



Fungicide Resistance Management with / of Multi-Site Fungicides, Biological Control Agents, and Plant Defence Inducers

The application of fungicides with different modes of action in mixtures (both ready-formulations and tank mixtures) and the alternation between non-cross-resistant fungicide classes are both suitable approaches to minimize the risk of resistance development alongside good agronomic practices. These strategies are particularly valuable for sustaining the effectiveness of site-specific fungicides by preventing upcome or further spread of pathogens with decreased sensitivity towards those fungicides with site-specific mode of action, if already present in farmers' field.

Multi-site fungicides, Biological Control Agents ("Biologicals") and Plant Defence Inducers ("PDIs") are important tools for disease control programs and resistance management, considering that Biologicals belonging to FRAC classes with code BM01 / BM02 can also show a multi-site or multiple mode of action type of pathogen control, bearing a low or even very low resistance risk like multi-sites. PDIs contribute to resistance management strategies by reducing the entire inoculum potential.

Some general statements apply to all fungicides and products applied for disease control:

- For a mixture of non-cross-resistant partners to be effective in a resistance management strategy the rate of each component must be sufficient to provide satisfactory control when used alone at the same rate.
- The recommended label rate of each mixture component should be respected.

Use guidelines for Multi-sites

- Multi-site fungicides belonging to FRAC classes with code M1-M12 can be used solo or in mixtures with partners at manufacturer's recommended effective rates.
- There are no limitations or restrictions concerning the number of applications, the timing, or the sequence as long as they are within the limits of the manufacturer's labels and local regulatory requirements.

Use guidelines for Biologicals

- Biologicals belonging to FRAC classes with code BM01 and BM02 can be used solo or in mixtures with partners at manufacturer's recommended effective rates.

➤ There are no limitations or restrictions concerning the number of applications, the timing, or the sequence as long as they are within the limits of the manufacturer's labels and local regulatory requirements.

Use guidelines for Plant Defence Inducer

➤ Plant Defence Inducer belonging to FRAC classes with code P1-P08 can be used solo or in mixtures with partners at manufacturer's recommended effective rates.

➤ There are no limitations or restrictions concerning the number of applications, the timing, or the sequence as long as they are within the limits of the manufacturer's labels and local regulatory requirements.