METTLE® 125 ME Fungicide – In a Class by Itself

With strong preventative activity, METTLE® controls powdery mildew for improved fruit quality and yield, with no adverse crop effect. METTLE 125 ME Fungicide is an excellent example of how a powerful systemic active ingredient, combined with a state-of-the-art formulation provides superior disease control in grapes and strawberries.

DMI Fungicides

Demethylation Inhibitor (DMI) fungicides occupy an important position in the world fungicide market. These fungicides exhibit varying degrees of systemic activity and move within and around the plant through biological pathways and vapour action.

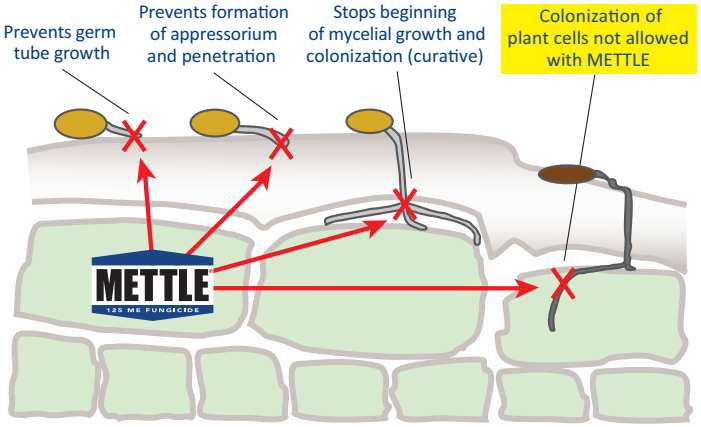
Tetraconazole – METTLE 125 ME Fungicide

A crucial attribute found in some DMI fungicides (e.g. METTLE) is their ability to protect new plant tissues (leaves/shoots) not present at the time of application. This feature separates them from those fungicides having only contact (e.g. Vivando®, Quintec®) or locally systemic and translaminar properties (e.g. Luna®, Vivando®, Pristine®, Inspire™).

Enhanced Systemic Protection™ (ESP)

METTLE 125 ME contains a tetrafluoroethoxy group, making it unique among systemic fungicides in the DMI class versus fungicides like difenoconazole (Inspire™), and myclobutanil (Nova™).

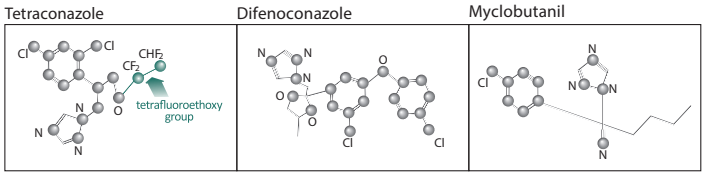
This tetrafluoroethoxy group provides a high degree of systemic activity due to optimization of the systemic properties necessary for active ingredient movement within the treated plant. The **Enhanced Systemic Protection™**, found only in METTLE 125 ME, results in improved fungicidal performance compared to other DMI fungicides.



METTLE 125 ME Fungicide – Mode of Action

DMI Brands

There are many DMI fungicides used for powdery mildew control in grape, including:



METTLE 125 ME Fungicide | Inspire™ Fungicide | Nova™ Fungicide

All DMI Fungicides Are Not Created Equal

Although these are all in the DMI class of active ingredients, there are significant differences in their ability to move systemically within the plant. These differences depend largely on the chemical structure of the active ingredient and formulation used for delivery.

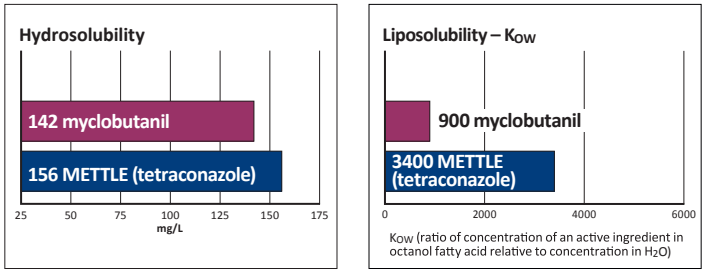
Systemic Pathways

The systemic activity of an active ingredient is dictated by the optimization of the following biological pathways:

- Hydrosolubility – responsible for the translocation through water transport tissues.
- Liposolubility – responsible for penetration through the cuticular waxes of the leaves and translocation through the lipids of the cell membranes within plant tissues.
- Vapour Action – responsible for distribution on and inside the plant canopy and clusters.

Hydrosolubility and Liposolubility

Hydrosolubility is a measure of the amount of active ingredient that will dissolve in pure water. It is an important characteristic in determining the ultimate transport, fate and effectiveness of the active ingredient within the treated plant.



With METTLE 125 ME, the hydrosolubility and liposolubility of the active ingredient are optimally balanced, thereby providing protection of both treated and non-treated plant parts.

The degree of water solubility influences the amount of active ingredient available for transportation through the water conducting tissue of the plant. If hydrosolubility is too high, the active ingredient may be transported to and accumulated in the growing points only, leaving the other portions of the plant

unprotected. If hydrosolubility is too low, the active ingredient can bind to waxy substances in the plant's cuticle or cell walls, reducing the ability of the active ingredient to effectively reach the site of action where disease protection is needed.

