

Cotton

Research and Development Corporation

Final report on project CSP 72C:

Cotton Plot Picker

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Cotton Plot Picker

SUMMARY:

This project upgraded the harvesting equipment for CSIRO cotton breeding experiments, particularly for those sites located off the Australian Cotton Research Institute. The previous method of harvesting was heavily reliant on manual labour and bagging of samples from research plots. The new method is automated and computerised to speed up harvest.

Aim

To purchase a sound used commercial cotton picker and modify it into a plot picker incorporating sub-sampling, automatic computerised weighing and bulk handling facilities.

Industry Significance

The CSIRO breeding program has been very successful in producing varieties for the Australian cotton industry - in 1994 CSIRO varieties accounted for approximately 95% of plantings. To ensure continued rapid progress, the breeding program needs to operate at the highest possible level of efficiency.

Approximately 50 CSIRO variety trials comprising 15,000 plots and covering 50 ha are harvested each season. The time period required to harvest this number of plots with one picker is too long, increasing the risk of excessive weather damage to lint and seed. The rapid expansion in transgenic cotton lines in parallel with the conventional program will exacerbate the current limitations. Furthermore the current picker is very old, unreliable and parts are becoming scarce. One third of the plots are located on commercial farms where laborious collection into sacks is not required as the contents are not retained. An additional picker designed for bulk handling would enable faster picking on farm sites with reduced use of labour and vehicle usage (truck only) and elimination of manual handling. The old picker could be used concurrently for the majority of research station picking thus reducing the harvest period to less than half. The new picker could also be used on the ACRI (where most material is retained for seed), as it would be designed for collection into sacks as well as bulk handling.

Most milestones were met, although picker purchase was delayed and final construction and testing was not completed until halfway through harvest in 1996.

Staffing

Research staff

Dr G.A. Constable* #
 Mr P.E. Reid *
 Mr C.M. Patrick *
 Mr L.J. Heal *
 Mr M Barnes #
 Mr T Murphy +

* CSIRO funded
 + CRDC funded
 # CRC funded

Other collaborating staff

Mr C Rath*, CSIRO Canberra workshop

BUDGET - CSP 72C

Item	original	actual
	\$	\$
A. STAFFING	0	0
B. TRAVEL	4,168	4,100
C. OPERATING		
Picker modifications	49,000	33,764
Truck modifications	20,000	16,836
D. CAPITAL		
Second hand CIH-1822 picker	80,000	57,500
Surplus		7,800
TOTAL	153,168	120,000

Actual costs of most items were less than anticipated. In particular, the second hand picker was obtained at a good price, despite the shortage of this model in Australia. We are indebted to Ian Brimblecombe and Ian Thomas at St George for their help at the machinery auction.

RESULTS

The following photographs show two views of the completed plot picker. Testing and modifications were necessary to minimise wind effects on the load cells. Final testing showed an error of 150g seed cotton in plots which weighed 7 kg. This accuracy is the same as for the previous picking method.

We are now very pleased with the new equipment, which we believe to be the most advanced in the world. Special mention should be made of Mr Max Barnes, whose enthusiasm and skill with fabrication was a vital component for the successful commissioning of this new harvest process.

