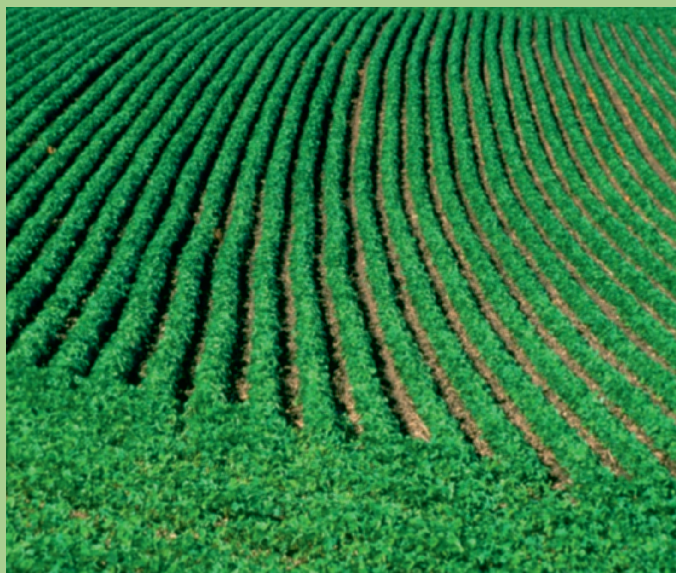


Working Together Globally To Manage Fungicide Resistance

FRAC
FUNGICIDE RESISTANCE
ACTION COMMITTEE

Fungicide resistance affects all those concerned with crop health; farmers and growers, as well as the advisors and industry who provides advice and products to ensure healthy productive crops.

Sound resistance management is key to ensure optimum crop yields and quality. It helps maintain the effectiveness and number of modern fungicides that are available to farmers and growers. Resistance and poor disease control in the field could quickly lead to overuse of some fungicides as users strive to control their disease problems, leading in turn to increased and undesirable loading on the environment.



FRAC, the Fungicide Action Committee, was formed in 1982. It operates as an expert group within CropLife International and has the following objectives: (1) providing advice to producers, suppliers and users of crop protection products on how best to use fungicides in order to avoid, delay and manage fungicide resistance in crops worldwide and (2) providing educational material to train people in the science of fungicide resistance and its management. FRAC members are frequent contributors to scientific publications, conferences and symposia.

FRAC is a specialist
technical group of:

CropLife
INTERNATIONAL

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FRAC Structure

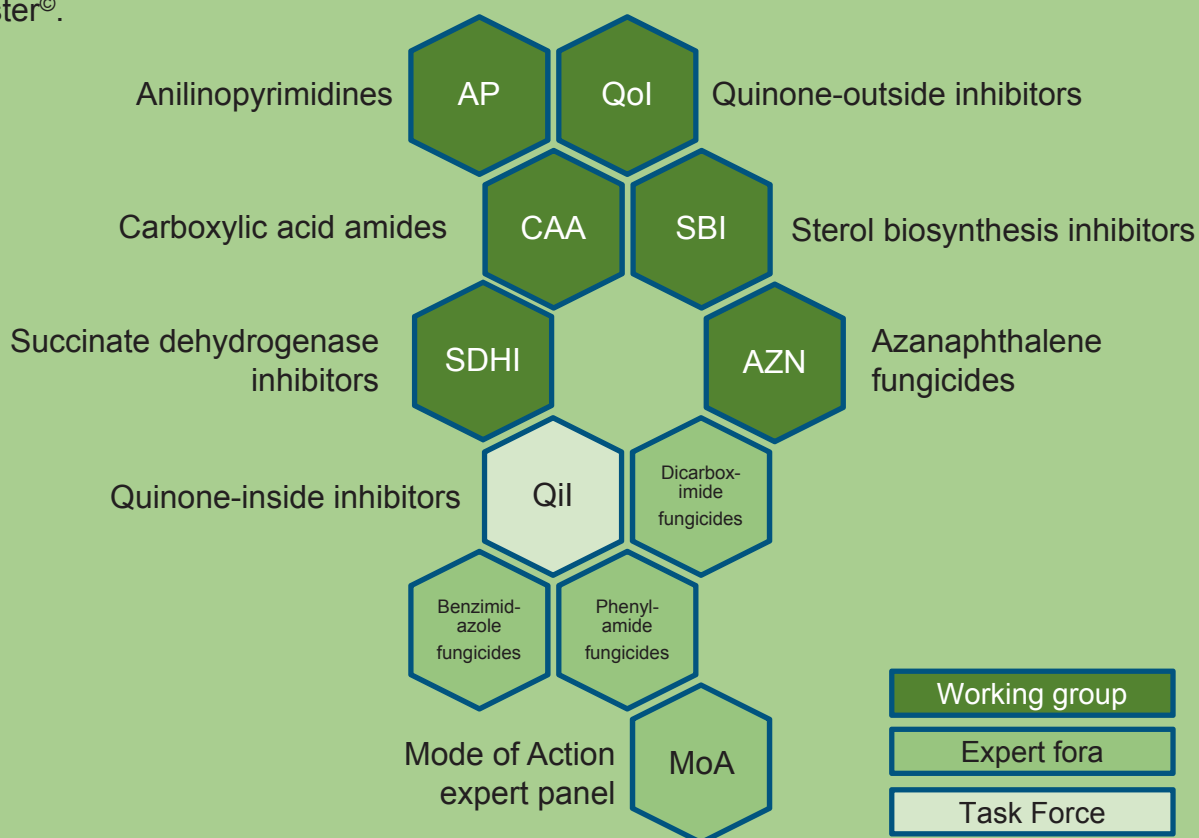
Working groups, expert fora, the mode of action expert panel and task forces are the major platforms for our work on resistance management.

