

Part 4. Final Report Plain English Summary

Professor Joseph Kloepper of Auburn University, USA has conducted widely acclaimed research into plant-growth promoting rhizobacteria. He is one of the leading scientists in biocontrol of plant diseases. He visited the biological disease control program at the Australian Cotton Research Institute (ACRI) from 1 to 10 September, 1999. His visit was supported by the Cotton R&D Corporation through a travel grant (project DAN146C).

Prof. Kloepper's group and a group of scientists at the ACRI have strong common interests and collaborative links between the two research groups would be mutually beneficial. The cotton disease biocontrol project DAN 123 C has developed biocontrol agents for controlling seedling diseases and vascular wilts. Seedling disease biocontrol agents that have been developed at the ACRI perform as well as the chemical fungicides. A biocontrol method has also been developed using an endophytic bacterium (bacterium that colonises the plant internally) belonging to a *Bacillus* sp. This biological control agent has successfully reduced Fusarium wilt in field. An understanding of the ecology of this biocontrol bacterium and an effective formulation are essential for further development of this biocontrol method. General experience among scientists who work on endophytic bacteria is that the ecological studies of these bacteria are hard to conduct using conventional techniques. Prof. Kloepper is one of the few biocontrol researchers who is working on endophytic biocontrol agents and has expertise in developing biocontrol agents which perform in the field. His group developed a successful biocontrol seed formulation for cotton diseases. This formulation, which contains a strain of another *Bacillus* species, *Bacillus subtilis*, is marketed and used in America on crops including cotton. He has active research projects on biocontrol of cotton diseases, including Fusarium wilt.

Prof. Kloepper held discussions with pathologists and microbiologists at the ACRI. He visited some cotton farms in NSW and Queensland, and the seed processing facility at Cotton Seed Distributors in Wee Waa. To take advantage of his visit to Australian cotton industry, and provide other cotton researchers with an opportunity to interact with Prof Kloepper, a one-day workshop entitled 'Micro-organisms and Cotton Productivity' was conducted on 7 September, 1999, in Narrabri.

The Workshop was attended by several researchers as well as a cross-section of the cotton industry including members of the Australian Cotton Growers Research Association, Cotton R&D Corporation, cotton seed companies, and some cotton growers. Dr Albert Rovira another prominent plant microbiologist and Dr. Rothrock, a visiting scientist from America were also in attendance. The costs for the Workshop were covered by the Australian Cotton Cooperative Research Centre.

During Prof. Kloepper's visit, a number of areas were identified for collaborative research. A collaboration between the two research teams could result in faster development of biocontrol methods. These methods will reduce cotton yield losses from diseases. Biocontrol methods are perceived to be sustainable and environmentally acceptable methods by the community.