Improving the Sustainability of Wheat Products at Williams

Introduction

Wheat is among the most popular agricultural crops in the United States. The information below regarding wheat production, as well as implications and risks that could result from wheat agriculture, is derived mainly from the website of the Environmental Protection Agency. According to the United States Department of Agriculture, the United States produced a total of 2.220 billion bushels of wheat in 2009 (Perkins). This makes the country the third largest wheat producer in the world behind China and India. In 2009, wheat was harvested from 53 million acres of land, which brought about $5.5 billion profit. Wheat is mainly grown in the Great Plains, as about two-thirds of the total production comes from that area. Fig. 1 illustrates the approximate distribution of wheat-planted area in 1998. There are about 240,000 farms in the country that harvest wheat. Consequently, it could be concluded from these numbers that wheat is a type of grain with great utility, which brings back significant revenue.

53 million acres is a significant
amount of land and, therefore, it is important to understand the implications and risks associated with using this much land for wheat agriculture.

To begin with, in order for farmers to plant wheat, they need to prepare the land through a process, called "tillage." Tillage involves activities such as plowing and eliminating weeds. The goal is to ensure a good “contact between the seeds and the soil (Major).” However, tillage often involves the removal of the top layer of the soil, making it vulnerable to erosion by water and wind. A possible consequence of erosion is that the topsoil layer, which contains a number of nutrients, is lost which means that the crops will not be able to benefit from these nutrients. Widespread erosion is a serious problem and, “in many agricultural areas, soil is eroding at a rate of several tons of soil per acre per year or higher (Major).” Fig. 2 shows soil erosion in the United States in 1997 and “each red dot represents 5000 acres of highly erodible land and each yellow dot represents 5000 acres of non-highly erodible (McCarthy).”

Another concern about industrial agriculture is the use of genetically modified seeds (GMOs). GMOs are more resistible than regular crops to unfavorable weather conditions, crop diseases, and herbicides, which increases the efficiency of the production process. Concerns about the use of GMOs include the possible reduction of genetic diversity, which could lead to crop failure, the risk of weed
species developing tolerance to particular herbicides, and most importantly, the unclear effects of GMOs on human health.

The use of fertilizers and pesticides is also regarded with caution when speaking about industrial agriculture. The application of these chemicals could lead to their absorption in the soil and groundwater. Additionally, rain and snow could wash away fertilizers and pesticides, carry them to rivers and other bodies of water, and thus, contaminate the water.

The many issues related to industrial agriculture have made me question whether the wheat products that Williams College uses are sustainable enough, and if not, whether there are more sustainable alternatives that we could turn to.

**Setting**

Williams College is located in Massachusetts, which means that, if harvested and/or produced in the Great Plains, our wheat products would have to travel an average of 1500 miles. This journey, commonly known as foodmiles, involves added transportation costs and, unfortunately, the emission of carbon dioxide in the atmosphere (Boyd). So, can we grow wheat in the Berkshires? It turns out that this is not an easy task. According to the article, “Catching an amber wave” there are a number of reasons why wheat production in New England is quite challenging. While, “in the 1800s, when there were no supermarket bread aisles and families fed themselves, small wheat plots and local mills for grinding flour were common,” once agriculture in the Midwest began to develop, major production moved there (Russell). New England
features a hilly and rocky topography, which makes it hard to find uninterrupted, flat stretches of land appropriate for growing wheat. In addition, the humid climate of New England “fosters rot and diseases and lowers the protein and gluten content of locally grown wheat (Russell).” Some farmers also say that, “the learning curve for growing grains is steep,” which means that if one decides to undertake wheat production here, they would have to invest a lot of their time into a venture with an unknown outcome (Russell). Other problems that the article discusses are the fact that equipment is very expensive and difficult to find in our region, and there are very few mills and storage facilities available. As discouraging as these facts are, I decided to investigate if there are reasonable possibilities for Williams to get its wheat products from local, and, potentially, organic producers.

