# A Turbidity Test for a Genetic Component of Spirit Yield in Wheat

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## Introduction

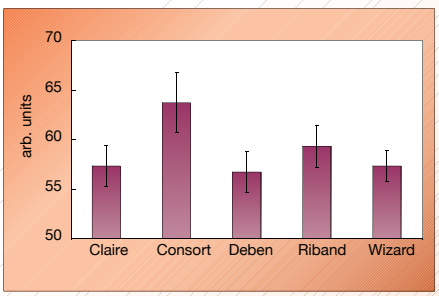
- Turbidity test applied to barley, as possible screen for malting quality
- Starch released more easily from mealy than from steely endosperms
- Feed varieties thus had low turbidity
- The variety Optic had particularly high levels
- Interest in applying a similar test to wheat
- Ease of starch release could be useful distilling character

## Method

- Based on Koliatsou and Palmer (J Am Soc Brew Chem (2003) 61, 114-118)
- Milled and sieved wheat flour shaken with ethanol and allowed to settle
- Top portion is drawn off and extent of light scattering measured
- More starch granules remaining in suspension gives higher turbidity

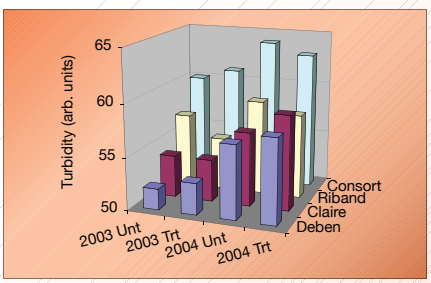
## Initial study

- Varieties from replicated trial at SCRI
- Consort significantly higher than Claire, Deben and Wizard
- Riband not significantly different from other varieties



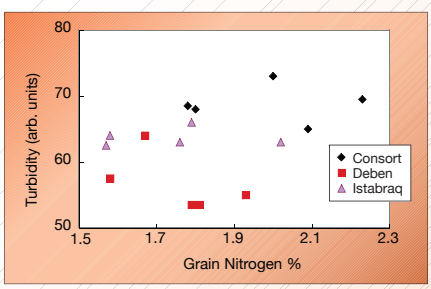

## Effects of treatments and seasons

- 4 varieties, with and without fungicide, over 2 seasons
- There were significant effects of variety and season
- Fungicide treatment had no effect on turbidity
- There was no variety x season interaction
- Consort was the top variety in both years



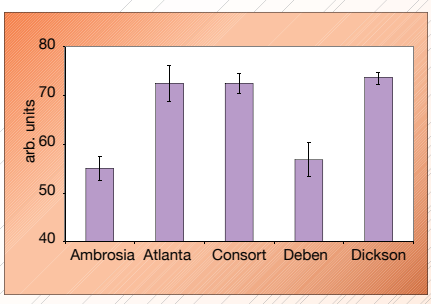

## Effects of site and nitrogen

- Samples from 2003 provided by Scotch Whisky Research Institute
- 5 samples from 3 varieties covering range of sites and N contents
- Differences between sites and, generally, between varieties
- No obvious association between turbidity and N content
- Turbidity appears to be essentially a varietal character




## Extension to further varieties

- Samples from 2004 harvest grown at a number of sites
- Dickson and Atlanta (with Consort as a parent) have high turbidity
- Ambrosia has low turbidity, similar to Deben, but higher spirit yield




## Conclusions

- High turbidity is a characteristic of some good distilling wheat varieties
- It is characteristic of Consort and some of its progeny (but not Wizard)
- Turbidity is unaffected by nitrogen content and fungicide application
- It is modified by seasonal variation, but varietal rankings are constant
- There are, however, other factors that clearly contribute to spirit yield
- Identifying and combining factors would be a useful breeding strategy
- Turbidity would be a useful screening test within such an approach