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Wheat Letter

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U.S. Wheat Associates (USW) is the industry's market development organization working in more than 100 countries. Its mission is to "develop, maintain and expand international markets to enhance the profitability of U.S. wheat producers and their customers." USW activities are funded by producer checkoff dollars managed by 19 state wheat commissions and USDA Foreign Agricultural Service cost-share programs. For more information, visit www.uswheat.org or contact your state wheat commission. Stakeholders may reprint original articles from *Wheat Letter* with source attribution. Click [here](#) to subscribe or unsubscribe to *Wheat Letter*.

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USW Crop Quality Reports: <http://www.uswheat.org/cropQuality>

1. **Markets Focus on Quality and Southern Hemisphere Crop Conditions**

By Stephanie Bryant-Erdmann, USW Market Analyst

With harvest finished in most Northern Hemisphere countries, all eyes are turning toward crop quality reports for wheat from those countries and crop development in Australia and Argentina – the largest Southern Hemisphere wheat exporters.

Quality Reports

United States: The annual USW Crop Quality booklet is now available in [English](#), [Spanish](#) and [French](#) on the www.uswheat.org website on the Crop Quality page in the Market & Crop Information menu. USW also featured by-class quality updates in *Wheat Letter*, including the [hard red spring \(HRS\)](#), [soft red winter \(SRW\)](#), and summaries for hard red winter (HRW), soft white (SW) and northern durum in this issue.

Canada: In its October "Principle Field Crops" report, Agriculture and Agri-Food Canada (AAFC) reported that harvest delays in Western Canada from excessive moisture, and in some cases, snow, continue to

hurt wheat and durum quality. On Oct. 12, Canada Grains Commission (CGC) reported 20 percent of the tested Canadian Western Red Spring (CWRS) samples were No. 1 CWRS, compared to 45 percent in 2015/16. Twenty percent of the tested CWRS samples graded as Canadian Western Feed, compared to just 7 percent in 2015/16.

AAFC pegged 2016/17 Canadian wheat production (excluding durum) at 24.2 million metric tons (MMT), up 9 percent from 2015/16 due to a 16 percent increase in average wheat yields that more than offset lower than expected harvested area. AAFC reported average wheat yields of 52.7 bu/acre (3.54 metric tons per hectare [MT/ha]) compared to 45.5 bu/acre (3.06 MT/ha) in 2015/16. Canadian durum production will increase to 7.31 MMT, up 36 percent from 2015/16 due to a 4 percent increase in harvested area and a 30 percent increase in yields year over year. While Canadian durum production increased in 2016/17, the abundant rainfall that boosted yield potential also hurt wheat quality. CGC reported 27 percent of tested Canadian Western Amber Durum (CWAD) samples graded No. 1 or No. 2 CWAD, compared to 58 percent in 2015/16. AAFC expects 2016/17 Canadian total wheat exports (including durum) to total 22.0 MMT, up 1 percent from 2015/16.

European Union (EU): Following a record setting year in 2015/16, EU wheat production declined 10 percent to 136 MMT in 2016/17 according to Stratégie Grains (SG). This is 1 percent below the 5-year average of 138 MMT. Average EU soft (non-durum) wheat yields fell 11 percent year over year to 83.0 bu/acre (5.59 MT/ha) after excessive moisture lowered yield in France, Germany, the United Kingdom (U.K.) and Poland – the top four wheat producing countries in the EU. In addition to lower yields, quality is lower in France and Poland. SG estimates French milling output at 55 percent, a significant drop from 88 percent in 2015/16 and the 5-year average of 84 percent. Polish milling wheat output is pegged at 50 percent compared to 80 percent in 2015/16 and the 5-year average of 69 percent. Total EU milling supply is forecast at 81.9 MMT, down 24 percent year over year and 13 percent below the 5-year average.

