

---

## Outcome

During this trip I was able to liaise successfully with the following colleagues concerned with resistance and its management: Drs Rick Roush (Cornell), Alan Devonshire (Rothamsted), Chris Curtis (London School of Hygiene and Tropical Medicine) and Alan McCaffery (Reading University). Outcomes of the discussions were:

(1) I received affirmation that the likely nature of the pyrethroid resistance recently detected in St George, was an esterase-mediated mechanism, as suggested by Dr Robin Gunning. I established contacts relevant to the new project on the esterase resistance in *Helicoverpa armigera*. Clones for the *para* gene for *kdr* resistance and for esterases were made available.

(2) I was given up-to-date information on pyrethroid resistance studies in *H. armigera* in India and Thailand, and *Heliothis virescens* in the USA. It appears that *kdr* type resistance is not common in Asian populations of resistant *H. armigera* as was first thought. In particular, the dominant form of pyrethroid resistance in India is metabolism. Endosulfan resistance has been detected in Pakistan *H. armigera*.

(3) I discussed different aspects of resistance management to transgenic plants. As a result, I have become concerned about the directions being taken in models overseas that seem biased towards seed mixtures as the preferred control strategy. This bias arises more from social/political constraints in the USA cotton industry than because it necessarily is the only viable option to manage Bt plants. However, seed mixtures do seem to be the 'best' biological option in potato crops for the control of Colorado potato beetle because this insect is not very mobile.

---

## Itinerary

Dates	Purpose	Talks/seminars
Friday, 13 August 1993	Travel to U.K.	
Saturday, 14 August	Arrive Birmingham	
Sunday-Friday, 15-20 August	17th International Congress of Genetics	Invited paper 'Evolutionary biology of insecticide resistance in the moth, <i>Helicoverpa armigera</i> '
Sunday, 22 August	Travel to Harpenden	
Monday-Wednesday, 23-25 August	Visit Rothamsted Agricultural Station, Harpenden	Seminar 'Resistance management for <i>Helicoverpa armigera</i> in Australia: problems, insights and changes'.
Wednesday, 25 August	Visit Dr Alan McCaffery, Reading University	
Thursday, 26 August	Visit Dr Chris Curtis, School of Hygiene and Tropical Medicine, London University	Seminar 'Insecticide resistance and its management'
Friday, 27 August	Visit Rothamsted Agricultural Station, Harpenden	
Sunday, 29 August	Depart London	
Tuesday, 31 August	Arrive Canberra	