

A Visual Scale to Estimate Severity of Fusarium Head Blight in Wheat

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Since 1993, Fusarium Head Blight or Scab of wheat has been a serious problem in the northern plains states. Agronomists and pathologists often have estimated severity of the disease under field conditions. Several rating systems and scales have been used by different workers, leading to some confusion.

The trained eye can estimate proportional areas quite accurately, especially if a pictorial scale is used for comparison. Such pictorial disease rating scales have been widely used for many crops (C. James.1971 A Manual of Assessment keys for Plant Diseases.)

Unlike a leaf or fruit which has a continuous surface, the wheat head has discrete units — the spikelets. These provide a convenient unit for estimating disease severity. Counting infected spikelets and expressing that as a percentage of total spikelets is a very accurate way to measure severity but it is also very time consuming.

It is quite easy to see and count the first one, two or three infected spikelets in a head. A scale which combines the accuracy of counts at the low end where it is most critical, with the ease of estimating proportions (one-third, one half, two thirds) is very workable. Scales designed this way are called "Horsfall-Barrett" scales, after their originators.

The scale presented here is a modified Horsfall-Barrett scale with 10 categories of infection. In seasons favoring scab, most wheat heads have about 13-14 spikelets, so one infected spikelet would be about 7%, two 14%, etc. The first three classes are for one, two or three spikelets infected. The succeeding three classes are for the easily estimated proportions 1/3, 1/2, and 2/3. The heads illustrated were selected as typical of the disease severity shown. Some variation in symptoms may occur, particularly in location and grouping of infected spikelets at the lower severities.

To sample a field choose several representative spots, well away from field edges, and away from other field irregularities. At each site grab a good double handful of heads (a group of 20-30). Include all heads, don't select! Score each head using the picture scale. Repeat this at each location. A minimum of 4-6 spots should be scored in this way.

Averaging the scores of all heads (including the zero's) will give an **Average Plot** (or Site) **Severity**. Averaging scores from only the infected heads will give **Average Infec-ted Head Severity**, and the count of infected (non-zero) heads divided by the total number scored gives **Incidence of Infected Heads**. These three measures are interrelated: Plot Severity = Incidence X Head Severity. Plot severity has been called "index" in some publications.

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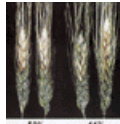
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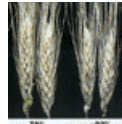
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