

**GLOBAL RESISTANCE MANAGEMENT PROGRAM FOR  
DUPONT'S INSECTICIDE - INDOXACARB**

**D. A. Marsden and C. E. Clark  
E.I. DuPont Company  
Newark, DE**

**Abstract**

The E.I. DuPont Company has developed a low cost, easy to use, baseline monitoring test kit. This kit allows monitoring of LC50 values on field populations as well and using a single discriminating dose to monitor for changes in susceptibility in a global resistance management program for any foliage feeding pest, particularly Lepidoptera.

**Introduction**

With the large investment of time and the resources involved with the commercialization of a new insecticide, companies are developing resistance monitoring programs prior to the commercial launch of new products in order to better manage resistance and extend the life of this valuable new chemistry. An example of this type of pre-commercialization effort is the Global Resistance Monitoring Program developed and implemented by DuPont Ag. Products for the new insecticide, Indoxacarb.

**Discussion**

DuPont has developed a bioassay monitoring technique which; closely resembles the mode of exposure of the insects to the insecticide in the field, is simple to perform, and provides informative data within a short period of time. This data can then be used for management decisions based on detected changes in susceptibility levels. This bioassay technique can be used to test several foliage feeding lepidopteran species notorious for resistance development including; *Spodoptera exigua*, *Helicoverpa armigera*, *Heliothis virescens*, and *Plutella xylostella*. This program has already been started in 16 countries, representing the major agricultural production regions of the world. Baseline susceptibility to Indoxacarb has been established for the 4 species listed above globally and for seven additional species of economical importance in specific regions. These include: *Tuta absoluta*, *Alabama argillacea*, *Spodoptera frugiperda* in Brazil; *Cydia pomonella*, *Phthorimaea operculella* in Europe; *Earias* sp., *Spodoptera litura* in Asia.

**Summary**

By determining the baseline LC<sub>50</sub> and LC<sub>95</sub> values for Indoxacarb on key Lepidoptera pests in key regions of the world, a single discriminating concentration can be developed for routine monitoring of pest susceptibility. Slight changes in susceptibility will be a warning for intensified monitoring and significant changes in susceptibility will indicate the need for changing the use pattern of Indoxacarb before field performance problems occur; thus prolonging the effective use of this novel chemistry. In addition, development and implementation of a resistance management program is becoming a more important issue to regulatory agencies. The growing importance of resistance monitoring and baseline efficacy documentation is an area of increasing interest to regulatory authorities like the EU EPPO, and the US EPA for new product registration. Currently, these agencies are viewing this type of testing as the responsibility of the industries developing the new pesticide. In the future these voluntary programs may become part of the required registration package. The establishment of baseline susceptibility data for each species by geography before the commercial launch of Indoxacarb will be the foundation for our global monitoring program in years following its introduction.