

Adjusting water winches for even distribution

Operators can use the correct rotation angle and take wind conditions into account to significantly improve the distribution uniformity of high pressure water winches.



The rotation angle effect

Water winches (Travelling gun irrigators) apply water most evenly when the angle of the gun is set at between 240° and 270°. The rotation angle does not affect the volume of water applied, but it can affect the distribution.

A gun moving through a full 360° rotation will typically apply water in a ‘dome’ pattern; with too much water applied to the middle portion of the field and almost none applied at the outside edges.

The distance between the irrigator run paths should allow a slight overlap. Most travelling irrigator guns typically ‘throw’ water across a 97.5 m wetted diameter. Check with the manufacturer for recommended spacing of irrigation paths.

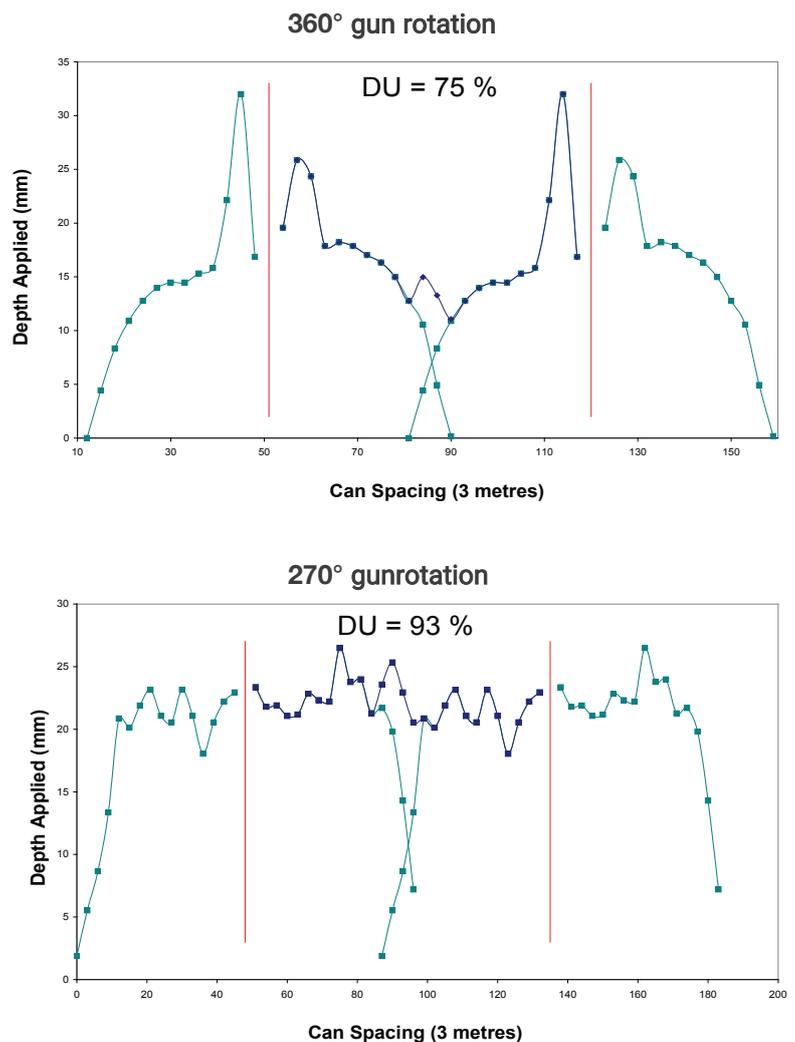


Figure 1 Effect of 360 and 270 degree patterns for travelling gun irrigators¹

¹ Source: Growcom

Wind effect

Wind velocity and direction will affect high pressure systems more than low pressure systems due to the higher percentage of fine droplets formed under high pressure.

The following recommendations will reduce the impact of wind on water distribution when using a water winch:

- **Do not space travel lanes wider than more than 40 per cent** of the manufacturer's published wetted diameter under no-wind conditions.
- **Every possible effort should be made to design travel-lane directions** at right angles (90°) to the prevailing winds.
- **Do not irrigate when wind velocities exceed approximately 15 km/hr.** Irrigate at night if possible, since in most windy areas wind velocity decreases at night.
- **Do not irrigate when the wind direction is parallel,** or nearly parallel to the travel direction of the irrigator.

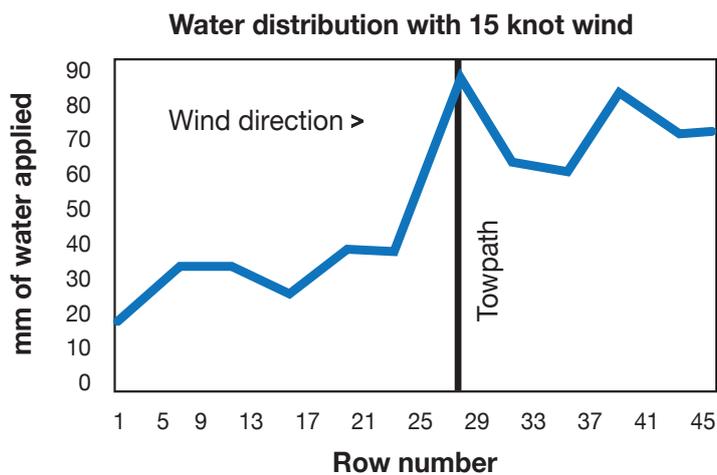


Figure 1 Impact of wind on uniformity of water distribution¹

Resources

Travelling gun rotation angles – <https://www.hort360.com.au/wordpress/wp-content/uploads/2019/11/Travelling-guns-gun-rotation-angle-effects.pdf>

Travelling gun wind effects – <https://www.hort360.com.au/wordpress/wp-content/uploads/2019/11/Wind-effects-on-the-performance-of-travelling-guns.pdf>

¹ Source: SRA Irrigation manual