

Close Spacing Irrigation

Senninger®
A Hunter Industries Company

AGRICULTURAL IRRIGATION

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Serving the Irrigation Industry for Over 50 Years



Senninger - First LEPA Bubbler

Working closely with Texas A&M, Senninger introduced the Quad-Spray specifically for LEPA (Low Energy Precision Application) back in the 1980's. Today, there is renewed interest in areas where water is limited because LEPA applicators require very little water and energy.



LEPA Plus Close Spacing

LEPA has evolved into one of the most effective irrigation methods known today for center pivot systems. When combined with close spacing, it is:



- Proven successful in dry regions and in areas where water is regulated or there is concern about diminishing natural resources
- Designed for low pressures, which makes it ideal for reducing energy and pumping costs
- Helps growers save water, save energy, and see increased yields

What is Close Spacing?

- Close Spacing irrigation increases the number of hose drops to be spaced at 40 inches or less.
- The drops use LEPA bubblers mounted about 18 inches off the ground.
- This delivery prevents wind-drift losses and reduces evaporation loss.



What is Close Spacing?

- Close spacing works best on relatively flat farms. The maximum recommended slope for fields is one percent.
- While most soil types will benefit from close spacing, it is important to consider each soil's water holding capacity when setting up close spaced Bubblers. Some soils, like porous sandy soils, can handle much higher application rates than others.



Water shown within the root zone in heavy silt clay loam soil beneath Close Spaced LDNs

Conservation Tillage

By adding strip-till or no-till farming practices, the residue keeps the soil cool and traps the water, allowing it to pool over the soil until it can soak in.



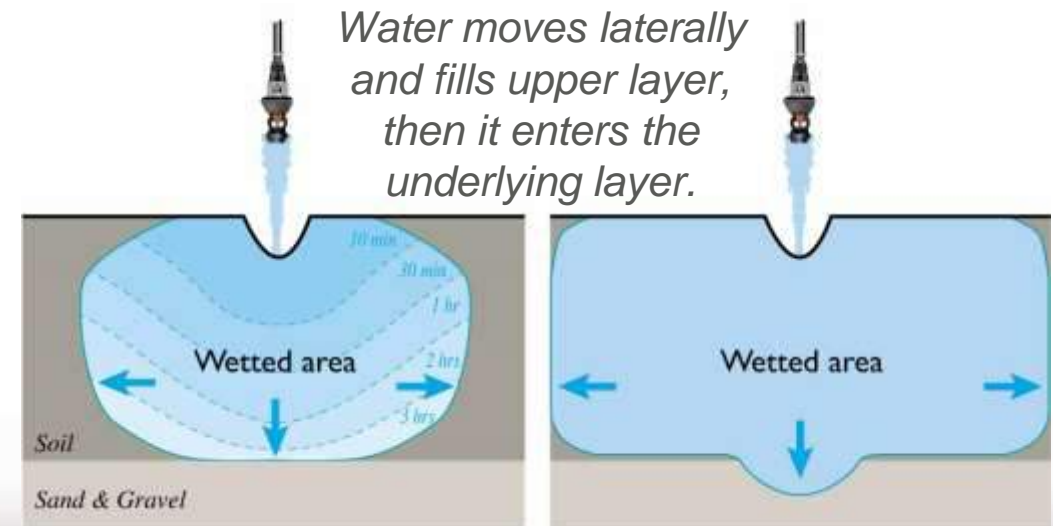
- Old root channels act as waterways to help fill the soil profile.
- This helps increase soil moisture at the same time it helps reduce runoff and soil sealing.

How Does Close Spacing Work?

Installations using close spaced LEPA Bubblers can often reduce the number of cycles needed to fill the soil profile. Subsequent cycles are scheduled to just add the water needed to keep the water in the root zone.

- Achieves a more uniform root zone coverage
- Maximizes water usage

Source: LEPA Conversion and Management by Dr. Guy Fipps and Leon New



Close Spacing Effectiveness

- At least 20 percent more water reaches the soil compared with conventional spray nozzles. Close Spacing achieves application efficiencies typically exceeding 95 percent.*
- NRCS officials in Texas have endorsed converting existing center pivots to Precision Application Residue Managed (PARM) sprinklers which qualify for federal funding.

** SOURCE: LEPA Conversion and Management by Dr. Guy Fipps and Leon New*

20%
MORE WATER
REACHES THE SOIL

>95%
APPLICATION
EFFICIENCY

Close Spacing Effectiveness



- In addition to Texas where LEPA was first developed, Close Spacing irrigation is effectively used in Arizona, California, Colorado, Kansas, Idaho Nevada, New Mexico and Washington.
- Close Spacing is used for various crops including cotton, potatoes, onions, carrots, alfalfa and corn.

