PERFORMANCE OF NEW CSIRO INGARD VARIETIES

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The 1995/96 season saw the first occasion when CSIRO varieties with the Monsanto Ingard gene were tested on commercial farms. This article presents a summary of those trials.

CSIRO has been backcrossing the Monsanto Ingard gene into a range of varieties and breeding lines since 1992. The first CSIRO Ingard varieties have been accelerated through winter nurseries in Kununurra before the trial program and seed production which began in 1995/96.

Methods

Six locations were chosen for these trials: Biloela, Brookstead, Boggabilla, Moree, Narrabri and Warren. At each location five commercial conventional varieties were compared with ten Ingard lines. The trial was done under sprayed and unsprayed conditions. At Brookstead and Warren, the sprayed and unsprayed plots were at different positions in the one field, at other locations the sprayed and unsprayed plots were in different fields. The unsprayed trials at Biloela and Narrabri had no sprays at all while the other sites had some control for non-Helicoverpa pests. This paper will present data for the conventional variety and its Ingard equivalent.

Results

A hail storm at the Narrabri site (Australian Cotton Research Institute) in early November totally destroyed the unsprayed site. It was resown, but mirid pressure and the late sowing made data unreliable. At Biloela Research, heavy mirid pressure also reduced the value of the unsprayed plots in determining effectiveness of the Ingard gene against Helicoverpa. All other plots (six sprayed; four unsprayed) provided excellent results.

Figure 1. Lint yield at six sites for sprayed and unsprayed conventional cotton compared with Ingard cotton. Average of five varieties.

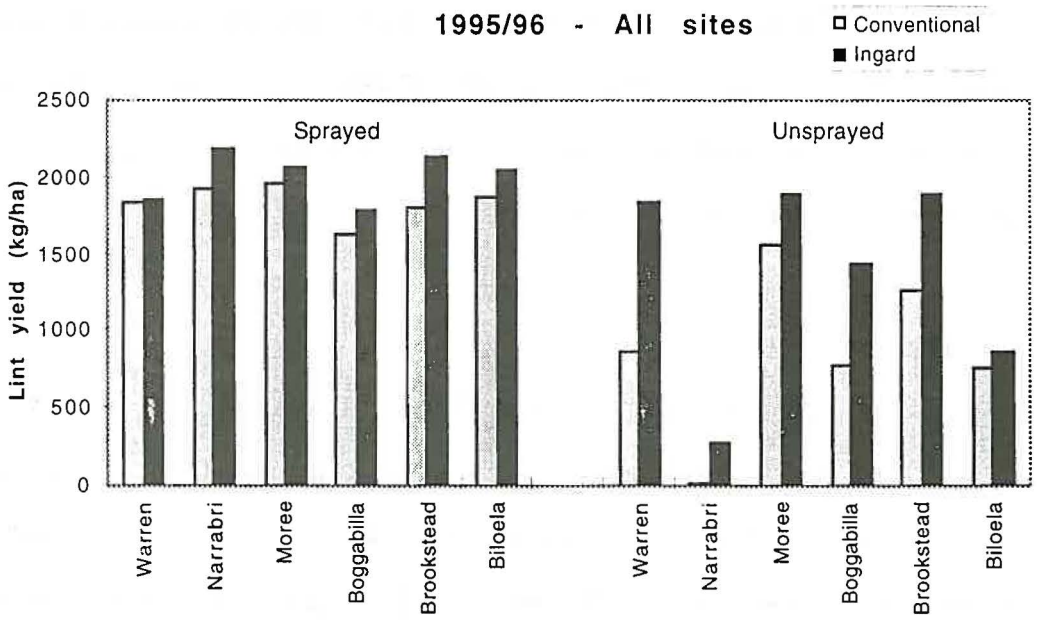
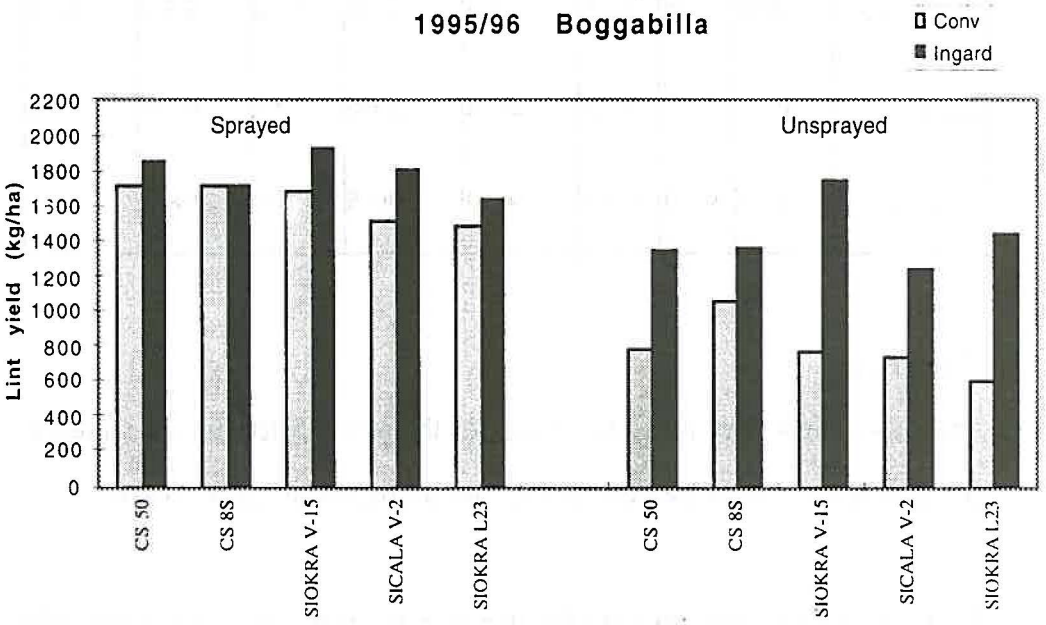


