The importance of wheat

There is more land planted to wheat in the world than any other crop. It provides 20 percent of the world’s caloric consumption, and for the world’s poorest 50 percent, 20 percent of their protein consumption too.

Washington’s 1,904 wheat farmers support at least 3,836 workers in off-farm jobs. Another 1,120 jobs are sustained by the personal spending of farmers, their families and employees for a total wheat farming employment contribution of 6,860 jobs.

For every dollar in revenue generated by wheat farming, 73 cents is earned by businesses that support farmers. Off-farm purchases by farmers and their employees add 28 cents more for a total of $1.01 in economic activity beyond farmers’ own sales, mostly in small towns where agriculture serves as a crucial anchor for businesses.

Including spending on transportation and wheat processing, an additional $1.03 in economic activity is generated as well as 1,309 more jobs, for a total employment contribution from wheat farming, transportation and processing of 8,169 jobs.

In the last five years, the WGC has devoted more than $24 million to wheat research, marketing and education.

Washington Wheat Facts 2016/2017

1. Apples ....................... $2.4 Billion
2. Milk .......................... $1.1 Billion
3. Cattle & Calves ............ $858 Million
4. Potatoes ..................... $772 Million
5. Wheat ......................... $600 Million

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There are no GMO (Genetically Modified Organisms) wheat varieties today. An array of university researchers and private companies are working to develop the next generation of seed to feed the future using advanced breeding techniques. Breeders can improve wheat to better deal with disease, insects, weather and to produce higher yields. That’s important because in the next 30 years, two billion people will be added to the planet along with the need to feed them.

Norman Borlaug, father of the Green Revolution and winner of the 1970 Nobel Peace Prize said, “If the naysayers do manage to stop agricultural biotechnology, they might actually precipitate the famines and the crisis of global biodiversity they have been predicting for nearly 40 years.”

One of the earliest cultivated forms of wheat, Einkorn has 14 chromosomes. Emmer wheat, a later relative, has 28 chromosomes. Scientists believe emmer wheat crossed with a weed—jointed goatgrass—to create modern wheat’s 42 chromosome structure, including its unique gluten genes.

It takes upwards of 10 years for a wheat variety to move through the gauntlet of obstacles between the first cross to commercial production. During that time breeders observe and evaluate the performance of the variety in the field and test its quality in the lab. Because environment plays such a large role in wheat performance, it is important to measure each potential variety, called a line, across a number of years and a wide geographical region. In Eastern Washington wheat country precipitation can vary from as little as 8 inches to as much as 25 inches annually. When a breeder feels the line has met the challenges, it is entered into Washington State University’s Variety Testing Trials. There, the line spends three more years proving itself against dozens of other lines hoping to make it across the finish line to become a “named” variety.

Trade, money, engineering and biotechnology—all the ingredients needed to produce civilization started from the desire to grow grain. There’s archeological evidence our ancestors were farming as early as 10,000 years ago in an area that is now Turkey. Even earlier than that, perhaps 20,000 years ago during periods of scarce game, we began eating the seeds out of the heads of wild wheat relatives. Grinding wheat between two rocks to produce flour began about 6,000 years ago. Thanks to wheat, hunter-gatherers were able to cease their endless roaming for food and create villages, towns and the first nation-states.
There are many specialized flour comes in two types: refined kernel’s endosperm and does includes the endosperm, bran and the germ. In research studies, whole wheat is associated with: reduced risk of chronic diseases like diabetes and cancer, reduced risk of obesity, and better weight control.

About 1 in 141 people—less than 1 percent of the U.S. population—suffers from Celiac disease, an autoimmune disease caused by a reaction to gluten protein found in wheat. Another 0.5 percent of the population suffers from non-celiac gluten sensitivity and about the same percentage have a wheat allergy. For those few, eating wheat is unsafe. But for 98 percent of the U.S. population, products made from wheat flour are a nutritious and healthy food choice. What’s more, according to Consumer Reports, switching to a gluten-free diet may actually be harmful due to the extra fat, sugar and sodium added to products to compensate for their lack of taste and texture. Not to mention, many gluten-free foods are not enriched or fortified with essential nutrients such as folic acid and iron. The National Foundation for Celiac Awareness says, “eliminating gluten when people do not have a medical necessity for doing so is unwarranted.” Gluten-free products are definitely damaging to consumers’ pocketbooks, costing upwards of three times more than traditional wheat-based alternatives.
The six types of wheat

There are six market classes of wheat in the U.S., each with properties that millers and bakers use for specific products. Hard wheats, like hard red winter grown predominantly in the Midwest, and hard red spring grown throughout the Northern Tier states, are recognized as bread wheats. Soft white wheat, grown predominately in the Northwest, is recognized for its superior cookie and cracker performance in this country and steam breads, sponge cakes and noodles overseas. Durum wheat, grown mostly in North Dakota and the desert Southwest, is used to make pasta. Other wheat classes include soft red winter, grown east of the Mississippi River, and hard white wheat, which is used to make many whole wheat products.

