Plain English Summary.

A Pilot Study carried out in a NSW cotton crop in 1993 showed that lint and seed production could be improved by up to 25% by honey bee pollination. The current project had the objective of determining whether yield and fibre quality of an irrigated cotton crop grown in NSW could be improved by introducing managed honey bees into the crop.

Field work was carried out during Jan.-Feb., 2000 using a 30 hive commercial apiary situated adjacent to a 47ha cotton crop at Boggabri, NSW. The crop was subjected to standard management practices which included 4 applications of pesticides during the 30 days the apiary was present.

Data was collected from 3 sources - a field trial where bee visit numbers to flowers in 60 plots were recorded and compared to cotton production data from those plots; lint quality was determined from plots receiving high, low and medium numbers of bee visits; and a small cage trial where cotton production was compared between caged rows of cotton with half the cages containing a hive of bees and the remaining cages not containing a hive of bees.

(i) Field Trial. The results for cotton bolls harvested from plots which received the equivalent of 10 bee visits compared to plots which received the equivalent of 0 bee visits were -

significant increases were obtained for the Total Number of Bolls Harvested (11.1%), Total Mass of Bolls (16.5%), Total Lint Mass (15.8%), Total Seed Mass (19.7%), and Total Number of Seeds per Sample (16.5%).

non-significant increases were obtained for the Mass of 100 Seeds (3.8%), Average Single Seed Weight (3.9%), Average Number of Seeds per Boll (4.7%), and Average Weight of Lint per Boll (5.0%).

(ii) Quality examinations showed significant differences with increased bee visits for Micronaire and Fineness, and no significant differences between treatments for the remaining 7 characters examined.

(iii) the Cage Trial resulted in cages with bees showing significant increases for the Total Boll Mass, Total Lint Mass and Total Seed Mass. Non-significant increases were shown for Average Single Seed Weight, Total Number of Seeds, Average Number of Seeds per Boll, Number of Bolls, and Average Weight of Lint per Boll.

These data indicate that the advantage to be gained from including a managed honey bee pollination program in a cotton production program result from an increase in the number of flowers setting bolls which survive to maturity and are able to be harvested. Minor increases in size, weight and quality of individual bolls indicate that these factors have not been reduced at the cost of the increased numbers of bolls harvested.