Black Sea: On Oct. 13, Russian consultancy SovEcon estimated 2016/17 Russian wheat production at 72.0 MMT, up 18 percent year over year due to increased yields. Favorable weather boosted Russian wheat yields to an estimated 41.5 bu/acre (2.79 MT/ha) compared to 37.6 bu/acre (2.53 MT/ha) in 2015 according to Russia's Ministry of Agriculture. Analyst group UkrAgroConsult reported Ukrainian farmers harvested 25.8 MMT of wheat this year, down 5 percent from 2015/16. Record yields of 61.9 bu/acre (4.16 MT/ha) were not able to completely offset the 12 percent reduction in planted area due to dry planting conditions last fall. Still production is 20 percent above the 5-year average. SG pegged 2016/17 Kazakh wheat production at 17.9 MMT, which would be up 31 percent from 2015/16 due to improved yields. USDA expects Black Sea exports to total 54.0 MMT, up 7 percent from 2015/16, if realized.

SGS Russia, an independent crop inspection service, classified 18 percent of the Russian wheat crop as feed wheat, on par with data collected by the same date in 2015/16. High protein wheat (greater than 12 percent protein on a 12 percent moisture basis) is estimated at 1 percent of total production, medium protein (10.6 to 11.9 percent) milling quality wheat is 30 percent of the supply, and lower protein (8.8 to 10.6 percent) milling quality wheat is estimated at 51 percent of the crop. SGS reports the average protein of Ukraine's 2016 wheat crop as 10.5 percent (12 percent mb) compared with 9.9 percent in 2015. The crop has lower average moisture and a much higher average falling number compared with 2015.

Southern Hemisphere Wheat Development

Argentina: Though Argentine wheat harvest typically occurs from late November through January, Bolsa de Cereales, the Argentine Grain Exchange, reported harvest started the week of Oct. 24 in areas where hot, dry weather hastened wheat maturity and stands at 3 percent of total planted area complete. In other parts of Argentina where wheat development is closer to a normal pace, excessive rains caused flooding in low-lying areas. On Oct. 13, the Buenos Aires Grain Exchange estimated 2016/17 Argentina wheat production at 13.0 MMT, up 19 percent from 2015/16 due to increased planted area. Argentine farmers

planted 4.30 million hectares (10.6 million acres) of wheat for 2016/17, up 19 percent from 2015/16 in response to President Macri's elimination of the wheat export tariff and currency devaluation. USDA expects 2016/17 Argentina wheat exports to fall to 8.0 MMT, down 12 percent year over year. If realized, exports would still be 21 percent more than the 5-year average.

Australia: Cooperative Bulk Handling Ltd (CBH), Western Australia's primary grain marketer and handler, lowered its harvest estimate for the state to 13 to 14 MMT on Oct. 25 due to widespread frost damage, compared to its previous estimate of 15 to 17 MMT. The east coast of Australia received five times its average September rainfall, which is also causing concerns about quality. Australian farmers increased planted wheat area for 2016/17 to 31.9 million acres (12.9 million hectares), up one percent from 2015/16. In September, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) forecast 2016/17 wheat production at 28.1 MMT, up 16 percent from 2015/16 due to favorable conditions early in the growing season. This estimate is likely to be revised when Australian wheat harvest begins in December. USDA expects Australian exports to increase to 20.5 MMT, up 28 percent from 2015/16 and 8 percent above the 5-year average.

USW looks forward to sharing the latest news about the 2016 wheat crop at its annual series of Crop Quality seminars and personal visits from its representatives.

2. USW Submits Annual Report on Trade Barriers to U.S. Trade Representative

By Elizabeth Westendorf, USW Policy Specialist

Every year, the U.S. Congress requires the Office of the U.S. Trade Representative (USTR) to submit a comprehensive report detailing the trade barriers and policy challenges facing exported U.S. goods and services. The annual National Trade Estimate (NTE), which came in at more than 450 pages last year, takes months of collaborative work to pull together. That is why each year, USTR asks industry stakeholders to provide input on their key trade barriers. Last week, USW submitted comments on the NTE to USTR.

Many of the trade challenges our industry faces are ongoing, unresolved issues. One topic that has been part of USW's NTE submissions for several years is that of China's domestic wheat subsidies. USW has shared the results of its investigation of this issue, including through the NTE, to USTR and that work finally came to fruition when the United States government announced it was taking a World Trade Organization (WTO) case against China. In its 2016 submission, USW specifically stated that it ["strongly supports the dispute launched by USTR against China's market price support programs on Sept. 13, 2016.](#) The action is the most significant taken by the U.S. government to date in addressing the imbalances caused by subsidies that violate WTO commitments."

