Stored Barley Method

Scope
- Estimate storage life of barley based on sprout damage and storage conditions.
- Quality control.

Rapid Visco Analyser

The Rapid Visco Analyser (RVA) is a cooking stirring viscometer with ramped temperature and variable shear profiles optimized for testing viscous properties. The instrument includes international standard methods as well as full flexibility for customer tailor-made profiles. Combining speed, precision, flexibility and automation, the RVA is a unique tool for product development, quality and process control and quality assurance.
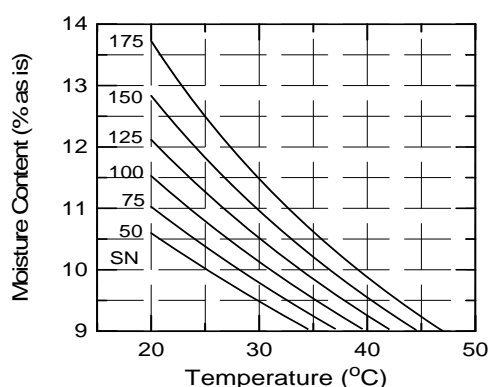
Description

Barley must retain high viability level in storage, typically above 95%, to be accepted for malting. The period that the grain will retain this viability depends on the initial quality of the grain, its variety and the storage time and conditions. In particular, sprout-damaged grain loses viability much more rapidly in storage than sound grain. The RVA Stirring Number test provides a rapid method for assessing sprout damage in malting barley.

The CSIRO in Australia has developed and made available mathematical models of barley storage life based on quantification of the damage level and storage conditions for known varieties. A software package, SAFESTOR, has been developed to allow easy use of these models. This can be used by storage managers to pinpoint potential storage failures before they occur, and take steps to prevent the downgrading.

The SAFESTOR software package is available from Mr Mark Bason, Perten Instruments of Australia. You are required to sign the SAFESTOR agreement before you may use the SAFESTOR software. A copy of the agreement is available from Perten Instruments of Australia.

Fig. 1. Predicted safe storage conditions for barley variety Grimmett with various levels of soundness as indicated by the Stirring Number (SN). Storage period is 15 months. Safe storage conditions lie to the lower left of the relevant lines. Apply a safety margin (e.g. 0.6% moisture or more) on use.

Method

Determine degree of sprout damage using Stirring Number Method and profile shown below. In the SAFESTOR software, enter the variety, moisture content and temperature of the barley lot in storage for which the lifespan estimation is required. Lifespan estimates will be given by the program.

Sample Preparation

4.00 g ground grain at 14% moisture and 25.0 ml distilled water

Profile

Time	Type	Value
00:00:00	Temp	95°C
00:00:00	Speed	960 rpm
00:00:10	Speed	160 rpm
00:03:00	End	
Idle Temperature: 95 ± 1°C		
Time Between Readings: 2 s		

Measure

FV: Final viscosity (cP)

Estimates of lifespan are subject to various sources of error, and should not be considered more accurate than a half to double the estimated figure. A safety margin can be entered to reduce the risk of overestimating the grain lifespan (e.g. by entering a moisture content 0.6% higher, or a temperature 4°C higher, than that of the stored grain). See the SAFESTOR document for more details.

The model can be used to quickly assess the likelihood that stored grain will lose malting quality over the envisaged storage period. It is designed to be used by barley storage managers to allow them to intelligently intervene where storage failures are likely. The intervention options are to load out the barley early, cool the storage, or dry the grain. The model allows quantification of these strategies, that is, how soon the grain must be sold and malted, or target cooling temperatures or drying moistures.