

# Adjusting to New Crop Wheat

Transitioning from old to new crop always presents many challenges.

As data and other information are coming in on the 2011 hard red winter (HRW) wheat crop, there are some things for millers and bakers to consider, especially as it relates to adjusting to the

new crop.

As the 2011 HRW wheat harvest in the United States is winding down, millers around the world are facing the challenge of adjusting to the changes required to mill the 2011 crop efficiently.

Each year, flour millers must adjust to the subtle differences that occur with each new wheat harvest, and this year will be no different.

These subtle changes in the wheat crop each year can impact flour extraction, the ability to meet the needs of customers and profitability of the milling

companies significantly.

As the next crop begins to arrive at the mill, it is a good time to review the qualities that affect the millability of wheat. Kernel density and size, as measured by test weight, thousand-kernel weight, and various other tests are important to monitor changes annually.

Hardness and moisture also are important, as the miller prepares to set up the mill for

maximum flour extraction.

Most discussions for new crop wheat quality, however, are directed to the functionality of the flour.

Changes in protein content, flour absorption, and mixing tolerance are critical to both the miller and the baker, as they make the annual transition from old crop wheat to new crop wheat while continuing to make a consistent product to meet the requirements of their customers.

## Wheat Conditioning

This year, adjustments may need to start in the cleaning house and wheat conditioning process. The environment has been hard



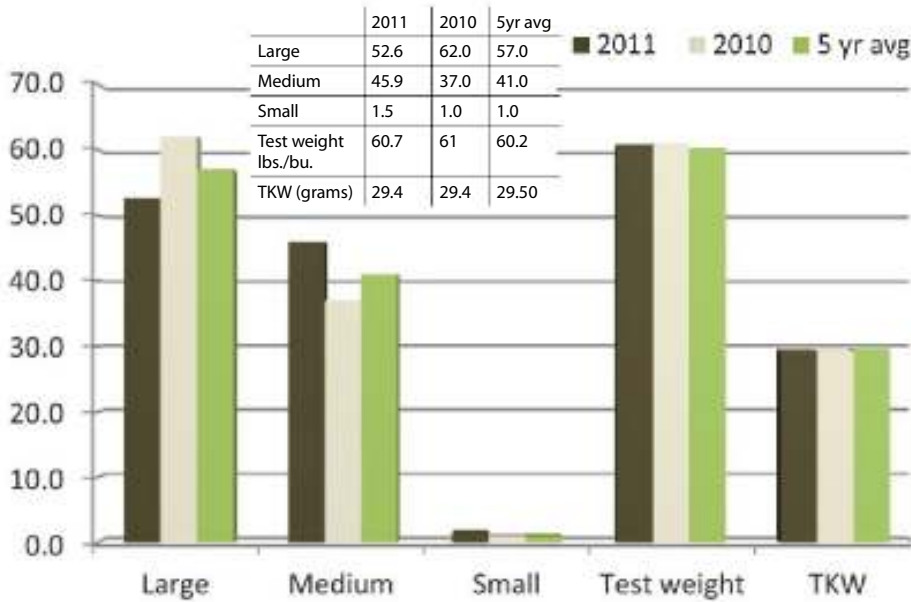
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# Wheat Quality Data Comparisons



The chart on the left includes data collected as of August 5 by Plains Grains, Inc. The complete data can be reviewed on its website, [www.plainsgrains.org](http://www.plainsgrains.org). The chart shows the breakdown in percentages (on the far left) the number of large, medium, and small kernels for 2011, 2010, and the five-year average. Data for test weight and thousand kernel weight also are included.

on the crop this year.

Drought affected a large part of the U.S. HRW wheat growing region. Current quality data identifies a significant shift in three key characteristics—test weight, protein content, and kernel size.

The increase in test weight and protein content is good news.

Lower protein has been a concern the past few seasons resulting in increased demand and the use of enzymes and dough improvers to meet customer specifications.

Higher average protein in the HRW wheat this year will help the miller provide higher-protein flour at a more competitive price.

The challenge this combination of higher test weight and lower protein may have is the need for a longer tempering or conditioning time. The higher test weight is a signal of denser wheat.