Sprinkler Options - Bubbler Pads

The bubbler side of the deflector pad gently deposits water directly into furrow or onto the soil surface, distributing water in a bubbling narrow stream that avoids wetting foliage.



Sprinkler Options - Shroud & Pad Inserts

- Shroud not required.
- Simply twist and flip the Bubbler Pad to use the spray application for various crop stages. Models available based on trajectory:
 - Convex (*green*)
 - Concave (*blue*)
 - Flat (*black*)



CC 33-Groove/Bubbler
Other options:
CC 24-Groove/Bubbler
CC Smooth/Bubbler



CV 33-Groove/Bubbler
Other options:
CV 24-Groove/Bubbler
CV Smooth/Bubbler



FL 33-Groove/Bubbler
Other options:
FL 24-Groove/Bubbler
FL Smooth/Bubbler



CT/Bubbler

Sprinkler Options - Shroud & Pad Inserts

The shroud deflects the water from the bubbler insert down in a gentle dome-shaped pattern.



*Bubbler insert (tan)
on left*

*CM1 insert (red)
on right*






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Components - Pressure Regulators

- Bubblers are designed to operate at 6 to 10 psi (0.41 to 1.03 bar).
- In low pressure systems, even small fluctuations have great impact on the flow.

	Flow variations over 5% - use of pressure regulators mandatory
	Flow variation of 5% - use of pressure regulators recommended
	Flow variations less than 5% - use of pressure regulators optional

Design Pressure	Pressure Variations				
	1 psi 0.069 bar	2 psi 0.138 bar	3 psi 0.207 bar	4 psi 0.276 bar	5 psi 0.345 bar
6 psi 0.41 bar	8.3 %	16.7 %	25.0 %	33.3 %	41.7 %
10 psi 0.69 bar	5.0 %	10.0 %	15.0 %	20.0 %	25.0 %
15 psi 1.03 bar	3.3 %	6.7 %	10.0 %	13.3 %	16.7 %
20 psi 1.38 bar	2.5 %	5.0 %	7.5 %	10.0 %	12.5 %
	% Flow Variation				

Components - Pressure Regulators

- Pressure regulators will assure applicators operate properly.
- To ensure adequate pressure, a pressure gauge should be installed at the end of the pivot just above the bubbler head.
- Higher pressures can create small droplets susceptible to wind-drift, misting and evaporation.



Components - Goosenecks

- Goosenecks are constructed out of non-corrosive, UV-resistant thermoplastic for long life and reduced plugging
- Double goosenecks are used to double the drops from a single outlet to help close up the spacing without the need to add outlets (Single 180 and 125 models also available).



Components - Truss Rod Hose Slings

- Truss Rod Hose Slings securely fasten 3/4" flexible hose to the truss rod to maintain the drop/sprinkler position.
- They support flexible hose to prevent kinking and abrasive wear.
- Color coded models for various truss rod sizes:
5/8" (rust), 11/16" (green),
3/4" (black), 13/16" (grey),
7/8" (blue)



Components - Weights and Spacer

- Drop weights help maintain drop hose placement.
- On installations using the UP3 Shroud without a weight, the Shroud Bubble Spacer should be used.



Zinc One Weight
ONEWT4



Magnum Weight
MAGWGTSPL



LDN Shroud Bubble Spacer-UP3
(used in place of weight)
LDNSBS-UP3



Senninger - Foremost on Options

- **Bubbler pads (10 models)** for better performance in different crops and soil types
- **Bubbler pad inserts (14 models)** used with the Shroud to improve coverage and reduce runoff
- **Easy conversion to spray irrigation** with a flip of the pad for more efficiency and reduced labor
- **UP3 Dual Nozzle fitting to change flows** to match plant demand and varying water supplies
- **Small nozzles for lower flows** down to 0.10 gpm to reduce inner span overwatering

MORE
LEPA
OPTIONS

Senninger - Foremost on Components

- **Single and double goosenecks with truss rod hose slings** for precise drop hose placement
- **Weights** for drop hoses to help maintain drop hose placement
- **Reliable pressure regulators** will assure applicators operate properly

MORE
LEPA
OPTIONS

More Information

Senninger has literature available with more information about Close Spacing product options.

Additional information can be found online at [senninger.com](http://www.senninger.com)

<http://www.senninger.com/close-spacing-irrigation-reduces-water-use-increases-yields/>

<http://www.senninger.com/save-water-increase-yields-with-close-spacing/>

<http://www.senninger.com/a-closer-look-at-close-spacing/>



Thank You

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