



CLOSE SPACING LEPA BUBBLERS



MECHANIZED IRRIGATION

Application guide for 30-inch spacing with LDN LEPA components.

Close Spacing



Close spacing has helped some growers maintain high yield with as little as 2.8 gallons of water per minute per acre.

What is Close Spacing?

Close spacing is a water-efficient irrigation practice that combines bubbler heads made for LEPA (Low Energy Precision Application) irrigation with conservation tillage.

Growers developed the practice as a way to combat wind-drift, evaporation loss and water shortages caused by severe drought. They found that by doubling their drops from traditional 60 inch increments to tighter 30 inch spacing between heads, they could:

- Reduce evaporation loss
- Avoid wetting crop leaves
- Prevent wind-drift losses
- Achieve a more uniform root zone coverage
- Maximize their water usage

By adding strip-till or no-till farming practices to the mix, water is further protected from wind and evaporation. The residue keeps the soil cool and traps the water; allowing it to pool over the soil until it can be soaked in. This helps increase soil moisture at the same time it helps reduce runoff and soil sealing.

Bubblers Close Spacing



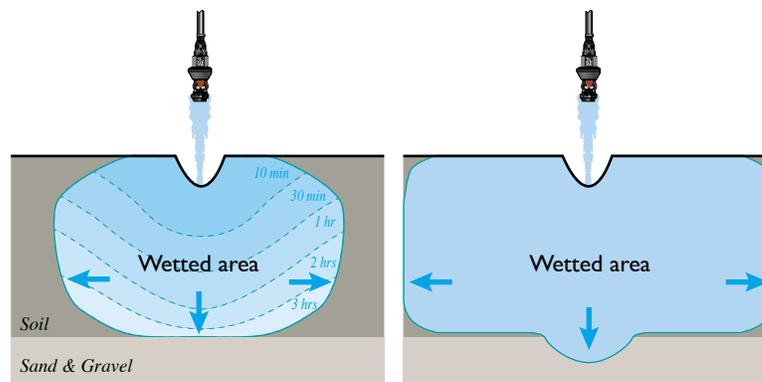
How it Works

Success with close spacing depends on three key factors: the right irrigation equipment, the right farming practices and the right field conditions.

Bubblers: The Right Equipment for Maximum Efficiency

Most of the benefits realized through close spacing are a result of LEPA bubblers. Bubblers apply water near the soil surface and directly into furrows with 95 to 98% efficiency. They significantly reduce wind and evaporation losses by depositing water 8 to 18 inches above the soil. This close application avoids hitting the crop leaves so nearly all the water pumped is absorbed by the soil. It also makes the Bubbler ideal for growers with limited water availability. With 30 inch spacing between heads, bubblers can uniformly soak the soil and fill in the soil profile during pre-watering, which stores water to be used during the season. Bubblers use less energy than conventional low-pressure sprinklers and can operate using fewer gallons per minute – approximately 0.27 to 4.42 gpm (61 to 1004 L/hr). On top of this, at least 20% more water will reach the soil surface compared to conventional spray nozzles, which are very susceptible to high wind speed, low relative humidity, temperature, and evaporation losses. |

Source: *LEPA Conversion and Management* by Leon New and Guy Fipps



Close Spacing Conservation Tillage & Row Planting

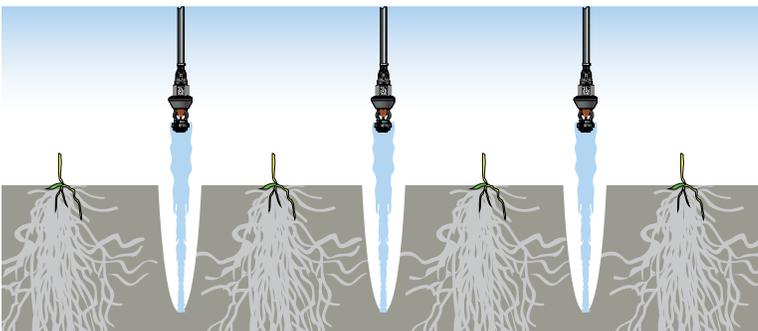


Conservation Tillage & Row Planting: The Ideal Farm Practices for Water Conservation

Strip-till and no-till practices help maximize and preserve soil moisture. While conventional tillage dries out the soil, growers that have adopted conservation tillage practices retain approximately 2 to 4 inches of soil moisture depending on the season.

Combining strip-till and no-till with close-spaced bubblers also helps prevent runoff and compaction despite Bubbler's slightly higher water application rate. Crop residue helps trap water deposited until the soil can soak it in. It protects the water from evaporation and heavy winds while it simultaneously acts as a buffer for the soil. Old root channels and cracks in the soil can help cut losses by acting as waterways, which helps fill in the soil profile.

Row planting is also a great help to the success of close spacing. This practice keeps bubblers centered in the furrow, which is ideal for further controlling runoff. If water does run, the water will remain trapped in the rows and it will not run far.



Growers who strip-till and no-till can take advantage of the old root channels left by previous crops. These channels help the water reach the root zone easier, where crops will fully use it.

Flat Land: The Ideal Field Conditions for Reducing Losses

Close spacing works best on relatively flat farms. The maximum recommended slope for fields considering close spacing is one percent. While just about any type of soil 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.

Sprinklers Close Spacing



LDN Bubbler Pad

The LDN Bubbler pad gently deposits water directly into the furrow basins. It distributes water in a narrow stream that avoids wetting the foliage. This minimizes evaporation and wind-drift losses.

