2015 Hard Red Wheat / Hard White Wheat

Crop Quality Report
California Wheat

California’s wheat growing regions are defined by climate, value of alternative crops, and distinct differences in variety selection.

Five of the six wheat classes grown in the United States are produced in California, with Hard Red wheat accounting for nearly 70% of planted acres this year.

Consistent with prior years, the 2015 crop had high protein, low moisture, high flour extraction, and strong baking performance — all of which make California wheat very good for blending.

Most California hard wheat is planted from October to January and harvested in the months of June and July. With the strong demand for new crop wheat in the domestic marketplace, importers are encouraged to express their interest in purchasing California wheat in early spring. For Hard White wheat, buyers should consider communicating with grain handlers and contracting for acres before planting time.

California hard wheat varieties are known for their low moisture and large and uniform kernel size. Because wheat is predominantly grown under irrigation, growers achieve high yields and consistent quality.

2015 Crop Conditions
California experienced a fourth consecutive year of drought. The record warm winter resulted in the lowest snow pack in 500 years. A high percentage of wheat was again cut for non grain purposes in 2015.

Data in this Report
Samples for this year’s report were collected from grain handlers and producers around the state. This program collects samples throughout the harvest season, resulting in a crop quality report that is highly representative of the crop. Grade information is provided by the Federal Grain Inspection Service.

Milling and end-use quality analysis was conducted by the California Wheat Commission Laboratory.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>METRIC TONS (1,000 MT's)</th>
<th>SHORT TONS (1,000 ST's)</th>
</tr>
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<tbody>
<tr>
<td>2015</td>
<td>336</td>
<td>370</td>
</tr>
<tr>
<td>2014</td>
<td>392</td>
<td>432</td>
</tr>
<tr>
<td>2013</td>
<td>751</td>
<td>828</td>
</tr>
<tr>
<td>2012</td>
<td>706</td>
<td>778</td>
</tr>
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<td>2011</td>
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</tr>
<tr>
<td>2009</td>
<td>743</td>
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*All common wheat (excluding Durum).
## 2015 HARD RED WINTER (COMPOSITE AVERAGE)

<table>
<thead>
<tr>
<th></th>
<th>High Protein (12.5 &amp; Above)</th>
<th>Intermediate Protein (11.0-12.4%)</th>
<th>Low Protein (10.9 &amp; Below)</th>
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<tbody>
<tr>
<td><strong>WHEAT</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Protein (12% MB)</td>
<td>13.2</td>
<td>11.9</td>
<td>10.3</td>
</tr>
<tr>
<td>Protein (Dry Basis)</td>
<td>15.0</td>
<td>13.5</td>
<td>11.7</td>
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<tr>
<td>Protein (As-Is)</td>
<td>13.7</td>
<td>12.3</td>
<td>10.5</td>
</tr>
<tr>
<td>Ash (14% MB)</td>
<td>1.41</td>
<td>1.42</td>
<td>1.44</td>
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<tr>
<td>Ash (Dry Basis)</td>
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<td>1.65</td>
<td>1.67</td>
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<td>Ash (As-Is)</td>
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<tr>
<td>Moisture</td>
<td>8.2</td>
<td>9.0</td>
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<tr>
<td>Falling Number (sec)</td>
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<td>374</td>
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### Test Weight

<table>
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<tr>
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<th>kg/hl</th>
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<tr>
<td>Protein (12% MB)</td>
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<td>Protein (Dry Basis)</td>
<td>63.9</td>
<td>84.0</td>
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<td>Protein (As-Is)</td>
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<td>82.3</td>
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<td>Ash (14% MB)</td>
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<tr>
<td>Ash (Dry Basis)</td>
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<td>Ash (As-Is)</td>
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<tr>
<td>SKCS Hardness Score</td>
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<tr>
<td>1000 Kernel Weight (g)</td>
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### Kernel Size Distribution

<table>
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<tr>
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<tr>
<td>Protein (12% MB)</td>
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<tr>
<td>Wet Gluten (14% MB)</td>
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### FLOUR

<table>
<thead>
<tr>
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<th>Lab Mill Yield (%)</th>
<th>Protein (14% MB)</th>
<th>Protein (Dry Basis)</th>
<th>Ash (14% MB)</th>
<th>Ash (Dry Basis)</th>
<th>Gluten Index</th>
<th>Wet Gluten (14% MB)</th>
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<td>0.42</td>
<td>0.49</td>
<td>98.4</td>
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### FARINOGRAPH

