APS / EPA / OPP Discussion: Fungicide Resistance Management

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APS / EPA / OPP Discussion: Fungicide Resistance Management

- Overview
- Fungicide resistance management basics
- Implementation examples
- Discussion points: roles of APS, EPA, IR-4, industry
- Define action steps

Fungicide Resistance Management

Situation

- Some plant pathogens can have devastating economic impact (outbreak pests).
- Others have a continual, annual impact.
- Fungicides are essential tools, sometimes the only available means, for managing plant diseases.
- Few effective fungicide modes of action are available.
- These modes of action need to be protected.
- With some notable exceptions, most fungicide resistance management has been reactive rather than proactive.

Fungicide Resistance Management

Situation

Some crops cycle through one mode of action after another, successively burning out each one, because only one effective mode of action is registered at any time. This results in a series of section 18s, and eventually results in pathogen populations which are resistant to most single - site modes of action.

Fungicide Resistance Management

Task

Define action steps which:

- **Protect existing modes of action**
- **Accelerate broader access to new modes of action**
- **Result in proactive fungicide resistance management**

Fungicide Resistance Management Basics

Be proactive

Manage use of these products with resistance *prevention* in mind.

Scout

Know how to identify various pathogens.

Thoroughly and frequently scout all fields.

Assure that disease hot spots are not developing (don't try to "put out the fire).

Fungicide Resistance Management Basics

Use fungicides preventively

Begin when conditions are favorable for disease development, before the first signs of disease are visible.

Use the full rate of each product

Reduced rates can increase the possibility of resistance development.

Fungicide Resistance Management Basics

Apply on the correct application intervals

Don’t extend fungicide application intervals beyond recommended intervals.

Alternate products with different modes of action.

Tank mix with multi-site fungicides

sulfur, copper, EDBCs, ...

Assure thorough coverage

ground application, high volume, drop nozzles, adjuvants

Fungicide Resistance Management Basics

Manage inoculum levels

Be aware of the situation in adjacent fields

Remove or plow under inoculum sources in the field

Remove inoculum sources around storage and packing facilities

Use clean seed and transplant material

Integrate other pest control tactics

tolerant varieties

crop rotation

manage nitrogen fertilizers

manage irrigation method and quantity

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Role of APS and APS members

Educate user communities

Monitor resistance status of pathogen populations (proactive)

Assess extent of resistance issues in specific situations (reactive)

Work with industry to develop and implement new modes of action

Research ways to integrate these with other pest control tactics

Fungicide Resistance Management Discussion

Role of fungicide manufacturers

Discover and develop new modes of action

Register pre-mixes with two modes of action

Label consistent with resistance management concepts

Mode of action symbols, resistance management statements on labels (Pesticide Registration Notice 2001-5)

Fund and/or conduct resistance monitoring

Educate user communities

Fungicide Resistance Management Discussion

Label wording example

Common approach, consistent with FRAC guidelines:

" . . . do not make more than four applications of [product] or other Group [#] fungicides per season. Do not make more than two sequential applications of [product] without alternating to a labeled fungicide with a different mode of action."

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Label wording example

Even more conservative approach:

"The number of [fungicide product] sprays per crop must not exceed 50% of the total number of [target pathogen] sprays. Alternation with other modes of action is recommended after each application. Do not make more than two consecutive [product] applications before rotating to a product which is effective on [target pathogen] and which has a mode of action different from [product]. Apply the alternate product within 14 days of the [product] application. When more than one [product] application is made per crop, at least one application must be tank mixture with a different mode of action which is effective on [target pathogen]."

Fungicide Resistance Management Discussion

Role of IR-4

Expand access to new modes of action

Develop residue, efficacy and crop safety data

Obtain new registrations