2015 FRAC Update

EPPO Resistance Panel
Rothamsted, 16-17 September 2015
Role and Purpose of FRAC

- The main goal of **FRAC** is to provide resistance management advice and guidelines and thereby sustain the effectiveness of “at risk” fungicides.

- **FRAC** represents a centre of knowledge and expertise, and seeks via effective networking with independent bodies to actively promote effective resistance management.

- **FRAC** offers a wide range of services (publications, FRAC code lists, methods, training) to assist researchers, advisors and growers.

- Key route for communication is the FRAC website: www.frac.info
List of FRAC International member companies

- Adama
- BASF
- Bayer Crop Science
- Dow
- DuPont
- FMC/Cheminova
- Isagro
- Syngenta

Not all CLI companies participate to FRAC (e.g. Monsanto)
Several other companies are represented in regional groups
QiI Task Force

• Cyazofamid (ISK) and amisulbrom (Nissan)
• Draft guidelines established for Europe
• Sensitivity monitoring carried out on grape downy mildew and potato late blight
• First draft recommendations for these crops to be available soon on the FRAC web page
• Likely to soon become a formal Working Group
Outreach to other national groups

- FRAG UK
- NORBARAG Nordics/Baltics
- AFPP WG France
- FRAG NL Netherlands
- ECP-F Germany
- FRG India
- FRMRG Australia
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<td>Dr. D. McKenzie</td>
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<td>Chairman Anilinopyrimidines WG, Dicarboximide expert forum</td>
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<td>Dr. R. Rodriguez</td>
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FRAC Organisation Changes

- Duncan McKenzie elected as FRAC SC Scientific Support Officer
- Sumitomo was invited to join the QoI WG (mandestrobin)
- FMC and Isagro have joined the SDHI WG (IR9792, proposed common name = fluindapyr)
- ISK considering to join NAFRAC SDHI group (isofetamid)
Update from Working Groups
2015
SBI Working Group

- In general stable situation.
- In *Septoria* populations with highest EC50 values observed in areas of high disease pressure and pronounced use of azoles.
- The following changes were made to the recommendation for *use in cereals*:
  - When used in mixture recommended effective rates of the SBI *must* be maintained.
  - To ensure good performance in situations of high disease pressure it is *essential* to adhere to dosages and spray timings as recommended by manufacturers
  - Mixing with a non-cross resistant fungicide at effective dose rates may contribute to a *more effective disease control and resistance management*
- The situation in Phakopsora continues to be stable until 2010/11, but a variability in performance of DMI-mixtures has been observed.
QoI Working Group

• In general stable situation
• Asian Soybean Rust (*P. pachyrhizi*):
  - Isolates containing the F129L mutation were found for the first time in a number of samples. However sensitivity monitoring bioassays show that sensitivity has remained in the range of previous years.
  - Use recommendations strengthened.
• Sugarbeet Cercospora:
  - High levels of QoI resistance found in parts of Europe.
  - Recommendations adjusted.
• No other changes to use recommendations
• New case of QoI resistance reported in Japan: Elsinoe
Grape downy mildew
Overall, no significant change in resistance situation; field performance of registered products was good. No change in recommendations.

Potato late blight
Fully sensitive. Recommendations unchanged.

Cucurbit downy mildew
CAA resistance was detected in US in 2013 and a first case of CAA resistance was observed in 2014 in Murcia (Spain). No changes to use recommendations
Grapes *Botrytis*: Frequencies of resistant strains vary from low to moderate with high regional variability, particularly in France.

*Strawberry Botrytis*: Compared to 2013, the frequency of resistant isolates in the monitored populations remained stable.

*Botrytis of vegetables*: Overall, data show a low frequency of resistant isolates in all studied crops with the exception of tomato.

*Apple scab*: Frequency of moderately adapted populations have increased gradually during the past years. However, these populations are controlled by recommended label rates.

