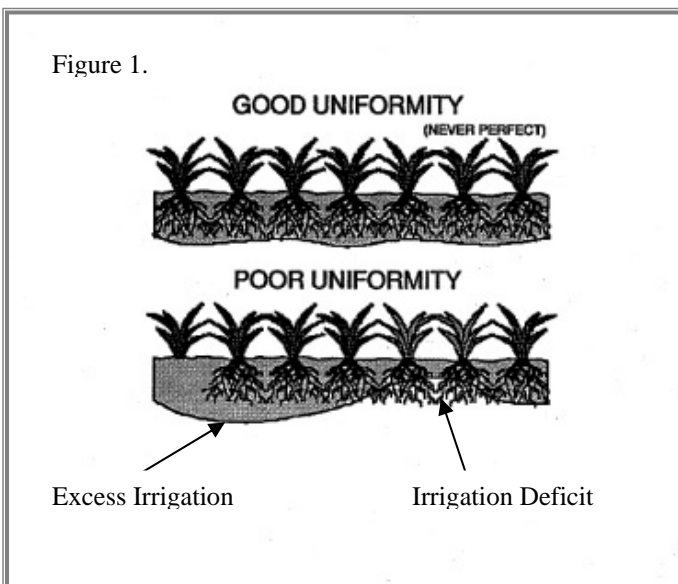


Irrigation Distribution Uniformity: What Is It and Why Do You Care?

When the topic of lawn irrigation comes up with landscape professionals, the concept of “distribution uniformity” (DU) will undoubtedly get a mention. That’s because it plays an important role as a measure of your irrigation system’s ability to apply water evenly, which ultimately determines how much water you’ll use to keep your lawn green. Although no irrigation system applies water perfectly uniform, the more you can improve the DU of your system, the more water you will save. For people concerned with using less water, while maintaining a healthy lawn, it makes sense to understand what DU is and to know what you can do to improve the DU of your sprinkler system.



The best way to understand what is meant by distribution uniformity, and why it is important, is to look at a picture. As can be seen in figure (1), it is possible (and



Although there are several methods for calculating DU, the end result will be a measurement that is expressed as a percentage, where a higher number reflects a more even application of water. For example, 100% DU means that all the water being applied to your lawn is being applied evenly across the surface. Anything less than 100% would mean that some areas of your lawn are receiving less water than the rest. If you have a spot in your lawn that gets stressed or turns brown while the larger balance remains green, you are likely witnessing this effect first hand. Most homeowners attempt to correct this brown spot by increasing the amount of time that they water, which (at the cost of over watering the majority of the lawn) may eventually work. Stop here though,

and give this some thought. If the majority of the lawn is healthy and green, then the amount of water in that area is sufficient—it is just the way it is being distributed that is causing the brown patches. Fixing the distribution problem is the better approach to eliminating the area of stress in the lawn, not adding more and more time to your irrigation controller.



So how exactly do you determine the DU of a sprinkler system? Landscape professionals use a diagnostic tool called a catch-can test to compute a commonly accepted DU known as the Low Quarter Distribution Uniformity. This is done by placing small catch cups in a grid across the lawn to capture and measure the amount of water being

applied by the sprinklers. An average catch-can volume is then computed for the entire sample, and for the lowest 25% of the sample. Once these two averages are determined, they are expressed as a ratio and then converted to a percent.

$$\text{LQDU} = \frac{\text{Average Minimum}}{\text{Average Total}} \times 100$$

Where:

LQDU = Lower Quarter Distribution Uniformity

Average Minimum = Average of lower 25% of sample

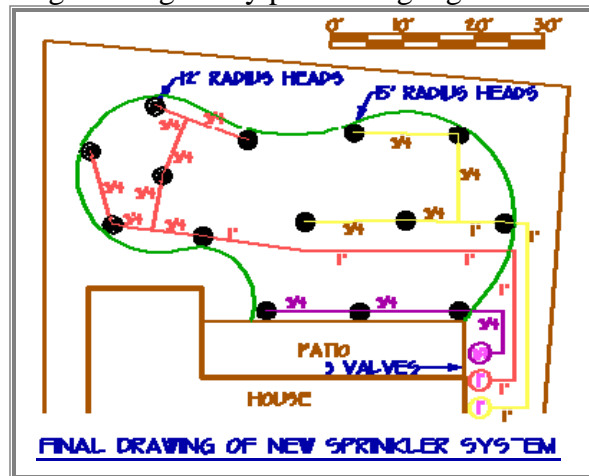
Average Total = Average of total sample

If you're not fond of math, or if that was more information than you would care to absorb, don't sweat it. Just know that most landscape irrigation systems have DUs between 55% and 75%, although there are many with DUs that are lower¹. This means that *everyone is over watering a portion of their lawn in order to ensure that the areas receiving the least amount of water stay green*. The goal then is to reduce the amount of over watering that occurs by ensuring the best possible distribution uniformity for your irrigation system. The following table gives some expected DU values for the three most common sprinkler types.

Sprinkler Type	Excellent	Good	Poor
	(Achievable)	(Expected)	(Consider not scheduling if lower than this)
Multiple Stream Rotors	85%	75%	60%
Single Stream Rotors	80%	70%	55%
Fixed Spray Heads	75%	65%	50%

Estimated DU by Sprinkler Type and System Quality²

So what can you do to improve your irrigation system DU? Well, the best way to obtain good distribution uniformity is to design and build the irrigation system correctly from the start, and then ensure it keeps operating as designed by performing regular maintenance. This makes good DU a challenging thing to attain if you've inherited a poorly planned irrigation system, an irrigation system that was shoddily installed, or if your system simply has a lot of deferred maintenance. In these cases (for those of you without the time, training, or interest in tackling the job) the best approach might be to hire someone trained in irrigation system design and maintenance to evaluate your system and make recommendations for any necessary repairs or upgrades. Check with the [California Landscape Contractors Association](#) for a listing of reputable local businesses, and make sure you express your concern for making the best use of your water. For do-it-yourself types, check out the section on *Irrigation System Tune Up Hints* for ideas about how to improve the system you have.



For those of you that think you have great DU and that your sprinkler system works just fine (because your entire lawn is always green), conduct this simple test to check that you're not just over watering. Try gradually trimming back the amount of time you water, paying close attention to the areas in the lawn that begin to show signs of stress first. Once you identify why the sprinkler system is not providing as much water to the stressed area as the rest of the lawn, you can correct it and it should green up again in a short amount of time. This test can be repeated to identify all the weaknesses in the sprinkler system, until the signs of stress appear uniformly across the lawn (indicating you have reached the real threshold for water needed). Remember, good DU is noteworthy, great DU is remarkable, so the chances are that if you do this test the grass will show you where your sprinkler system needs tuning

up. In the process you'll probably find that, after some sprinkler system maintenance, your lawn could have been doing fine with less water. Remember, making even a little effort to tune up your irrigation system can lead to substantial water savings over time, so prove to yourself that you're not using too much water.