20 (23)min	15 (18) min
3	1.1 in	132 (152) min	66 (76) min	44 (51) min	33 (38) min
4	0.7 in	84 (96) min	42 (48) min	28 (32) min	21 (24) min

For example: You have cool-season grass, live in zone 4 and it is June. Your sprinkler outputs 1 inch per hour. According to the chart you will need 145 minutes of irrigation each week.

Since applying more than 42 minutes of water at one time will provide more water than your soil can hold in the root zone you need to provide water on multiple days in a week. Ideally this would be 36 minutes, 4 days per week. This keeps you below the 42 minute cap.

With only 2 days per week, in this example you will not be able to maintain enough water in the soil between irrigations to maintain perfect cool-season turf. The turf will get 42% less water than they need even if you irrigated 73 minutes twice a week.

What to Expect

For some soil types, turf quality will be severely impacted with twice weekly watering. The following two tables show the expected irrigation deficit for each month for turf.

Expected cool-season turf irrigation deficit by month for each soil type, 2-day per week irrigation

	Month						
Map Number	April	May	June	July	August	Sept.	October
1	-	-	-	-	-	-	-
2	40%	53%	59%	60%	55%	45%	18%
3	-	-	9%	13%	-	-	-
4	16%	33%	42%	44%	33%	23%	-

Expected warm-season turf irrigation deficit by month for each soil type, 2-day per week irrigation

	Month						
Map Number	April	May	June	July	August	Sept.	October
1	-	-	-	-	-	-	-
2	16%	33%	42%	45%	36%	23%	-
3	-	-	-	-	-	-	-
4	-	10%	21%	24%	12%	-	-

Turf can tolerate a sustained 20% deficit with minimal impact. Occasional greater deficits are fine, but sustained deficits greater than 20% may kill or diminish turf quality. Warm-season turf is generally more tolerant of severe drought stress.

- Zone 1: Expect no problems.
- Zone 2: Ultimately cool-season turf will not survive with 2 days a week. Warm-season turf will go dormant and look rough, but should partially survive.
- Zone 3: Cool-season turf will be slightly stressed in mid-summer, but should survive and stay green. Warm-season turf will have no problems.
- Zone 4: Cool-season lawns will be severely stressed this summer and will likely be damaged. They should improve in fall but may need to be over-seeded in September. Warm-season grasses will look rough in summer but should be fine. If you have mixed turf, the warm-season grass will begin to replace cool-season grasses.

Shrubs and Trees

Shrubs and trees have deeper roots and overall most need less water than turf. While there may be some stress on these plants, death is unlikely. Water trees and shrubs deeply, twice a week.

If you have turf *and* shrubs that get irrigated by a sprinkler system together, apply the half the number of minutes shown on the chart two times per week. The turf may look rough during the heat of summer, but all but the most water-loving shrubs should be fine.

Ideally, the shrubs would be set to run differently than the turf and the two types of plants will be on separate zones. You can also hand-water shrubs. Drip systems will likely need larger emitters.

8 Ways to Minimize Impacts of Limited Irrigation

1. Raise your mowing height. Taller grass is more tolerant of stress and will develop stronger roots.
2. Fertilize with a product containing potassium (K). This is the last number on a fertilizer analysis. Don't over-fertilize. (7 lbs of 9-9-9 per 1,000 ft^2 is plenty now.)
3. Water deeply. If you are hand watering, make sure you are getting the entire root zone wet. For shrubs and trees, water should go at least 18" down. For warm-season turf it should go 12". For cool-season turf, 10".
4. Physically check to see if your irrigation schedule is providing enough water. Use tuna cans to measure output and dig into the soil to ensure the root zone is filled.
5. Water in early morning to decrease loss due to evaporation.
6. Salt will build up in deficit situations. At least once a month, run the system 10 or 20% longer to flush salts down below the roots.
7. Lack of uniformity will create dry spots. Work on improving this and try increasing irrigation time slightly.
8. Lawns are easier to replace than trees. Ensure shrubs and trees stay happy.