STEROL BIOSYNTHESIS INHIBITOR (SBI) WORKING GROUP

Annual Meeting 2012 on December 07, 2011, 08:30 – 16:00 Protocol of the discussions and recommendations of the SBI working group of the Fungicide Resistance Action Committee (FRAC)

Participants of the SBI WG Meeting on December 07, 2012

BASF	Martin Semar Gerd Stammler
Bayer CropScience	Thierry Gestat de Garambe (excused, deputy Frank Göhlich) Andreas Mehl Klaus Stenzel
Makhteshim Agan	Martin Huttenlocher
Syngenta	Andy Leadbeater Helge Sierotzki Elizabeth Shaw

Members of the WG SBI not participating

Du Pont	Jean-Luc Genet Robert Bird

Venue of the meeting: Lindner Congress Hotel, Frankfurt
Hosting organization: FRAC

Source: www.frac.info
December 2012

ANTI-TRUST GUIDELINES (FROM FRAC CONSTITUTION) WERE SHOWN BEFORE THE MEETING STARTED

1. DMI AND AMINES : CEREAL DISEASES

1. 1. WHEAT

1.1.1. Leaf spot (*Mycosphaerella graminicola / Septoria tritici*)

Presentation of monitoring data: BASF, Bayer CropScience, Makhteshim, Syngenta

- Disease pressure in 2012 in Europe was moderate to high.
- DMIs field performance was good when used according to the manufacturers and FRAC recommendations. No general field resistance has been reported.
- After the slight increase in the frequency of less sensitive isolates from 2002 to 2004, the situation has stabilised between 2005 and 2008. In 2009 a trend to slightly higher EC50 values was observed in important cereal growing areas (UK, F, D, IRL), this trend has slowed down in 2010 to 2012. Outliers with higher EC_{50} values in lab tests were detected since 2009, slightly increasing in 2012. Increasing number of combinations of cyp51 mutations have been identified and some of them can influence sensitivity.

1.1.2. Powdery mildew (*Blumeria graminis* f.sp. *tritici* / *Erysiphe graminis* f.sp. *tritici*)

In 2012 the disease pressure was moderate across Europe.

DMIs

Presentation of monitoring data: Bayer CropScience

- DMI field performance was good.
- Sensitivity data presented confirmed that the situation was stable remaining in the range of variability seen over more than 15 years.

Amines

Presentation of monitoring data: BASF, Bayer CropScience

- Field performance of amine based products was good.
- Sensitivity data presented confirmed that like with DMIs the situation was stable remaining in the range of variability seen over more than 15 years.

1.1.3. Wheat brown rust (*Puccinia triticina*)

Presentation of monitoring data: BASF

- Brown rust disease pressure was moderate in most of the countries in Europe.
- Good field performance of DMIs against rust has been maintained.
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- Sensitivity data from 2012 for wheat brown rust showed that the sensitivities in 2012 were in the range of those of the last eight years.

1.1.4. Eyespot (*Tapesia* spp, *syn. Oculimacula* spp.)

Presentation of monitoring data: Bayer CropScience

- Sensitivity data have been presented for Prothioconazole (W and R types). Between 2003 and 2012 there is no change in the sensitivity of both types, stable situation has been observed during the last 9 years. Resistance factors are low.

1.1.5. Tan spot (*Pyrenophora tritici-repentis*)

No monitoring was carried out during 2012.

1.2. BARLEY

1.2.1. Powdery Mildew (*Blumeria graminis* f.sp. *hordei* / *Erysiphe graminis* f.sp. *hordei*)

In 2012, disease pressure was moderate in Europe..

DMIs

Results from 2012 monitoring were presented by Bayer CropScience:

- DMI products performed well.
- The sensitivity of the populations stayed in the range observed in the previous years.

Reduced sensitivity was reported in barley powdery mildew in western and eastern Australia (ACNFP/Curtin University).

Amines

Results from 2012 monitoring were presented by Bayer CropScience:

- Amine products performed well.
- The sensitivity of the populations stayed in the range observed in the previous years.

