



QWCR Quality wheat facts

WHAT DOES A “FALLING NUMBER” TEST MEAN?

When it rains just before harvest, grain may start to germinate (or sprout) in the head. The germination causes an increase in α -amylase (alpha-amylase), an enzyme that breaks down starch, and there are also increases in enzymes that break down proteins. Of these, the starch degrading enzyme, α -amylase has a greater effect on reducing the quality of flour, and of products made from the flour. The longer the grain sprouts, the greater the amount of α -amylase formed. If badly sprouted grain is milled, the flour can cause product problems such as sticky, doughy bread which won't slice in mechanical slicers, or noodles which are too stretchy, and slip from the wooden rods where they are draped to dry.

To some extent, estimating the degree of germination by eye gives an idea of how much α -amylase is present, but this is an imprecise way of measuring it, so a test called the “**Falling number**” method is used to measure the effect of the α -amylase accurately.

In the falling number method, an instrument, which measures the time taken for a plunger to fall to the bottom of a precision bore glass tube filled with a heated paste of wheatmeal and water, is used. The time taken (in seconds) for this to happen is known as the **falling number**, and is 62 seconds for badly sprouted wheat. Of this, it takes 62 seconds to mix the wheat meal and water,



but then the plunger falls immediately to the bottom because the mixture is so thin. High quality wheat gives a thicker paste, and the test then takes between 300-600 seconds. The greater the sprout damage, the less viscous (or sticky) the starch paste, and so the lower the falling number. Wheats with falling numbers greater than 300 are quite suitable for breadmaking - this is one of the specifications for Australian Prime Hard wheat. For other milling grades, falling numbers greater than 250 are acceptable.

Quality Wheat CRC Ltd. has released WheatRite®, a simple kit which can be used by growers to measure rain damage before harvest, so pockets of badly damaged wheat can



be avoided and premium wheat is not downgraded. The test takes only 5 minutes and results, which can be read by eye, correlate well with Falling Number. An electronic reader, ReadRite, has also been developed for silo use. Articles have appeared in *Farming Ahead*, *Australian Grain* and *Groundcover*. WheatRite® is distributed by Graintec, ph. 07 4638 1761.

Sprout damage can also be measured by the Australian-designed and -built RVA (Rapid Visco-analyser). This method is faster than the falling number method and involves stirring a heated paste of wheatmeal and water with a motor driven paddle in a disposable aluminium can for a period of 3 minutes. The Stirring Number is a measure of the drag on the paddle or viscosity of the heated wheatmeal paste and is highly correlated with measurements of the Falling Number. However, the Falling Number method is currently the international standard.



WHY DOES A BIT OF RAIN AT HARVEST CAUSE GRAIN TO LOSE WEIGHT?

As described under the heading falling number, grain can start to germinate in the head if it rains just before harvest. Although the grain may not be fully sprouted, after wetting it swells, and doesn't return to its previous size on drying out. This means the same weight of grain now fills a larger space, or, to put it another way, the same volume of grain weighs less.

Test or **Hectolitre weight** (the weight of 100 litres of grain) is used to assess the specific volume. Hectolitre weights of sound grain usually range between 76 and 84 kg per hectolitre, whereas weather damaged grain can fall as low as 60 kg per hectolitre.

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