

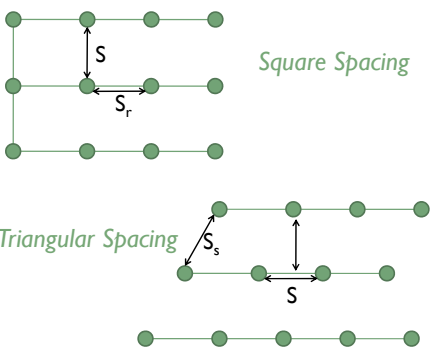
Sprinkler Layout and Uniformity



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Sprinkler Spacing





Square Spacing

Triangular Spacing

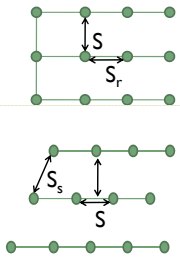


Head Spacing

- Uniformity
- Wind effects
- Dependability of sprinklers
 - A broken or stuck sprinkler isn't doing its job
- Sprinkler overthrow and overlap
 - Runoff on streets or sidewalks many times is the result of improper sprinkler layout or excessive applications due to overlap


Compensating for Wind

- 0 – 3 mph winds
 - $S_s \ \& \ S_r = \text{Diam.} * 0.55$
- 4 – 7 mph winds
 - $S_s \ \& \ S_r = \text{Diam.} * 0.50$
- 8+ mph winds
 - $S_s \ \& \ S_r = \text{Diam.} * 0.45$

Sprinkler Uniformity





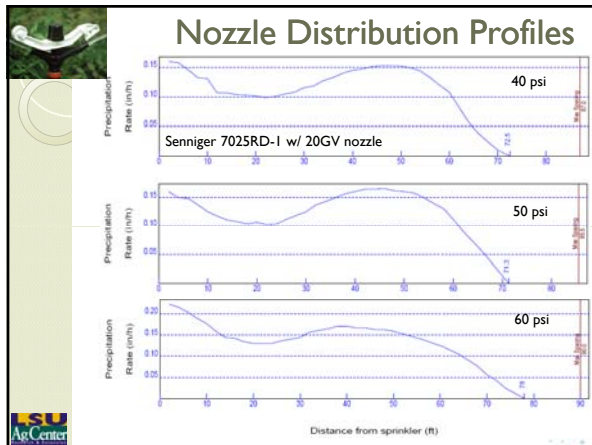
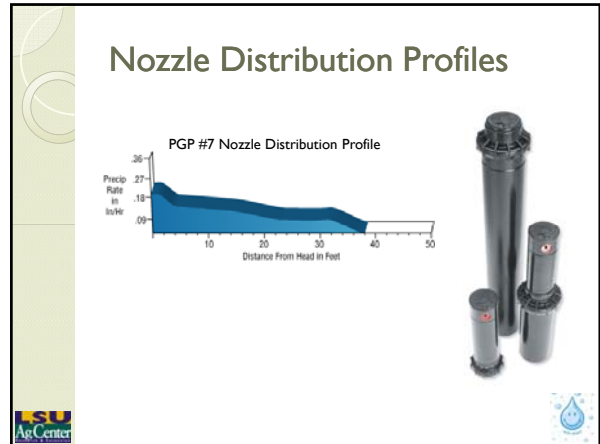
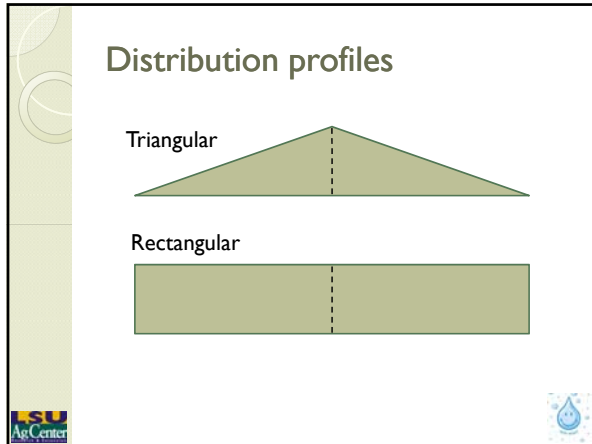