<table>
<thead>
<tr>
<th></th>
<th>Peak Time (min)</th>
<th>Stability (min)</th>
<th>Absorption (%)</th>
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<tbody>
<tr>
<td></td>
<td>17.9</td>
<td>22.9</td>
<td>65.4</td>
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<tr>
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<td>15.2</td>
<td>18.5</td>
<td>64.9</td>
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<tr>
<td></td>
<td>12.8</td>
<td>21.9</td>
<td>64.5</td>
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<td></td>
<td>11.8</td>
<td>23.7</td>
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<td>4.6</td>
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### BAKING RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Baking Absorption*</th>
<th>Bread Volume (cc)</th>
<th>Crumb Grain &amp; Texture</th>
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<tr>
<td></td>
<td>66</td>
<td>960</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>946</td>
<td>8</td>
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<tr>
<td></td>
<td></td>
<td>915</td>
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</tr>
<tr>
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<td></td>
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<td>785</td>
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Wheat samples were collected by handlers. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec. Lab mill yield: Brabender Quadromat Sr. Mill, modified in 1997. Bread Volume: AACC Method 10-10B. Falling number test performed with FOSS Alphatec. Test weight conversion from lb/bu to kg/hl according to FGIS PN-97-5, (1.292 x lb/bu) + 1.419. *Baking absorption test was added this year.
### 2015 HARD RED VARIETY SPECIFIC INFORMATION

<table>
<thead>
<tr>
<th>WHEAT</th>
<th>CAL ROJO</th>
<th></th>
<th>JOAQUIN</th>
<th></th>
<th>WB-JOAQUIN ORO</th>
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<tbody>
<tr>
<td></td>
<td>High Protein</td>
<td>Intermediate Protein</td>
<td>High Protein</td>
<td>Intermediate Protein</td>
<td>High Protein</td>
<td></td>
</tr>
<tr>
<td>Protein (12% MB)</td>
<td>12.7</td>
<td>11.5</td>
<td>13.2</td>
<td>12.1</td>
<td>14.2</td>
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<tr>
<td>Protein (Dry Basis)</td>
<td>14.4</td>
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<td>Protein (As-Is)</td>
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<td>14.0</td>
<td>12.8</td>
<td>15.1</td>
<td></td>
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<tr>
<td>Ash (14% MB)</td>
<td>1.30</td>
<td>1.40</td>
<td>1.40</td>
<td>1.41</td>
<td>1.44</td>
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<tr>
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<td>1.62</td>
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<td>Ash (As-Is)</td>
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<tr>
<td>Moisture</td>
<td>9.7</td>
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<tr>
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<td>330</td>
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<td>390</td>
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### Test Weight

<table>
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<th>JOAQUIN</th>
<th>WB-JOAQUIN ORO</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb/bu</td>
<td>62.6</td>
<td>64.6</td>
<td>64.5</td>
</tr>
<tr>
<td>kg/hl</td>
<td>82.3</td>
<td>84.8</td>
<td>83.3</td>
</tr>
<tr>
<td>SKCS Hardness Score</td>
<td>68</td>
<td>58</td>
<td>47</td>
</tr>
<tr>
<td>1000 Kernel Weight (g)</td>
<td>39.6</td>
<td>47.3</td>
<td>41.0</td>
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### Kernel Size Distribution

<table>
<thead>
<tr>
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<th>CAL ROJO</th>
<th>JOAQUIN</th>
<th>WB-JOAQUIN ORO</th>
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<tbody>
<tr>
<td>Large</td>
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<td>96</td>
<td>90</td>
</tr>
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<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Small</td>
<td>0</td>
<td>0</td>
<td>0</td>
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### FLOUR

<table>
<thead>
<tr>
<th></th>
<th>CAL ROJO</th>
<th>JOAQUIN</th>
<th>WB-JOAQUIN ORO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Mill Yield (%)</td>
<td>70.4</td>
<td>72.5</td>
<td>70.5</td>
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<tr>
<td>Protein (14% MB)</td>
<td>11.3</td>
<td>13.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Protein (Dry Basis)</td>
<td>13.0</td>
<td>13.8</td>
<td>14.9</td>
</tr>
<tr>
<td>Ash (14% MB)</td>
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<td>0.32</td>
<td>0.30</td>
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<tr>
<td>Ash (Dry Basis)</td>
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<td>0.37</td>
<td>0.35</td>
</tr>
<tr>
<td>Gluten Index</td>
<td>99.6</td>
<td>91.4</td>
<td>74.9</td>
</tr>
<tr>
<td>Wet Gluten (14% MB)</td>
<td>27.2</td>
<td>34.7</td>
<td>39.6</td>
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### FARINOGRAPH

