2009 Harvest
U.S. PACIFIC NORTHWEST
Soft White Wheat Quality Report

This project is funded by the wheat commissions of Idaho, Oregon, and Washington, Wheat Marketing Center, Inc., and U.S. Wheat Associates.
Pacific Northwest soft white wheat is known for its white bran, low moisture content, and weak dough strength characteristics. Soft white wheat is well suited for products such as cakes, pastries, cookies, crackers, pancakes, sponge cakes, snack foods, flat breads, and steamed breads.

The soft white wheat class includes the subclasses of white club wheat and western white wheat. White club wheat has very weak gluten characteristics. Western white wheat is a blend of the white club wheat subclass and soft white wheat. The amount of white club wheat in western white wheat ranges from 10 to 90 percent. The minimum percentage of white club wheat in western white wheat is 10 percent and any higher amounts are contract specifications that are negotiated between the buyer and seller.

### Wheat Growing Areas of the Pacific Northwest

#### Wheat Production Zones

**2009 Soft White and White Club Wheat Production**

By production zone

<table>
<thead>
<tr>
<th>Production Zone</th>
<th>Million Metric Tons (MMT)</th>
<th>Million Bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Central</td>
<td>1.36</td>
<td>50.0</td>
</tr>
<tr>
<td>Northeast</td>
<td>1.64</td>
<td>60.3</td>
</tr>
<tr>
<td>Central</td>
<td>1.17</td>
<td>43.0</td>
</tr>
<tr>
<td>Southeast</td>
<td>0.68</td>
<td>25.0</td>
</tr>
<tr>
<td>Southwest</td>
<td>0.21</td>
<td>7.7</td>
</tr>
<tr>
<td>Northwest</td>
<td>0.01</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5.07</strong></td>
<td><strong>186.3</strong></td>
</tr>
</tbody>
</table>

Wheat production estimates courtesy of Washington Wheat Commission during the winter and early spring. Generally cool temperatures prevailed early in the growing season with some limited periods of high temperatures. Dry conditions prevailed during the wheat harvest with some localized rain showers.

### Wheat Samples

At harvest, National Agricultural Statistics Service collected 354 soft white wheat and 54 white club wheat samples this year, based on wheat production. Federal Grain Inspection Service (FGIS) graded each sample. Wheat Marketing Center conducted wheat, flour, and finished product tests on composites based on production zones and protein levels. The major soft white wheat varieties were Eltan, Stephens, ORCF102, Louise, and Brundage.

**Weather**

The Pacific Northwest had dry conditions at planting. Most of the wheat production area received adequate rainfall.

### Wheat Production Zones

U.S. soft white wheat is grown in the Pacific Northwest, which includes the states of Idaho, Oregon, and Washington.
<table>
<thead>
<tr>
<th>Production Zone</th>
<th>Wheat Quality</th>
<th>Flour Quality</th>
</tr>
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<tbody>
<tr>
<td><strong>North Central</strong></td>
<td>1.22 MMT</td>
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</tr>
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<td>Soft White Wheat Estimated Production = 1.22 MMT</td>
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</tr>
<tr>
<td>2008 Average</td>
<td>74.1 0.42 9.0 92.4 1.28 7.4 23.3 389 629</td>
<td>14.9 319 472</td>
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<tr>
<td>2009 Average</td>
<td>74.1 0.42 9.0 92.4 1.28 7.4 23.3 389 629</td>
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<td>3 Year Average</td>
<td>74.1 0.42 9.0 92.4 1.28 7.4 23.3 389 629</td>
<td>14.9 319 472</td>
</tr>
<tr>
<td>Northeast</td>
<td>1.22 MMT</td>
<td>1.22 MMT</td>
</tr>
<tr>
<td>South White Wheat Estimated Production = 1.11 MMT</td>
<td>1.11 MMT</td>
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</tr>
<tr>
<td>2008 Average</td>
<td>74.1 0.42 9.0 92.4 1.28 7.4 23.3 389 629</td>
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**Production Zone**
- 1SWH
- 2SWH
- 3SWH

**Wheat Quality**
- Production = Estimated Wheat
- Wheat Grade
- Test Dockage
- Protein
- Extraction

**Flour Quality**
- Production = Estimated Wheat
- Flour Yield
- Flour Ash
- Flour Protein
- L* a* b* Color

**Zone**
- Central
- Northeast
- Southwest
- Northwest

**Production Period**
- 2008
- 2009
- 3 Year Average

**Production Values**
- MMT: Million Metric Tons
- %: Percentage
- lb/bu: Pounds per Bushel

**Quality Parameters**
- Moisture
- Amylograph
- Protein
- Yield
- Ash
- falling number
- Whole falling number
- Amylograph Peak
- Whiteness

**Assessment**
- 1SWH
- 2SWH
- 3SWH

**Evaluation Notes**
- Wheat quality and flour quality parameters are evaluated across different production zones and years, focusing on key metrics like protein percentage, extraction, flour yield, and color characteristics. The data is representative of 3-year average production for a detailed analysis of trends and performance across various zones and production years.
### Wheat Production

