

## Table 25. Fungicide Resistance Management

Disease-causing fungi may become resistant to fungicides if label precautions are not followed carefully. This table is designed to help growers alternate applications between fungicides with different modes of action to avoid or delay development of fungicide resistance in fungi. Many product labels use the same letters and numbers as those listed in the MOA Code column below. This list is not exhaustive, but does contain many of the fungicides used in the Midwest.

Trade Names	Common Name	Risk of Resistance	MOA Code <sup>1</sup>
Acrobat <sup>®</sup> , Forum <sup>®</sup>	dimethomorph	medium	15 <sup>3</sup>
Actigard <sup>®</sup>	acibenzolar-S-methyl	none-low	P <sup>2</sup>
Aliette <sup>®</sup>	fosetyl-A1	low	33 <sup>3</sup>
Amistar <sup>®</sup> , Quadris <sup>®</sup>	azoxystrobin	high	11 <sup>3</sup>
Bravo <sup>®</sup> , Echo <sup>®</sup> , Equus <sup>®</sup>	chlorothalonil	none-low	M <sup>4</sup>
Cabrio <sup>®</sup> , Headline <sup>®</sup>	pyraclostrobin	high	11 <sup>3</sup>
copper (several)	copper	none-low	M <sup>4</sup>
Curzate <sup>®</sup>	cymoxanil	medium-high	27 <sup>3</sup>
Dithane <sup>®</sup> , Manzate <sup>®</sup> , Penncozeb <sup>®</sup>	mancozeb/maneb	none-low	M <sup>4</sup>
Endura <sup>®</sup>	boscalid	medium	7
Flint <sup>®</sup> , Gem <sup>®</sup>	trifloxystrobin	high	11
Folicur <sup>®</sup>	tebuconazole	medium	3
Gavel <sup>®</sup>	mancozeb (M) + zoxamide (22)	low-medium	M <sup>2</sup> , 22
Maneb <sup>®</sup> , Manex <sup>®</sup>	mancozeb/maneb	none-low	M <sup>2</sup>
Messenger <sup>®</sup>	harpin	none-low	NA <sup>5</sup>
Microthiol <sup>®</sup> , Thiolux Jet <sup>®</sup>	sulfur	none-low	M <sup>2</sup>
Presidio <sup>®</sup>	fluopicolide	medium-high	43
Previcur Flex <sup>®</sup> , Propimax <sup>®</sup>	propamocarb	low-medium	28
Pristine <sup>®</sup>	boscalid (7) + pyraclostrobin (11)	medium-high	7, 11
Procure <sup>®</sup>	triflumizole	medium	3
Quintec <sup>®</sup>	quinoxifen	medium	13
Rally <sup>®</sup>	myclobutanil	medium	3
Ranman <sup>®</sup>	cyazofamid	medium-high	21
Reason <sup>®</sup>	fenamidone	high	11
Revus <sup>®</sup>	mandipropamid	medium-high	40
Revus Top <sup>®</sup>	mandipropamid difenoconazole	low-medium	40 3
Ridomil <sup>®</sup>	mefenoxam	high	4
Rovral <sup>®</sup>	ipridione	medium	2
Scala <sup>®</sup>	pyrimethanil	medium	9
Sovran <sup>®</sup>	kresoxim-methyl	high	11
Switch <sup>®</sup>	cyprodinil (9) + fludioxonil (12)	low-medium	9, 12
Tanos <sup>®</sup>	cymoxanil (27) + famoxadone (11)	medium	27, 11
Tilt <sup>®</sup>	propiconazole	medium	3
Topsin M <sup>®</sup>	thiophanate-methyl	high	1
Ziram <sup>®</sup>	ziram	none-low	M <sup>2</sup>

<sup>1</sup> MOA=mode of action, or FRAC code

<sup>2</sup> P=host plant defense inducers

<sup>3</sup> Fungicides with a numbered MOA code have very specific activity sites and may cause resistance to develop in fungi. These fungicides should be alternated with fungicides with different MOA codes. Read product labels to determine resistance management strategies.

<sup>4</sup> M=multi-site activity. Fungicides with mode of action code M are contact fungicides. It is not necessary to alternate these fungicides for resistance management.

<sup>5</sup> NA=not available