

# *Cotton Research and Development Corporation*

---

## PROJECT FINAL REPORT - PROJECT CSO 3C

PROJECT TITLE:           **SHALLOW LEADING TINES FOR  
DEEP TILLAGE**

RESEARCH STAFF: Mr A.L. Palmer   Agricultural Engineer (Research)  
NSW Agriculture  
P.M.B. 19  
Trangie           NSW   2823  
ph. (068) 88 7404   fax. (068) 88 7201

Dr J.M. Kirby           Principal Research Scientist  
CSIRO Division of Soils  
G.P.O. Box 639  
Canberra        ACT   2601  
ph. (06) 246 5921   fax. (06) 246 5965

PROJECT COMMENCED: 1 November 1991 (Funds received and work commenced)

PROJECT COMPLETED: 30 June 1992

AIMS: To test and demonstrate the use of shallow leading tines for deep tillage.

### SUMMARY OF RESULTS:

The use of shallow leading tines for deep tillage was pioneered in the U.K. about 15 years ago. It has not been widely adopted in Australia despite considerable potential advantages. This project aimed to test the technology under Australian conditions incorporating soil and operating parameters relevant to Australian cotton growers.

Experiments were conducted on the Agricultural Research Centre at Trangie and on cotton farms at Warren, Narrabri and Moree on red, grey and black soils under conditions ranging from wet to dry.

The results of these experiments confirmed the potential of shallow leading tines to loosen more soil for similar energy inputs thereby substantially reducing the specific draft. Specific draft is the total draft of the tines per unit volume of loosened soil. In most cases, the total draft of deep tillage and leading tines at each site depended only upon the working depth of the deep tillage tine. When leading tines were used, the draft reduction on the deep tillage tine was offset by the draft of the leading tines. In approximately two thirds of the leading tine configuration/deep tillage tine depth/site combinations, the specific draft was up to 95% less than that of a deep tillage tine alone at the same depth. In the other combinations, the specific draft was up to 124% greater than that of a deep tillage tine alone. No one leading tine configuration was consistently better than the others and the efficacy of all varied from site to site. The results prove the potential of the technology. However, the significant number of cases in which the leading tines