In the report, USW also identified policy barriers in four broad issue areas: market access; domestic subsidies; export subsidies; and sanitary and phytosanitary (SPS) barriers. Regarding SPS barriers, USW focuses on policies that attempt to protect domestic producers from imported competition without scientifically justified reasons. Consistent USW submissions to the NTE have also facilitated U.S. government activities related to market access efforts in Canada, Brazil and Morocco. USW submitted additional comments on the EU, India, Japan, Kenya, South Korea, Mexico, Taiwan and Turkey.

The NTE submission provides a good overview of the key issues that USW's policy team works on every year. Submitting our NTE comments annually allows us to assess global progress on these barriers and bring up any new issues we face. It also gives USTR up-to-date information on ongoing problems.

With the national rhetoric on trade turning more and more protectionist, it is important to remember that trade agreements work for American agriculture and its overseas customers, especially when they are

enforced. The NTE serves a vital purpose to the enforcement function of the U.S. trade agenda. It is important that all countries play by the rules, and the USTR NTE is one important way to hold other countries accountable. USW is grateful for the continued efforts of the U.S. government on these issues.

USW's [latest NTE submission is posted online](#).

3. High Yielding 2016 HRW Crop Offers Lower Protein but Higher Milling Yields

With generally outstanding kernel characteristics providing strong flour yield potential, the 2016/17 U.S. HRW crop should provide high value to customers. Growing conditions across the southern and central plains helped the crop reach near record yields, though this also contributed to lower protein levels. Even though mixing times are shorter than the 5-year averages, the loaf volumes achieved indicate there is adequate protein quality to make good quality bread. Conditions in Washington, Oregon, Idaho and Montana resulted in a wide range of kernel characteristics and protein levels in the regional Pacific Northwest (PNW) crop. Complete national and regional quality reports are posted at www.uswheat.org/cropQuality.

Of the 499 HRW samples tested, 93 percent graded U.S. No. 2 or better. Overall test weight averaged 60.5 lb/bu (79.6 kg/hl), which is above the 5-year average of 60.3 lb/bu (79.3 kg/hl) and significantly above last year's average of 59.0 lb/bu (77.6 kg/hl). Overall dockage of 0.5 percent is significantly below last year and equal to the 5-year average of 0.5 percent. Shrunken and broken (0.9 percent) and total defects (1.3 percent) are also significantly below 5-year averages. Wheat ash is well below and thousand kernel weight and kernel diameter are well above last year and the 5-year averages. This is a sound crop, with average 2016 wheat falling number at 392 sec.

The average protein of 11.5 percent is more than a full percentage point lower than the 5-year average of 12.8 percent. Protein content distribution varied by growing region. Overall, approximately 50 percent of samples were less than 11.5 percent protein, 35 percent between 11.5 percent and 12.5 percent and 15 percent greater than 12.5 percent.

Flour and Baking Data: The Buhler Laboratory mill flour yield overall averaged 76.6 percent and significantly exceeds the 2015 and 5-year averages. Flour ash (14 percent mb) of 0.56 percent is comparable to 2015 (0.59 percent) and the 5-year average of 0.53 percent. Gluten index values averaged 93 percent, which is comparable to last year and equal to the 5-year average. The W value of 211 is comparable to last year's average of 214 but well below the 5-year average of 246. Overall average bake absorption is 62.9 percent, slightly above the 2015 absorption of 62.5 percent and the 5-year average of 62.5 percent. Farinograph development and stability times were 4.0 min and 6.7 min, respectively, both of which are lower than last year and significantly below the 5-year averages of 5.4 min and 10.9 min, respectively. Overall loaf volume averaged 821 cm³ and is well below 2015 (870 cm³), but only slightly below the 5-year average of 836 cm³.

4. New SW Crop Offers Return to Lower Protein Levels

The 2016 SW wheat crop is generally characterized by lower than average protein content, ending a string of dry years for PNW farmers. Kernel size and weight are greater than average and finished product characteristics are acceptable. Falling number varied across the region, resulting in sound supplies overall. The 2016 white club (WC) quality characteristics mirror SW trends. Complete national and regional quality reports are posted at www.uswheat.org/cropQuality.

