SWITCH - fungicide resistance management

SWITCH® provides lasting systemic and protectant activity against Botrytis in wine grapes, even under high temperatures or wet conditions.

Fungicide resistance management

Other botryticides are available that also contain a GROUP 9 fungicide such as 'cyprodinil' or 'pyrimethanil', however, these products don't have the resistance management 'back up' partner fungicide in fludioxonil. They are only solo formulations. Recent resistance testing conducted by Curtin University showed a high percentage of botrytis infections show a sensitivity shift to Group 9. In these cases, without the back up of a fludioxonil component (or alternative fungicide from another group) efficacy of solo group 9 fungicides such 'Solaris' and 'Scala' could be compromised.



Mode of Action (MoA)

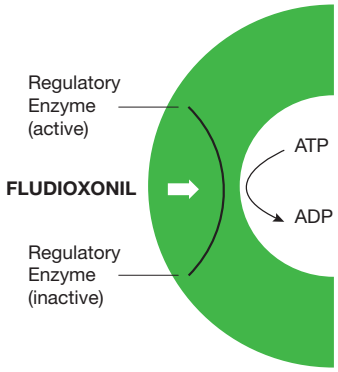
SWITCH combines the benefits of two active ingredients: Cyprodinil (GROUP 9) and Fludioxonil (GROUP 12), which belong to the Anilinopyrimidine and Phenylpyrrole chemical classes, respectively.

Fludioxonil

SWITCH is the well respected Botrytis fungicide Botrytis fungicide that contains the GROUP 12 fungicide, Fludioxonil, and its unique MoA.

1. Fludioxonil inhibits spore germination and growth of germ tubes and mycelia on the plant surface
2. Fludioxonil interferes with a fungal cell's ability to properly regulate osmotic pressure, causing the cell to burst from excessive intracellular pressure
3. Fludioxonil blocks a protein-kinase, which catalyses phosphorylation of a regulatory enzyme of glycerol synthesis (Figure 1).

Mode of Action: FLUDIOXONIL



Cyprodinil

Cyprodinil is a systemic (xylem mobile) fungicide discovered and commercialised by Syngenta.

Cyprodinil prevents fungi from penetrating the plant as well as disrupting inter and intra-cellular mycelial growth in the plant. Cyprodinil has two biochemical modes of action:

1. Cyprodinil inhibits the biosynthesis of methionine, which is essential for fungal growth.
2. Cyprodinil prevents the secretion of hydrolytic enzymes, which are important for invasion of host cells (Figure 2).

Mode of Action: CYPRODINIL

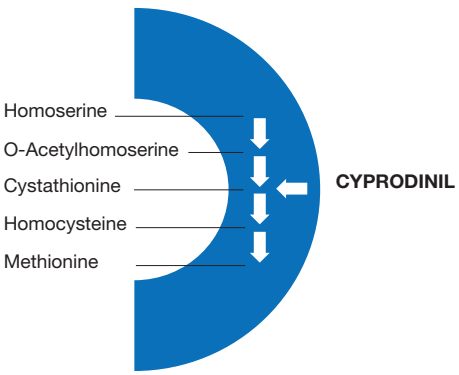


Figure 2: Cyprodinil prevents the secretion of hydrolytic enzymes, which are important for invasion of host cells.

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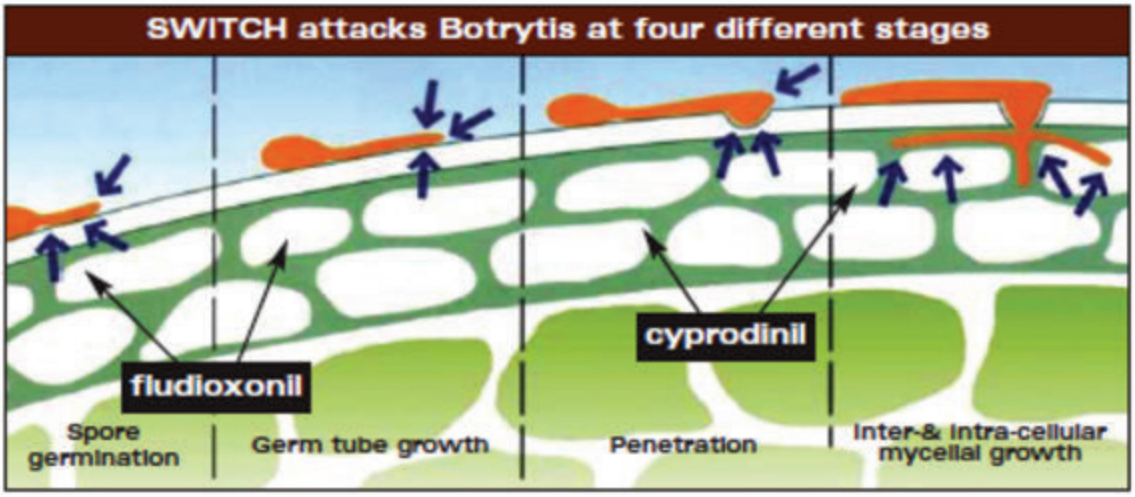


Figure 3: The two active ingredients in SWITCH attack Botrytis at four different stages of fungal disease development

Because SWITCH contains two fungicides from different MoA groups, it is ideal for use in fungicide resistance management programs. The MoA of Fludioxonil specifically is distinctly different from other fungicides used in the Australia grape industry.

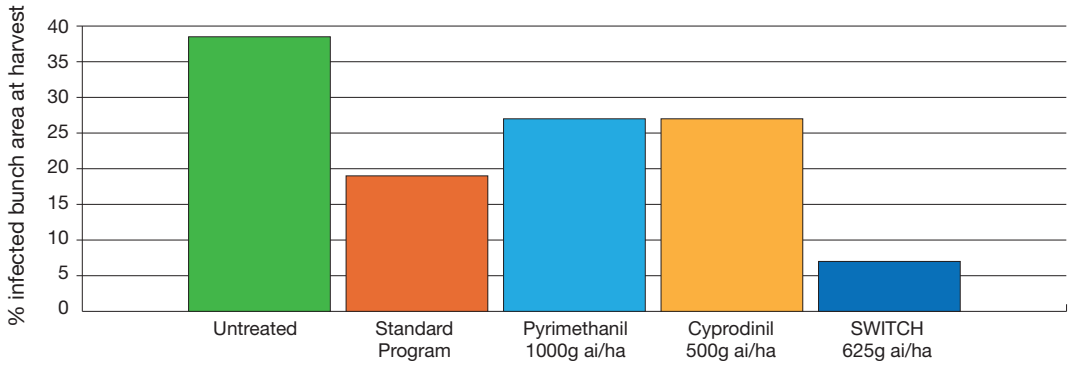


Figure 4: Performance of SWITCH in locations with resistance to anilinopyrimidines (Trial # 1993, Ruedlingen, Switzerland). Treatments applied at stages A (flowering), B (bunch closure), C (veraison) and D (3 weeks before harvest).

Compared to other Botrytis fungicides, SWITCH acts on more sites within the pathogen.

Table 1: SWITCH is more convenient and comprehensive than standalone products.

Product	Fungicide Group		Site of Action			
	Group 9	Group 12	Spore Germination	Germ tube growth	Penetration	Inter & Intra-cellular mycella growth
SWITCH	Yes	Yes	Yes	Yes	Yes	Yes
Cyprodinil (eg Solaris)	Yes	No	No	No	Yes	Yes
Pyrimethanil (eg Scala)	Yes	No	No	No	Yes	Yes

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