



## **STEROL BIOSYNTHESIS INHIBITOR (SBI) WORKING GROUP**

**Annual Meeting 2011 on December 09, 2011, 08:30 – 14:30  
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 09, 2011**

BASF	Martin Semar Gerd Stammler
Bayer CropScience	Thierry Gestat de Garambe Andreas Mehl Klaus Stenzel
Du Pont	Jean-Luc Genet
Makhteshim	Martin Huttenlocher
Syngenta	Andy Leadbeater Helge Sierotzki

### **Members of the WG SBI not participating**

Dow	Greg Kemmitt (excused)
Makhteshim	Renato Castagna (excused)
Du Pont	Robert Bird (excused)
Isagro	no nomination of member
Syngenta	Suhendro (new member, excused)

**Venue of the meeting:** Lindner Hotel & Residence Main Plaza, Frankfurt  
**Hosting organization:** FRAC

# ANTI-TRUST GUIDELINES 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 2011 in Europe was low to moderate with a late onset of disease.
- 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 EC<sub>50</sub> values was observed in important cereal growing areas (UK, F, D, IRL), this trend has slowed down in 2010 and 2011. A few outliers with higher EC<sub>50</sub> values in lab tests were detected since 2009. 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 2011 the disease pressure was low to moderate across Europe.

#### DMIs

No monitoring was carried out during 2011.

Results from 2010 monitoring were previously presented by Bayer CropScience:

- DMI field performance was good.
- Sensitivity data presented confirmed that the situation was stable remaining in the range of variability seen over the past 10 years.

#### Amines

Presentation of monitoring data: BASF

- 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, Bayer CropScience

- 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 2011 for wheat brown rust showed that the sensitivities in 2011 were in the range of those of the last eight years.

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

No monitoring was carried out during 2011.

Results from 2010 monitoring were previously presented by Bayer CropScience:

- Sensitivity data have been presented for Prothioconazole (W and R types). Between 2003 and 2010 there is no change in the sensitivity of both types, stable situation has been observed during the last 8 years. Resistance factors are low.

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

No monitoring was carried out during 2011.

Results from 2010 monitoring were previously presented by Bayer CropScience:

- In 2009, some limited first analyses with DMIs were undertaken, the absence of historical data does not allow any conclusions yet. The mean EC50 values varied in a narrow range.
- Some monitoring has been carried out in 2010, results are not available yet.

## **1.2. BARLEY**

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

No monitoring was carried out during 2011.

In 2010, disease pressure was low.

#### **DMIs**

Results from 2010 monitoring were previously presented by Bayer CropScience:

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

## **Amines**

Results from 2010 monitoring were previously 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 2011.
- Field performance of DMIs was good.
- Stable situation. Sensitivity monitoring data were presented for 2011: the sensitivity of the populations stayed in the range observed in the previous years.

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

Presentation of monitoring data for 2011: no data could be presented, monitoring analyses still ongoing.

- Disease incidence was low to moderate in 2011
- Field disease control was good.

Presentation of monitoring data for 2010: Bayer CropScience, Syngenta

- Disease incidence was low to moderate in 2010.
- Field disease control was good.
- Results from 2010: The sensitivity of the populations in 2010 stayed in the range observed in the previous 10 years.

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

Presentation of first monitoring data for 2011: Bayer CropScience

- Disease incidence was low
- Data from Ireland, UK and France and Germany showed a similar sensitivity distribution in a narrow range.

### **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 partner's 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, 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 especially under curative application timings and/or extended spray intervals.
- Sensitivity shifts have been observed with a trend to stabilize in season 2010/11. High 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. Phome leaf spot and stem cancer, blackleg (*Leptosphaeria maculans* / *L. biglobosa*)**

Presentation of monitoring data for 2010: BASF, Bayer CropScience, Syngenta

- Monitoring data from 2006 to 2010 showed a stable sensitivity range, no indication for reduced sensitivity. Studies on 2011 samples are ongoing.

For recommendations see General Recommendations.

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

Presentation of monitoring data: BASF, Bayer CropScience

- Monitoring data from 2010 showed no indication for reduced sensitivity. Studies on 2011 samples are ongoing.
- For recommendations see General Recommendations.

## **2.3. SUGAR BEET**

### **Leaf spot (*Cercospora beticola*)**

No monitoring was carried out during 2010 and 2011.

Data for 2009 were previously presented by DuPont.

In 2009, some limited first analyses were undertaken; the absence of historical monitoring data from Europe does not allow any conclusions yet.

### **3. DMI AND AMINES: OTHER CROPS**

#### **3.1. GRAPE VINE:**

##### **Powdery mildew (*Erysiphe necator*)**

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

- Disease pressure was low to moderate.
- Performance of DMIs and amines was as expected.
- 2011: 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. From 2010 monitoring as previously reported: Stable situation for the amines over the last years with sensitivity levels close to baseline.

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: no data could be presented, monitoring analyses still ongoing.

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

Monitoring data for 2010 were previously presented by Syngenta:

- No sensitivity changes in European populations were observed in the 2010 monitoring compared to 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*)**

Data for 2011 were presented by Syngenta.

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

- See General Recommendations.

### **3.3. BANANA:**

#### **Black Sigatoka (*Mycosphaerella fijiensis*)**

The conclusions and guidelines of the March 2010 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 March 2012.

### **4. SBI-CLASS III (HYDROXYANILIDES: Fenhexamid)**

#### **Grey mould (*Botrytis cinerea*) on grape vine**

- Disease pressure was moderate across Europe in 2011. Field performance was good.
- 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 Botrycide-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 Botrycide-treatments should be made with Fenhexamid-containing mixtures.

## **4. NEXT MEETING**

Next annual meeting is planned for December 07, 2012.