Mode of Action Labelling Guidance

Mode of Action Labelling

The development of resistance is a critical focus for the crop protection industry. The more farmers use a pesticide with the same mode of action (MoA), without another overlapping MoA and/or non-chemical control measures, the more likely it is that pests will develop resistance. Academics and industry experts agree that sequential applications or applying mixtures of products with different effective MoAs are key strategies to delay the onset of pest resistance.

The crop protection industry understands the consequences of the development of resistance and is proactively taking the lead in addressing the problem. CropLife International with the support of the fungicide, herbicide and insecticide Resistance Action Committees (RACs), is advancing the understanding and practice of responsible resistance management. All RACs have communication resources which include websites, training modules, brochures and posters to emphasize the need to increase diversity in pest control, in particular by using several efficient MOAs in sequence or in mixtures.

The inclusion of MoA information on product labels, supported by training and other resources, is critical to ensure growers have the information they need to follow resistance management guidelines. MoA labelling is currently only a regulatory requirement in a small number of countries, however there are strong indications that more countries will make it mandatory in the foreseeable future.

Industry Commitment

To support the widespread adoption of responsible resistance management practices, CropLife International members have voluntarily made a commitment to include MoA icons and groups on all product labels by 2023. The inclusion of MoA information on product labels will ensure growers have simple access to critical information to support implementation of resistance management.

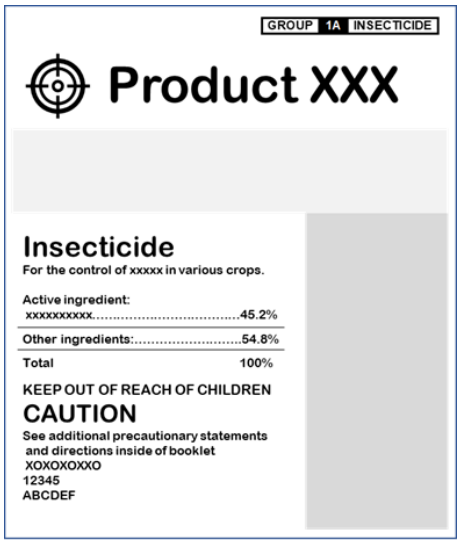
CropLife International encourages all pesticide manufacturers to adopt this MoA labelling icon approach, for managing pesticide resistance and the stability of crop production. CropLife International would encourage pesticide regulatory authorities to consider the mandatory use of the icons and the global icon format or at least allowing them to be voluntarily displayed on the label.

MoA Labelling Guidance

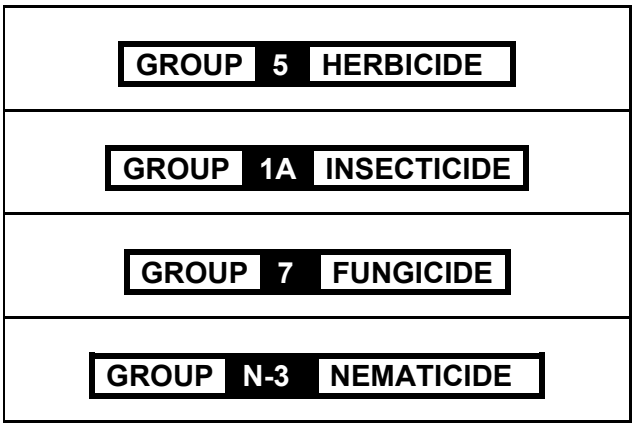
The MoA labelling provides a clear and simple method to inform, pesticide retailers and users, the type of pesticide and its mode of action group. The MoA groups can be used to identify products with the same mode of action; these should not be used repetitively. It is recommended that pesticides are used as part of an integrated pest management strategy in order to maximize pest control and sustainably manage pesticide effectiveness.

Labelling Specifics

It is recommended that the MoA icon is displayed in a prominent position on the label. A position at the top right of the front panel of the label is strongly recommended (see diagram). A clearly defined font should be used, e.g. Arial or Calibri for users of Latin script. A black and white colour scheme is recommended.



The icon uses the word GROUP in capital letters in black font on a white background; the mode of action letter or numeral should be in white font on a black background; the word HERBICIDE (or FUNGICIDE or INSECTICIDE or NEMATICIDE) in capital letters in black font on a white background. Both lines, and the whole indicator, are contained within black rectangles. See examples below.



