

## WINDBREAK RESEARCH IN SOUTH AUSTRALIA

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Numerous studies have shown that crops grown in the sheltered zone of a windbreak will yield significantly more due to the modified microclimate (1). However, the windbreak effect still needs to be quantified over a range of crops and environments before their economic value can be reliably determined.

This research project is part of a five-year national program coordinated with similar windbreak trials in Western Australia, Victoria and Queensland. It is funded by RIRDC and LWRRDC. The purpose of this paper is to announce this research in progress and report a portion of the results from the first year of work.

### MATERIALS AND METHODS

The windbreak trial at Roseworthy is investigating the effect of a 9 metre (m) high *Pinus halepensis* windbreak on crops of wheat, canola and faba beans. These crops are grown in 70 m wide strips to a distance of 24 times the height of the trees on both the windward and leeward sides of the windbreak.

Crop growth, yield, water use and air temperature are being measured at various distances from the windbreak. An automatic weather station on the windward side of the windbreak is logging air and soil temperature, rainfall, relative humidity, solar radiation, wind speed and direction.

### RESULTS AND DISCUSSION

Table 1 shows the wheat grain yield for the first year (1994) of the experiment. This was an exceptionally dry year with 180 mm rainfall falling between April and October which is less than half the average growing season rainfall. Nevertheless, the yield of wheat grown in the shelter of the windbreak - in the area from 3 to 12 times the height of the trees - was significantly above that of the open field yield. Four more years of trials will give an accurate estimate of the windbreak effect.

Table 1. Wheat yields obtained from machine harvested strips at various distances from the windbreak.

	Windward Sites				Leeward Sites				
SITE*	W24	W3	W1	E3	E6	E9	E12	E18	E24
kg/ha	722	1150	33	1431	1466	1289	1175	977	805

\* Distance from windbreak in both westerly (W) and easterly (E) directions identified as a function of tree height

### REFERENCES

1. Bird, R.D., Bicknell, D., Bulman, P.A., Burke, S.J.A., Leys, J.F., Parker, J.N., vander Sommen, F.S. and Voller, P. 1991. The role of shelter in Australia for protecting soils, plants and livestock. *Agroforestry Systems* 20, 59-86.