Resistance management recommendations and proposals for Fungicides not included in current working groups

<table>
<thead>
<tr>
<th>Compound</th>
<th>Fludioxonil, (Fenpiclonil)</th>
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<tbody>
<tr>
<td>Chemistry</td>
<td>Phenylpyroles (PP)</td>
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<tr>
<td>FRAC MoA Code</td>
<td>12</td>
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<td>TARGET SITE &amp; CODE</td>
<td>E2: osmotic signal transduction, MAP / histidine- kinase (os-2, HOG1)</td>
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**Uses**
- Foliar applications: *Botrytis* spp. on grape, berries, cucumber, tomato, peas, beans, lettuce and ornamentals; *Sclerotinia sclerotiorum* on peas, beans and leafy vegetables, oil seed rape; *Alternaria* spp. on pome; Turf diseases such as *Microdochium nivale*, *Typhula* spp., *Rhizoctonia* spp, *Colletotrichum graminicola*
- Seed treatment: *Microdochium nivale*, *Fusarium* spp.
- Post-harvest: *Botrytis cinerea*, *Penicillium* spp., *Monilinia* spp., *Gloeosporium*.

**Resistance Status**
- Low to Medium risk.
- Resistance found sporadically; mechanism speculative
- Some species are naturally tolerant
- Reduced sensitivity has been detected with no practical consequence in the field (grape)
- Main resistance mechanism based on efflux pumps: Multi Drug Resistance (MDR)
- Resistance management is required.
- Monitoring programs are regularly conducted to assess sensitivity in some target species

**Resistance Mechanism**
- MDR or HOG1 alterations

**Recommendations**

**For foliar application:**
- Grape, fruits & vegetable crops for *Botrytis* as a lead pathogen:
  - Apply PP preventatively & limit the number of sprays
  - If 2 to 5 applications for *Botrytis* control: apply 2 PP maximum, consecutively only if mixed with a different robust partner having a different MoA for each application
  - If 6 or more applications: apply 3 PP maximum. Strict alternation with a different robust MoA if PP is applied solo and maximum of 2 consecutive applications in case of pre or tank mix with a robust partner of different MoA.

**Other pathogens and crops:**
- Apply PP preventatively & limit the number of PP sprays to 50% max of spray program for the targeted pathogen. Strict alternation if PP is applied solo and maximum of 2 consecutive applications in case of pre or tank mix with a robust partner.

**Ornamental crops for *Botrytis* as a lead pathogen:**
- Apply PP fungicides preventatively and in rotation with fungicides from a different cross-resistance group with satisfactory efficacy against *Botrytis*. If used solo, strict rotation is required. If used in mixture, apply PP fungicides in a max. of 2 consecutive applications.
- Limit the number of PP applications for Botrytis control to max. 1 appl. of 1-3 total appl., max. 1/3 of 4-11 total appl., max. 4 appl. of 12-20 total appl. and max. 1/5 of >20 total appl.

**Turf & Landscapes:**
- Apply preventatively, when conditions are favorable for disease development. For overwintering diseases, apply with mixing partner just before snow cover.

**For Post-harvest:** Post-harvest applications are not considered as part of the foliar applications if the treated material is separated from the field. To avoid resistance issues within the post-harvest facility, implement high standards of hygiene measures such as regular sanitization of the facilities and appropriate disposal of infected material.

**For seed treatment:** Resistance risk is low. Seed application is not considered as part of the number of applications.

* Regional/local FRAC recommendations may be more restrictive

**Requested by / date**
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**FRAC SC approval / date**
22nd of June 2020