HEAT is the world’s NUMBER ONE crop

~ More land is planted to wheat in the world than any other crop.
~ Wheat is a staple food for more than 35 percent of the human population.
~ Wheat provides 20 percent of the world’s nutritional needs.
~ In 2021, the US exported 992 million bushels of wheat to nearly 50 countries.
~ Washington, Oregon and Idaho together are called the Pacific Northwest (PNW).
~ The PNW produces enough wheat each year to fill the Seahawks’ Stadium!

HEAT grows JOBS

~ Washington wheat farmers support 9,442 jobs in the state, including their own.
~ The state benefits from 5,353 jobs in businesses and industries directly supporting Washington wheat farmers.
~ An additional 4,090 jobs are supported from personal purchases of both farmers and their employees.
~ At least $0.88 of every $1.00 generated by Washington wheat goes to businesses that support farmers.
~ Washington’s wheat farmers and their employees contribute to the state’s economy by spending $0.87 of every $1.00 earned for off-farm purchases.
~ This results in a total of $2.73 in economic activity, beyond farmers’ own sales.

2021 PNW ALL WHEAT PRODUCTION

<table>
<thead>
<tr>
<th>State</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>87.2 million bushels</td>
</tr>
<tr>
<td>Idaho</td>
<td>76.5 million bushels</td>
</tr>
<tr>
<td>Oregon</td>
<td>31.7 million bushels</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>195.4 million bushels</strong></td>
</tr>
</tbody>
</table>

2021/22 TOP TEN WHEAT PRODUCING COUNTRIES*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>134.2 mmt</td>
</tr>
<tr>
<td>2</td>
<td>European Union</td>
<td>126.3 mmt</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>107.8 mmt</td>
</tr>
<tr>
<td>4</td>
<td>Russia</td>
<td>85.3 mmt</td>
</tr>
<tr>
<td>5</td>
<td>U.S.</td>
<td><strong>49.7 mmt</strong></td>
</tr>
<tr>
<td>6</td>
<td>Canada</td>
<td>35.2 mmt</td>
</tr>
<tr>
<td>7</td>
<td>Australia</td>
<td>33.0 mmt</td>
</tr>
<tr>
<td>8</td>
<td>Pakistan</td>
<td>26.7 mmt</td>
</tr>
<tr>
<td>9</td>
<td>Ukraine</td>
<td>25.4 mmt</td>
</tr>
<tr>
<td>10</td>
<td>Turkey</td>
<td>21.5 mmt</td>
</tr>
</tbody>
</table>

*Projected
mmt=million metric tons
One bushel:

- Weighs 60 pounds
- Yields around 42 pounds of white flour
- Yields around 60 pounds of whole wheat flour
- Fills 53 boxes of cereal
- Rolls into 420 three-ounce cinnamon buns
- Presses into 72 pounds of flour tortillas
- Bakes into 200 sponge cakes
- Earned U.S. farmers an average price of $5.05 in 2020/21

2021 Top Ten Wheat Producing States

<table>
<thead>
<tr>
<th></th>
<th>Production (million bushels)</th>
<th>Avg Yield Acre (bushels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kansas</td>
<td>364.0</td>
</tr>
<tr>
<td>2</td>
<td>North Dakota</td>
<td>196.1</td>
</tr>
<tr>
<td>3</td>
<td>Oklahoma</td>
<td>115.0</td>
</tr>
<tr>
<td>4</td>
<td>Montana</td>
<td>100.8</td>
</tr>
<tr>
<td>5</td>
<td>Washington</td>
<td>87.1</td>
</tr>
<tr>
<td>6</td>
<td>Idaho</td>
<td>76.5</td>
</tr>
<tr>
<td>7</td>
<td>Texas</td>
<td>74.0</td>
</tr>
<tr>
<td>8</td>
<td>Colorado</td>
<td>69.5</td>
</tr>
<tr>
<td>9</td>
<td>Minnesota</td>
<td>55.6</td>
</tr>
<tr>
<td>10</td>
<td>Illinois</td>
<td>48.1</td>
</tr>
</tbody>
</table>

~ Wheat is a type of grass.
~ Einkorn and Emmer are the earliest cultivated forms of wheat.
~ Einkorn has 14 chromosomes, and Emmer has 28 chromosomes.
~ Research scientists believe Emmer crossed with a weed called Jointed Goatgrass to produce modern wheat.

Washington's 2020 Top Five Farm Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Value ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>2.1</td>
</tr>
<tr>
<td>Apples</td>
<td>1.2</td>
</tr>
<tr>
<td>Potatoes</td>
<td>0.948</td>
</tr>
<tr>
<td>Soybeans</td>
<td>0.753</td>
</tr>
<tr>
<td>Grains</td>
<td>0.692</td>
</tr>
</tbody>
</table>

Most Washington wheat is grown in the eastern part of the state.