<table>
<thead>
<tr>
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<th>CAL ROJO</th>
<th>JOAQUIN</th>
<th>WB-JOAQUIN ORO</th>
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<tbody>
<tr>
<td>Peak Time (min)</td>
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<tr>
<td>Stability (min)</td>
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<tr>
<td>Absorption (%)</td>
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<td>70.7</td>
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### BAKING RESULTS

<table>
<thead>
<tr>
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<th>CAL ROJO</th>
<th>JOAQUIN</th>
<th>WB-JOAQUIN ORO</th>
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</thead>
<tbody>
<tr>
<td>Baking Absorption*</td>
<td>61</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>Bread Volume (cc)</td>
<td>960</td>
<td>946</td>
<td>1024</td>
</tr>
<tr>
<td>Crumb Grain &amp; Texture</td>
<td>9</td>
<td>9</td>
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*Baking absorption test was added this year.
## 2015 HARD RED VARIETY SPECIFIC INFORMATION

<table>
<thead>
<tr>
<th>WHEAT</th>
<th>SUMMIT 515</th>
<th>WB9112</th>
<th>WB9229</th>
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<tbody>
<tr>
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<td>High</td>
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<td>Protein (12% MB)</td>
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<tr>
<td>Protein (Dry Basis)</td>
<td>14.7</td>
<td>13.6</td>
<td>14.5</td>
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<tr>
<td>Protein (As-Is)</td>
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<td>13.6</td>
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<tr>
<td>Ash (14% MB)</td>
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<td>1.41</td>
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<td>Ash (As-Is)</td>
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<tr>
<td>Moisture</td>
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### Test Weight

<table>
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<td>lb/bu</td>
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<td>kg/hl</td>
<td>82.4</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>SKCS Hardness Score</td>
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<td>76</td>
<td>72</td>
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<tr>
<td>1000 Kernel Weight (g)</td>
<td>39.5</td>
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### Kernel Size Distribution

<table>
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</tr>
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### FLOUR

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<th>WB9229</th>
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<td>70.6</td>
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<td>Protein (14% MB)</td>
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<td>0.34</td>
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<td>Ash (Dry Basis)</td>
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<td>88.5</td>
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<td>94.9</td>
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<tr>
<td>Wet Gluten (14% MB)</td>
<td>32.5</td>
<td>29.4</td>
<td>33.6</td>
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### FARINOGRAPH

<table>
<thead>
<tr>
<th></th>
<th>SUMMIT 515</th>
<th>WB9112</th>
<th>WB9229</th>
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<tbody>
<tr>
<td>Peak Time (min)</td>
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<td>9.4</td>
<td>23.8</td>
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<tr>
<td>Stability (min)</td>
<td>20.2</td>
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<td>24.4</td>
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<tr>
<td>Absorption (%)</td>
<td>64.2</td>
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<td>67.0</td>
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### BAKING RESULTS

<table>
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<tr>
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<th>SUMMIT 515</th>
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<th>WB9229</th>
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<tbody>
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<td>Baking Absorption*</td>
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<td>65</td>
<td>67</td>
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<tr>
<td>Bread Volume (cc)</td>
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<td>927</td>
<td>960</td>
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<tr>
<td>Crumb Grain &amp; Texture</td>
<td>8</td>
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*Baking absorption test was added this year.
## Varietal Descriptions

**Cal Rojo (HRW)** is a widely adapted, high yielding variety for both the San Joaquin and Sacramento Valleys. It is mid-early maturing and receives high scores for grain, milling, and baking quality.

**Joaquin (HRW)** is adapted to the San Joaquin Valley and has high protein and test weight with excellent milling and baking properties.

**WB-Joaquin Oro (HRW)** is adapted to the San Joaquin Valley and has high protein and test weight with excellent milling and baking properties, similar to the variety Joaquin. In addition, WB-Joaquin Oro carries two genes for stripe rust resistance, one of which is effective against all current races.

