

## Where to find FRAC information material?

FRAC's main communication vehicle is the website. This is a key resource for everybody with an interest in fungicide resistance and its management.



Visit the FRAC-Website at [www.frac.info](http://www.frac.info)



Or download the FRAC Mode of Action App for Android or iOS



Android



iOS

Downloads available on [www.frac.info/knowledge-database](http://www.frac.info/knowledge-database)



### The Mode of Action Poster®

The poster shows the molecular structures and respective codes of all fungicides included in the internationally accepted FRAC Code List®. Fungicides sharing the same mode of action and being cross resistant are shown grouped together.



### The Monographs

Three Monographs are currently available in the FRAC collection. Each is written by recognized experts and cover essential areas such as risk assessment, resistance management and sensitivity monitoring.



### The Monitoring Methods

The use of the correct methodology is crucial when conducting a resistance monitoring campaign and establishing the sensitivity of fungal isolates. The 'Monitoring Methods pages' provide detailed information on validated methods for use with each chemistry covered by FRAC.



### Additional publications

**List of Confirmed Cases of Resistant Plant Pathogens** maintained by FRAC and including key references.

A **Pathogen Risk List** can be viewed together with background information on the classification in the different risk classes.

A key strategy to prevent and manage resistance is combining fungicides of different modes of action. Guiding principles on how to use mixtures in resistance management are given in the **FRAC recommendations for fungicide mixtures**.

WORKING TOGETHER GLOBALLY TO MANAGE

# FUNGICIDE RESISTANCE



[www.frac.info](http://www.frac.info)

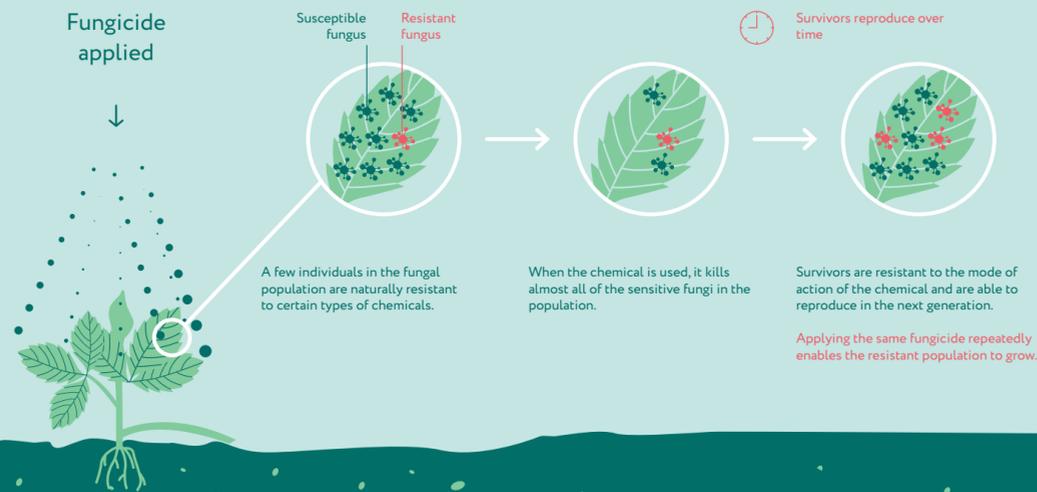


**FRAC**  
FUNGICIDE RESISTANCE  
ACTION COMMITTEE

## What is the impact of resistance?

Field resistance of plant diseases reduces the fungicide's long-term effectiveness and farmers can lose valuable tools to protect their crops.

The more frequently farmers use the same fungicidal mode of action, without applying any resistance management strategy, the more likely resistance will occur.



## What needs to be done?

Sound resistance management is key to ensure optimum crop yields and quality. It helps maintain the effectiveness and broad spectrum of modern fungicides that are available to farmers.

## How does FRAC help?



### Providing Platforms

By providing platforms (FRAC Working Groups and Expert Fora) to member companies, which conduct research to identify and to monitor field resistance, so that findings can be published.



