

Terms & Concepts for Fungicides

J.W. Rimelspach & M.J. Boehm

Department of Plant Pathology
The Ohio State University

1. **Coverage** - Distribution of a chemical on the plant surface. (Think where the disease is located?)
2. **Eradicant** - An agent to eliminate a pathogen. (Mercury compounds were great eradicants.)
3. **Fungicidal** (Fungicide) - A substance that kills fungi.
4. **Fungistatic** (Fungistat) - A substance that inhibits the growth of fungi.
5. **Fungitoxicant** - A substance that is toxic to fungi, can be fungicidal or fungistatic.
6. **Fungicide** - The term commonly used for all fungitoxicants.
7. **Fungicide Resistance** - when a fungus is insensitive (not affected by) a fungicide, ie not killed!
ASensitive@ fungi are killed by the fungicide.

Ways pathogens are resistant to a fungicide:

- a. decrease entrance into the fungus
- b. the fungicide is detoxified
- c. decreased effectiveness at the target site within the fungus
- d. there is compensation for the Adamage@ the fungicide does, etc...

Why pathogens are resistant to fungicide:

- a. genetic mutations occur and/or
- b. natural occurring individuals are not affected (insensitive), and then by reproduction these become the majority pathogen in the turf.

8. **AMode of Action@** - How fungicides work.
9. **Timing of Fungicides (Mode of Action)**

Preventive/Protectants - must be present on the surface of the plant **before the pathogen** in order to prevent infection.

Curative - applied when pathogen of the disease is present. Intent is to halt active disease.

ACurative@ is based on time, usually hours, after the infection period, (ie Rubigan 72-96 hours). This is often called the Kick-Back period.

10. Placement of Fungicides (Mode of Action)

Contact - Fungicides must come in contact with the pathogen, so all plant parts that may be exposed to the pathogen must be covered with the fungicide so the plant is protected. Think of painting the turf, turf not painted is not protected.

(Fore and Daconil are examples.)

Systemic - Fungicide enters and moves within the plant.

(Not all systemics are the same. The direction and degree of movement vary.)

- Local penetration and limited long distance movement.

-Upward movement (acropetal)

-Upward and downward movement (acropetal and basipetal)

11. Movement of Fungicides (Mode of Action)

Apoplastic Movement - upward, with water, in the xylem, most of today's Asystemic@ fungicides are in this group.

Symplastic Movement - downward, with carbohydrates in the phloem.

12. Biochemical Processes of Fungicides (Mode of Action)

General or Nonspecific or Broad Spectrum Biochemical - Mode of Action

- fungicide affects the pathogen in many ways.

Specific or Narrow Biochemical - Mode of Action

- fungicide activity is targeted at a specific site in the pathogen. (Because these affect only one biochemical function or pathway, genetic changes or naturally insensitive fungus have a much greater chance to overcome the fungitoxic effect resulting in the development of resistance.)

13. Fungicide Names

- Trade Name

- Common Name

- Chemical Name