

# Water for Profit

## EFFECT OF WIND ON THE PERFORMANCE OF TRAVELLING GUN IRRIGATORS



WATERFORPROFIT

**The effect of wind on the efficiency and uniformity of travelling gun irrigators has been evaluated under a wide range of conditions.**

### Introduction

In general the wind elongates the pattern of the spray downwind from the gun, shortens the pattern upwind, and narrows the pattern at right angles to the wind.

### Wind velocity effects

The wetted width and wetted distance upwind from the sprinkler decreases at about the same rate as the wind velocity increases. The wetted distance downwind from the sprinkler increases as wind velocity increases but the increase is proportionally less than the decrease in width and distance upwind. As a result, higher wind velocities decrease the wetted area covered by the sprinkler. This narrowing effect of wind on the sprinkler pattern makes the expected wind direction and velocity an important design parameter.

The effective water application rate also increases as the wind velocity increases because the area wetted decreases. Hence, extra care should be taken in selecting a travelling big gun on soils with marginal infiltration rates as the application rate, in windy conditions, could exceed the infiltration rate of the soil.

### Line pressure effects

Increasing the pressure in the system increases both the upwind and downwind throw distances more than the width, with the greatest increase being in the downwind direction.

This is because the higher pressure produces greater droplet breakup and therefore creates smaller droplets which are carried further downwind than large ones in high winds.

### Recommendations

- 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.

*Information has been sourced from: D F Heerman and R A Kohl (1983) in M E Jensen (ed), ASAE Monograph 3, St Joseph, MI. and is gratefully acknowledged.*

For more details contact Growcom on 07 3620 3844.



*Disclaimer: This information is provided as a reference tool only. Seek professional advice for irrigation specifics.*

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