Home of soft white wheat

Although wheat is also grown on the west side of the state, the majority of farms are concentrated east of the Cascade mountains. Eastern Washington farmers predominantly grow two kinds of soft white wheat. Common varieties have elongated heads. About 90 percent of Washington’s soft white crop in any given year is planted to common varieties.

Club wheat migrated to the Northwest from South America and before that, Spain. It is even softer than soft white and has a unique compact head shape. Club wheat is super soft! Certain countries, especially Japan, buy club wheat in a 10 to 20 percent blend with common varieties creating the Western White wheat blend.

Wheat is a type of grass and Eastern Washington’s cool nights and warm days are ideal for its production. Kansas and North Dakota trade places as the nation’s top wheat-producing state, but neither has the diversity of climates that makes Washington so unique and where it’s possible for farmers to grow soft white wheat, hard red winter wheat, hard red spring wheat and hard white wheat.

US White Wheat Top Markets

<table>
<thead>
<tr>
<th>Country</th>
<th>Thousand Metric Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>867.7</td>
</tr>
<tr>
<td>Japan</td>
<td>746.2</td>
</tr>
<tr>
<td>South Korea</td>
<td>532.9</td>
</tr>
<tr>
<td>Yemen</td>
<td>491.3</td>
</tr>
<tr>
<td>Thailand</td>
<td>180.0</td>
</tr>
<tr>
<td>Indonesia</td>
<td>165.8</td>
</tr>
<tr>
<td>Guatemala</td>
<td>143.3</td>
</tr>
<tr>
<td>Taiwan</td>
<td>114.2</td>
</tr>
<tr>
<td>Vietnam</td>
<td>92.5</td>
</tr>
<tr>
<td>Malaysia</td>
<td>47.9</td>
</tr>
</tbody>
</table>

Pacific Northwest All Wheat Production 2016

<table>
<thead>
<tr>
<th>State</th>
<th>Million Bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>157.2</td>
</tr>
<tr>
<td>Idaho</td>
<td>101.8</td>
</tr>
<tr>
<td>Oregon</td>
<td>39.9</td>
</tr>
<tr>
<td>Total</td>
<td>298.9</td>
</tr>
</tbody>
</table>

Researchers at the Agricultural Research Service of the USDA test the superior performance of club and soft white wheat flours against other classes of grain by making thousands of cookies every year and measuring the diameters.

TOP TEN Wheat Producing States 2016

<table>
<thead>
<tr>
<th>State</th>
<th>Production (million bu)</th>
<th>Avg. Yield/Acre (bu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas</td>
<td>467.4</td>
<td>57.0</td>
</tr>
<tr>
<td>North Dakota</td>
<td>333.1</td>
<td>45.0</td>
</tr>
<tr>
<td>Montana</td>
<td>212.6</td>
<td>42.3</td>
</tr>
<tr>
<td>Washington</td>
<td>157.2</td>
<td>71.5</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>136.5</td>
<td>39.0</td>
</tr>
<tr>
<td>South Dakota</td>
<td>111.2</td>
<td>51.6</td>
</tr>
<tr>
<td>Colorado</td>
<td>106.0</td>
<td>48.2</td>
</tr>
<tr>
<td>Idaho</td>
<td>101.8</td>
<td>91.3</td>
</tr>
<tr>
<td>Texas</td>
<td>89.6</td>
<td>32.0</td>
</tr>
<tr>
<td>Minnesota</td>
<td>74.8</td>
<td>59.0</td>
</tr>
</tbody>
</table>
A river of wheat

Farmers in wheat-growing areas of the country served only by the railroad are called “captive shippers” because they have no other way to get their wheat to market and transportation prices are correspondingly high. Washington farmers aren’t captive because of the 360-mile-long Snake/Columbia River system between Lewiston, Idaho and Portland, Oregon. Barge traffic on the river is the most efficient—and cleanest—form of transportation available. A tug pushing barges can haul a ton of wheat 576 miles on a single gallon of fuel, compared to 413 miles by rail and 155 miles by truck. And tugs have one-third the emissions of rail and one-twentieth the emissions of truck, per ton-mile. An average of 60 percent of Washington wheat moves by barge to Portland.

Two companies, Tidewater and Shaver, compete for farmers’ barging business.
**Glossary**

**All-purpose flour**—A combination of hard and soft wheat with the strength and tenderness that can be used to make everything from quick breads to delicate cakes.

