Section 3: Milling and Baking Quality

Milling and baking quality of wheat lines grown in the 2004-2005 Virginia Tech Wheat Test were assessed by the USDA-ARS Soft Wheat Quality Laboratory (SWQL) in Wooster, Ohio (Table 31). Quality evaluations were conducted using 3,000 gram seed samples from wheat lines grown at the War saw, Va., test site. The data presented here are for a single location and, therefore, are not a definitive measure of a given wheat line’s milling and baking quality. Quality varies from location to location and from year to year; therefore, data from multiple years and locations are needed to accurately define quality of a given wheat line. While wheat lines are listed in the table from highest to lowest “Milling Quality,” this parameter alone is not indicative of end-use quality, which relates to a cultivar’s suitability for use in manufacturing a vast array of products requiring flour with specific and diverse quality characteristics.

Milling and baking quality of wheat lines were compared to that of the check cultivar Sisson. On the basis of eight previous independent Allis-Chalmers milling-quality evaluations by the SWQL, Sisson scored a 70.7 for milling quality. The evaluation based on the 2005 crop yielded a score of 65.9 for Sisson. In comparison, SS-MPV 57 scored substantially higher than previously, 85.2 compared to 75.2, based on two evaluations. Pastry-baking quality of both cultivars is below average but acceptable. Lines receiving milling scores of “A” or “B” have statistically better milling scores than Sisson. Wheat lines receiving milling or baking quality scores below “D” may have questionable milling quality and/or baking quality for pastry products, such as cookies.

Milling-quality scores of released cultivars ranged from 85.2 for SS-MPV 57 to 58.7 for Coker 9553 with 13 cultivars and seven experimental lines having similar or better milling quality than Sisson (score ≥ 65.9). Baking-quality scores for released cultivars ranged from a high of 78.2 for SS 8404 to a low of 37.5 for USG 3209 compared to Sisson at 50.5. Flour yields among released cultivars ranged from a high of 78.9 percent for Pioneer Brand 26R31 to a low of 76.2 percent for Coker 9553, compared to 76.9 percent for Sisson. Cookie diameters of released cultivars ranged from a low of 16.43 cm for USG 3209 to a high of 17.65 cm for SS 8404, compared to 16.82 cm for Sisson.

Among released cultivars, flour protein concentration varied from 8.54 percent for SS 520 to 10.04 percent for USG 3342, compared with 8.50 percent for Sisson. Protein quality, specifically gluten strength, based on Lactic Acid Solvent Retention Capacity varied from a high of 116.7 for Renwood 3260 to a low of 74.9 for USG 3342, compared to 88.6 for the check cultivar Sisson. Lines having lower Lactic Acid scores would produce a dough having weak gluten strength and more suitable for pastry products, while lines having higher Lactic Acid scores such as Renwood 3260 would produce a dough having stronger gluten strength and more suitable for cracker or certain bread products.
### Table 31. Milling and baking quality of entries in the Virginia Tech Wheat Test based on evaluations of the 2005 harvest.

<table>
<thead>
<tr>
<th>Line</th>
<th>Historical Milling Quality Score</th>
<th>No. Tests</th>
<th>Milling Quality Score</th>
<th>Baking Quality Score</th>
<th>Straight Grade Flour Yield</th>
<th>Break Flour Yield</th>
<th>Softness Endosperm Separation %</th>
<th>Flour Protein %</th>
<th>Cookie Diameter CM</th>
<th>Lactic Acid Adj. 9% Prot.</th>
</tr>
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<tbody>
<tr>
<td>VA01W-205</td>
<td>77.2</td>
<td></td>
<td>83.8</td>
<td>A</td>
<td>77.7</td>
<td>32.7</td>
<td>8.8</td>
<td>8.49</td>
<td>17.82</td>
<td>103.7</td>
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<tr>
<td>VA03W-409</td>
<td>74.7</td>
<td></td>
<td>61.5</td>
<td>C</td>
<td>77.7</td>
<td>32.3</td>
<td>8.9</td>
<td>8.65</td>
<td>17.15</td>
<td>84.6</td>
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<tr>
<td>VA03W-412</td>
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<td>49.2</td>
<td>E</td>
<td>77.1</td>
<td>30.6</td>
<td>9.1</td>
<td>9.01</td>
<td>*</td>
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<td>VA02W-370</td>
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<td>46.5</td>
<td>E</td>
<td>76.8</td>
<td>27.8</td>
<td>9.9</td>
<td>9.51</td>
<td>*</td>
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<td></td>
<td>36.5</td>
<td>F</td>
<td>76.5</td>
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<td>*</td>
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(cont.)