

Spelt Variety and Planting Date Trial 2012 Results

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Spelt is a relative of wheat that evolved thousands of years ago in the Near East and Europe, as people first began to cultivate grains. European settlers brought the grain to the U.S. in the late 1800s, and it remained popular for decades. By the 1920s, however, spelt had fallen out of favor as a food for human consumption for several reasons, including its inconsistent yields and need to be dehulled.

More recently, spelt has re-emerged as a viable product in the health food and local grain markets, both in the U.S and in Europe. On a recent trip to Denmark to visit organic wheat growers and processors, we were amazed at the number of spelt products and popularity of the grain with farmers and consumers. Many consumers say spelt is much easier to digest than wheat and its nutrients are more “bioavailable,” that is, more readily accessed during digestion. While spelt does contain gluten and is not suitable for people with Celiac’s disease, many people who have sensitivity to wheat can digest spelt products.

Spelt has been grown in Maine and has been investigated as a possible grain for feeding organic dairy cows. See: SARE Project Number: FNE06-587 *Growing winter spelt as an organic grain or forage for dairy cows* <http://sare.org/MySare/ProjectReport.aspx?do=viewProj&pn=FNE06-587> and SARE Project Number: LNE06-240 *Expanding grain production and use on organic dairy farms in Maine and Vermont* <http://www.sare.org/MySare/ProjectReport.aspx?do=viewProj&pn=LNE06-240>

Spelt has not, however, been evaluated as a food-grade grain in Maine or Northern New England. Using data from trials conducted in other regions is insufficient because different soil and environmental conditions, as well as different varieties of spelt, impact the quality and nutritional profile of the grain. Research in Saskatchewan, Canada has indicated that spring spelt varieties may also have a place in Maine if sown early in the season (<http://library2.usask.ca/theses/available/etd-10212004-001220/>). There was a need to evaluate suitable varieties of spelt for Northern New England, especially varieties of winter spelt that are winter hardy and can potentially resist *Fusarium* infection. *Fusarium* has been a major issue in wheat production in the more humid Northeast.

METHODS

We tested four varieties of Winter Spelt during 2012 at the University of Maine Rogers Research Farm in Old Town, ME. Each variety was planted at three different dates in the fall of 2011 to test whether the varieties differed in their tolerance of late planting. The plots were managed organically with dairy manure as the primary source of fertility applied before planting at a target rate of 70 lbs of nitrogen per acre. Spelt grain was harvested on 1 August 2012. All samples were tested for DON (the deoxynivalenol mycotoxin produced by the *Fusarium* head blight fungus).

The harvested spelt was milled and sifted at the Somerset Grist Mill in Skowhegan, Maine. This company is very interested in obtaining more locally produced spelt to process and sell. Spelt Right Foods LLC (Beth George) conducted baking tests. Originally in Yarmouth Maine, Spelt Right has recently moved to NJ. In order to have enough flour for the bake tests, we combined each variety across planting date. The crude protein levels for the combined samples were calculated as weighted averages and were: Comet – 12%, Maverick – 11%, Oberkulmer – 15% and Sammy – 13%.

The varieties tested were Comet, Maverick, Oberkulmer, and Sammy. All were acquired from French’s Hybrids, Inc., Wakeman, OH (440-839-2934/800-977-0998, www.frenchshybrids.com). Variety descriptions can be found on their website.

RESULTS

Yields and protein levels were good for all of the varieties. The 2011-2012 season was exceptionally good for winter grains, with a mild fall and early spring, and this is reflected in yields ranging from just over one ton per acre for Oberkulmer to over 1.8 ton per acre for Maverick (Table 1). Oberkulmer, the tallest of the varieties, did have some lodging issues and would probably require a lower fertility rate. Grain protein levels were inversely related to yields, with Oberkulmer having the highest protein concentration and Maverick having the lowest. Similarly, later planting dates produced lower yields but higher protein levels (Table 1). All DON levels were below the 0.5 detectable limit of the test we use.

(2015 Update – Since 2012, a number of farmers have successfully grown winter spelt in Maine with yields reaching as high as 2.25 tons per acre for grain and 36 bales per acre for straw.)

In 2012, one spring spelt variety (an unnamed “common” variety) was planted in two locations in association with organic bread wheat variety trials. Yields were markedly different between sites most likely due to differences in nitrogen fertility. At the dairy farm in Sidney, which received approximately 55 pounds of N per acre as dairy manure, the spring spelt yielded 1401 pounds per acre, whereas at the University of Maine Smith Farm in Old Town, where plots received approximately 70 pounds of N per acre as dairy manure and an additional 16 pounds of N as Chilean nitrate topdress, the spelt yielded 3027 pounds per acre, comparable to the winter spelt yields.

