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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 significant financial losses due to 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 being partly or completely discolored

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 is also favored to a lesser extent by wet weather several days prior to flowering, as it encourages spore production 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.wheatscab.psu.edu/), (<http://www.wheatscab.psu.edu/>) based on local weather, is available.

Selecting varieties having the least susceptibility to scab has become a critical part of individual FHB management plans. Michigan State University's annual [variety performance report](http://www.varietytrials.msu.edu/wheat) (<http://www.varietytrials.msu.edu/wheat>) gives a FHB rating based on an index and DON level for each variety.

Soft white and soft red wheat, as sub-classes, are generally comparable in their susceptibility to FHB. However, soft white has a disadvantage in that the market is more sensitive to DON levels due to end-use requirements. While market discounts for DON vary, soft white wheat value is often docked when levels exceed 1 ppm, whereas discounts for soft red grain often begin at 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 and, to a lesser extent, wheat, barley and some hay crops. Using tillage to completely incorporate the residue from these crops will reduce the amount of inoculum generated within the field, although the risk of Fusarium spores from outside the immediate field remains.

Fungicides, such as Caramba and Prosaro, often reduce the severity of FHB by 50 to 60 percent and DON levels by 30 to 50 percent, although the actual reductions are highly variable. Conversely, the use of strobilurin fungicides (e.g. Quadris, Headline, and Aproach), when used alone and late in the vegetation stages, may lead to elevated DON levels. Using fungicides against FHB offers the additional benefit of boosting yields by 4 to 10 percent due to their activity against the many foliar diseases (e.g. leaf rust and leaf spots).

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Successful fungicide applications against FHB depend on the use of:

1) recommended fungicides (see table below). To date, the most effective products are Prosaro, Caramba and Proline. Tebuconazole (sold under various product names) is less effective on FHB but, because of lower product cost, might be considered where the risk of FHB is relatively low and yet the threat of foliar diseases remain.

2) proper application timing. Research suggests that there may be a 5 to 6 day window in time for applying a fungicide targeting FHB. This spray window begins at early flowering when at least one anther can be seen on approximately 50 percent of heads and extends for the next 5 to 6 days or until anthers can be found on nearly all heads.

3) application adjustments (see [Ground Application of Fungicide](#)):

- the boom height should be adjusted upward to target the wheat heads;
- dual nozzles angled 30 degrees down from horizontal both forward and backward are preferred, although flat fan nozzles angled forward 30 degrees from horizontal may be adequate for high ground speeds;
- use nozzles and pressure that provide a droplet size between the “fine” and “medium” categories (275 to 350 microns); and
- calibrate sprayer to deliver 10 to 20 gallons per acre with some preference given to the higher end of the range.



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 Products | | | | | | | | | | |
|---|----------------------|-----------------|-----------------|-------------------|--------------------|-------------|-----------|------------------------|-----------|------------------|
| Active ingredient | Product | Rate/A (fl. oz) | Powdery mildew | Leaf/glume blotch | Septoria leaf spot | Stripe rust | Leaf rust | Stem rust ⁴ | Head scab | Harvest Restrict |
| Metconazole 8.6% | Caramba 0.75 SL | 10.0 - 17.0 | VG ¹ | VG | VG | E | E | E | G | 30 days |
| Prothioconazole 41% | Proline 480 SC | 5.0 - 5.7 | -- ² | VG | VG | VG | VG | VG | G | 30 days |
| tebuconazole 38.7% | various ³ | 4.0 | G | VG | VG | E | E | E | F | 30 days |
| Prothioconazole 19% plus Tebuconazole 19% | Prosaro 421 SC | 6.5 - 8.2 | G | VG | VG | E | E | E | G | 30 days |

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

² Insufficient data to make statement about efficacy of this product

³ Multiple generic products containing tebuconazole may 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

⁴ 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 table 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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