**Annual cropping**—Land in higher precipitation regions planted yearly, usually in a rotation with other crops.

**Bleached flour**—Any refined flour with a whitening/aging agent added.

**Bran**—The fiber rich outer layer of the kernel included in whole wheat products.

**Dryland farms**—Farms that depend on rain or snow for moisture. Most wheat farms in Washington are dryland.

**Endosperm**—The part of a seed that serves as the food source for the developing plant embryo, contains starch with protein and other vitamins and minerals.

**Enriched flour**—Flour with specific nutrients returned to it that were lost while being milled. Restored nutrients include folic acid, riboflavin, niacin, thiamine and iron.

**Germ**—The part of the seed that will germinate.

**Gluten**—A protein in wheat, barley and rye that is formed from two proteins—gliadin and glutenin—when water is added. Provides elasticity to dough and is essential for allowing bread to rise.

**Head**—The top portion of the wheat plant where seeds develop. Other portions of the plant: stem, leaves, crown and roots.

**Lodging**—The word farmers and researchers use to describe wheat that has fallen over due to root disease or weather or both.

**Refined flour**—Flour made up of the wheat kernel’s endosperm.

**Soft or hard**—Refers to the density of the wheat kernel.

**Summer fallow**—Land in the intermediate to drier areas that is rested for a year to allow moisture to accumulate before planting.

**Whole wheat flour**—Includes all parts of the wheat kernel—bran, germ and endosperm—shown to be particularly healthful.

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**For more information about wheat:**

**Washington Grain Commission (WGC)** [www.wagrains.org](http://www.wagrains.org)

WGC is a Spokane-based state agency created by wheat farmers in 1958 as the Washington Wheat Commission. The name was changed to the WGC when barley was brought under the organization’s auspices in 2009. Ten members (seven farmers, two industry representatives and a WSDA official) sit on the board.

**Washington Association of Wheat Growers (WAWG)** [www.wawg.org](http://www.wawg.org)

WAWG is an association of the state’s wheat farmers working to improve Washington’s wheat industry. WAWG is active in legislative efforts on the state and national level and helps to administer wheat industry programs funded by the WGC.

**Wheat Life** [www.WheatLife.org](http://www.WheatLife.org)

*Wheat Life* is a monthly magazine of WAWG which chronicles the agricultural, political and cultural life of farmers, their landlords, agricultural businesses and other links in the grain chain. Past issues can be found online at WheatLife.org.

**National Association of Wheat Growers (NAWG)** [www.wheatworld.org](http://www.wheatworld.org)

A grassroots organization representing wheat farmers in 25 wheat producing states, including Washington, NAWG is active in lobbying for strong U.S. wheat and agricultural policies.

**Washington State University (WSU)** [www.wsu.edu](http://www.wsu.edu)

A land grant institution established under the Morrill Act of 1862 and signed by Abraham Lincoln, WSU was founded in Pullman in 1890. It is responsible for much of the state’s wheat research and breeding.

**Agricultural Research Service (ARS)** [www.ars.usda.gov](http://www.ars.usda.gov)

The ARS is an agency of the U.S. Department of Agriculture (USDA). In the Northwest, the ARS is based on WSU’s Pullman campus. In addition to breeding club wheat, ARS scientists research regional disease and pest issues of wheat.

**Wheat Marketing Center, Inc. (WMC)** [www.wmcinc.org](http://www.wmcinc.org)

Through on-site research working hand-in-hand with international cooperators, the Portland-based WMC aims to increase U.S. wheat in foods around the world.

**U.S. Wheat Associates (USW)** [www.uswheat.org](http://www.uswheat.org)

The export arm of the American wheat farmer, USW promotes U.S. wheat through funding provided by wheat farmers across the nation, including Washington, and federal funding through the Market Access Program and Foreign Market Development program.

**Washington Wheat Foundation (WWF)** [www.wawheat.org](http://www.wawheat.org)

The WWF advances the small grain industry by building support through programs, activities and research that advances the industry and increases public awareness.

**Wheat Foods Council (WFC)** [www.wheatfoods.org](http://www.wheatfoods.org)

The WFC is a partnership of wheat farmers, millers, bakers and end use manufacturers dedicated to increasing domestic consumption of wheat-based foods through information, education and promotion programs. Gluten facts can be found on the WFC website.

**Washington State Department of Agriculture (WSDA)** [http://agr.wa.gov](http://agr.wa.gov)

The WSDA is a state agency headquartered in Olympia. It has employees in every county in the state carrying out activities that support farmers, distributors and consumers of Washington’s food and agricultural products. The federal government has authorized the WSDA to inspect grains for export through its Grain Inspection Program.

**Home Baking Association (HBA)** [www.homebaking.org](http://www.homebaking.org)

HBA is a non-profit organization with the mission of growing the practice of home baking by sharing tools and knowledge with current bakers as well as future generations.