

Ag@School

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AGRICULTURE

Is Your Food and Much More!

Washington farmers produce over **300** different commodities



Washington State Department of Agriculture

WASHINGTON STATE DEPARTMENT OF AGRICULTURE | 1111 WASHINGTON ST SE, OLYMPIA, WA 98504-2560 | AGR.WA.GOV

Food comes from farms. Farmers and ranchers grow crops and animals to feed you and many others around the world. In the USA we enjoy the safest, most abundant, least expensive food supply in the world. Washington state is second only to California in the diversity of agricultural commodities produced.



Today's Children... Tomorrow's Leaders

ag•ri•cul•ture (ag' rə' kul' chər), n. growing plants and animals for food and other uses



AGRICULTURE IS EVERYWHERE

Can you have an AG-FREE DAY? NO WAY

All the food we eat, the cotton t-shirts and jeans we wear, leather shoes, lumber for our houses and furniture, soap, glue, many medicines, tires, books we read, and thousands of other things we use in our daily lives come from agriculture. Much of agriculture is growing and harvesting plants. We cannot live without plants. They provide all the food we eat—either directly as crops, or indirectly as food for animals. They also make the oxygen we breathe, clean carbon dioxide from the air, cool our surroundings, and prevent soil from eroding. People in agriculture grow all sorts of plants, raise animals, and manage forests--- all things humans use for food, clothing, shelter, even fuel.

Think & Discuss

If we had no farmers, how would your life be different?

Fun Fact!

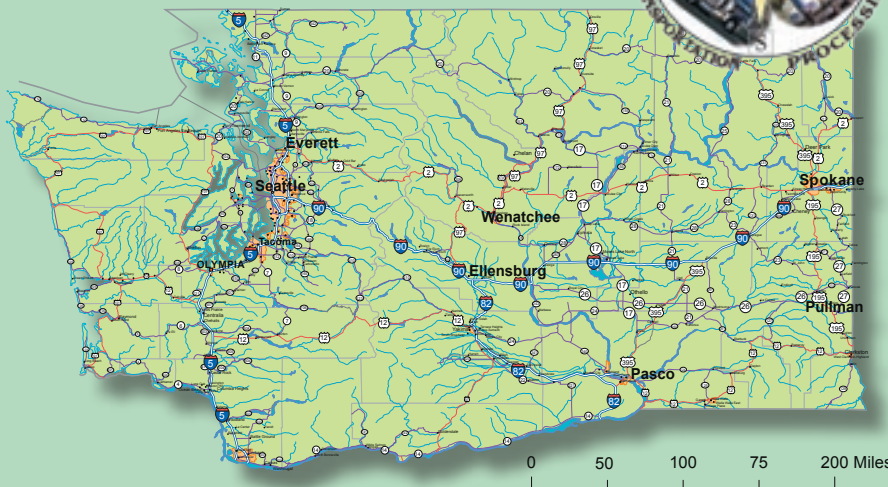
Washington produces every native North American fruit that is grown commercially in the U.S. Three are blueberries, blackberries, and Concord grapes. Can you name the fourth? (Hint: You may eat them with turkey and dressing.)

Answers: Cranberries

Agriculture is Science and Technology

Agriculture is the nation's largest industry. It is everywhere, and so are more than 250 different ag careers. The ag industry consists of about 24 million people who produce, process, transport, sell, and trade the nation's food and fiber. Fewer than 2 million people are actually farmers. America's farmers are the world's most productive. They produce 16% of the total world food production on just 10% of the world's land. US farmers grow more food using fewer resources than ever before. Growers produce the raw products and other people turn them into the things we eat and use every day. Consider all the jobs from farm to your table, closet, or fuel tank. Explore Ag careers at www.agriculture.purdue.edu/USDA/careers

Agriculture - From Field to Table



Imagine you are a truck driver and your office is in Seattle. Your boss gives you the following work schedule. Trace your driving route on the map. In the blanks, write the name of the highway you would use to get to that stop and how many miles you traveled.