Uniformity

- The less uniform a system is, the more water it takes to deliver the appropriate amount of water to a plant
- DU = Distribution uniformity

DU (percent)	Water the plant needs	+	DU (decimal)	=	Amount of water you need to apply to keep dry areas green
30%	1.00"	+	0.30	=	3.33"
50%	1.00"	+	0.50	=	2.00"
70%	1.00"	+	0.70	=	1.42"

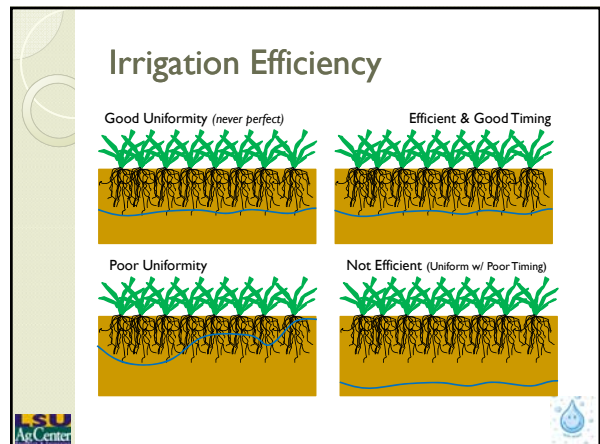





Sprinkler Types and Quality



Sprinkler Type	Excellent (Achievable)	Good (Expected)	Poor (if lower than this, consider not scheduling)
Single Stream Rotors	DU = 80%	DU = 75%	DU = 55%
Fixed Spray Heads	DU = 75%	DU = 65%	DU = 50%

- ### Factor affecting uniformity
- Wind speed, direction
 - Water pressure
 - Stream deflection, foliage
 - Broken or clogged heads
 - Clogged lines
 - Malfunctioning valves






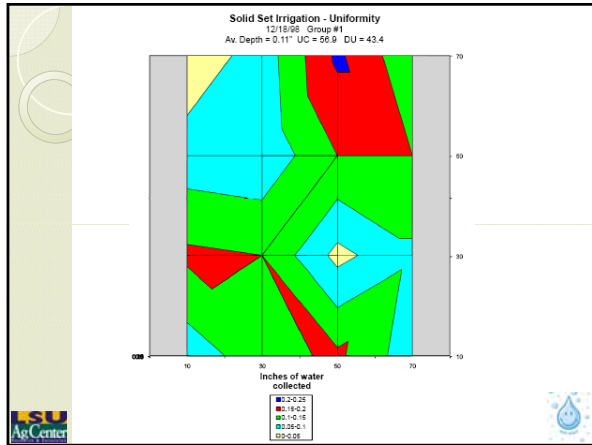
Calculating Sprinkler Uniformity

- Distribution Uniformity (DU_{LQ})
 - Focus is on under watered areas
- Scheduling Coefficient (SC)
 - Creates a “multiplier” to use to properly water dry areas
- Coefficient of Uniformity (CU)
 - Treats wet and dry areas the same

Irrigation Audits

Checking how well you did








Can #	Low Quarter (LQ)								Average
	1	2	3	4	5	6	7	8	
Catch (ml)	2	4	6	8	10	12	14	16	9
Deviation	7	5	3	1	1	3	5	7	4

$$CU = 100 \times \left[1 - \frac{\text{Avg. Deviation}}{\text{Avg. Catch}} \right] = 100 \times \left[1 - \frac{4}{9} \right]$$

$$CU = 100 \times [1 - 0.44] = 100 \times [0.56] = 56\%$$

$$DU = 100 \times \left[\frac{\text{Avg. Catch}_{in_LQ}}{\text{Avg. Catch}} \right] = 100 \times \left[\frac{3}{9} \right]$$

$$DU = 100 \times [0.33] = 33\%$$



Performance Criteria

- DU; CU
 - > 75% = Excellent
 - 50 – 75% = Good
 - <50% = Poor




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