FEATURES

- Deposits water straight down to the soil
- Flow Range: 0.27 to 21.18 gpm (6l to 48l L/hr)
- Pressure Range: 6 to 20 psi (0.41 to 1.38 bar)
- Aerated bubble does not atomize water

The LDN Bubbler pad is Senninger's top sprinkler for LEPA (low energy precision application) irrigation.

To convert to spray irrigation, simply twist the LDN Bubbler pad to remove it. Flip the pad over and re-install it with the groove-side up, facing the upcoming stream. Convert back to LEPA irrigation with just a flip of the pad.

LDN Shroud

The LDN Shroud deflects water down in a wide, dome-shaped pattern that gently distributes the water without spraying.

FEATURES

- Ideal for germination and low crop watering
- Flow Range: 0.27 to 21.18 gpm (6l to 48l L/hr)
- Pressure Range: 6 to 20 psi (0.41 to 1.38 bar)
- Applies water directly to the soil and/or plants

The LDN Shroud is ideal for growers with sensitive soils concerned about compaction.



To use the LDN Shroud, simply twist the LDN's deflector pad and remove it. Flip the deflector pad over and re-install it with the groove-side facing the soil. The deflector must include a brown bubbler pad insert to redirect the water upward into the Shroud when the system is on.

There is no need to remove the Shroud from the applicator to switch between spray irrigation and LEPA irrigation.

Close Spacing Components

Pressure Regulators

Maintaining proper system pressure is critical for low-pressure applicators. Sprinklers are designed to operate within a range of flows and pressures. As long as sprinklers can operate reliably under expected conditions, they will distribute water uniformly and efficiently. Higher pressures can cause overwatering near the sprinkler head and create small droplets susceptible to wind-drift, misting and evaporation.

Bubblers generally require 6 to 10 psi pressure regulators to operate properly. To ensure adequate pressure, a pressure gauge should be installed at the end of the pivot just above the bubbler head.



PSR Pivot Special Regulator™

*Outlet pressure:
6 to 50 psi
(0.41 to 3.45 bar)*

*Maximum inlet pressure:
100 to 135 psi
(6.89 to 9.31 bar)*

*Flow:
0.5 to 15 gpm
(114 to 3407 L/hr)*



PRL Pressure Regulator Low Flow

*Outlet pressure:
6 to 45 psi
(0.41 to 3.10 bar)*

*Maximum inlet pressure:
100 to 150 psi
(6.90 to 10.34 bar)*

*Flow:
0.1 to 8 gpm
(23 to 1817 L/hr)*



PMR-MF Pressure-Master Regulator® Medium Flow

*Outlet pressure:
6 to 60 psi
(0.41 to 4.14 bar)*

*Maximum inlet pressure:
100 to 150 psi
(6.90 to 10.34 bar)*

*Flow:
2 to 20 gpm
(454 to 4542 L/hr)*



Goosenecks & Truss Rod Hose Slings

Goosenecks allow placement of the applicators closer to the crop to minimize wind-drift and prevent kinking. They keep drops in position and let growers easily make adjustments. Truss Rod Hose Slings are used to divide existing outlets in half and close up spacing.

Senninger goosenecks are constructed out of non-corrosive, UV-resistant thermoplastic for long life and reduced plugging. Three models are available: 180° single, 125° single, and 125° double.



LDN System Assembly

MOUNTING

- Bubblers should be mounted no less than 8 to 18 (0.20 to 0.45 m) inches above the ground.
- To prevent overwatering, Bubblers should be installed with wider spacing on the first few spans until the flow from 30 inch spaced applicators matches soil need. (Refer to your sprinkler printout)

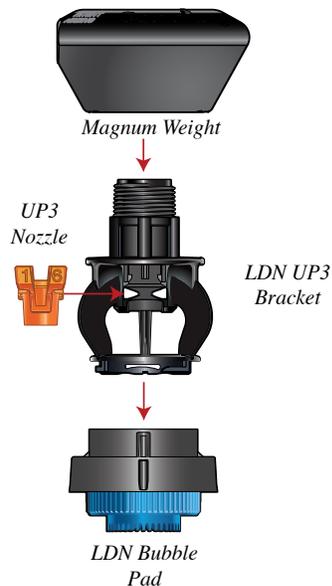
WEIGHTS

- A weight is recommended to keep the LDN steady in wind conditions.
- If using the Magnum Weight, use the internal fit technology to nest the weight onto the base of the LDN.
- Conventional slip-over weights can be used with the LDN.
- If no weight is used, the LDN Shroud must be installed with the Shroud Spacer.

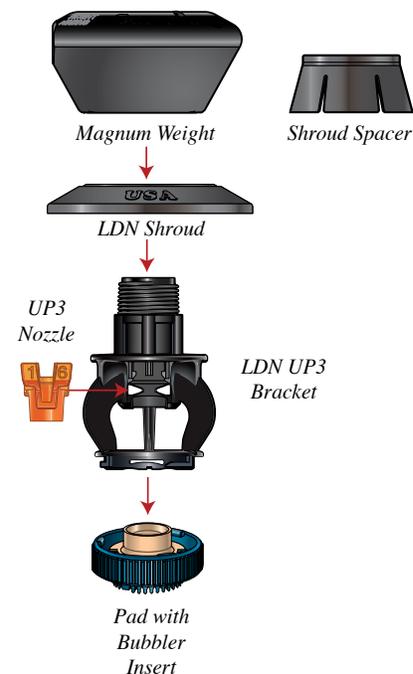
PRESSURE REGULATOR LOCATION

- Pressure regulators can be installed at the top of the drop or directly above the applicator.
- Always follow your customized printout for proper pressure regulator placement.

LDN Bubbler Setup



LDN Bubbler Setup



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