Resistance management recommendations and proposals for Fungicides not included in current working groups as requested by manufacturers

<table>
<thead>
<tr>
<th>Compound</th>
<th>Quinoxyfen, Proquinazid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>Azanapthalenes</td>
</tr>
<tr>
<td>FRAC MoA Code</td>
<td>13</td>
</tr>
<tr>
<td>TARGET SITE AND CODE</td>
<td>E1 - Signal transduction (mechanism unknown)</td>
</tr>
<tr>
<td>Uses</td>
<td>Powdery mildew control in wheat, barley, grapevines, stone fruit, cucurbits, peppers, hops, strawberries</td>
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</tbody>
</table>

**Resistance status**

- Resistance known to these molecules in *Blumeria graminis* and *Erysiphe necator*.
- Medium risk.
- Resistance management required.
- Clear cross resistance seen between the 2 actives in *Erysiphe necator*; weaker cross-resistance observed in *Blumeria graminis*.
- Active resistance monitoring program for *Erysiphe necator* and *Blumeria graminis*.

**Recommendations**

**Recommendations for cereals**

- Apply Group 13 fungicides preventatively.
- Apply a maximum of 2 Group 13 fungicides containing sprays per crop solo or in mixture (co-formulations or tank mixes) with effective mixture partners from different cross-resistance groups.
- If a second application is needed, it should be in tank-mix with an effective powdery mildewicide with another mode of action.
- Always follow product specific label recommendations for resistance management.

**Recommendations for grapes**

- Apply Group 13 fungicides preventatively.
- Group 13 fungicides must be applied in spray programs with fungicides of a different mode of action.
- Apply a maximum of 3 Group 13 fungicide containing sprays per season, solo or in mixture.
(co-formulations or tank mixes) with effective mixture partners from different cross-resistance groups.

- Do not exceed 2 consecutive applications of Group 13 fungicides per season.

**Recommendations for cucurbits, fruiting vegetables and strawberries**

- Apply Group 13 fungicides preventatively.

- Group 13 fungicides must be applied in spray programs with fungicides of a different mode of action.

- The number of sprays of group 13 fungicides per crop should not exceed 50% of the total number of powdery mildew sprays per season, solo or in mixture (co-formulations or tank mixes) with effective mixture partners from different cross-resistance groups.

Do not exceed 2 consecutive applications of Group 13 fungicides per season

Always follow product specific label recommendations for resistance management

<table>
<thead>
<tr>
<th>Requested by / date</th>
<th>Revised 30th March 2020</th>
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<tbody>
<tr>
<td>FRAC SC approval / date</td>
<td></td>
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