A total of 402 SW and 66 WC wheat survey samples were collected for analysis this year from state, private grain inspection agencies and commercial wheat handling operations. The average SW (and WC) test weight of 60.8 lb/bu (80.0 kg/hl) is greater than last year's average of 59.3 lb/bu (78.0 kg/hl). Shrunken and broken kernel percentages are lower for SW and WC than last year and the 5-year averages. Other Federal Grain Inspection Service (FGIS) grading factors for SW and WC are similar to last year and the 5-year averages. SW and WC dockage averages are the same as last year and similar to the 5-year averages. Wheat moisture content for SW increased to 9.8 percent from 8.9 percent last year, and WC moisture content increased to 9.6 percent from 8.0 percent last year.

SW wheat protein content at 10.1 percent (12 percent mb) is lower than last year and the 5-year averages. WC protein at 9.9 percent (12 percent mb) is significantly lower than last year at 11.7 percent and the 5-year average of 10.4 percent. The higher protein segment of the SW crop provides opportunities in blends for Asian noodles, steamed breads, flat breads and pan breads.

SW and WC wheat ash contents (14 percent mb) are lower than last year and the 5-year averages. Thousand kernel weight for SW and WC are heavier than last year and 5-year averages. Both SW and WC kernel diameters are larger than last year, but smaller than the 5-year averages. Falling number values are 314 sec. for SW and 301 sec for WC, compared to the 5-year averages of 336 and 327, respectively.

Flour, Dough and Baking Data: The 2016 SW crop Buhler Laboratory mill flour extraction of 75.0 percent is higher than last year and similar to the 5-year average, and WC extraction is much higher at 77.2 percent than last year's 70.8 percent. Flour protein contents (14 percent mb) are 8.9 percent and 8.8 percent for SW and WC, respectively. Flour ash contents (14 percent mb) for both SW and WC are lower than last year and the 5-year averages. Flour falling number values are 358 sec. for SW and 325 sec. for WC. Amylograph peak viscosity values are 393 BU for SW and 298 BU for WC, much lower than last year and the 5-year averages. Starch damage values are similar for SW and higher for WC than last year and the 5-year averages.

The solvent retention capacity (SRC) water values for SW and WC are lower than last year and the 5-year averages; SRC sucrose and lactic acid values are lower than last year and the same as 5-year averages; and SRC sodium carbonate and SRC gluten performance index (GPI) values are similar to last year and the 5-year averages.

Farinograph peak and stability times show SW has slightly weaker gluten properties than last year but is similar to the 5-year averages. WC farinograph data show similar gluten characteristics to last year and the 5-year averages. SW has a lower average alveograph L value than last year and the 5-year average. The WC alveograph L value is longer than last year and similar to the 5-year average. Extensograph resistance and extensibility values for SW and WC are shorter than last year and the 5-year averages.

Sponge cake volume for SW of 1184 cm³ is smaller than last year and the 5-year average, but the total score is higher than last year and the 5-year average. The WC sponge cake volume of 1233 cm³ is smaller than last year and similar to the 5-year average, and total score is higher than last year and the 5-year average. SW and WC cookie diameter values are smaller than last year and the 5-year averages. SW and WC cookie spread factors are less than last year and the 5-year averages.

Each flour was made into southern-type steamed bread and compared with control flour. Specific volumes are less for SW and WC than last year and the 5-year averages. Total scores for SW and WC are lower than last year and the 5-year averages.

5. High Yields, Strong Performance with Variable DON Levels in the U.S. Northern Durum Crop

Buyers will find larger supplies but a somewhat diverse quality mix in the 2016 northern hard amber durum crop. Grade factors remain high across a broad part of the region, but protein content, vitreous kernel levels and DON are factors that vary and will have a significant impact on prices. End-use performance of the crop is strong for milling yields and semolina color, but somewhat lower than the 5-year average for cooking qualities. Buyers can buy with confidence, but diligent contract specifications will be needed for DON levels, which do not always correlate with grade parameters. Complete crop quality reports for the northern durum and Desert Durum® crops are posted at www.uswheat.org/cropQuality.

