

IRAC, Neonicotinoid Subcommittee

The Neonicotinoid Subcommittee of Insecticide Resistance Action Committee (IRAC-US) was created in 2003 with the charter to act as the official industry body for coordinating information and resources on resistance management for the neonicotinoid chemical class. Recent public interest in insecticide resistance issues as well as the publication of EPA Pesticide Registration (PR) Notice 2001-5 on "Guidance for Pesticide Registrants on Pesticide Resistance Management Labeling" has highlighted the need for an accepted representation from the Industry in North America.

The members of the Neonicotinoid Subcommittee proposed that this subcommittee of IRAC will:

1. Coordinate information exchange and identify resources with-in government, universities, and the public on neonicotinoid insecticide resistance management issues.
2. Serve as spokespersons for the Industry's view on neonicotinoid insecticide resistance management issues by providing an outlet for comments and position papers.

All members of the Neonicotinoid Subcommittee are also members of IRAC-US. The subcommittee will help clarify the IRAC guidelines and policies unique to North America for the neonicotinoid chemistry as required.

The goal of the Neonicotinoid Subcommittee of IRAC US is to create harmonized insect resistance management (IRM) guidelines for neonicotinoid insecticides. The neonicotinoids (post-synapse acetylcholine receptor agonists) which include acetamiprid, clothianidin, dinotefuran, imidacloprid, thiacloprid and thiamethoxam are assigned to the IRAC Mode of Action Classification Group 4A.

The Neonicotinoid Subcommittee members including Arvesta, Bayer, Cerexagri, DuPont, FMC, Mitsui Chemicals (represented by Landis International), Nisso America and Syngenta have been working in collaboration with IRAC toward harmonization of IRM guidelines both on the labels for neonicotinoid insecticides and the application of neonicotinoid products in agriculture, forestry, turf and ornamentals.

Although the neonicotinoid insecticides are valuable tools for insect pest control, varying levels of resistance have been reported for insect pests in different countries around the world. Resistance management presents many challenges, and begins with good agricultural practices including crop rotation, utilization of resistant varieties, sanitation, healthy seed, as well as pest monitoring and forecasting. The IRM guidance language added to the label is only one line of defense against resistance development. The product label will typically recommend minimum effective rates and may recommend a combination of mixing products or alternation of products that have different modes of action. It may also restrict the number of applications used during a season for insect resistance management purposes and encourage the use of alternative products with different modes of action.

The Neonicotinoid Subcommittee is currently examining strategies for IRM and places emphasis on formulating guidelines that are biologically sound and sufficiently straightforward for end-users to follow in their insect pest management programs.

GENERAL GUIDELINES FOR USE OF NEONICOTINOID INSECTICIDES (IRAC Mode of Action Classification Group 4A)

Resistance management begins with good agricultural practices including crop rotation, utilization of resistant varieties, sanitation, healthy seed, as well as pest monitoring and forecasting. For resistance management to work effectively, it needs to be a community effort.

The following guidelines have been accepted by the members of the Neonicotinoid Subcommittee.

These guidelines focus on both soil and/or foliar applications of neonicotinoid insecticides. Soil applications are considered to include seed treatment, in-furrow, side-dress and chemigation application methods. Due to the time-limited effectiveness of soil applied neonicotinoid insecticides, the duration of exposure of the insect pest to the soil-applied insecticide should be considered before making a foliar application.

1. To reduce selection pressure, apply insecticides only when pest control is warranted, based on insect presence or historical pest pressure.
2. Neonicotinoid applications for pests with a high propensity for resistance development:
 - a. Limit the number of neonicotinoid applications per crop or per season where necessary.
 - b. Use only one, long-lasting soil application per crop or per season. Soil applications include in-furrow, side-dress, drench, and chemigation applications or as delivered by seed treatment.
 - c. If the crop has already been treated with a soil-applied neonicotinoid and additional insect control is necessary, use a labeled product or products with a different mode of action as the control with the soil-applied neonicotinoid diminishes.
 - d. Where possible, minimize the number of generations exposed to the same chemistry, ideally to a single generation. Do this by limiting the number of sequential foliar applications of neonicotinoids and alternate with effective labeled insecticides of a different mode of action in a "windows" approach. Windows of 2-3 neonicotinoid applications should be alternated with non-neonicotinoid applications providing similar length of control and removing neonicotinoid exposure to a similar number of generations.
3. Tank Mixes: For resistance management, rotation between insecticides with different modes of action is considered a more sustainable practice than tank mixtures. However, for improved efficacy or broader spectrum of pest control, it is often considered necessary to tank mix different chemicals. When using tank mixtures, it is important that the components are effective against the insect pest. It is also important to mix labeled rates of each compound and use compounds that have different modes of action to maximize pest control. Where possible, compounds should persist for similar periods in order to expose insects to both modes of action for the same length of time. Use of multiple products of the same mode of action in the spray tank could lead to increased selection pressure.

4. Insect Pest Management (IPM): Applications of insecticides, including those containing neonicotinoids, should be integrated into an overall insect pest management program. Cultural practices known to reduce insect pest development should be followed. Consult your local extension specialist, certified crop advisor and/or manufacturer representative for additional IPM strategies established for your area.
5. Product performance: Determine the efficacy of insecticides used in the pest management program against the target pest. If a Group 4A mode of action insecticide appears to be less effective against an insect that it previously controlled or suppressed, contact the manufacturer representative, local extension specialist, or certified crop advisor for further investigation.