Figure 1 shows a summary of sprayed and unsprayed plots at all locations. Under unsprayed conditions, Ingard varieties yielded an average of 56% more than conventional. Under sprayed conditions there was still an average of 9% yield improvement for Ingard varieties over conventional, indicating the difficulty the industry has in controlling insecticide resistant Helicoverpa in the current cotton production system.

An example of the actual variety data for one site (Boggabilla) is shown in Figure 2.

Figure 2. Lint yield at Boggabilla for sprayed and unsprayed conventional cotton compared with Ingard cotton. Five conventional varieties compared with their Ingard equivalent.



The consistent performance of Ingard varieties is evident in the data: the best conventional variety for each location has always been mirrored by the Ingard version under sprayed or unsprayed conditions. That result is particularly important for field circumstances where specific varietal characteristics are required - for example a field with a history of Verticillium incidence which requires Sicala V-2, should use the Ingard equivalent Sicala V-2 for best results.

Fibre quality

Table 1 shows that for all fibre properties, Ingard and conventional varieties have been insignificantly different or identical.

Table 1. Fibre quality measurements (HVI) of conventional and Ingard varieties. Mean of five varieties and six trial locations.

	lint%	length (inch)	Unif	Strength	Extension	Mic	Maturity ratio	Maturity %	Fineness
Conventional	39.8	1.18	84.6	29.4	5.57	3.80	1.00	87.9	140
Ingard	40.1	1.17	84.4	28.8	5.60	3.80	0.99	87.0	141
Relative	100.5	99.4	99.8	97.9	100.5	100.0	98.7	99.0	101.2

Conclusion

These data show very pleasing results for the new CSIRO Ingard varieties. Yield and quality are at least the same as the conventional equivalent variety.

Further breeding is underway to develop new and better Ingard varieties with single and double Bt genes.

Acknowledgments

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