Working groups (WG) expert fora (EF) and task forces are organized by fungicides sharing the same mode of action.

Each technical group consists of representatives from manufacturers and/ or distributors. All member companies provide monitoring and other technical data. The groups unanimously agree on resistance management guidelines for all fungicides within the mode of action or chemical class on all applicable crops. Guidelines are published on the FRAC website and are regularly reviewed and updated.

Once resistance situation to a mode of action has stabilized in grower fields and the resistance management practices for a Working Group become well established, working Groups are transitioned to Expert Fora as repositories of information and to provide advice.

The MOA-Expert Panel is responsible for updating the FRAC Code List[®] and FRAC MOA Poster[®].



Global FRAC Members:



Regional and National Groups

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.

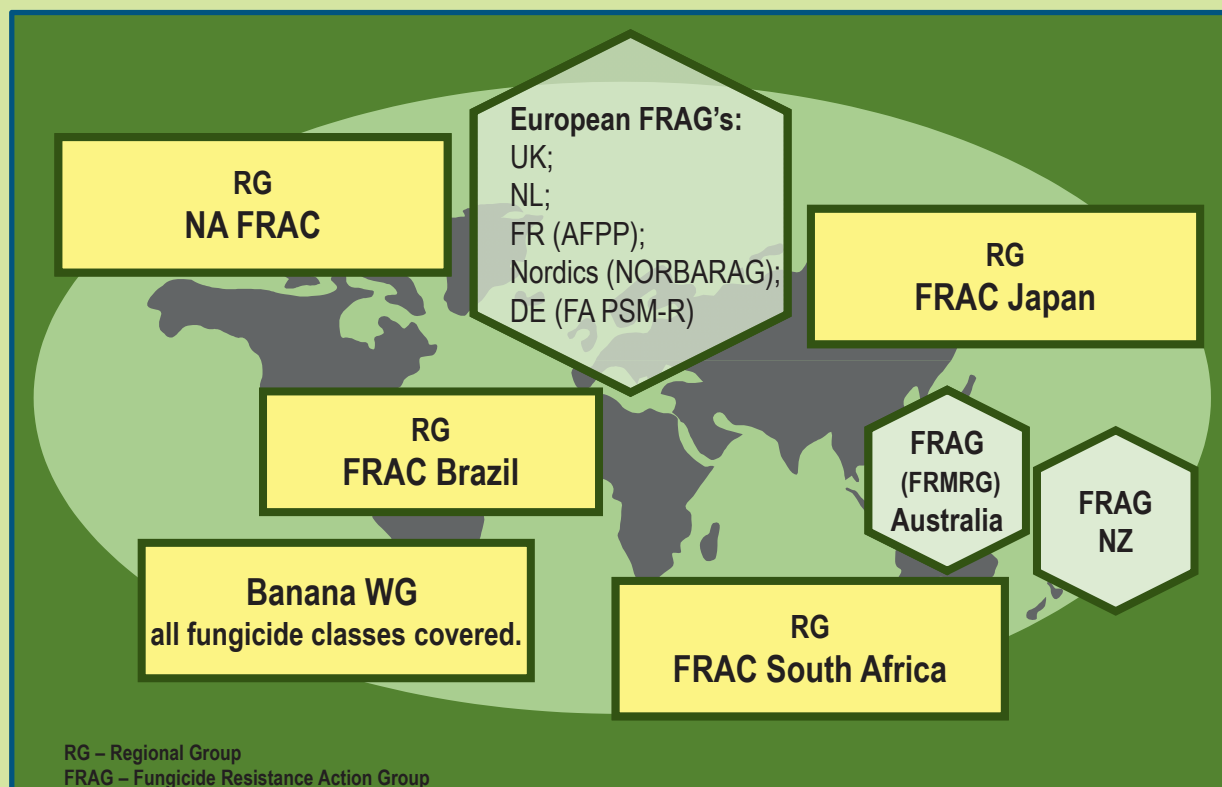
Regional FRAC's work closely with the FRAC Working Groups and the Steering Committee as well as working directly with their respective CropLife Associations at the regional and national level