1.2.2. Scald (*Rhynchosporium secalis*)

Presentation of monitoring data: BASF, Bayer CropScience, Syngenta

- Disease pressure was low in Europe in 2012.
- Field performance of DMIs was good.
- Stable situation. Sensitivity monitoring data were presented for 2012: the sensitivity of the populations stayed in the range observed in the previous 10 years.

1.2.3. Net blotch (*Pyrenophora teres /Drechslera teres*)

Presentation of monitoring data for 2011: Syngenta

- Disease incidence was low to moderate in 2011
- Field disease control was good.
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- The sensitivity of the populations in 2011 stayed in the range observed in the previous years.
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Presentation of monitoring data for 2012: Bayer CropScience, Syngenta

- Disease incidence was moderate in 2012.
- Field disease control was good.
- The sensitivity of the populations in 2012 stayed in the range observed in the previous years.

1.2.4. Ramularia leaf spot (*Ramularia collo-cygni*)

Presentation of monitoring data for 2011 (second year of monitoring): Bayer CropScience

- Disease incidence was low
- Data from Ireland and UK showed a similar sensitivity distribution in a narrow range as the year before.

1.3. GENERAL RECOMMENDATIONS FOR CEREALS (DMIs AND AMINES)

The recommendations for the use of DMI and amine fungicides in mixture or alternation programmes with different mode of action fungicides remain unchanged.

Repeated application of DMI or amine fungicides alone should not be used on the same crop in one season against risky pathogens (e.g. cereal powdery mildews, barley net blotch, scald) in areas of high disease pressure for that particular pathogen.

Reduced rates of DMIs can contribute to accelerate the shift to less sensitive populations. It is critical to use effective rates of DMIs in order to ensure robust disease control. DMIs must provide effective disease control and be used at manufacturers recommended rates.

When used in mixture recommended effective rates of the SBI should be maintained.
Split and reduced rate programmes, using multiple repeated applications at dose rates below manufacturer's recommendations, provide continuous selection pressure and accelerate the development of resistant populations, and therefore must not be used.

To ensure good performance in situations of high disease pressure it is of importance to adhere to dosages and spray timings as recommended by manufacturers. Highly curative applications should be avoided. Application timing has to be appropriate to all mix partners' characteristics. Mixing with a non-cross resistant fungicide at effective dose rates may contribute to a higher level disease control.

The amine fungicides are effective non-cross-resistant partner fungicides for DMIs on cereals for the control of pathogens included in the label recommendation of each respective product.

2. DMI: INDUSTRIAL CROPS

2.1. SOYBEAN:

Asian soybean rust (*Phakopsora pachyrhizi*)

Presentation of monitoring data: BASF, Bayer CropScience, FRAC Brazil, Syngenta

- A sensitivity baseline has been established in Brazil based on 2005/6 data.
- Extensive monitoring was carried out since 2007/8 across the country.
- The performance of DMIs used alone was reduced.
- Sensitivity shifts have been observed with a trend to stabilize in season 2010/11. This trend continued in season 2011/12. Some variability between and within populations were found in addition to regional differences.

Recommendations for Asian soybean rust:

Refer to the general recommendations for SBI's.

In addition to ensure robust disease control it is essential to

- Apply DMI fungicides always in mixtures with effective non-cross resistant fungicides. Refer to manufacturers recommendations for rates.
- Apply preventively or as early as possible in the disease cycle
- Apply DMI fungicide containing products always at intervals recommended by the manufacturers and adjusted to the disease epidemics. Avoid extended spray intervals.

2.2. OILSEED RAPE

2.2.1. Phoma leaf spot and stem canker, blackleg (*Leptosphaeria maculans* / *L. biglobosa*)

Presentation of monitoring data for 2011: BASF, Bayer CropScience

- Monitoring data from 2006 to 2011 showed a stable sensitivity range, no indication for reduced sensitivity. Studies on 2012 samples are ongoing.

For recommendations see General Recommendations.

2.2.2. Sclerotinia stem rot, white mould (*Sclerotinia sclerotiorum*)

Presentation of monitoring data: BASF

- Monitoring data from 2011 showed no indication for reduced sensitivity. Studies on 2012 samples are ongoing.

- For recommendations see General Recommendations.