**Method**

I gathered my information from a number of sources. First, I contacted Mark Thompson, the executive chef of Dining Services at Williams, for a list of the wheat products, brands, vendors, prices, and purchases that Williams has made between April 2009 and April 2010. Following the advice of Ms. Katharine Millonzi of the Zilkha Center, I only focused on the different types of wheat flour that Williams purchases. Then I looked up on the Internet information about the two main brands of flour that Williams uses. Afterwards, I contacted Michael Faber, the manager of Wild Oats organic supermarket, found out where Wild Oats gets their flour from, and looked up information for that local producer in Vermont. In addition, Ms. Millonzi helped me find the
prices of organic local flour, produced by a farm in Clinton Corners, NY. I also collected information about other farms from the Internet.

**Results**

**Table 1 Current and possible flour sources for Williams College**

<table>
<thead>
<tr>
<th>Brand/Farm</th>
<th>Average Price</th>
<th>Origin</th>
<th>Local</th>
<th>Organic</th>
</tr>
</thead>
<tbody>
<tr>
<td>King Arthur Flour</td>
<td>$15.7/bag 50 lb.</td>
<td>Great Plains</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>King Arthur Organic Flour</td>
<td>$7.95/bag 5 lb.</td>
<td>Great Plains</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>General Mills</td>
<td>$14.7/bag 50 lb.</td>
<td>Midwest</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Vermont Fresh Network</td>
<td>N/A</td>
<td>Vermont</td>
<td>Yes</td>
<td>Depends on individual farmers</td>
</tr>
<tr>
<td>Wild Hive Farm</td>
<td>$60.4/bag 50 lb.</td>
<td>New York</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Eden Organic</td>
<td>$60.3/bag 50 lb.</td>
<td>Midwest</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Williams College uses flour not only to prepare products, such as pizza, pasta, bread, and pastries, but also to cook a large variety of meals. Between April 2009 and April 2010 the College spent about $10,215 on 36,207 lbs. of flour. The three main brands of flour that Williams uses are King Arthur, Sir Gallagher (a subdivision of King Arthur Flours), and General Mills. A 50 lb. bag of King Arthur flour cost an average of $15.7. A 5 lb. bag of organic King Arthur flour costs $7.95. A 50 lb. bag of General Mills flour cost an average of $14.7. The average price of a 50 lb. bag of organic flour from Wild Hive Farm is $60.4. The average price of a 50 lb. bag of organic flour from Eden Organic is $60.3.
Discussion

The main brand of flour that Williams uses is King Arthur Flour (which also includes the Sir Gallagher brand). According to the company’s website, although the enterprise itself is located in Norwich, VT, “for King Arthur Flour, “local” flour has meant ‘milled from U.S.-grown wheat’ (Maine).” Therefore, the fact that the actual company is situated in Vermont does not mean that the wheat that their flour is produced with comes from a local farm. The website of the company emphasizes the fact that it gets its flour from the Midwest, particularly from Kansas. This means that flour travels to Vermont about 1,600 miles, which is far from perfect, if we are concerned about foodmiles. However, the brand also offers organic flour, although there was no information whether big packaging (which Williams usually needs) is available and its current price of $7.95 for 5 lb. is quite high.

On the other hand, King Arthur Flour has committed to:

“to lessen our impact on the local and global environment by conserving energy, water, and other natural resources; reducing waste generation; recycling and purchasing recycled products; and reducing their use of toxic products. We are committed to pollution prevention, continual improvement and meeting or exceeding all environmental and regulatory requirements (About).”

According to its website, the company is also strongly opposed to and does not use GMOs in its flours. It is also 100% employee-owned, which could be considered as a guarantee for high-quality vigilance.
The other major source of flour for Williams is General Mills. Its website says that it is the “world’s sixth-largest food company.” Its headquarters are located in Minnesota and most of its grain comes from the Great Plains. The company’s 2010 Corporate Sustainability Report features a large section on the ways General Mills affects and is concerned about the environment. According to General Mills’ website, in 2005 the company began a five-year sustainability program for its manufacturing facilities, and in 2009 it had surpassed its waste reduction goal. General Mills also states that it undergoes periodical environmental audits, the results of which are turned into recommendations for its future development. The company claims that it is currently working on saving energy during production, harnessing wind power, and promoting cleaner transportation that would reduce its carbon footprint. (Powell)

As much as these two companies seem committed to producing flour in an increasingly sustainable way, their products have to travel a long way before they get to Williams, and their large-scale industrial agriculture practices pose a significant threat to the environment.