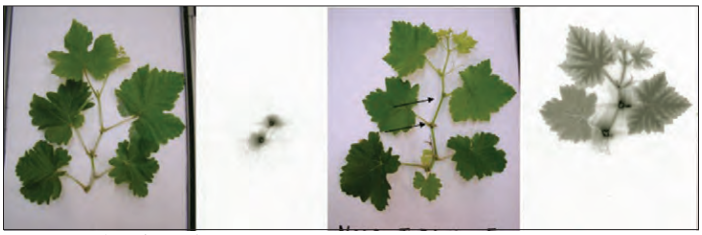
Vapour Action

The vapour action of a fungicide is its ability, through the release of fungicidal vapours, to protect portions of the plant that do not come in direct contact with the spray solution. With METTLE 125 ME, the amount of vapour action present ranks among the highest in the DMI fungicide class, giving it enhanced disease fighting capability.

Tetraconazole Translocation

Time sequenced photographs depict translocation of radio-labeled tetraconazole through a growing grape vine. Note how tetraconazole moves upward to protect the new growth.

METTLE Systemic Movement in Grape (radio – labeled C14)



0 days after application
Topical application of METTLE at 2 nodes

7 days after application
METTLE redistribution into adjacent leaves and toward growing point

14 days after application
METTLE has moved into leaves not present at time of application

21 days after application
METTLE continues to protect the developing vine

Formulation Types

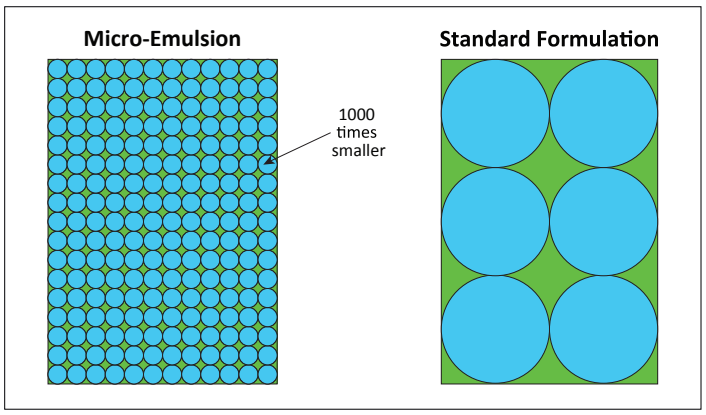
As the speed and extent of active ingredient distribution within the plant is largely dictated by its chemical structure, the transfer of the active ingredient from the leaf surface into the plant is largely influenced by the type of formulation.

Micro-Emulsion (ME) Technology

The use of ME technology represents an important advancement in DMI fungicide formulation technology.

ME formulations have been used extensively in pharmaceutical and cosmetic products due to their excellent physical properties which safely and effectively delivering the active ingredient to the target site.

With METTLE 125 ME, the retention, spread and penetration of the spray droplets are maximized, leading to increased uptake, enhanced distribution and longer residual activity for better disease control compared to other DMI fungicides.

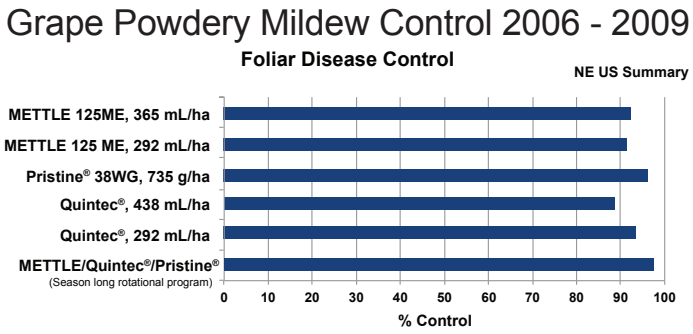


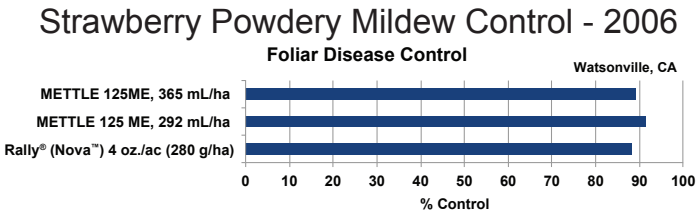
The ME formulation of METTLE 125 ME is comprised of smaller, more uniform particles compared to other DMI fungicide formulations and is created from the careful selection of the highest quality co-formulants available and produced to exact specifications.

METTLE for Grape and Strawberry Disease Control

Powdery Mildew Control

The systemic activity of METTLE makes it an ideal choice when used alone, in tank-mix combinations, or in rotation with other fungicide classes for superior control of powdery mildew in grape and strawberry.





METTLE® 125 ME FUNGICIDE

ISAGRO USA

a product discovered by ISAGRO S.p.A and manufactured by ISAGRO USA, Inc. for Arysta LifeScience North America, LLC

Arysta LifeScience