



Bake Testing of Vermont Grown Wheat

By Randy George, [Red Hen Bakery](#)

One of the most exciting aspects of developing a locally-based grain growing and processing system is the opportunity that it offers for farmers and bakers to come together and discuss what can be done from the field to the hearth to produce the best bread possible. In the commodity model, farmers and millers work hard to optimize yields and efficiency. Evaluation of quality for bread wheat in that setting is usually focused on protein quantity. There is rarely a dialogue between bakers and millers about the finer points of quality. In contrast, the work at NGGA is based on a deeper discussion. But sometimes too much dialogue can muddy the waters. I have witnessed the confusion that can arise when different bakers report different results with the same flour, leaving farmers unsure of what they should be doing. Of course, left to our own devices, there would probably be as many opinions on a given wheat sample as there are bakers. But in order to offer the farmers meaningful feedback on their crops and help them as they make decisions about future plantings, we bakers need to speak with some certainty about the primary qualitative features of the flour we are working with.

This fall I had the opportunity to test four flour samples from different wheat varieties grown in Vermont this year. For these tests, I used an analytical tool which fellow baker Thom Leonard adapted from a French test for his work with a small mill in Kansas. Thom runs this test using a straight dough (yeast-risen), hearth-baked bread formula. For my tests, fellow NGGA member baker Jeffrey Hamelman and I agreed upon a formula for a naturally leavened bread, since this type of bread is the desired end point for most of the bakers that are interested in using more local wheat.

The goal of this test is to take a few dozen qualitative traits that are evaluated throughout the bread-making process and distill them down to a single number that indicates the overall quality of the flour. The individual traits are weighted variously depending on their overall importance in making a good loaf of bread, with flavor being weighted most heavily. So, for example, if a flour does not come together very well in the mixing bowl but it makes a tasty loaf of bread, there will only be a small effect on the overall score. If a flour sample scored perfectly for every trait (a practical impossibility), it would receive a score of 1.0. My hope and goal is that the bake score will be an indicator to the farmer/millers of how they are doing in terms of producing flour that is well suited to producing naturally-leavened hearth-baked bread. (Other types of baked goods would need a test of their own.)

Results

It is important to note that the Harvard and A.C. Morley samples were stone-milled and lightly sifted by Ben Gleason. The Redeemer and Jerry samples were stone-milled at

Butterworks Farm and sifted at the Extension Service lab. Clearly, the extraction rate (and resulting ash content) was much lower on the latter two samples. When running the test, I evaluated the performance of each based on what can be expected of a flour of the given extraction.

Note that, for the time being, we do not have one piece of testing equipment that this test expects: an inverse density meter to precisely measure the volume of a baked loaf of bread. Until we have such an instrument, I have adjusted our tests to remove loaf volume from consideration.

The results of the test were as follows:

A.C. Morley- 0.42

Harvard- 0.80

Redeemer- 0.87

Jerry- 0.65

These results were interesting for a number of reasons. A.C. Morley is a variety that has been grown for many years by a number of local farmers because of its favorable agronomics. This test demonstrated that, although A.C. Morley seems to perform well in the field, it leaves something to be desired in the bakery. The good baking qualities of Harvard were a surprise because the lab tests showed the wheat from this sample to have a protein level of only 9.8% (on a 14% moisture basis), which is generally considered far too low for baking bread. This is an excellent example of why any evaluation of wheat should include both laboratory and bakery tests. The Redeemer, on the other hand, showed some of the highest protein levels we have ever seen for Vermont-grown winter wheat (11.95% in this sample) and, as would be expected, the baking characteristics were very nice. I would put that particular sample of wheat up against the finest Midwestern samples.

It is my hope that we can continue testing local wheat samples in this way and that the results of these tests can assist the farmers as they select varieties and review their growing practices.