The 2016 northern durum crop is the largest since 2000. With some variance, conditions favored high yields. Disease pressures were prevalent across northern areas, and many producers applied fungicides at flowering time, but continued high humidity kept the disease threat high. Disease was largely absent in the drier southern areas. Differences in moisture and disease pressure in the last half of the growing season resulted in a range of DON levels, but the crop benefited from mostly dry conditions during harvest.

In the 210 northern durum samples tested, the average grade is U.S. No. 1 Hard Amber Durum (HAD), and grade qualities are very similar to 2015. Specific kernel factors in 2016 include an above-average test weight of 61.2 lb/bu (79.7 kg/hl), average damaged kernels of just 0.4 percent and an average vitreous kernel content of 90 percent. Nearly two-thirds of the crop has test weights above 60 lb/bu (78.1 kg/hl), and more than 80 percent is above 75 percent vitreous kernels. The portion of the crop with greater than 90 percent vitreous kernels is slightly lower than 2015.

The mostly dry harvest secured a sound crop with low average moisture of just 11.4 percent and average falling number of 423 sec. Sixty percent of the crop is above 400 sec., and only 2 percent below 300 sec. Protein levels are slightly lower, as expected with a record yield, averaging 13.4 percent (12 percent mb) compared with 13.9 percent last year and the 5-year average of 13.6 percent. There is a wider than normal range of protein due to vast differences in growing season moisture across the region.

Fusarium was prevalent across most northern areas, but non-existent in other regions. The crop average DON is 1.0 ppm, similar to 2015 at 0.8 ppm and the 5-year average of 1.2 ppm. In the most affected regions, DON is a significant marketing challenge. Although many producers applied fungicides at flowering time to control fusarium, high humidity throughout kernel fill favored DON development. Lab testing of semolina from the survey samples shows minimal DON, indicating much of the DON in the 2016 crop may be on the exterior of the kernel.

Milling performance, based on a Buhler Laboratory mill, reveals a significant jump in total extraction, averaging 73.6 percent, and semolina extraction, averaging 67.9 percent. These are both three percentage points above the 5-year averages. Part of the increase can be attributed to the replacement of all purifier screens on the lab mill. The milled product reflects higher ash of 0.71 percent, compared to 0.64 percent in 2015, and a higher speck count. Wet gluten averages 32.4 percent, well below 37.0 percent last year and 35.4 percent for the 5-year average. The average gluten index of 60.8 percent is up from 2015 and the 5-year average.

Semolina properties show very high color scores with a b* value of 30.3. Mixing properties are similar to 2015 and slightly weaker than the 5-year average. Evaluation of the cooked spaghetti reflects some impact from lower protein with lower color scores, a slight increase in cooking loss and slightly lower cooked firmness values compared to last year and the 5-year averages.

Desert Durum® production acreage was less than in 2015, weather conditions during harvest were ideal, and grain quality was uniformly very good. The crop still exhibits consistently large kernels and low moisture, traits that contribute to efficient transportation costs and high extraction rates. Typical kernel

characteristics of high protein content, low kernel moisture, high test weight and high vitreous kernel percentage are present in this year's crop. The 2016 crop will deliver the valuable milling, semolina, and pasta quality traits that customers have learned to expect.

6. Kansas State University Scientists Gain Upper Hand on Devastating Wheat Scab Disease

By Pat Melgares, [Originally printed on www.ksu.edu](http://www.ksu.edu)

Kansas State University scientists say they have isolated and cloned a gene that provides resistance to Fusarium head blight, or wheat scab, a crippling disease that caused \$7.6 billion in losses in U.S. wheat fields between 1993 and 2001.

Their findings are [published online in the journal Nature Genetics](#). The article details about 20 years of research that included scientists in China and several American universities.

"This has been a very difficult project," said Bikram Gill, university distinguished professor of plant pathology and director of the [Wheat Genetics Resource Center](#) at Kansas State University. He estimates that nearly 100 scientists, faculty, staff and students have participated in the work.

"The breakthrough that we're reporting is the cloning of a resistance gene," Gill said. "We have identified the DNA and protein sequence, and we are getting some idea of how this gene provides resistance to the wheat plant for controlling the disease. The cloning of this gene is the key to unlock quicker progress for control of this disease."