No change in use recommendations
SDHI Working Group

- **Septoria** – stable situation, no increase, new mutations (N86S, SDH subunit B: N225T)
- **Barley net blotch** – clear increase, group is concerned but no field efficacy impacts reported and no clear pattern of development, thus no change in guideline, low in UK, moderate in F, DE, BE; 5 mutations added
- **White mold, OSR** – single resistant isolates in FR, no resistant mutations detected in DE, PL, UK, CZ
- **Grey mold** – further increase of resistance reported in grapes in DE (FR stable)
- **Grey mold**, other crops – single cases of resistant mutations reported
- **Apple scab** - no resistance found, single isolates from trial site in BG found with reduced sensitivity. No product performance affected
- **Cucurbit powder mildew** – resistance reports from ES, IT and China (FR, GR, DE, CH – no resistant mutations), monitoring ongoing
- **Alternaria solani** – Isolates with reduced sensitivity were detected in Europe in Netherlands and Belgium. Fully sensitive elsewhere.
- **Soybean rust** – monitoring data showed full sensitivity
## SDHI Resistance Monitoring

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Apply SDHI fungicides **always in mixtures**

The mixture partner:
- should provide satisfactory disease control when used alone on the target disease
- must have a different mode of action

Apply a **maximum of 2 SDHI fungicide containing sprays** per soybean crop.

Apply the SDHI fungicide preventively or as early as possible in the disease cycle. Do not rely only on the curative potential of SDHI fungicides. Strongly reduced rate programs including multiple applications must not be used. Refer to manufacturers’ recommendations for rates.

Good agricultural practices must be considered to reduce disease pressure and resistance risk, e.g. avoiding **multiple cropping**.
AZN Working Group

• Wheat powdery mildew
  – No major change in sensitivity recorded. Highest level of resistance in north Germany and parts of the UK.
  – Field performance remains good
  – No changes to current resistance risk management recommendations

• Grape powdery mildew
  – No significant change of overall EU wide sensitivity of *E. necator* populations
    Resistant isolates continue to be reported in several countries
  – Performance remains good when used in rotational spray programs
  – No changes to current resistance risk management recommendations

• Cucurbit powdery mildew
  – No monitoring was conducted in 2014.
  – Field performance remains as expected when the product is used according to label recommendations
QiI Draft Recommendations

*Plasmopara viticola – Grape downy mildew*

- Apply QiI fungicides preferably in a preventive manner
- Apply a maximum of 50 % of the total number of intended applications for disease control not exceeding a total of 4 QiI fungicides sprays during one crop cycle
- Apply QiI fungicide based products according to manufacturers’ instructions

*Phytophthora infestans – Late blight of potatoes*

- Apply QiI fungicides preferably in a preventive manner
- Apply a maximum of 50 % of the total number of intended applications for late blight control
- Alternation with fungicides having other modes of action is recommended in spray programs
- Apply QiI fungicide based products according to manufacturers’ instructions
DuPont and Syngenta are working on resistance management recommendations for oxathiapiprolin which are expected to be ready in December 2015.
FRAC Classification Update

- Inclusion of Tolprocarb (melanine biosynthesis, I3, code 16.3)
- Inclusion of Dimethachlone (signal transduction, E3, code 2)
- Inclusion of Picarbutrazox (unknown MoA, U17)
- Validamycin re-classification in discussion (currently H3: trehalase and inositol-biosynthesis)
- Phenamacryl (JS399-14, Jiangsu, China), Pyraziflumid (NF 0721, Nihon Nohyaku) are being discussed among MoA experts
Aspergillus Resistance to DMIs

• Rothamsted Research Programme
  – Title: “Understanding the sources and spread of azole resistance in environmental Aspergillus fumigatus populations”
  – Principal Investigator: Bart Fraaije;
  – 4 years = Dec 01, 2014 - Nov 31, 2018
  – Scientific Advisory Board (SAB) to manage the project. Head: Prof. John Lucas

• Objectives
  – Identify high risk areas for azole resistance development in the environment
  – Define risk factors and build a basis for developing precautionary measures

• Linkage to Dutch project sponsored by Dutch government