The FRAC Banana Group is the only crop-based Working Group dealing

with all fungicide modes of action in banana.

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

FRAC maintains communication lines with FRAGs, research institutions, 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.



FRAC Steering Committee

The Steering Committee is the management team for all FRAC administration. It consists of the Chairpersons of all the Working Groups, Expert Fora, RG FRAC Groups plus a scientific support officer and a communications/website manager.

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.

FRAC Communication and Education Activities

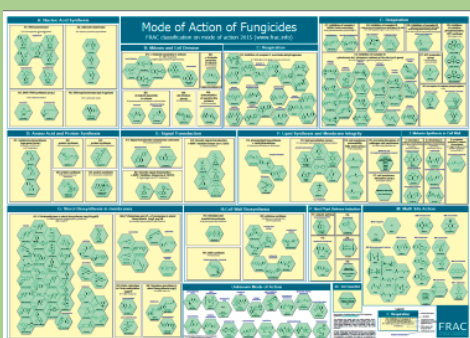
FRAC's key communication vehicle is the website: www.frac.info.

The site is a key resource for everybody with an interest in fungicide resistance and its management.

Each Working Group has its own dedicated area with WG meeting minutes, including monitoring results and technical recommendations. The latest guidelines on fungicide use for the crops concerned and much information on the fungicides and resistance phenomena relevant to the respective mode of action are available. The Expert Forum pages contain a wealth of information relevant to the specific areas of chemistry.

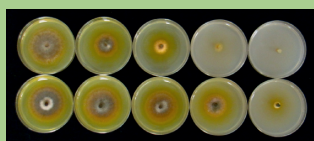
The Publications page contains information relevant to the advisor, researcher and student. Documents are updated on a regular basis.

Examples of publications available on www.frac.info:



The FRAC Code List© includes the internationally accepted designations of commercial fungicides according to their mode of action, chemical grouping and resistance risk. The classification of new fungicides is done by the MoA expert panel based on provided scientific data. This list is updated annually. The Mode of Action Poster© (shown at left) shows the molecular structures and respective codes of all fungicides included in the FRAC Code List. Fungicides sharing the same mode of action and being cross resistant are shown grouped together. Both documents are available for download.

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 documents can be downloaded and CDs are available from the FRAC Scientific Support Officer.



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.

Some additional publications available on www.frac.info:

1. FRAC maintains a List of Confirmed Cases of Resistant Plant Pathogens including key references. Additions to the list are always welcome; please contact the Scientific Support Officer.
2. A Pathogen Risk List can be viewed together with background information on the classification in the different risk classes.
3. 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 fungicides mixtures.