That is why I decided to explore alternative sources of flour. I called the manager of Wild Oats and he told me that the store gets flour for its bakery from the Vermont Fresh Network. The Vermont Fresh Network:

“encourages farmers, food producers and chefs to work directly with each other to build partnerships. Building these regional connections contributes to stronger local communities and their economies (About us).”
The company serves as a mediator between producers and consumers. The way it works is that producers and consumers sign up as members and the Network connects them with each other, depending on what their needs are. Their website lists Middlebury College as one of those members. Unfortunately, when I called the Network, they were not able to quote a flour price and told me that they have very few local farmers who produce wheat and mill flour. They gave me the number of Gleason Grains Farm, but they have already run out of wheat and will not have any available until late July.

Then, I decided to look beyond our surroundings and came across the Wild Hive Farm, located in New York State, which offers organic flour from local wheat producers. Wild Have Farm is another enterprise that is committed to supporting local economy and production:

“Wild Hive Farm does this in a variety of ways, not only by supporting local, organic farmers through grain and produce purchases, but also by providing a number of jobs to members of the community (Wild)."

Fig. 3 shows the Wild Hive Bakery, which uses organic local flour. The Farm’s website says that it tries to provide a job network for bakers, millers, drivers, and other people involved in the harvesting, milling, and distributing process. However, the price of the flour that Wild Hive Farm quotes is about four times higher than the

![Figure 3 Freshly baked bread at the Wild Hive Farm Store](http://www.wildhivefarm.com/photos/displayimage.php?album=1&pos=0 image)
current price at which Williams buys its flour.

I thought that maybe the reason why that flour is so expensive is because it is not only organic, but produced in a region that is not generally typical for growing wheat and milling flour. Consequently, I tried to find a company that offers organic flour, which is derived from wheat grown in different conditions. Such company is Eden Foods, which is situated in Michigan, and sells organic flour, derived from local wheat. “Eden buys all food from, and pays farms directly, in a sustainable way. Most is grown a few miles to a few hundred miles from home base,” says their website. In addition, their company overview says that their food is packaged in the areas where it was produced, and the company itself was selected as the best food company worldwide by The Better World Shopping Guide.

Unfortunately, when I looked up flour prices, an average bag of 50 lb. all-purpose organic flour costs $60.3.

**Conclusions**

After weighing all the facts about growing wheat in New England, the possibility of Williams getting its flour locally is not very high because the available supply is not sufficiently reliable. Getting organic flour locally or from elsewhere is not a great option from an economic point of view, since organic flour is at least four times more expensive than the flour we use right now. The best way to go for Williams is to maybe supply a small part of its wheat from organic farms, while at the same time thoroughly investigate local (organic or not) options. The Vermont Fresh Network would be a great place to start because it can connect Williams with current and future local producers, which
would give the College the opportunity to support the local economy. In a blog post, called “Maine wheat? A vision of the future,” the King Arthur Flour company announced its support of the Kneading Conference, a local food movement in Maine, similar to the Vermont Fresh Network. King Arthur Flour is currently educating local wheat producers in Maine about the processes and technology required to produce wheat and flour successfully (Fig. 4 and 5).

“We’re giving our support to the movement to build a knowledge base among practitioners... so that one day soon Maine – and perhaps other locales around the country – will boast a thriving, sustainable wheat supply,” says the blog. In any case, while it is impossible for Williams to get a significant portion of its flour locally at this point, it should consider buying at least a small portion, which will, hopefully, increase in time, from local producers.

Figures 4 and 5: Workshops and demonstrations in Maine (http://blog.kingarthurlflour.com/2010/04/30/mainewheat-a-vision-of-the-future/images)
Works Cited and Consulted:

<https://www.kingarthurflour.com/about/>.

<http://www.edenfoods.com/about/>.


"Workshops and demonstrations in Maine ." King Arthur Flour. Web. 18 May