As protein content increases, the tempering time must increase. The combination of denser wheat and higher protein will result in a longer tempering time required to allow the water to penetrate the kernel fully and to achieve the desired moisture levels and flour quality.

It is difficult to say just how long a tempering time will be required, since many factors influence tempering time, but mills with tempering times less than 16 hours may have to make some adjustments.

notice thousand kernel weight (TKW) is slightly lower than average.

However, the most concerning characteristic of the early crop quality data is the smaller than average kernel size as measured by the kernel size

distribution test.

The kernel size test is performed by sieving a sample of wheat on a Ro-Tap sifter using the Tyler No. 7 (2.82 mm) and Tyler No. 9 (2 mm) screens. The kernels remaining on top of the No. 7 screen are defined as large. Kernels passing through the No. 7 but remaining over the No. 9 are considered medium sized. The kernels passing through the No. 9 screen are considered small.

Data posted August 5 on the Plains Grains Inc. website, [www.plainsgrains.org](http://www.plainsgrains.org), contains data from 386 wheat samples from Texas, Oklahoma and Kansas. According to this data, 47.3% of the wheat kernels are large, ▶

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## Impact of Kernel Size

Looking further into kernel size, we

51.0% medium, and 1.6% small.

Data taken from the U.S. Wheat Crop Quality report records the 2010 kernel size distribution as 62% large, 37% medium, and 1% small, with the five-year average 57/41/1, respectively. Putting the data from these tests together, we can see that that this year's wheat is small and dense.

#### Implications for the Miller and Baker

The first place to look, again, is the cleaning house. With a smaller-than-average kernel size, attention to the

cleaning systems must be given.

Worn screens on separators may need to be replaced, and the troughs on indent separators may need to be adjusted so as to not to remove small, but good quality kernels during the wheat-cleaning process.

The gravity table and destoner will also need adjustment to accommodate the denser wheat, but still remove the stones from the process.

Once adjustments are made to properly clean and condition this year's crop, the miller will need to turn

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- Mark Fowler, associate director,  
IGP, KSU

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attention to the milling process itself.

#### The Milling Process

The smaller kernels will cause a change in the distribution of stock throughout the mill. The miller will see a difference in the granulation of break system passages including changes in the amount of sizing stock produced.

Well-maintained rolls in the mill are always important to maximize extraction and the operation of an efficient mill; however, freshly cut corrugated rolls in the break system when introducing new crop wheat are especially important.

Running break release to monitor the distribution of stock is an important part of balancing the mill.

This year, it is a good idea to perform a full granulation test to evaluate the change in sizing stock distribution to the purifiers and reductions system, as well.

As the wheat continues to mature post harvest, it will continue to change the sizings distribution, which will need to be monitored.

Some of the changes in the flour that the baker will experience relate to changes primarily in the percent of water absorption and mixing tolerance of the flour.

As mentioned, the average protein content of the HRW wheat is above average. Higher protein translates to higher water absorption and longer mixing stability, as measured by the farinograph. Both of these characteristics are good news to bakers, but it also means adjustments to the process will be required.

The miller and baker have to work together and communicate the changes as the new crop wheat is introduced to

Despite drought conditions in some key wheat-growing areas of the United States, other areas have fared a little better. Higher average protein in the HRW wheat this year will help the miller provide higher-protein flour at a more competitive price. Photo by Kansas State University.



the customer.

As millers begin to blend the new crop wheat into the mill, it will be important to monitor the changes, to mill balance and product distribution throughout the mill.

Changes in protein content and protein quality of the flour are always the first topic of discussion each harvest.

#### **Kernel Weight and Size**

Thousand-kernel weight and kernel size may be the bigger story this year. Although some question the direct relationship between these measurements and flour yield, there is no question

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that they impact mill performance and efficiencies.

Milling yield and the factors that affect it remain important characteristics in determining the quality of wheat that is available each year.

Each year, the new wheat crop brings new and different challenges and opportunities for flour millers and bakers.

Early crop quality surveys and good communication between all the people and departments within a company are crucial to making good decisions and being prepared for the annual changes and challenges.

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