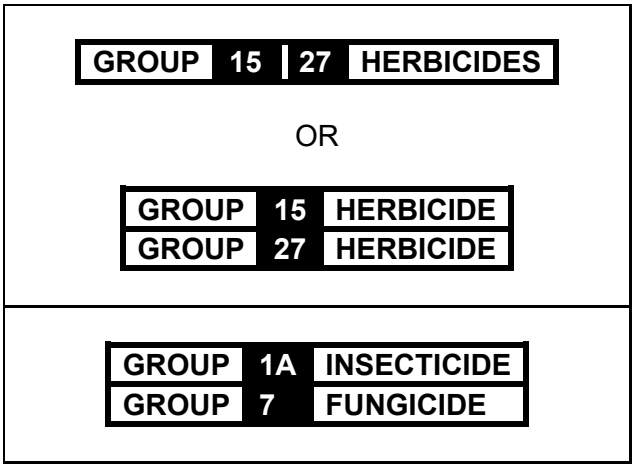
The words GROUP and HERBICIDE, FUNGICIDE, NEMATICIDE or INSECTICIDE (as appropriate) in capital letters which should not be less than one-quarter of the height of the largest letter or numeral on the label and be between 2 mm and 12.5 mm high. (Note: the largest letter or numeral on the label refers to individual words in the label text and not to a dropped capital or other specially formatted single letter.) If more than one pesticide is included in a product then the icon should be written in plural e.g. INSECTICIDES not INSECTICIDE. The appropriate letter(s) or number(s) representing the Mode of Action (MoA) group(s) of each active constituent(s) are to be inserted between the words GROUP and HERBICIDE, FUNGICIDE, NEMATICIDE or INSECTICIDE.

The width of the white line that separates the groups for the pesticides in a product with more than one active ingredient should be defined. It should be wide enough so that when the icon is printed on small packets the line is clear.

The letter(s) representing the mode of action should be written in capital letters which should not be less than one-half the height of the largest letter or numeral on the label and between 4 mm and 25 mm high. In any event, the words GROUP and HERBICIDE, FUNGICIDE, NEMATICIDE or INSECTICIDE must be no less than half, and no more than the actual size of the group number or letter.

Note that where a product has two or more active constituents, and these are represented by two or more modes of action, you must use two or more appropriate MoA identifier letters or numbers in a single statement. Alternatively, each individual active ingredient can be placed in a stacked format (see examples below).

If the product contains two or more active constituents which perform different functions, for example, an insecticide and a fungicide. you must show each function separately (that is, one indicator panel for the insecticide and another for the fungicide component). See examples below.



Where required, appropriate translation should be used to ensure MoA labels are clear to product users. Labelling should also consider the FAO/WHO Guidelines on Good Labelling Practice for Pesticides. MoA labelling must follow all country regulations and may vary.

Pesticide MOA Group Reference Information

Coding of Insecticides & Nematicides
Insecticide and nematicide MoA should be defined using the IRAC numeric groups from the Insecticide Resistance Action Committee (IRAC) website http://www.irac-online.org/modes-of-action/. This is the most up to date source of MoA groups.

Coding of Fungicides
Fungicide MoAs should be defined using the FRAC numeric code from the annually updated list on the Fungicide Resistance Action Committee (FRAC) website (www.frac.info). To find this list, go to http://www.frac.info/publications/downloads and select the FRAC Code List. This list is

published as PDF and Excel files and information is also presented in a MoA poster. The MoA APP for Android and IOS – can be loaded from Google play store or Apple store.

Coding of Herbicides
HRAC recently changed from a letter-based to a number-based mode of action code system. Herbicides MoAs should be defined using the HRAC numeric groups from the annually updated list on the Herbicide Resistance Action Committee (HRAC) website: http://hracglobal.com/tools/classification-lookup.

In the case where countries have already adopted MoA labelling based on letters and have products on the market with letter codes, it is recommended that for an interim period (timeline to be defined by country, where duration is not defined we would suggest a two year timeline) both the number and the letter grouping is shown on the label, as illustrated below.

