Minutes of the FRAC OSBPI Working Group Meeting

13 April 2021 – 9:00 to 13:00

Virtual meeting

Participants

Corteva	Jean-Luc Genet (Chair)
	Olivier Couery
	Mamadou Mboup
Syngenta	Helge Sierotzki
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Introduction

A FRAC OSBPI Working Group was formed in 2015 to generate common resistance management recommendations for the fungicides oxathiapiprolin and fluoxapiprolin. OSBP fungicides are active against oomycete fungi and used for the control of Phytophthora and downy mildews of numerous crops. OSBPIs inhibit an oxysterol binding protein (OSBP) homologue. Oxysterol binding proteins are implicated in the movement of lipids between membranes, among other processes. Inhibiting OSBP may disrupt other processes in the fungal cell, such as signaling, maintaining cell membranes, and the formation of more complex lipids that are essential for the cell to survive.

Oxathiapiprolin and fluoxapiprolin are cross-resistant.
OSBPIs have been classified under the FRAC Code 49. The resistance risk is medium to high.

FRAC Code	Target site and code	Group name	Chemical group	Common name	Comments
49	F9 lipid homeostasis and transfer/ storage	OSBPI oxysterol binding protein homologue inhibition	piperidinyl-thiazole-isoxazolines	Oxathiapiprolin Fluoxapiprolin	Resistance risk assumed to be medium to high (single site inhibitor). Resistance management required. .

Anti-Trust Guidelines (from FRAC Constitution) were shown before meetings started.

OSBPI Minutes of the 2021 discussions

Review of sensitivity monitoring 2020

Grape downy mildew (*Plasmopara viticola*)

Data presented by Bayer, Corteva and Syngenta

In 2020, sensitivity data have been generated for samples originating from Austria, Bulgaria, Croatia, France, Germany, Greece, Hungary, Italy, Portugal, Romania, Slovakia, Slovenia, Spain and Switzerland.

Most 2020 samples in monitored areas were sensitive.

Less sensitive isolates were detected at low frequency in a small number of trial sites in Italy (Emilia-Romagna, Puglia), Spain (Galicia) and Croatia.

In previous years, a few isolates with reduced sensitivity have been found in a small number of trial sites located in Austria, France, Italy, Germany, Portugal and Spain where OSBPI fungicides have been used intensively during several years. The frequency of these isolates was however low. In some of these isolates, target site mutations have been identified at positions 770, 837 and 863 (based on *P. capsici* homology numbering). More work is needed to understand the relevance of these mutations on OSBPI sensitivity.

In 2019, *P. viticola* samples were analyzed from India and were found to be fully sensitive to OSBPI fungicides.

Potato/tomato late blight (*Phytophthora infestans*)

Data presented by Bayer, Corteva and Syngenta

In 2020, sensitivity data have been generated for samples originating from Belgium, Czech Republic, Croatia, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden and the UK.

All 2020 samples in monitored areas were sensitive.

In 2019, single isolates with reduced sensitivity were detected in four commercial areas of Indonesia and in the Antioquia region of Colombia. In most of the isolates from Indonesia, a mutation has been detected at position 770 (based on *P. capsici* homology numbering).

Cucurbit downy mildew (*Pseudoperonospora cubensis*)

Data presented by Corteva and Syngenta

In 2020, sensitivity data have been generated for samples originating from cucumber, melon and zucchini crops in France, Germany, Greece, Italy, Poland and Spain. All samples were sensitive.

As in 2019, sensitivity monitoring conducted in China showed a broad sensitivity situation, however three populations with slightly higher EC50 values were detected in the Shandong (2) and Henan (1) provinces of China (crops grown under polytunnel). Molecular characterization of these populations is in progress. Practical relevance of this observation needs further investigations.

In past years, molecular characterization of isolates has revealed the presence of target site mutations at *Phytophthora capsici* homolog positions 700, 767, 770 and 793.

Lettuce downy mildew (*Bremia lactucae*)

Data presented by Syngenta

In 2020, sensitivity data have been generated for samples originating from Belgium, France, Italy, Poland and Spain. All the samples analyzed were sensitive.

Onion downy mildew (*Peronospora destructor*)

Data presented by Syngenta

In 2020, populations from Bulgaria, Croatia, Italy, Germany, Spain, Greece, Slovenia, Poland, Lithuania, Netherlands and Hungary were analyzed by sequencing of the OSBP gene. None of the target site mutations known to cause reduced sensitivity to OSBPI fungicides in other pathogens were detected.

Sunflower downy mildew (*Plasmopara halstedii*)

No 2020 data was reported.

In 2019, data was presented by Corteva for samples from France, Hungary, Italy and Romania. All isolates were fully sensitive.

OSBPI – General Use Recommendations

- Fungicide programs must deliver effective disease management. Apply OSBPIs at effective rates and intervals according to manufacturers' recommendations. Effective disease management throughout the season is a critical component to delay the build-up and spread of resistant pathogen populations.

- Apply OSBPIs only preventatively and in mixtures with effective fungicides from different cross-resistance groups.

- The mixture partner should give effective control of the target disease(s) at the rate and interval selected.

- Foliar exposure to OSBPI products should not exceed thirty-three percent (33%) of the total period of protection needed per crop.

The number of foliar applications of OSBPI products within a total disease management program must be limited as follows:

OSBPI – Grapes

- Make no more than two (2) applications per season.

OSBPI – All other crops

- Make no more than four (4) applications or maximum 33% of the total period of protection needed per crop, whichever is more restrictive.

- Where the total number of fungicide applications targeting oomycetes is less than three (3), apply no more than one (1) application of an OSBPI product.

- There should be no more than two (2) foliar applications of any OSBPI product per crop for the control of soil-borne pathogens.

- Applications of OSBPI-containing products are to be made no more than three (3) times in sequence before applying a fungicide with a different mode of action. In areas where the agronomic risk is very high (e.g. continuous potato or cucurbit cropping) and resistance has already been reported, further restrictions to the number of consecutive applications are recommended.

- Applications of OSBPI products can be made in alternation with a fungicide with a different mode of action.

OSBPI – Seed/soil treatments

- No foliar fungicide application of an OSBPI fungicide should be made following a seed/soil treatment* with OSBPI fungicides targeting the same soilborne/seedborne pathogen.

* Directed stem sprays are interpreted as foliar not soil application.

OSBPI – Multiple crops

- In case of non-cucurbit multiple crops, do not make more than six (6) foliar applications of OSBPI product per year on the same acreage or greenhouse, targeting the same pathogen.

- Specifically, in the case of cucurbit crops, do not make more than four (4) applications per year on the same acreage or greenhouse, targeting *P. cubensis*.

OSBPI – Nursery crops

- OSBPI products must not be used in nursery production of transplanted agricultural crops.

Next meeting:

6 April 2022 (location TBD)