A disease that shows up periodically in more humid growing regions, Fusarium head blight caused severe damage in Minnesota and North Dakota in 1993 and subsequent years. Gill noted that a 1997 epidemic in Minnesota, which ruined 50 percent of the state's wheat crop that year, caused an estimated \$1 billion in losses.

Fusarium head blight is caused by the fungus *Fusarium graminearum*, which produces a toxin that makes the crop unfit for human and animal consumption. James Anderson, a professor of wheat breeding and genetics at the University of Minnesota, said there are frequent epidemics of the disease reported in the United States, Canada, Europe, Asia and South America.

The fungus is also a menace to the barley industry. Gill noted that since the 1997 outbreak in Minnesota, malting barley is rarely grown in the upper Midwest because the industry implemented zero tolerance for the toxin Deoxynivalenol produced by fusarium.

Previously, the wheat variety known to best resist Fusarium head blight was a Chinese cultivar named Sumai 3. But while scientists knew Sumai 3 provided resistance, they did not know what DNA sequence was responsible for resistance — until now.

Kansas State University faculty and students used sophisticated wheat genome sequencing techniques to isolate the gene. Gill said that Eduard Akhunov, associate professor of plant pathology, prepared a library of "millions of clones" of Sumai 3 DNA. Lead scientists Nidhi Rawat at the University of Maryland and Mike Pumphrey at Washington State University sifted through the library.

"It's like searching for the proverbial needle in the haystack to find one clone that contained the resistance gene," Gill said.

"It looks like when the fungus attacks the wheat plant, the resistance gene protein has domains for binding and making pores in the cell wall of the fungus, and stopping it from spreading and infecting the developing grain," he said.

Traditional and molecular wheat breeding will benefit from the finding, Gill said. Without knowing the DNA source of this resistance, scientists would have to grow wheat in a field, hope for the right growing conditions to test new varieties against the disease, and then reproduce successful varieties for future years.

Instead, processes that would take years to replicate can be done in a fairly short amount of time in a diagnostics lab.

"An analogy I can think of is in the cloning of the most common gene that causes breast cancer," Gill said. "A woman can get diagnosed very early and be treated to avoid getting the cancer. We can do the same thing with this gene. Once you diagnose the plant, you can use it in breeding without exposing the plant to the disease."

Among several, Gill credited Anderson, whose research team has been working on resistance to Fusarium head blight since 1993 and was the first to genetically map the location of the gene to a small segment of the wheat chromosome. Anderson has worked closely with researchers at Kansas State University and Washington State University to help prove the identity of the resistance gene.

Gill also acknowledged Pumphrey, an associate professor in the department of crop and soil sciences at Washington State University, for his work leading to the discovery. Pumphrey was a graduate student at Minnesota under Anderson and later with Gill at Kansas State University.

The project was funded by the [U.S. Department of Agriculture's Wheat and Barley Scab Initiative](#) and the [National Science Foundation](#). The agricultural experiment stations at each of the participating universities also provided support.

7. Wheat Industry News

- **IGP-KSU Grain Purchasing Training.** Registration is now open for this course planned for April 2017 at the IGP Institute in Manhattan, KS. This course benefits individuals who are responsible for buying U.S. food and feed grains, and is divided into continuous back-to-back one-week sessions. The first week will investigate how grain is traded and transported, while the second week will focus on commodity price risk management. For more information and to register visit www.grains.k-state.edu/igp.
- **IGP-KSU Flour Milling and Grain Processing Courses.** Registration is open for three 2017 courses at the IGP Institute in Manhattan, KS. The Introduction to Flour Milling course will be held twice Jan. 16 to 20 and July 31 to Aug. 4, and will discuss all aspects of the flour milling process from wheat selection to flour blending and functionality. The Basic Milling Principles course is scheduled for June 5 to 9 and will help participants develop a conceptual understanding of the milling process with a focus on mill balance and setting the brake system. The Advanced Milling will be held June 12 to 16 and will focus on quantitative tools and practices to influence flour quality in the mill. [For more information and to register visit www.grains.k-state.edu/igp](#)
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