

Resistance status and resistance management recommendations for fungicides not covered in current FRAC working groups or expert fora

COMPOUND(S) (ISO COMMON NAME)	Proquinazid, Quinoxifen
FRAC GROUP	Group 13
GROUP NAME	Azanaphtalenes
MODE OF ACTION GROUP	E – Signal Transduction
TARGET SITE AND CODE	E1 – Signal Transduction (mechanism unknown)
Uses	Powdery mildew control in wheat, barley, grapevines, stone fruit, cucurbits, peppers, hops and strawberries
Resistance Status	<ul style="list-style-type: none"> Resistance known to these molecules in <i>Blumeria graminis</i> and <i>Erysiphe necator</i>. Medium risk. Resistance management required. Clear cross resistance seen between the 2 actives in <i>Erysiphe necator</i>; weaker crossresistance observed in <i>Blumeria graminis</i>. Active resistance monitoring program for <i>Erysiphe necator</i> and <i>Blumeria graminis</i>
Resistance Mechanism	Unknown
Recommendations <i>Resistance management strategies might differ in regions or countries because of different disease pressure or national guidelines/regulation.</i>	<p>Recommendations for cereals</p> <ul style="list-style-type: none"> Apply Group 13 fungicides preventatively. Apply a maximum of 2 Group 13 fungicides containing sprays per crop solo or in mixture (coformulations 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. <p>Recommendations for grapes</p> <ul style="list-style-type: none"> 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.



	<ul style="list-style-type: none">• Do not exceed 2 consecutive applications of Group 13 fungicides per season. <p>Recommendations for cucurbits, fruiting vegetables and strawberries</p> <ul style="list-style-type: none">• 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 crossresistance groups.• Do not exceed 2 consecutive applications of Group 13 fungicides per season• Always follow product specific label recommendations for resistance management
Requested by / date	Corteva / March 2020
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