<table>
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<tr>
<th>Production Zone</th>
<th>Soft White Wheat Estimated Production = 1.22 MMT</th>
<th>Soft White Wheat Estimated Production = 1.62 MMT</th>
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<tbody>
<tr>
<td>North Central</td>
<td>8.8 9.4 8.0 1.0 119 53 1.9 66</td>
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</tr>
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<td>Central</td>
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</tr>
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<td>White Club Wheat</td>
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### Physical Dough Properties

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<tr>
<th>Production Zone</th>
<th>Hard Red Spring Wheat Estimated Production = 1.11 MMT</th>
<th>Hard Red Winter Wheat Estimated Production = 0.68 MMT</th>
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### Finished Products

<table>
<thead>
<tr>
<th>Production Zone</th>
<th>Wheat Protein Ranges %</th>
<th>Sugar Snap Cookie Spread cm</th>
<th>Sponge Cake Volume cc</th>
<th>Chinese Southern Type Steamed Bread Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Central</td>
<td>8.5-9.4 8.0 1.0 119 53 1.9 66</td>
<td>8.4 8.4 2.0</td>
<td>1211 61</td>
<td>1.90 62</td>
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<td>Northeast</td>
<td>&lt;8.5 8.0 1.0 119 53 1.9 66</td>
<td>8.5-9.4 8.0 1.0 119 53 1.9 66</td>
<td>10.5-12.0 8.0 8.0 1.0 1127 51</td>
<td>2.12 71</td>
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<td>2.53 68</td>
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<td>White Club Wheat</td>
<td>Estimated Production = 0.22 MMT</td>
<td>8.2 8.2 2.0</td>
<td>1177 52</td>
<td>2.17 67</td>
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### Graphs

- **PHYSICAL DOUGH PROPERTIES**
  - **FARINEGRAPH**
    - 14% mb, 24% mb, and 32% mb absorption levels
  - **ALIVEOGRAPH**
    - 48% mb, 60% mb, and 72% mb protein levels
  - **3 YEAR AVERAGE**
    - 66% mb protein levels

- **FINISHED PRODUCTS**
  - **SPREAD cm**
    - 80% mb protein levels
  - **SPREAD Factor / weight / height**
    - 50% mb protein levels
  - **TOP GRAIN Score**
    - 60% mb protein levels
  - **CHINESE SOUTHERN Type Steamed Bread**
    - 70% mb protein levels
**Farinograph**

PNW Soft White Wheat Farinograph Stability
3 Year Averages by Production Zone

- 2007
- 2008
- 2009

- <8.5% Wheat Protein Range
- 8.5–9.4% Wheat Protein Range
- 9.5–10.4% Wheat Protein Range
- 10.5–12.0% Wheat Protein Range
- >12.0% Wheat Protein Range

**Alveograph**

PNW Soft White Wheat Alveograph “W” Value
3 Year Averages by Production Zone

- 2007
- 2008
- 2009

- <8.5% Wheat Protein Range
- 8.5–9.4% Wheat Protein Range
- 9.5–10.4% Wheat Protein Range
- 10.5–12.0% Wheat Protein Range
- >12.0% Wheat Protein Range

White Club Wheat
### Amylograph

**PNW Soft White Wheat Amylograph Peak Viscosity**

3 Year Averages by Production Zone

- **North Central Production Zone**
- **Northeast Production Zone**
- **Central Production Zone**
- **Southeast Production Zone**
- **Southwest Production Zone**

### Sponge Cake

**PNW Soft White Wheat Sponge Cake Volume**

3 Year Averages by Production Zone

- **North Central**
- **Northeast**
- **Central**
- **Southeast**
- **Southwest**

- **<8.5%**
- **8.5–9.4%**
- **9.5–10.4%**
- **10.5–12.0%**
- **>12.0%**

- **2007**
- **2008**
- **2009**

- **cubic centimeters (cc)**
SUMMARY
These results were from composite samples of the Pacific Northwest soft white wheat and white club wheat harvest. Composite samples were prepared by production zones and protein levels. These composite samples were analyzed for wheat and flour quality, physical dough properties, and finished product characteristics. Harvest information is summarized as follows:

**Wheat Quality**
Wheat data indicated higher test weights at most protein levels in most production zones when compared to the 2008 averages. Lower dockage levels were evident in all soft white wheat production zones. In general, low wheat moisture at less than 10 percent prevailed in the major wheat producing zones of North Central and Central. Average falling number values in North Central, Northeast, Central, Southeast, and Southwest production zones were greater than 300 seconds at most protein ranges. Lower wheat ash contents were present in the Northeast and Southwest production zones. Wheat samples from North Central and Northeast production zones had higher thousand kernel weights when compared to last year.

**Flour Quality**
Flour quality parameters indicated higher wet gluten contents in wheat samples with higher protein levels. Falling number values were greater than 300 seconds at all protein ranges.

**Physical Dough Properties**
Physical dough property tests indicated generally lower water absorption and weaker gluten strength, as measured by the farinograph, in samples with lower protein content. Longer gluten extensibility, as shown by alveograph L values, was observed in samples, with higher protein content.

White club wheat had weaker gluten strength than soft white wheat, as indicated by alveograph W values.

**Finished Products**
Within a production zone, lower protein samples made better sugar snap cookies. Average sponge cake volumes were higher in samples from the North Central, Northeast, Southeast, and Southwest production zones. Steamed bread specific volumes generally increased with increasing protein content.