Insecticide Resistance Management
A Global Industry Response

Insecticide Resistance Action Committee

www.irac-online.org

IRAC Executive Members

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Role of IRAC

IRAC implements comprehensive strategies to confront resistance by:

- ► Identifying the scope of resistance problems
- ► Developing methods for detecting and monitoring resistance
- ► Discovering how resistance occurs
- ► Devising programmes to counter the loss of pest susceptibility
- ► Developing susceptibility management strategies that incorporate all practical pest management methods into a crop protection programme

IRAC Mode of Action Scheme

The IRAC Mode of Action (MoA) Classification provides farmers, growers, advisors, extension staff, consultants and crop protection professionals with a guide to the selection of insecticides or acaricides for use in an effective and sustainable insecticide or acaricide resistance management (IRM) strategy. The list is reviewed and re-issued at intervals as required and is also available in a small easy to use booklet.

IRAC International Structure

IRAC INTERNATIONAL

What is Insecticide Resistance ?

Resistance may be defined as 'a heritable change in the sensitivity of a pest population that is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label recommendation for that pest species'. Cross-resistance occurs when resistance to one insecticide confers resistance to another insecticide, even where the insect has not been exposed to the latter product. Clearly, because pest insect populations are usually large in size and they breed quickly, there is always a risk that insecticide resistance may evolve, especially when insecticides are misused or over-used.

Mechanisms of Resistance include:

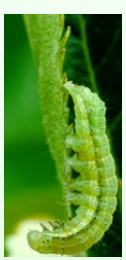
- ► *Metabolic Resistance* - the insect has an enhanced ability to destroy or eliminate the insecticide.
- ► *Target Site Modification* - the site where the insecticide acts is modified to reduce the effect of the product. These mechanisms are specific to particular classes of insecticide with given modes of action.
- ► *Delayed Penetration* – entry of the insecticide is delayed in comparison to the susceptible types.
- ► *Behavioural Resistance* – resistant insects may detect or recognize and avoid the insecticide.

The Key to Managing Resistance

The key to managing resistance is to reduce selection pressure. Consistent with modern pest management principles, IRAC recommends the following resistance management guidelines to keep valuable protection tools for crop pests and vectors working effectively and keep costs down.

Recommendations:

- ►Consult an adviser for regional insecticide resistance and IPM strategies
- ►For crops, consider options for minimizing insecticide use by selecting early maturing or insect-resistant varieties. Manage the crop for 'earliness'.
- ►Include efficient cultural and biological control practices in pest control programmes.
- ►Carefully select crop protection tools not only for cost & effectiveness but also for ability to maintain beneficial insects
- ►Follow label recommendations for rotating or mixing products from different classes based on modes of action
- ►Where there are multiple applications per year, alternate products of different classes
- ►Use insecticides and acaricides at labelled rates and spray intervals
- ►Calibrate equipment for accurate application: use recommended spray volumes and pressures
- ►Monitor pest or vector populations during the growing season and gauge effectiveness of controls
- ►Time applications against most susceptible stages based on local economic thresholds
- ►In the event of a control failure that can be linked with resistance don't re-spray with insecticide from the same class



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