**Summit 515 (HRW)** is a variant of the variety Summit with two effective genes for stripe rust resistance added by marker assisted selection. Summit 515 has very high yield potential in both the San Joaquin and Sacramento Valleys.

**WB9229 (HRW)** is adapted to both the San Joaquin and Sacramento Valleys. It has medium to high protein and test weight and has excellent milling and baking properties. It is moderately resistant to Septoria and is resistant to the current races of stripe rust.

**Blanca Grande 515 (HW)** is a variant of the variety Blanca Grande, with two effective genes for stripe rust resistance added by marker assisted selection. Blanca Grande 515 has excellent end-use quality and high yielding ability in both the San Joaquin and Sacramento Valleys.

**Patwin 515 (HW)** is a high yielding variety with high protein levels, and adapted to both the Sacramento and San Joaquin Valleys. Patwin 515 is a variant of Patwin with the addition of stripe rust resistance genes Yr5 and Yr15.

**WB7618 (HW)** is most adapted to the Sacramento Valley. WB7618 has excellent protein and excellent milling and baking properties. It has excellent standability, and is moderately resistant to both Septoria and the current races of stripe rust.

### HARD RED WHEAT GRADE HARVEST DATA

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<tbody>
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<td>Shrunken/Broken* (%)</td>
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<td>MWVI (%)</td>
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Harvest year = Calendar year. *Total Screenings are those factors represented on the grade certificate that are cleaned out in the flour mill. Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5, (1.292 x lb/bu) + 1.419. Net Wheat = (100%-(FM+SHBN+Dockage)) x (100%-Moisture)/100%. Clean, Tempered Wheat (CTW%) = (100%-(FM+SHBN+Dockage)) x (100%-Moisture)/(100%-16% (temper moisture)). Millable Wheat Value Index (MWVI) = 100%/CTW.
## 2015 HARD WHITE VARIETY SPECIFIC INFORMATION

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<tr>
<th>WHEAT</th>
<th>Blanca Grande 515*</th>
<th>Patwin 515</th>
<th>WB7618</th>
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<tr>
<td></td>
<td>High Protein</td>
<td>High Protein</td>
<td>Intermediate Protein</td>
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<td>Protein (As-Is)</td>
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<td>Ash (14% MB)</td>
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<td>Moisture</td>
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<td>Falling Number (sec)</td>
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### Test Weight

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### Kernel Size Distribution

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### FLOUR

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### FARINOGRAPH

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### BAKING RESULTS

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<th>Bread Volume (cc)</th>
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<td></td>
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<tr>
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For protein ranges not indicated, please contact the California Wheat Commission. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec.


*Limited samples available for testing. Call the California Wheat Commission for more information. **Baking absorption test was added this year.
The California Wheat Commission laboratory has the equipment necessary for evaluation of common and durum wheat milling quality, flour chemical analysis, physical dough testing, semolina analysis, bake and noodle production tests, and pasta analysis.

The Commission’s staff is available to work with customers in the area of quality assurance, product development, problem solving, quality control training, and research. California Wheat Commission’s Lab Test Order Form of laboratory services is available on the California Wheat Commission website, please use when requesting services.

Customer Assistance and Support

The Commission is available to answer technical questions about California’s wheat quality, including recommendations for blending and appropriate end-use. The Commission conducts specialized training programs in milling, baking, semolina, pasta, and quality control. These specific programs may be customized to meet the customers’ needs.

Crop and Export Survey

California produces five of the six classes of U.S. wheat: Hard Red Winter (HRW), Desert Durum®, Hard White, Soft White and Hard Red Spring. While HRW, Hard White, and Durum are the predominately produced and exported classes, information and contacts for all the above classes of wheat are available by contacting the Commission office. Every effort is made to provide an accurate assessment of quality to buyers. With greater amounts of wheat being sold by variety, varietal specific information is emphasized in Commission surveys.

Variatel Development

Private and public breeding programs play an important role in the development of new varieties available to California wheat producers. The Commission analyzes hundreds of samples each year to support these programs and encourages the release of new varieties that will meet the customers’ needs. New varieties are evaluated by commercial mills through the California Wheat Collaborator program.

Research

The Commission laboratory is available for flour, semolina, milling, end-product, and new-product research. Technical expertise is available in hearth breads, pasta, Asian food products, standard loaf bread, steamed bread, Asian noodles, cookies, tortillas and Middle Eastern flatbreads.