Grain Quality Testing

New services offered through UVM Extension

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Grain Evaluation

Most common measures used by mills and bakers:
- Mycotoxin (DON) content
- % Moisture
- Test Weight
- Falling Number
- Grain Protein
% Moisture

- Moisture content is the essential first step.
  - Subsample (minibatt)
  - Bite test

- Determines time of harvest.
Moisture

* % moisture is used for other grain quality tests.

* Moisture content is crucial in grain storability.

-Wheat or flour with a moisture content higher than 14.5% attracts mold, bacteria, and insects.
Test Weight

- Test weight is recorded as pounds per bushel.

**Standard bushel weights:**

- Wheat = 60 lbs/bu
- Barley = 48 lbs/bu
- Oats = 32 lbs/bu
- Rye = 56 lbs/bu

- Test weight gives an indication of the milling yield
- A low test weight = lower volume of usable flour
- A high test weight = high flour extraction
Falling number analysis is an indicator of kernel germination (sprouting) and the resulting increases in alpha amylase activity.

- Alpha amylase, an enzyme breaks down starch to sugar.
- As the amount of enzyme activity increases, the falling number decreases.

- ↑ 300 seconds = good
- ↓ 200 seconds = bad
HOW THE FALLING NUMBER MACHINE WORKS
Effects of a Low Falling Number:

**Bread**
- It can reduce mixing strength
- Cause sticky dough
- Affect loaf volume and shelf life

**Pasta**
- Reduce shelf life
- Increase cooking loss
- Produce softer cooked pasta
Importance of Crude Protein

Protein content is a **KEY** specification for wheat and flour purchasers.

- Affects processing properties:
  - Water absorption
  - Gluten strength
  - Texture
  - Appearance
Testing Equipment

Elemental Analyzer (CHN)

Near Infrared Reflectance (NIR) Spectroscopy
Grain Crude Protein (CP)

* 8.5 - 10% CP = pastry & crackers
  Soft wheat varieties

* 10 - 15% CP = pan & hearth breads
  Hard wheat varieties
Sample Submission Form

Cereal Grain Quality Evaluation
Sample Submission Form

Cereal Grain Quality Laboratory
University of Vermont
James M. Jeffords Building
Corrigan Dr.
Burlington, VT 05405

Office: 802-540-6101
Fax: 802-540-6092
E-mail: croupl@vt.edu

Contact us about testing outside the dates above.

*Please submit one Sample Submission Form with each sample to be analyzed.

<table>
<thead>
<tr>
<th>Farm/Company Name</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Contact</td>
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<tr>
<td>Address</td>
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<td>City, State, Zip</td>
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Are you a member of the Northern Grain Growers Association? YES or NO

Sample Description (circle one):
□ Spring Wheat □ Winter Wheat □ Durum □ Barley
□ Oats □ Triticale □ Rye □ Other (please specify):

Analysis Required

<table>
<thead>
<tr>
<th>NGGA Member Cost per Sample (USD)</th>
<th>Non-Members Cost per Sample (USD)</th>
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<tbody>
<tr>
<td>Test Weight (lbs/bu):</td>
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<tr>
<td>Grain Moisture (%):</td>
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<tr>
<td>Whole Grain Protein by NIR (%):</td>
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<td>Ash Content (%):</td>
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<td>Falling Number:</td>
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<td>All of the above:</td>
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<td>Mycotoxin (DON):</td>
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* Please submit a quart of whole grain for each sample submitted. Please do not send flour.
**Prices are based on analyzing a clean sample. Grain samples with stones and dirt will not be accepted.
Special instructions or comments:

Please make checks payable to UVM Extension. 
Become a NGGA member today! For more information on becoming a member check out www.northerngrowers.org

Prices are good through December 2010.
QUESTIONS???