



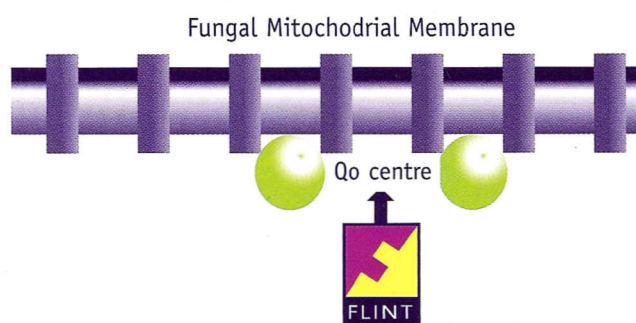
General Information:

FLINT is a new broad-spectrum **mesostemic** foliar fungicide for the control of powdery mildews, rusts and leafspots in ornamentals and other crops. FLINT penetrates the plant and provides the translaminar activity via a high affinity for the waxy layer of the plant surface, localized vapour movement and re-disposition on the plant. The active ingredient of FLINT - *trifloxystrobin* belongs to the new class of fungicides, the oximinoacetate within the strobilurin chemical group of fungicides.



Mode of Action:

The mode of action of FLINT results in the inhibition of the respiration in the mitochondria of the target fungi. The active ingredient in FLINT interrupts the electron flow by acting at the Qo center on cytochrome bc1 in the respiratory chain. As a result, the important biochemical process is severely disrupted, growth is stopped and the fungus dies.



One or more stages in the life cycle of the causal organism may be inhibited by FLINT depending on the pathogen. In sensitive fungi, early stages of fungal development including spore germination, germ tube extension and appressorium formation are strongly inhibited preventing infection from taking place. Later development stages, for example, haustoria's formation in powdery mildew are highly sensitive.

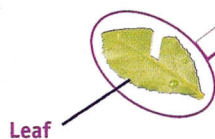


Characteristics of FLINT in and on plants:

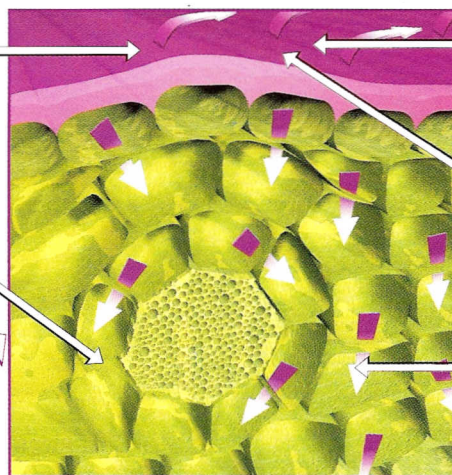
FLINT is a mesostemic fungicide exhibiting unique combination of chemodynamic properties. The product also has unique redistribution characteristics which contribute to the high level of protection in treated crops.

Strong redistribution effect
FLINT redistributes through the canopy by vapour movement and contributes to disease control throughout the growing crop.

Penetration into leaf tissue
Significant amount of FLINT continuously penetrates the leaf tissue from the surface deposit thus sustaining a high level of disease control.



