AWB Wheat Quality Fact Sheet
Immature Grain

AWB Receival Standards

Immature Grains are included in the definition of "Dry Green, Sappy or Frost Distorted", for which there is a maximum limit of 1% by count for the total of these across the major milling grades. Assessment is conducted on wheat held above a 2mm screen following sieving.

Milling wheat varieties containing over 1% but not exceeding 10% dry green, sappy or frost distorted grains will be downgraded to AGP. Any grain exceeding this will be classified as Feed, where there is no limit.

Nature

AWB Receival Standards include Immature Grains under the broad definition of, Dry Green, Sappy or Frost Distorted grains, "which arise from the harvesting of grain before it has matured, is affected by frost during the maturation phase, affected by or during drying operations, or by any distortion occurring during plant growth due to the use of herbicides. This definition does not include grain pinched as a result of dry conditions or disease during maturation."

Immature Grains are Dry Green or Sappy grains that have a pale green colour and may be shrunken and or shrivelled. The grains often have increased levels of active alpha amylase and protease enzymes. In addition sappy grains, as the name indicates, resemble grain in the milk stage when squeezed.

Note that Frost Affected grains, included in the Receival Standards definition above, are discussed separately in another factsheet.

Cause

The defect occurs during grain filling and is caused by early harvesting or desiccating the crop before the grain is fully mature.

Immature Grains usually occur when there has been a significant amount of secondary growth that has not matured at the same time as the main crop. Affected grains are highly visible in a bulk due to the obvious colour difference.

Impact

The increased activity of alpha amylase and protease enzymes can have a dramatic impact on end product quality. Alpha amylase enzymes break down starches and in extreme cases may convert these to sugar, whilst protease enzymes have the ability to denature proteins.

Both of these factors affect the dough properties of end products resulting in breads that 'flop' after baking and noodles that are sticky.

Customer reaction to the presence of Immature Grains is quite strong due to its potentially serious effects on end products and its high visibility amongst sound grain.

What can be done?

The most effective way to limit the amount of Immature Grains is to avoid early harvesting or desiccating the crop until it is fully mature.

Due to the light weight nature of Immature Grains it may be possible to reduce the levels present in harvested grain by adjusting harvester settings to blow these lighter grains out with the chaff.

During post harvest there may be an opportunity to grade grain (via either a commercial seed cleaner or on-farm) to remove Immature Grains that tend to be smaller and lighter than sound grain. Growers should review their capability and the economic advantages of large scale cleaning of such parcels.