CSE48C Executive summary

Grant Code: CSE48C

Cotton Research and Development Corporation
Report on Overseas Travel

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Aim of Travel: To participate in the VIth International Colloquium on Invertebrate Pathology and Microbial Control. The Colloquium also incorporated the Second International Conference on *Bacillus thuringiensis*.

Summary:

- The Bt conference was held over the five days of the conference and covered issues such as resistance, novel Bt toxins, synergism between toxins and other bacterial components, mode of action of Bt toxins, genetics, and transgenic plants.

- To date field populations of only two species are known to have developed resistance to Bt. However, there was a new report of resistance to *Bacillus sphaericus* in mosquitoes in Brazil. Resistance to Bt endotoxins has now been detected in 11 species of insects through laboratory selection, including resistance to the CryIC toxin by *Spodoptera exigua* and *S. littoralis*; in most of these, the resistance is broad-spectrum but the mechanisms are not yet identified. Various selection procedures (crystals + spores, crystals alone, activated toxin) have been used successfully. Resistance in *S. exigua* was apparently linked to an inducible detoxification mechanism.

- Selection with multiple toxins showed that pyramiding toxins decreased the rate at which resistance occurred but did not prevent resistance developing in *Culex quinquefasciatus* selected against CryIV and Cyt toxins.

- There are now 49 different Bt endotoxins identified. A new system of classification of the toxins is being developed by an international committee and will be published shortly.

- Only one paper on transgenic plants was presented at the meeting. Ciba-Geigy reported on its transgenic maize that utilises CryIA(b) under the control of tissue-specific promoters (green tissue, pollen-specific, pith). Good control but some leakiness with tissue-specific promoters was reported. When the CaMV 35S promoter was used Bt production declined as the plants matured; there was no corresponding decline with the tissue-specific promoters.

- *H. armigera* was reported to be most sensitive to CryIA(c), *ca* 15-fold less to CryIA(b) further 6-fold less to CryIA(a); there was no measurable susceptibility to Cry IB, IC, or ID.

- Clones of *cryIA(c)* were reported to produce toxins that differed significantly, with LC_{50}s ranging between 5.6 and 23.9.