



Approved Turfgrass Fungicides (Ireland)

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Ruth Mann, The Sports Turf Research Institute, Turfgrass Protection Department
00441274 518913/00447894096399 or ruth.mann@stri.co.uk

Fungicide group	Active Ingredient	Example Products§	Physical mode of action	Biochemical mode of action	No. of action sites	Risk of resistance*	Notes
Phthalonitrile	Chlorothalonil	Daconil Weatherstik	Contact	Affects fungal cell function	Multi site	Low	Broad spectrum, protectant fungicide.
Dicarboximide	Iprodione	Chipco Green	Local penetrant†	Inhibits spore germination and fungal growth	Single-site?	Medium to high	Iprodione has historically been listed as multi-site. However, due to widespread resistance in <i>Botrytis cinerea</i> , it is suspected that it does not have true multi-site action and so should be considered as single-site.
Carbamate	Propamocarb hydrochloride	Previcur-N Proplant	Acropetal penetrant‡	Inhibits membrane function	Single-site	Low to medium	Reduces mycelial growth and development of sporangia and zoospores. Effective against <i>Pythium</i> diseases.
Strobilurins	Azoxystrobin	Heritage	Acropetal penetrant‡	Prevents electron transfer in mitochondria, leading to insufficient energy for growth	Single-site	High	All strobilurins have the same biochemical mode of action but differ in their physical mode of action. Azoxystrobin has upward movement in the xylem, following absorption by the leaf, stem and roots; pyraclostrobin is primarily stored in the waxes of the leaf cuticle and trifloxystrobin is described as mesostemic (binds to the leaf cuticle and also has vapour phase activity that can move the product over short distances in the leaf canopy).
	Pyraclostrobin	Insignia	Local penetrant†				
	Trifloxystrobin	Scorpio	Local penetrant†				
Demethylation inhibitors (DMI)	Propiconazole	Banner Maxx	Acropetal penetrant‡	Disrupts ergosterol production, preventing growth	Single-site	Medium	Resistance risk is considered to be medium, as the resistant isolates do not appear to be fit for survival in the absence of the fungicide. Resistance problems result in a slow decrease in product performance leading to increased dose rates and/or more frequent applications to achieve the same level of control.

§ This is NOT an exhaustive list of available products for each active ingredient

* The risk of resistance has been taken from the FRAC fungicide list (http://www.frac.info/publication/anhang/FRAC_Code_List2.pdf)

† A local penetrant penetrates into the leaf tissues but does not move far from the site of application

‡ An acropetal penetrant is moved systemically upwards from the point of absorption in the plant via the xylem (the part of the plant that transports water)

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