Cross-section through leaf



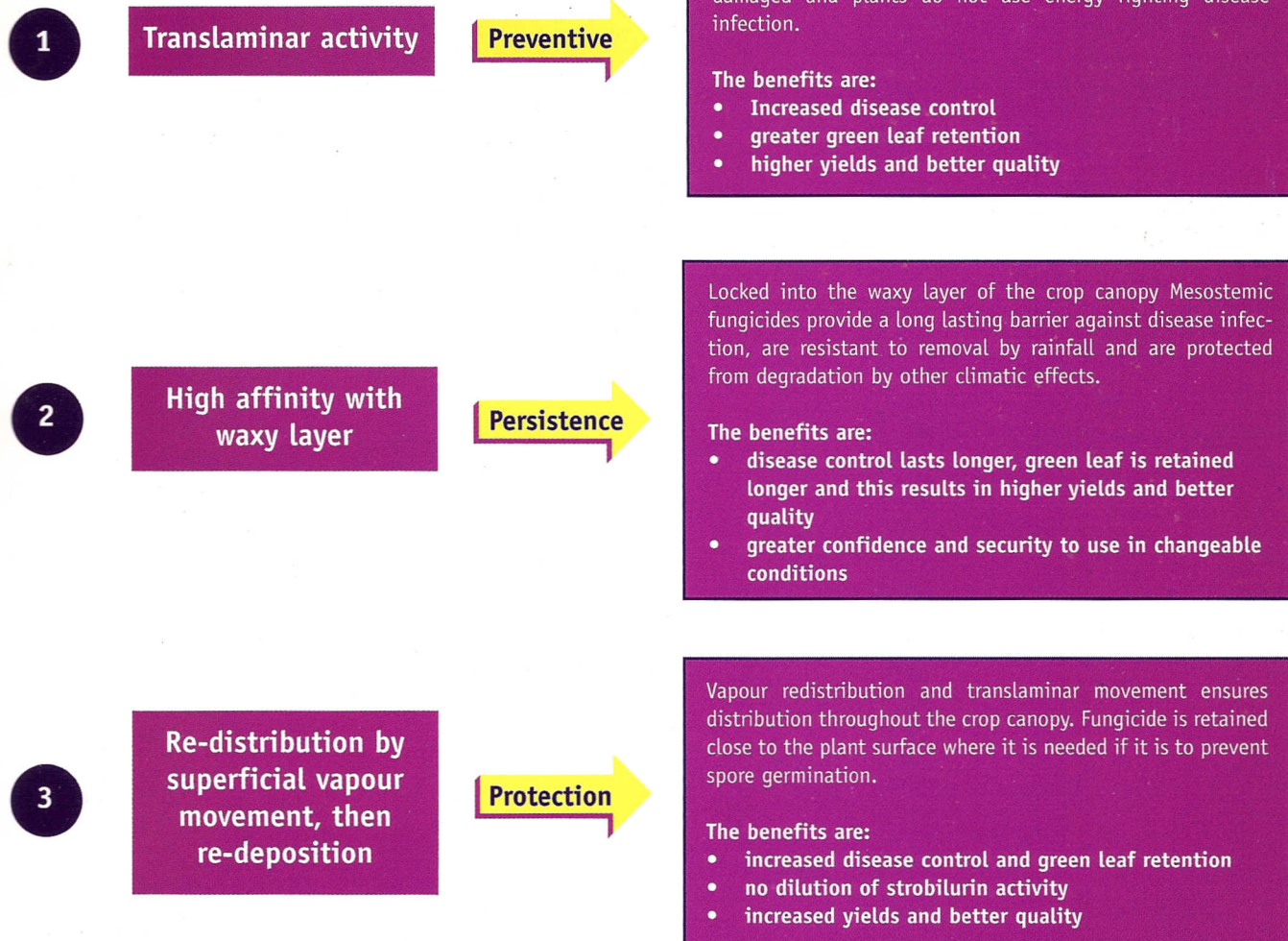
Strong activity on the plant surface
FLINT is strongly attracted to the plant surface. Here it provides a barrier against disease infection, thus stopping a disease before it can affect yield and quality potential.

Locked-on to resist rain erosion
FLINT bonds strongly to the plant waxy layer, where it is protected from climatic effect and resistant to removal by rain or irrigation. This locked-on barrier provides long lasting disease control.

Translaminar movement
Small amounts of FLINT penetrates the leaf and moves to the opposite, untreated surface of the leaf providing protection against infection on both leaf surfaces.



The mesostemic power activity leads to the three dimensions of FLINT



NB: Normal range of temperature and relative humidity do not influence the activity or length of control.