<table>
<tr><td colspan="2">Interim Herbicide MoA Dual Code Labelling</td></tr>
<tr><td>One single active constituent

GROUP 15 (K3) HERBICIDE</td><td>Two or more active constituents

GROUP 15 (K3) HERBICIDE
GROUP 27 (F2) HERBICIDE</td></tr>
<tr><td colspan="2">Include the following statement:
Legacy HRAC-codes K3 & F2 in italics</td></tr>
</table>

Countries that have not yet adopted MoA labelling should only use the number grouping on the label when labelling is agreed.

Resistance Management Language for Product Labels
In addition to mode of action number labelling, it is strongly recommended by CLI and the Resistance Action Committees (RACs) to include guidance on the management of resistance on the product label. Where possible companies will voluntarily add resistance management language to their product labels that explains how to use MoA information in resistance management recommendations.

Resistance management guidance for insecticides
The Insecticide Resistance Action Committee (IRAC) recommends that resistance management guidelines be presented under a headed section titled: **"RESISTANCE MANAGEMENT"** on all insecticide labels and the following three IRM elements be incorporated in the text.

- The name of the active ingredient(s) and mode of action identifier (IRAC Mode of Action groups).
- A statement that the product should be rotated with different modes of action using mode of action treatment windows.
- Guidance to avoid treating consecutive generations with the same mode of action

EXAMPLE OF AN IRM RECOMMENDATION ON AN INSECTICIDE PRODUCT LABEL:

PRODUCT NAME *contains the* ***ACTIVE INGREDIENT NAME*** *and is an* ***IRAC* GROUP X*** *insecticide*
Do not exclusively use ***PRODUCT NAME*** or other **GROUP *X*** insecticides to control the same pest throughout the season. Avoid exposing consecutive generations of a pest to the same mode of action by using the "application window" approach which rotates products from different mode of action groups.
An "application window" is the period of residual activity that a single application or sequential applications of products from the same mode of action provide. It can also be defined as the duration of an insect generation or if unknown, then use an approximate 30 day period. Rotate windows with treatments of ***PRODUCT NAME*** and other **Group *X*** products followed by windows of treatments with other effective products with different modes of action. Multiple applications (recommend no more than two) of the same MoA insecticide are acceptable if they are used within the same application window.

*IRAC – Insecticide Resistance Action Committee

Resistance management guidance for fungicides

Resistance management guidelines should be presented under a headed section titled: RESISTANCE MANAGEMENT on the label. The following components are strongly recommended by the Fungicide Resistance Action Committee (FRAC).

Include a text statement which includes the following

- Include guidelines and restrictions as published on the FRAC website including such elements as maximum number of applications with the specific cross resistance chemical group permitted during the season, crop cycle, use of mixtures, alternation strategy etc.
- Include a statement which recommends incorporating alternate management tools in fungal management programs. These should include such elements as: the use of resistant/tolerant varieties, the use of correct cultural practices, the use of biologicals and natural compounds in the spray program.

EXAMPLE:

RESISTANCE MANAGEMENT

PRODUCT NAME contains the active ingredient ***ACTIVE INGREDIENT NAME*** which belongs to FRAC Group ***MOA NUMBER*** class of fungicides. ***PRODUCT NAME*** has a specific mode of action and is subject to the development of insensitive strains of fungi. Fungal pathogens can develop resistance to products with the same mode of action when used repeatedly. Because resistance development cannot be predicted, use of this product should conform to resistance management strategies established for the crop and use area. Consult your local or state agricultural authorities for resistance management strategies that are complementary to those in this label. Resistance management strategies may include rotating and/or tank mixing with products having different modes of action or limiting the total number of applications per season. Where possible use resistant/tolerant varieties, cultural practices, biologicals and natural compounds in the spray program. Responsible resistance management is encouraged to ensure effective long-term control of the fungal diseases on this label. ***PRODUCT NAME*** should not be alternated or tank-mixed with any fungicide to which resistance has already developed.

Resistance management guidance for herbicides
Resistance management label guidance is currently under review by the herbicide resistance action committee (HRAC) and will be communicated later.

About CropLife International
CropLife International is the voice of the global plant science industry. It champions the role of agricultural innovations in crop protection and plant biotechnology in supporting and advancing sustainable agriculture; helping farmers feed a growing population while looking after the planet; and progressing rural communities. The world needs farmers, and farmers need plant science. CropLife International is proud to be at the heart of helping farmers grow.