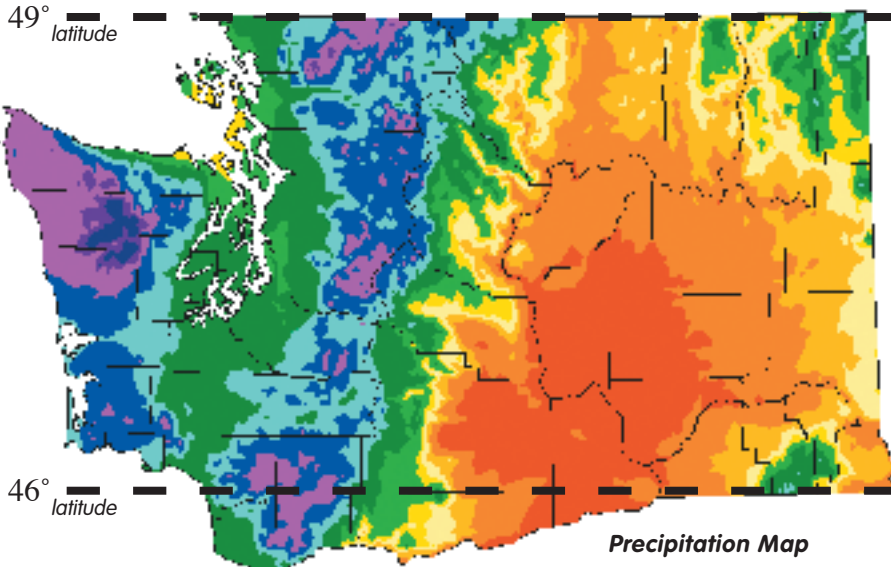
- Pick up raspberry jam at processor in Everett.
Highway _____ for about _____ miles
- Pick up fresh apples at fruit packing plant in Wenatchee.
Highway _____ for about _____ miles
- Deliver the apples and the jam to a supermarket in Spokane.
Highway _____ for about _____ miles
- Pick up a load of wheat flour near Pullman.
Highway _____ for about _____ miles
- Drop off flour in Pasco; pick up sweet corn.
Highway _____ & _____ & _____ for about _____ miles
- Deliver corn to processing plant in Ellensburg.
Highway _____ & _____ for _____ miles
- Pick up hay and deliver to port of Seattle for shipment to Japan.
Highway _____ for about _____ miles
- What is the total number of miles traveled?
_____ miles
- How many different highways did you travel? _____
- How many cities did you visit? _____

Answers: 1. 5, 30 2. 125 3. 2, 200 4. 195, 75 5. 195, 26, 395, 135 6. 82, 90, 120 7. 90, 110 8. 795 9. 10 10. 7

AG DEPENDS ON CLIMATE

Climate depends mainly on **latitude**. Latitude governs the angle of the sun's rays, length of day, and even prevailing winds. Washington lies between 45° North and 49° North. That puts it in the temperate climate zones (between 30° and 60° latitude). Our basic zones are Maritime and Steppe. Maritime is generally along coasts and has large amounts of rainfall and moderate temperatures. The Steppe Zone is located inland with an average rainfall of 10 - 20 inches. It has hot summers and cold winters. Within the Steppe Zone, Washington has two other zones: Desert, which has less than 10 inches

of rainfall, and the Highlands. The Highlands Zone is found in any mountainous area and temperature and precipitation vary with elevation, not latitude. **Our different climate areas are a main reason our state produces such a wide variety of crops.** Use the **precipitation** map to help answer the questions.



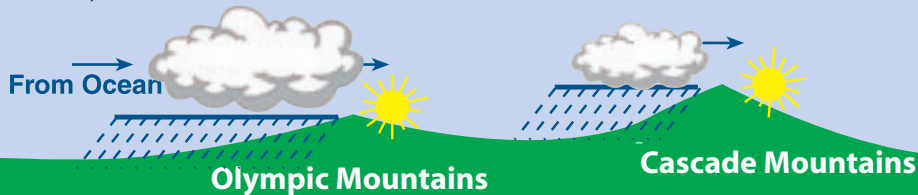
1. Outline Washington's wettest area. It is really a rain forest!
2. Which side of the Cascade Mountains gets the most rain? West or East?
3. Where is the Maritime Zone? Where is the Steppe Zone?
4. Most of the wheat is grown in Eastern Washington. Does that crop need a lot of rain?
5. Draw a circle around the desert. Why is this area our most productive agricultural region in the state? Hint: take a peek at page 4
6. Does this precipitation map give clues about where the Highland Zones are located?

