

TWINN CROP TRIAL



Dryland Wheat: Temuka, Chile 2009-2010

INTRODUCTION

The trial was conducted by the University of La Frontera, Chile, to assess the capacity of TwinN to produce high yields with reduced nitrogen (N) fertiliser application rates in an intensive wheat cropping system. Reduced N fertiliser applications were of interest to reduce input costs, reduce the carbon footprint of the crop system and reduce the negative effects of excessive N use on soil structure, pH and health.



KEY RESULT

An independent trial in dryland wheat showed:

- ♦ Two applications of TwinN combined with 60% of the standard N fertiliser application rate (120 kgN/ha) gave a yield equivalent to the 100% N application rate (200 kgN/ha).

TREATMENTS

Treatment	Kg N/ha: at planting	Kg N/ha: Z21	Kg N/ha: Z30	Total Kg N/ha
1	25	0	0	25
2	25	17.5 + Twin N	17.5 + Twin N	60
3	25	32.5 + Twin N	32.5 + Twin N	90
4	25	47.5 + Twin N	47.5 + Twin N	120
5	25	47.5	47.5+ Twin N	120
6	25	75	100	200

Pre-plant fertiliser application consisted of 160 kg P₂O₅, 50 kg K₂O and 2 kg boron per ha.

RESULTS

The trial site showed a good nitrogen response with the 25 kgN treatment producing a 29% yield decrease compared to the 100% control (200 kgN). Both the combinations of one or two TwinN applications plus 120 kgN produced very similar yields (~10 T/ha) as the 200 kgN standard grower program, with no statistical differences between the treatment yields.

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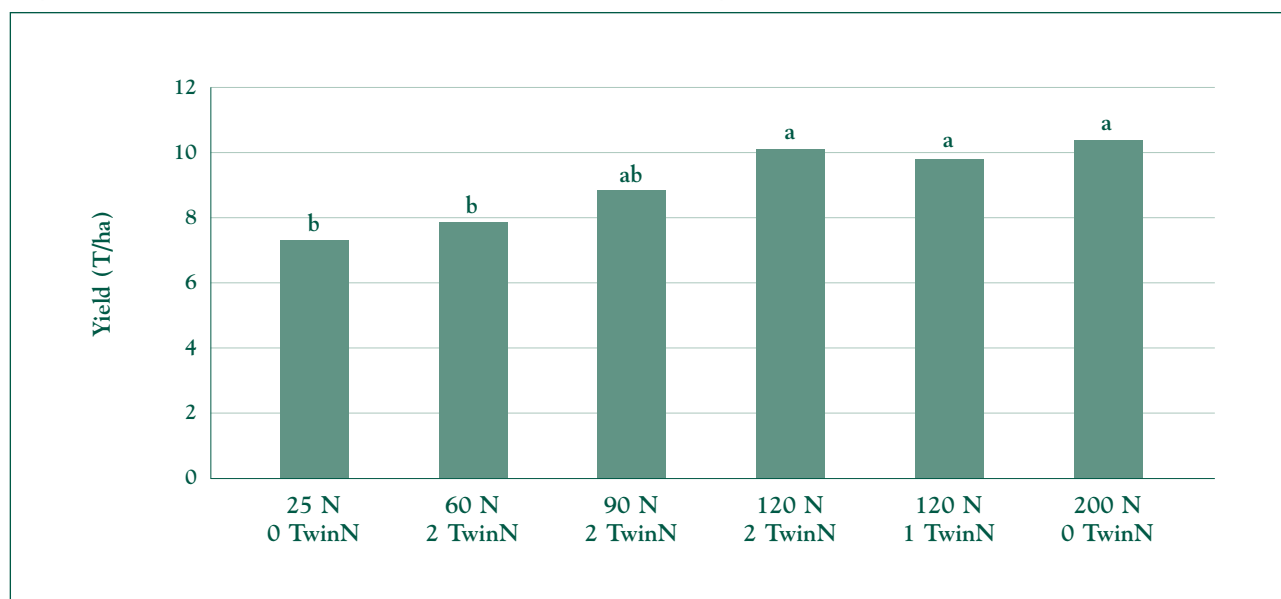
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Figure 1: Yield from different combinations of nitrogen fertiliser and TwinN



Note: Yields with the same letter above are statistically the same.

It should be noted that the treatments receiving two TwinN applications did not receive them at recommended timings as they were applied at Z21 (4 leaf stage) and Z30 (early tillering), rather than the recommended Z26-31 (early to mid tillering) followed by a second application at Z45 (booting). This reduces the validity of the comparison between one versus two applications.

The ability of TwinN to enable strong yields in wheat with a reduction of 80 kgN/ha provides growers with an option to reduce production costs, increase profitability and improve their soil by reducing urea rates and to reduce the effects of urea on the environment.



TRIAL SUMMARY

Performed & analysed by: University of La Frontera

Trial design: Randomised block design, 4 replicates per treatment. Plots were 2 x 6m.

Crop: Wheat

TwinN applications: TwinN was applied at 150 L/ha by backpack using a coarse nozzle to foliage and soil at plant bases in cool moist conditions. TwinN was applied at Z21 (4-5 leaf stage) and Z30 (early tillering). Note that Z26-31 followed by Z45 is recommended for high input/high yield wheat systems.

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Soil data:

The soil was an andisol with the analysis shown in Table 2.

Table 2: Soil analysis for 0-20 cm before the trial

pH	P mg/kg	K cmol/kg	Ca cmol/kg	Mg cmol/kg	Na cmol/kg	% Sat Al	S mg/kg	B mg/kg	Zn mg/kg
5.42	18	0.35	5.24	0.83	0.25	1.04	12	0.43	0.42

CONCLUSIONS

- ♦ The trial showed that application of TwinN to a high-yielding wheat crop enables a 40% reduction (80 kgN) in nitrogen fertiliser with no loss of yield.
- ♦ The result provides growers with a good option to reduce costs and increase profitability.
- ♦ The reduction in urea rates will improve soil pH, structure and productivity in the medium to long term.