2.3. SUGAR BEET

Leaf spot (*Cercospora beticola*)

Presentation of monitoring data for 2009-2011: Syngenta

- Stable situation in the last three years in the central European countries observed. The broad range of sensitivity leads to the assumption that a shift took place before routine monitoring was set up.
- Field performance can be affected when solo DMI's are used.
- For recommendations see General Recommendations.

3. DMI AND AMINES: OTHER CROPS

3.1. GRAPE VINE:

Powdery mildew (*Erysiphe necator*)

Monitoring data for 2011 and 2012 for DMIs were presented by Bayer CropScience, Dow and Syngenta.

- Disease pressure was low to moderate.

- Performance of DMIs and amines was as expected.

- 2011 and 2012: Sensitivity for DMIs in Europe was generally in the normal range of fluctuation as observed in the previous years with regional differences.

- No monitoring for amines was carried out in 2011. Monitoring data for 2012 are under evaluation.

Recommendations:

- DMI´s and amines should be used preventative and curative situations should be avoided.

- The existing strategy for effective disease control and resistance management continues to be successful and the use recommendation is a maximum of 4 applications per season. The strategy includes the use of mixtures or alternation with non-cross resistant fungicides.

- To ensure that SBI's can remain the effective basis for control of *Erysiphe necator* in grape vine, their use should adhere to the full recommended rate (either alone or in mixture) at the recommended timing and application volume and an accurate treatment of each row.

3.2. APPLE:

3.2.1. Apple scab (*Venturia inaequalis*)

Presentation of monitoring data for 2011 and 2012: BASF, Syngenta

- Disease pressure in 2011 was low across Europe; in 2012 disease pressure was moderate to high.

- The performance of DMIs was good on this disease in 2011 and 2012 when compounds were used according to the manufacturers' and FRAC recommendations within spraying programmes.

- No sensitivity changes in European populations were observed in 2011 and 2012 within a fluctuation range as in previous years. Proportion of less sensitive isolates is low and stable.

Recommendations:

- DMI fungicides are not recommended for season long use and a maximum of 4 DMI sprays either alone or in mixture is recommended.

- DMIs should be used in mixtures or (block) alternations with a non-cross resistant fungicide. Application of recommended label rates is important.

- Preventative applications should always be the first choice with DMIs. Curative applications are only recommended when accurate disease warning systems are available.

3.2.2. Powdery mildew (*Podosphaera leucotricha*)

Monitoring analysis for 2012 is still on-going

Monitoring was started in 2010 across Europe. No change in sensitivity comparing 2010 and 2011 was observed.

- See General Recommendations.

3.3. Tomato/Potato - *Alternaria solani* and *Alternaria alternata*

Presentation of monitoring data: Syngenta

Monitoring was started in 2012 in Europe.

Homogenous sensitivity of both pathogens was observed in different countries across Europe.

3.4. BANANA:

Black Sigatoka (*Mycosphaerella fijiensis*)

The conclusions and guidelines of the March 2012 meeting of the FRAC Banana Working Group are available on the FRAC Website (http://www.frac.info/frac/index.htm). The next meeting of the group is planned for early 2014.

4. SBI-CLASS III (HYDROXYANILIDES: Fenhexamid)

Grey mould (*Botrytis cinerea*) on grape vine

- Monitoring analysis for 2012 is still on-going.
- In 2012 disease pressure was low across Europe. Field performance was good.
- Statement for 2011 monitoring: Resistant isolates were detected in Europe, but with stable and low frequency over the last years not affecting the field performance.

Recommendations for the use of Fenhexamid

- Use Fenhexamid only protectively.
- Solo product:
  Spray programmes with a maximum of 3 treatments per season: max. 1 application with Fenhexamid
  Spray programmes with 4-5 treatments/season: max. 2 applications with Fenhexamid
  Spray programmes with 6 and more treatments: at the maximum one third of all Botryticide-applications
- Mixtures
  Both partners - if applied alone at the dose used in the mixture - must have sufficient activity against Botrytis. Not more than 50% of all Botryticide-treatments should be made with Fenhexamid-containing mixtures.

4. NEXT MEETING

Next annual meeting is planned for December 13, 2013.