### Guidelines for Resistance Management

By giving regularly updated Fungicide Resistance Management Guidelines for each Mode of Action Class addressed by a Working Group.



### Education Material

By providing educational material to train people in the science of fungicide resistance and the art of its management.



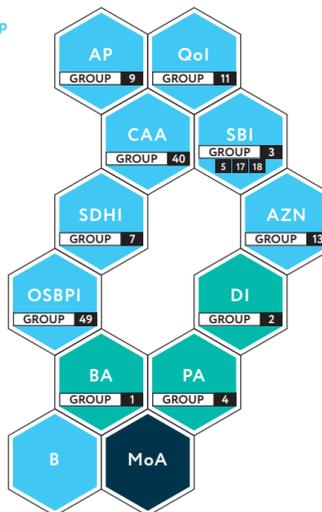
### Frequent Contribution

By publishing findings - FRAC members are frequent contributors to scientific publications, conferences and symposia.

## How to identify fungicides with different modes of action?



- Working group
- Expert fora
- Expert panel



A fungicides' mode of action is the way in which the active ingredient works to control the target disease.

The FRAC mode of action classification provides farmers, advisors, extension staff, consultants and crop protection professionals with a guide to the selection of fungicides for use in an effective and sustainable fungicide resistance management strategy (e.g. by rotating and mixing fungicides with different modes of action).

## How to find FRAC recommendations on Fungicide Resistance Management for MoA-classes?

Working groups, Expert Fora, the Mode of Action Expert Panel and Task Forces are the major platforms of FRAC. The groups unanimously agree on resistance management guidelines for all fungicides within the mode of action or chemical class on relevant crops. Guidelines are published on the FRAC website and are regularly reviewed and updated.

**AP**  
Anilinopyrimidines  
Andreas Mehl

**CAA**  
Carboxylic acid amides  
Gerd Stammler

**SDHI**  
Succinate dehydrogenase inhibitors  
Kristin Klappach

**OSBPI**  
Oxysterol binding protein inhibitors  
Jean-Luc Genet

**BA**  
Benzimidazole fungicides (BA)  
Jean-Luc Genet

**B**  
Banana WG  
Chair rotating

**QoI**  
Quinone-outside inhibitors  
Helge Sierotzki

**SBI**  
Sterol biosynthesis inhibitors  
Klaus Stenzel

**AZN**  
Azanaphthalene fungicides  
Greg Kemmitt

**DI**  
Dicarboximide fungicides  
Andreas Mehl

**PA**  
Phenylamide fungicides  
Helge Sierotzki

**MoA**  
Mode of Action  
Dietrich Hermann

→ Find it on the FRAC-Website at [www.frac.info/fungicide-resistance-management](http://www.frac.info/fungicide-resistance-management)

## FRAC Member Companies



FRAC is a specialist technical group of: CropLife

## How does FRAC (net)work at the regional and national level?

Dissemination and implementation of advice is done in very efficient ways by FRAC regional and national groups. They frequently manage resistance monitoring campaigns relevant for their geographies.

FRAC maintains communication lines with **national groups** consisting of research institutions, authorities and advisory bodies and information is passed freely between all involved experts. This forms a strong network in providing fact-based recommendations to growers and their advisors.

Regional FRAC's work closely with the FRAC Working Groups and the Steering Committee. Additionally, the FRAC Banana Group exists as the only crop-based Working Group.

FRAG (Resistance Action Groups) work on country level and typically include advisors and researchers as well as manufacturers.



## How is FRAC coordinating its work?

The Steering Committee is the management team for all FRAC administration. Under the leadership of Chairman Dietrich Hermann it consists of the Chairpersons of all the Working Groups, Expert Fora and FRAC Groups.

All members of the Steering Committee have broad experience in the science of fungicide resistance and the theory and practice of its management in different cropping systems throughout the world. The Steering Committee ensures all FRAC activities are conducted according to strict anti-trust guidelines.

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