Wheat has History

Agricultural scientist and humanitarian Norman Borlaug won the 1970 Nobel Peace Prize for his contributions to the Green Revolution. His work helped foster world peace by increasing the food supply and prevented billions of human deaths from starvation.

The oldest direct evidence of bread found to date was flatbread baked by hunter-gatherers more than 14,000 years ago.
Earliest known wheat (14 chromosomes)

When wheat plants fall down before harvest, it is called

This U.S. state ranks fifth in wheat production

Fourth-largest market for US white wheat

Top WGC priority

Super soft wheat variety!

Wheat class used in bread

Train loading facilities process 110 cars at a time

Part of a wheat kernel used in refined flour

A wheat plant wears a just above its roots

Number of pounds in an average bushel of wheat

Borlaug won the Nobel Prize

Can transport 2.4 million bushels of wheat

Summer is when fields are left unplanted to gather moisture and nutrients

Five days of wheat fun for fourth- and fifth-graders!

USDA’s agricultural research division

Comes in at No. 4 on Washington’s list of top farm products

Wheat protein that helps dough hold together and rise

Farmers have only one transportation alternative

The process from breeding to commercial production of a wheat variety takes about years

Father of the Green Revolution

Wheat class used in cookies and cakes

Number of wheat classes

Wheat is divided into six classes based on kernel color, hardness, and planting season.

Western White is a customized blend of 10 percent or more very soft club wheat with common soft white wheat varieties.

Gluten is a protein in wheat that gives dough elasticity.

Gluten, protein, and falling numbers are important industry measures of U.S. wheat quality.

Each class of wheat has specific end-use qualities:

Soft white wheat (winter, spring and club)—Cakes, cookies, crackers, flatbreads, cereals, pastries, pancakes

Hard red wheat (winter and spring)—Breads, hard rolls, bagels, pan bread, flat bread, pizza crust

Soft red winter wheat—Cookies, crackers, pretzels, pastries, flat breads

Durum—Pasta

Hard white—Asian noodles, steambreads, and blended flours

Washington State University has a Variety Testing Program and the United States Department of Agriculture (USDA) has its Western Wheat Quality Lab to help wheat breeders meet market challenges.

The Agricultural Research Service (ARS) is the USDA’s research division.

It can take more than ten years for a wheat variety to go from breeding to production in order to prove it can perform for U.S. and world markets.

Most wheat classes love Washington’s cool nights and warm days, diverse geographic climates and varied precipitation—from 8 inches to 25 inches annually.

A majority of wheat farms in Washington are dryland farms which depend entirely on precipitation and often utilize summer fallow, where fields are left unplanted to gather moisture and nutrients.

Lodging occurs when heavy wheat crops fall over from too much rain, wind or root disease.
~ The Washington Grain Commission (WGC) represents farmers who promote research, marketing and education in Washington state, the nation and throughout the world.

~ The WGC was formed in 1958 by farmers who voted to tax themselves on each bushel of grain sold.

~ The WGC budget for 2021/22 is $7.3 million.

~ In the past five years, the WGC has spent over $20 million on wheat research, marketing and education.

~ Wheat research is the WGC’s top priority. See www.wagrains.org for more information.

~ The WGC is proud to sponsor Wheat Week—a fun, hands-on program that teaches Washington’s 4th- and 5th-graders all about wheat.

Tidewater and Shaver are the primary barging companies serving the Columbia river system. Together they float an average of 60 percent of Washington’s wheat to port elevator locations.

In 2020/21 the US exported 54 percent of its wheat to nearly 50 countries.

Cargo ships called bulk freighters, and container ships transport wheat to hungry customers in Asia, Latin America and the Middle East.

Washington has five grain shuttle train loading facilities. Shuttle train facilities load 110 grain cars in 15 hours or less—some can load an entire train shuttle in as fast as 8 hours. That’s about four minutes per car! BNSF and Union Pacific are Class I railroads that serve Washington’s shuttle train loading complexes. Captive shippers are wheat farmers in areas of the country where there is only one transportation alternative.

2020/21 US WHITE WHEAT TOP MARKETS

1 Philippines 1,287 tmt
2 S. Korea 1,135 tmt
3 China 1,063 tmt
4 Japan 644 tmt
5 Indonesia 493 tmt
6 Yemen 347 tmt
7 Thailand 305 tmt
8 Nigeria 237 tmt
9 Vietnam 156 tmt
10 Taiwan 139 tmt

Tmt–thousand metric tons

~ Amounts are miles per gallon carrying one ton of cargo.
Source: Texas Transportation Institute, Texas A&M University, for the U.S. Maritime Administration