Table 1. Effect of variety and fall planting date on winter spelt plant height, grain yield, and protein.

| | Plant Height | Grain Yield at 13.5% moisture | Grain Protein at 12% moisture |
|--|--------------|----------------------------------|----------------------------------|
| | (inches) | (lbs per acre) | (%) |
| Spelt Varieties (data are averaged over the 3 planting dates) | | | |
| Comet | 33 | 3261 ab | 12.4 b |
| Maverick | 43 | 3741 a | 10.9 c |
| Oberkulmer | 54 | 2231 c | 14.7 a |
| Sammy | 40 | 2706 bc | 12.9 b |
| Planting Date (data are averaged over the 4 varieties) | | | |
| September 18 | 37 | 3546 a | 12.0 b |
| October 6 | 33 | 2975 b | 13.0 ab |
| October 18 | 32 | 2434 c | 13.3 a |

Values within a column that share a letter in common are not statistically different.

BAKE TEST REPORT – from Spelt Right Baking

The first trial was on November 29, 2012 in which we used the Maverick spelt. We used 50% hydration, and the same proprietary formula and procedure that we use with our whole grain spelt from other sources. Interestingly, in this trial, the bread structure held up better as compared to our standard bread. The structure of the crumb held up very well, and the texture was light. Persons familiar with the standard whole grain Spelt Right bread consistently said that they thought Maverick had a taste and texture more aligned with “whole wheat” rather than the “whole spelt” to which they were accustomed. The overall response, however, was very positive and we were extremely pleased with the commercial appeal of the bread.



Maverick Spelt Bread 11-29-12

We conducted the second trial on December 3, 2012. We made two separate formulas using 10lbs of Oberkulmer and 10lbs of Comet. The dough was very heavy for both of these varieties, so I added an extra 6 ounces (2.87%) of water to the Oberkulmer and an extra 12 ounces (5.75%) to the Comet. Both varieties were in the proofer for the same amount of time, but were proofed at a temperature that was slightly too high (as we were trying to hasten the proofing time given time constraints). The Oberkulmer structure fell (you will see by the flat tops on the loaves), and the Comet held up relatively well. The crumb of the Oberkulmer was frail and could not hold up to spreads like the cooled butter or peanut butter. The crumb of the Comet was sturdy and would make perfect sandwich bread. (The picture does not do justice to the quality of the Comet bread). The resounding response from six individuals who tried all three breads was that the taste and the texture of the Comet was by far the best. Also, the six who were testing the bread all were surprised as to how different each variety tasted. The only change in any of the formulas was the spelt variety; all other ingredients remained consistent.



Comet Spelt Bread 12-3-12

Spelt Grown in Maine

(This photo does not do the bread justice. Light but strong crumb; nice crust; great taste; good for sandwiches. May have been slightly overproofed, but structure held up well.



Oberkulmer Spelt Bread 12-3-12

Spelt Grown in Maine

(weak structure – flat top and brittle crumb likely from overproofing)

On December 13, 2012, we did a trial bake with Sammy and then with a mix of all the varieties. The bakes failed dismally, because we changed a variable we should not have changed: the bread pans. We were trying new bread pans and the gauge was not heavy enough and the breads were not able to proof or bake properly. The failed breads were used for breadcrumbs or other non-sandwich uses. On December 18, 2012, we did another trial run with the remaining 2.5 pounds of Sammy. The breads came out well with a good structure, nice crumb, and sturdy crust.

Bake Test Conclusion: Depending upon multiple factors, including demand, quality, availability, and price, Spelt Right would be interested in continued discussions of the possibility of working with the State of Maine through the University of Maine Extension program and the Maine Department of Agriculture in developing spelt as a staple crop in Maine.

OTHER SMALL GRAIN RESOURCES

Growing Organic Cereals

A fact sheet was developed to assist growers interested in all winter and spring organic grains:

<http://umaine.edu/publications/2207e/>

Organic Wheat and Barley Enterprise Budgets

Budgets that can be modified for any grain, including spelts. Available on the Northern New England Bread Wheat project website at <http://umaine.edu/localwheat/>.

UMaine Extension Small Grains and Oilseeds website - <http://umaine.edu/grains-oilseeds/>.



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