

EXECUTIVE SUMMARY

In June 1993, Mr Neville Gould, Team Leader, Agricultural Engineering, NSW Agriculture, Trangie travelled to the USA for 30 days to investigate for the Australian cotton industry the following issues :

- a) To discuss with researchers and manufacturers of anhydrous ammonia (NH₃) application equipment means of improving the current performance of metering systems and associated technology and to pursue potential commercialisation prospects arising out of our research.
- b) To present a paper at the American Society of Agricultural Engineers Summer meeting arising from research conducted in Projects DAN55C and DAN59N. This will enable the establishment of contacts with various engineers in related fields.
- c) To observe and assess both research and commercial endeavours in the area of cotton stalk pulling, collection, removal, transport, storage and usage of cotton stalk and cotton ginning trash (CGT) for alternative purposes (eg. ethanol fuel, paper).
- d) To assess and research and commercial efforts in the area of non-chemical weed control to ascertain the appropriateness of their developments to the Australian cotton industry.
- e) To discuss with manufacturer companies the problems of compaction caused by heavy harvesting and cotton picking equipment running on inappropriate wheel spacings and/or tyre sizes.

These issues relate directly to soils, nutrition and tillage, which are the three most important components of cotton production. Successful cotton production depends to a large extent on the way that these three components are managed. Visits were made to the principal contributors to the Australian cotton industry in these areas, either in terms of manufacturing or research.

Engineers within various sections of John Deere and Case IH were visited, with major emphasis being placed on their need to address design criteria suited to Australian conditions rather than USA. Inherent in these discussions was the need to provide equipment to metric specification, which suited the growing numbers of Australian cotton growers who are using permanent bed/minimum tillage production techniques combined with rotation crops. Equipment needed to be robust, flexible and compatible.

Research engineers were also visited at the Universities of California, Davis and Arizona (Tucson) to discuss their latest developments in non-chemical weed control and cotton stalk management respectively. These developments provide considerable potential, especially in improving the environmental effects compared to that offered by the current systems.

The two major providers of anhydrous ammonia application equipment, John Blue and Continental, were also visited. These companies were in stark contrast, with Continental having a strong development program whilst John Blue were keen to remove themselves from this industry to concentrate on the metering and distribution of less hazardous materials.

Additionally a visit was also made to the USDA Cotton and Ginning Mechanisation Centre in Memphis where a substantial amount of information was gained on the alternative uses of cotton ginning trash, ginning technology and other areas of cotton production and processing.