Characteristics of different types of fungicide

Characteristics	Mesostemic	Systemic	Penetrant	Contact
Acts on the plant surface	■	■		■
Absorbed by the waxy layer of the plant	■			
Superficial vapor movement and re-deposition	■			
Penetrates plant tissue	■	■	■	
Translaminar movement	■	■	■	
Transported in the vascular systems		■		





Resistance Management in Ornamentals.

FLINT is a modern site-specific fungicide belonging to the strobilurin class of chemistry. Fungal pathogens are known to develop resistance to fungicides with a specific mode of action. When site specific fungicides are introduced without clear resistant management strategy, resistance development may be rapid particularly in green house use.

FLINT exhibits cross resistance to other strobilurins and fungicides within the Strobilurin type Action and Resistance group (STAR compounds) but there is no known cross-resistance to fungicides of other classes including Morpholines, Pyrimidines, Sterol inhibitors, Dicarboximides, Benzimidazoles and Phenylpyrrols.

Many fungi that attack ornamentals and flowering plants including Powdery Mildew have a history of fungicides resistance development. Because resistance can not be predicted, implementation of resistance strategies to manage the resistance risks to Flint is needed. The following practices are recommended.

1. Use FLINT preventatively.
2. For leafspot and diseases other than Powdery Mildew.
Use no more than two application of FLINT before rotating to another effective product that is not in the strobilurin class for two application before rotating back to FLINT.
or
Rotate to another fungicide of non-strobilurin chemistry after each FLINT application.
3. For Powdery Mildew and Downy Mildew:
Between each FLINT application, make two application of non-strobilurin chemistry before rotating back to FLINT.
or
Rotate another fungicide of non-strobilurin after each FLINT application.
4. Do not apply more than four foliar sprays of FLINT per crop cycle or season for each at risk pattern.



Direction for Use:

Crop	Diseases	Rate	Direction for use
Roses	Powdery mildew (<i>Sphaerotheca pannosa</i>)	400-500 g/ha (40-50 g/100 lt water)	Apply as an early preventive spray 4 times per season either as a block of 2 – 3 consecutive treatments or in single alternation with fungicides of a different mode of action.
Carnations	Rusts (<i>Uromyces dianthi</i>) Ringspot (<i>Heterosporium enchinulatun</i>) Leafspot (<i>Septoria dianthi</i>)	200-500 g/ha (20-50 g/100 lt water)	Spray interval: 7 – 10 days.

NB: Water volume: 1000 lt/Ha





Maximum use rate Limit:

For foliar application do not apply more than 500 g/Ha per application.



Application Timing:

Best results are obtained when FLINT is applied on a preventive basis. However, FLINT has some curative activity when applied at first signs of disease.



Crop Tolerance:

FLINT is well tolerated by the crops listed on the label when used at the recommended label rates.

Note: As different ornamental varieties may differ in their sensitivity to chemical sprays, varietal tolerance test should always be carried out before large scale application is undertaken.

Re-entry period: As a general rule treated areas should not be entered before spray deposit on leaf surfaces has dried, unless protective clothing is worn.



Environmental behaviour:

FLINT displays no major risk to ecosystems under the recommended conditions of use:

- Low toxicity to birds
- Non-toxic to honey bees and earthworms
- Harmless to a wide range of beneficial arthropods
- No harmful effect on soil respiration and nitrification by bacteria
- Toxic to Aquatic organisms (fish, *Daphnia*, algae), but low risk at recommended doses and under recommended conditions of use
- No bioaccumulation in the aquatic food chain
- Fast dissipation from the environment



Human safety

FLINT has very favourable profile relatively to human safety.

- It has low acute toxicity to mammals and is unlikely to present any acute hazard in normal use. (Class III in the WHO classification scheme.)
- Flint is not irritating to skin and eyes
- Operator exposure studies indicate that there is no undue risk to operator under normal conditions of use.



Cautions

Users of this product are reminded to always refer to the product label for guidance on proper use and handling of the pesticides.

FLINT is the registered trade mark of Bayer AG, Germany.

