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## Managing Fusarium Head Blight

Fusarium head blight (FHB), commonly called scab, is the single most important disease of wheat and one of the most difficult to prevent. The disease can cause spikelets to appear bleached. Severely infected kernels tend to be shriveled, light weight and, sometimes, chalky white or pink in color. FHB is capable of causing some loss in grain yield, but the most significant financial losses stem from a mycotoxin created by the fungus within the infected grain called deoxynivalenol (DON or vomitoxin). More information can be found at [Scab Smart](http://www.scabsmart.org/) (<http://www.scabsmart.org/>).



**Symptoms include heads partly or completely discolored**  
(Wharton, MSU)

**Weather** has the greatest influence on disease development. Damp conditions and moderately warm temperatures at the time of flowering are most advantageous to the pathogen. However, it may also be favored by wet weather several days prior to flowering, as it encourages spore numbers and dissemination. Likewise, wet conditions following flowering can compound the problem as it favors both disease development and the production of DON. A [FHB Risk Assessment Tool](http://www.wheatcab.psu.edu/riskTool_2012.html) ([http://www.wheatcab.psu.edu/riskTool\\_2012.html](http://www.wheatcab.psu.edu/riskTool_2012.html)), based on local weather, is available.

**Selecting varieties** having the least susceptibility to scab is becoming increasingly important, though most high yielding varieties grown in Michigan are still at best moderately susceptible. Interestingly, fungicides for FHB tend to lower DON more so in the less susceptible varieties than in the susceptible ones. Michigan State University's annual [variety performance report](http://www.varietytrials.msu.edu/wheat) (<http://www.varietytrials.msu.edu/wheat>) gives a FHB rating and DON levels for each variety.

**Soft white and soft red wheat**, as sub-classes, are generally comparable in their susceptibility to FHB, though white wheat is often more apt to accumulate DON. Soft white wheat also has the disadvantage in that it is more likely than soft red wheat to incur discounts because of their different end-uses. While market discounts for DON vary, soft white wheat value is often docked when levels exceed 1 ppm, whereas discounts for soft red grain may not be imposed until 2 ppm.

**Crop rotations** matter, as residues from the previously infected crop can harbor the Fusarium fungus and, thereby, increase the chance for infection. The greatest risk is associated with residue from corn, wheat and barley. Hay sods can also pose a significant risk based on experience in Michigan. Using tillage to completely incorporate infected residue will reduce the amount of inoculum generated within the field, though the risk of inoculum from outside the immediate field remains.

**Fungicide use** can reduce the severity of FHB by as much as 50 percent and DON levels by 30 to 40 percent, though the actual reductions are highly variable. Fungicide use tends to reduce DON within moderately resistant varieties more so than varieties that are very susceptible. There is a tendency for strobilurin fungicides, when used alone and late in the vegetation stages, to elevate DON levels. Fungicides targeting FHB have the added advantage of suppressing the development of foliar diseases.

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Successful applications of fungicide against FHB depend on the use of:

- 1) recommended fungicides (table 1): To date, the most effective products are Prosaro and Caramba. Folicur (and other brands of tebuconazole) is less effective on FHB but, because of reduced product cost, might be considered where the risk of FHB is relatively low and the threat of foliar diseases persists. The rates of Prosaro and Caramba should be increased within the dosage range under high FHB risk conditions.
- 2) proper application timing: Applications should be made while the wheat heads are in the early stages of flowering (when anthers can be seen on 25 to 50 percent of heads). This level of flowering usually occurs, depending on air temperature, 2 to 5 days after the majority of the heads have fully emerged.
- 3) application adjustments: (see [Ground Application of Fungicide](#) )
  - a. the boom height should be adjusted upward to target the wheat heads;
  - b. flat fan nozzles should be angled forward 30 degrees from horizontal (where ground speed is below 6 mph, nozzles can direct spray forward and backward);
  - c. use nozzles and pressure that provide a droplet size between the “fine” and “medium” categories (275 to 350 microns); and
  - d. the sprayer should be calibrated to deliver 10 to 20 gallons per acre.



**Wheat is considered to be flowering when one or more anthers are visible.**

### Efficacy of fungicides for FHB management based on appropriate application timing

(source: North Central Region Committee NCERA-184)

Fungicide(s)			Powdery mildew	Leaf/glume blotch	Septoria leaf spot	Stripe rust	Leaf rust	Stem rust <sup>4</sup>	Head scab	Harvest Restrict.
Active ingredient	Product	Rate/A (fl. oz)								
Metconazole 8.6%	Caramba 0.75 SL	10.0 - 17.0	VG <sup>1</sup>	VG	-- <sup>2</sup>	E	E	E	G	30 days
Prothioconazole 41%	Proline 480 SC	5.0 - 5.7	-- <sup>2</sup>	VG	VG	-- <sup>2</sup>	VG	VG	G	30 days
Tebuconazole 38.7%	various <sup>3</sup>	4.0	G	VG	VG	E	E	E	F	30 days
Prothioconazole 19% plus Tebuconazole 19%	Prosaro 421 SC	6.5 - 8.5	G	VG	VG	E	E	E	G	30 days

<sup>1</sup> Efficacy categories: NR=Not Recommended; P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent.

<sup>2</sup> Insufficient data to make statement about efficacy of this product

<sup>3</sup> Multiple generic products containing tebuconazole may also be labeled in some states. These products include: Embrace, Monsoon, Muscle 3.6 F, Onset, Orius 3.6 F, Tebucon 3.6 F, Tebustar 3.6 F, Tebuzol 3.6 F, Tegrol, and Toledo

<sup>4</sup> Estimates of fungicide efficacy against stem rust are based on a small number of observations, and may be less reliable than the ratings for other diseases.

This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. No endorsement is intended for products listed, nor is criticism meant for products not listed.

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