



A
January, August & Final Reports

REPORTS

Part 1 - Summary Details

Please use your TAB key to complete part 1 & 2.

CRDC Project Number: DAQ106

January Report: Due 29-Jan-01
August Report: Due 03-Aug-01
Final Report: Due within 3 months of project completion

Project Title: Design and construction of a high clearance multi-treatment spray rig

Project Commencement Date: 01/07/00 Project Completion Date: 30/06/01
Research Program: Insect Management

Part 2 - Contact Details

Administrator: Mrs Vicki Battaglia, Senior Planning Officer (Projects),
PO Box 2282 TOOWOOMBA Q 4350

Organisation: Queensland Department of Primary Industries

Postal Address: PO Box 2282, TOOWOOMBA Q 4350

Ph: 07-46398886 Fx: 07-46398881 E-mail: battagv@dpi.qld.gov.au

Principal Researcher: Dr David Murray, Principal Entomologist

Organisation: Queensland Department of Primary Industries

Postal Address: PO Box 102, TOOWOOMBA Q 4350

Ph: 07-46881326 Fx: 07-46881199 E-mail: murrayda@dpi.qld.gov.au

Supervisor: Dr David Murray, Principal Entomologist

Organisation: Queensland Department of Primary Industries

Postal Address: PO Box 102, TOOWOOMBA Q 4350

Ph: 07-46881326 Fx: 07-46881199 E-mail: murrayda@dpi.qld.gov.au

Researcher 2 (Name & position of additional researcher or supervisor).

Organisation:

Postal Address:

Ph: Fx: E-mail:

Signature of Research Provider Representative:

V Battaglia



Part 3 – Final Report Format

The points below are to be used as a guideline when completing your final report.

1. Outline the background to the project.

For many years the insect pest management research conducted by the Entomology Team at QDPI Farming Systems Institute, Toowoomba has relied on makeshift spray equipment for the application of pesticides. The investigations carried out included evaluation of biopesticides (Gemstar and Bt), insecticide interactions with beneficials, insecticide efficacy, pest exclusion studies and spray application evaluation. While the various researchers have achieved a great deal with the available equipment, there is scope for safer, more reliable and time efficient methods to conduct much of this research. This is very important as we strive to conduct our research under practical field conditions, and expand our research program related to the development of Best Practice and IPM in cotton. Insect and weeds researchers at ACRI have pioneered the design and construction of two high clearance multi-spray rigs and identified the most appropriate features for this equipment. Our proposal is to draw on the experience gained in the construction of the previous two spray units, and build a third unit for the QDPI Farming Systems Institute Toowoomba based research. The spray rig will be light weight and transportable on a tandem trailer so that it can be readily moved to various research locations on the Darling Downs and elsewhere as required.

This Research Proposal is linked to existing and proposed CRDC projects. The spray capability of this item of equipment will support the following projects currently undertaken or proposed by QDPI Farming Systems Institute: DAQ84C Thresholds for green mirids in cotton; GRDC1C Regional management of heliothis on the Darling Downs; DAQ96C IPM in dryland cotton on the Darling Downs; DAQ98C Improved pesticide application performance; NEW Improved application and formulation of viral biopesticides against *Helicoverpa*. Depending on results with current fusarium research, there may be scope to use this spray unit for fungicide applications in DAQ99C Ecology and development of management strategies for fusarium wilt in cotton. All of these projects have direct need for pesticide application to small and large plot trials.

2. List the project objectives and the extent to which these have been achieved.

Design and construction of high clearance spray application rig.

Purchase and fitting of boom spray equipment

Field evaluation of high clearance applicator

At 30 June 2001, an order had been placed with Armour Industries, Gunnedah, for the construction of the Spray Mantis. Delivery is expected late October 2001 in time for use during the 2001/02 cotton season.

3. How has your research addressed the Corporations three outputs: Sustainability, profitability and international competitiveness, and/or people and community?

The QDPI Farming Systems Institute cotton research team operating in southern Queensland (Darling Downs) conducts insect pest management research involving insecticide application and evaluation against pest and beneficial fauna. All current spray applications are made using either grower/cooperator equipment, a low clearance 5 metre boom on a 4-wheeler ATV or hand held equipment. These units impose limitations on the type of investigations that can be undertaken by the researchers. One of the major issues is WH&S, particularly

where we are testing experimental or highly toxic substances. With conventional equipment, considerable time is spent locating plots in field layouts and rinsing spray application equipment between treatments. We did not have access to a high clearance spray rig. Two high clearance multi-treatment spray rigs have been purchased at ACRI and demonstrated their usefulness in replicated small plot experimentation. We aimed to have spray application capabilities for QDPI Farming Systems Institute research activities equivalent to those available at ACRI. This equipment grant will allow the design and construction of a high clearance multi-treatment spray rig that a number of researchers can utilise, improving the accuracy and safety of their chemical application. The Australian Cotton Industry will benefit from improved data quality and the time to conduct experiments will be reduced. Multiple treatments will be applied over a much shorter time span, improving the efficiency of research activities and reliability of data.

4. Detail the methodology and justify the methodology used.

Not applicable.

5. Detail results including the statistical analysis of results.

Not applicable

6. Discuss the results, and include an analysis of research outcomes compared with objectives.

Not applicable

7. Provide an assessment of the likely impact of the results and conclusions of the research project for the cotton industry. Where possible include a statement of the costs and potential benefits to the Australian cotton industry and future research needs.

Not applicable

8. Describe the project technology (eg. commercially significant developments, patents applied for or granted licenses etc).

Not applicable

9. Provide a technical summary of any other information developed as part of the research project. Include discoveries in methodology, equipment design, etc.

Not applicable

10. Detail a plan for the activities or other steps that may be taken;

(a) to further develop or to exploit the project technology.

(b) for the future presentation and dissemination of the project outcomes.

As research generates new data in specific trials, they will be disseminated via mechanisms routinely used by researchers – Australian Cottongrower, Workshops,, Grower meetings, Research Updates, etc.

11. List the publications arising from the research project. Nil

12. Are changes to the Intellectual Property register required? No

Part 4 – Final Report Plain English Summary

Provide a half to one page Plain English Summary of your research that is not commercial in confidence, and that can be published on the World Wide Web.

The high clearance multi-treatment spray rig (Spray Mantis) was designed and constructed by Armour Industries, Gunnedah, in collaboration with officers from ACRI, Narrabri. The spray rig will reduce the amount of hand sprayed application of insecticides, improving WH&S aspects. Current spray rigs allow only single treatment applications with considerable time lost in plot location and rinsing between treatments when conducting randomised small plot experiments. This multi-spray rig will improve the safety, accuracy and efficiency of experiments and improve the management of experiments throughout the season. The Spray Mantis offers scope for greatly increased efficiencies in experimentation related to the evaluation of new insecticides and their potential fit in IPM programs.