

USQ7C Executive Summary

Plain English Summary

Introduction

The aims and relevant achievements of this project are summarised below. The project was wide in scope and successful in industry interaction as farmers were provided with detailed and relevant information on machinery needs and current developments. Information was provided as possible, and if it didn't exist, was created and distributed to assist the industry in a number of areas. These included stubble handling equipment and techniques, planting and cultivation equipment, and pupae destruction guidelines. MACHINE-pak was developed to allow this information to be readily supplied back to the industry as a whole. There has always been a some flow of information between the extremities of the industry, and it was an important aim of this project to develop this and to spread new developments quickly through MACHINE-pak and personal visits. Technology developments continued and were enhanced. Guidance continued to be a focus, and as much interaction as possible was attempted with other companies including John Deere, Case, Agri-dry Rimik and Ag Systems. A centre of knowledge and technological development has been established at the USQ as a part of the NCEA, and has provided assistance on many levels to researchers, developers, commercial entities and the end user. The base level of the technology is continually being expanded to cover as many areas as possible, but is focussing on guidance and the development of guidelines for the interaction on intelligent steering control systems with physical tractor steering dynamics and the associated safety issues.

Summary of Aims and Achievements

The focus of this project included several aims. These included:

Aim a) To continue and develop work on residue handling in back to back cotton and rotation crops

Result a) Stubble handling and equipment in the cotton industry will be a continuing development while ever the industry exists. Somewhat of a steady state has been reached in that there are a few clearly defined methods and equipment groups to achieve the end results required under different tillage regimes. These machines, techniques and end results were developed over the course of this project and are defined in MACHINE-pak. Various equipment that is capable of handling stubble for the direct drilling of rotation crops into standing stubble and for the direct drilling of cotton into standing winter cereal stubble is also detailed. The planting equipment is one area that still requires further work.

Aim b) To help in the completion of evolving guidelines for the control of diapausing heliothis pupae in back to back cotton, cotton to fallow and in the direct drilling of rotation crops in standing stubble

Result b) The development of guidelines to assist growers in decisions regarding adequate levels of tillage to achieve maximum control of over-wintering heliothis pupae has progressed well. A document detailing current recommendations has been produced and approximately 2000 copies were distributed during the 1999 post harvest season. Extension of these ideas has continued during this time, with shed meetings, conferences and individual grower visits undertaken as often as required to spread the message throughout the industry. Coordination of information given to farmer groups on the Darling Downs has been achieved through interaction with Dave Murray and Julie Boddington. As much as possible, industry liaison personnel are used to increase the spread of the information throughout all growing areas.

Aim c) To extend ideas and concepts above into growing areas and leading growers operations to help industry adoption

Result c) As mentioned in b) above, extension was a major part of this project and will continue to be a part of all subsequent work.

Aim d) To offer and implement suggestions for mechanical improvements and new technological developments across the industry, including manufacturers and developers

Result d) As farmers request help in areas across the machinery range used in cotton, suggestions are made that can be implemented on farm, or are taken back to the manufacturer for inclusion. This has led to some excellent farmer initiated changes to currently manufactured equipment. Gessner industries have been especially helpful and keen in the uptake of new suggestions and requested changes. Case and John Deere have been helpful in providing equipment details required for the integration of new technology to their ranges. Good relationships have been fostered throughout the manufacturing community and communication is continuing. Excel Agriculture have also requested and been given advice and direction for the development of their equipment line. Other new technology links have been formed with Trimble and Micro Trak America to

speedily return the cotton yield monitoring system to the market. Other variable rate technologies will soon be released also.

Aim e) To ensure the guidance systems developed in previous projects are commercialised and fully released to the farming community

Result e) Guidance systems are now readily available in a variety of forms from different manufacturers. Due to the length of time taken to have the VGS System released through Case, there is now some market resistance to its adoption, but this year should see some adequate sales results. Case have had to be careful releasing an automated steering controller that fits to a major equipment line, but it now has their endorsement and needs to be supported by the industry. Agri-dry Rimik have also released the new furrow based Auto-Trak system that is suitable for fitting to new John Deere and Case equipment. It is a low cost, flexible guidance solution, and should provide accurate positioning of the tractor in a furrow for all ground-based operations. It is advised that the industry supports this development as well as providing much needed feedback to the manufacturers. A cotton picker guidance system is also complete, and should be visible in reasonable numbers this coming season. Work has progressed well with the development of steering integration devices for a large range of tractors. Ag Systems and Trimble are advised regularly as to the best steering integration options for their controllers.

Aim f) To produce a MACHINE-pak that details existing and new techniques and equipment for the Australian cotton industry.

Result f) MACHINE-pak has been completed and distributed throughout the industry. It is structured to include three chapters on the main rotation options and a series of appendices that detail equipment and techniques currently in use across the industry. Legal opinion from the USQ legal department and CRDC lawyers has been constructive and allowed the document to be modified so it complies with Australian law.

Further, the project has achieved the following:

a) Provision of engineering support to the wider industry and specific support to various CRDC funded projects including US30C with the development of the salinity test rig, DAQ85C Regional Heliothis Management, DNR1C Runoff Control, NEC3C Cotton Ginning Research, CSD InGard audit assessments, UNR machinery development, Monsanto's InGard management and others as requested.

b) Monitoring of picker efficiency using the cotton yield monitor and visual observations.

c) Development and transfer of steering system information to Ag Systems for inclusion and development of the Bee-Line GPS based guidance system. Interaction with Ag Systems has progressed well, and has allowed the information gathered during earlier CRDC funded guidance projects to be used for the benefit of the industry. Interaction has also begun with Trimble in the development of a new GPS guidance system.

To encourage the adoption of project developments by the industry as a whole, it is advised that:

a) the engineering assistance position in the industry is funded on an ongoing basis to ensure farmer access to the resources developed during the last three years. This will also allow ongoing development in the areas undergoing technological advancement at the present time, including GPS application, yield monitoring solutions, and variable rate application technology.

b) MACHINE-pak development and expansion be continued to cover more machinery requirements in the industry.

c) the industry accepts, support and provide feedback on all guidance solutions provided to the industry.

d) pupae destruction guidelines be refined and checked yearly to ensure the publication and distribution of the information to the wider industry