

# AWB Wheat Quality Fact Sheet

## Sprouted Grain

### AWB Receival Standards

When visual sprouting is detected, there is a nil tolerance unless the Falling Number of the delivery is assessed. Where the Falling Number is assessed, the visual sprouting limit no longer applies provided that the relevant Falling Number standard is achieved.

The Falling Number minimum standard to be achieved varies for the different milling grades. For Feed grades there is no minimum requirement.

The assessment method used at receival sites depends upon the severity of sprouting and is reliant on the availability of testing equipment.

The Receival Standards require on site load by load testing for Falling Number once visual sprouting has been detected in deliveries to that site, or a nil tolerance is applied for Sprouted Grain in milling grades.

Two alternative procedures for testing Falling Number can be incorporated if Receival Agents choose not to apply the standard procedure.

The first involves the off-site analysis of 500MT running site samples for each milling grade received. The running samples are a composite of individual loads. In this case, deliveries with Sprouted Grain will be accepted up to a set percentage for that grade based on the Falling Number result exceeding a pre-determined minimum. When the Falling Number on a site running sample falls below the minimum, no visually sprouted grain will be accepted.

The second alternative involves conducting on-site testing of 250MT running samples. If the Falling Number of the running sample is at least 20 seconds above the applicable receival standard minimum, then loads containing up to one percent Sprouted Grain will be accepted. In contrast, a Falling Number test will be conducted on individual loads containing greater than one percent Sprouted Grain, or loads that contain any level of visually sprouted grain when the Falling Number of the 250MT running sample is less than 20 seconds above the applicable receival standard minimum.

Note that adoption of one of the above alternative procedures requires the prior written consent of AWB and does not relieve the Receival Agent's primary obligation to comply with the Receival Standards.

### Nature

AWB's definition of Sprouted Grain is when the grain's outer covering of the wheat germ is split. It includes any further advanced stage of growth of the germ. Kernels exhibiting early stages of sprouting are those where the covering of the germ is split but without further development of the shoot. Grains that have had the germ knocked off or scalloped out due to header damage, or grains with pinholes are not considered sprouted.

Relative to sound grain, those that are sprouted are often visibly larger due to swelling from moisture absorption.

While grains with 'pinholes' are not considered sprouted, their presence may indicate the possibility of Sprouted Grain in the sample. Therefore it is recommended that an inspection for Sprouted Grains be conducted.

Grain exhibiting the early stages of sprouting is less noticeable and may only be detected through the use of the Falling Number test. This is the internationally recognised method used to determine the alpha amylase activity of the grain, measured in seconds, which is an indicator of weather damaged grain.

### Cause

Sprouting occurs as a result of rain at harvest time, where moisture penetrates the outer layers of the grain, initiating the germination process. This involves the synthesis and release of enzymes that attack starch, protein and lipid reserves within the grain, rendering it unsuitable for milling purposes. The most destructive of these is alpha amylase that attacks starch.

### Impact

Sprouting can have serious effects on end product quality and customers closely monitor wheat deliveries for Sprouted Grain.

As mentioned earlier, sprouting increases the activity of enzymes that are responsible for breaking down the important building blocks of grain that are vital for all end products. Alpha amylase breaks down the large starch molecules to smaller sugars making them readily available as an energy source to the growing seedling, whilst the enzyme protease breaks down protein. Sprouted Grains therefore contain damaged starch and protein components resulting in the production of poor quality end products.

For example bread made from flour with high enzyme activity will have a very dark crust and a sticky interior, or in severe cases the loaf may have a hollow interior. Noodles made from sprouted wheat will be sticky, and in some cases disintegrate during the cooking process.

### Blending Grain

It is important to note that for all practical purposes blending grain with a low Falling Number with grain having a high Falling Number will always reduce the overall quality of the entire grain parcel, and sometimes with disastrous consequences.

For example if equal portions of grain were blended, one portion having a Falling Number of 200 seconds and the other having a Falling Number of 400 seconds, the overall result for the blended grain would be around 260 seconds, at best. For this reason the blending of parcels of grain even with low levels of sprouting should never be attempted as it is likely to downgrade the value of the overall blend.

### What can be done?

As sprouting is caused by rain at harvest it can be difficult to avoid. With current technology, it is impossible to grade sprouted wheat out of sound wheat. In reality the only action growers can take to minimise the risk of sprouting, is harvesting the crop as soon as it is ready to avoid harvest rainfall. However care must be taken to ensure the grain is fully mature.

Once harvested, grain exposed to moisture may sprout even further, therefore harvested grain must be stored in a manner to ensure moisture ingress does not occur.