Legend (inches of rain per year)

Less than 10	25 to 30	80 to 100
10 to 15	30 to 40	100 to 140
15 to 20	40 to 60	140 to 180
20 to 25	60 to 80	more than 180

The Rain Shadow

Some parts of Washington receive over 100 inches of rain each year. As moist air from the ocean blows east it must rise over our mountain ranges. The air cools as it rises. Cold air cannot hold as much moisture so the clouds must release their moisture in the form of precipitation (rain, sleet, snow, or hail). This results in an area that receives less precipitation on the other side of the mountains (the rain shadow). Where are the rain shadow areas West of the Cascades?



Washington's Top Five

Hints:

- Roundish, crispy fruit, red, green or yellow
- Beverage produced by cows
- Grain most often consumed by humans
- Vegetable that grows underground; mashed-baked-fried-chipped
- Animals that produce steaks and burgers

A E X J A E A S
 P L N D N O E U
 P T C L I O W B
 L T O K T T X I
 E A R A P A T S
 S C T D P E S D
 Y O A F O H G Y
 P K L I M W I U



My Washington Plate

Draw a line from the hint to the food group on My Washington Plate where it belongs. **WOW** – Each of Washington's top five are represented in a food group!!

Grown In W

PUGET SOUND LOWLANDS

Most of our urban population is concentrated in this region. There is rich soil in these lowlands that stretches from the Puget Sound to the base of the Cascades. This area is perfect for that fabulous milk maker, the dairy cow, as well as for raspberries, vegetable seed, produce, tulips, nursery products, and shellfish.



The climate, physical features, and geography change as you cross Washington, dividing our state into distinct regions.

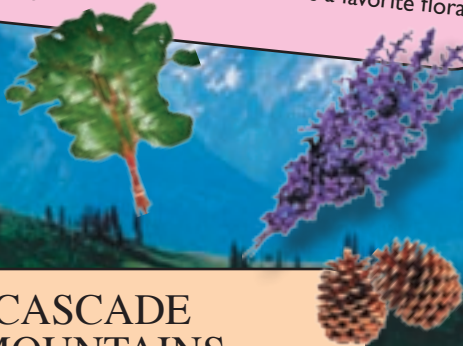
How many regions are there?

How many counties does our state have?

We also have deep-water ports. Place the ports of Seattle, Tacoma, Vancouver, Longview, Grays Harbor, and Port Angeles on the map below.

OLYMPIC PENINSULA

The Olympic Mountains provide timber and recreation. Forest products like an evergreen shrub named salal, are collected and shipped nationwide to florists. Lavender is a favorite floral crop from this region.



CASCADE MOUNTAINS

The Cascades have spectacular peaks and lots of timber and recreation areas. The lower elevations provide grazing areas for cattle as well as land that grows timothy hay and apples.



WILLAPA HILLS

The coastal hills are ideal for growing Christmas Trees. Trees are harvested in the fall and bundled in large stacks. This region also produces cranberries, oysters, and is home to many farmers markets and community supported agriculture (CSA) operations.



COLUMBIA BASIN

The dry region east of the Cascades is a huge lava plateau with rich soils. The heart of the basin receives less than 10 inches of precipitation yet this region is our most productive agricultural region. The reason is **irrigation**. The Columbia River and its tributaries provide water for a region that has ideal conditions for alfalfa, potatoes, corn, mint, grapes, apples, cherries, and many other crops.

Washington

ange as
tinct

OKANOGAN HIGHLANDS

The Okanogan Highlands are rugged foothills between the Cascades on the west, and the Rocky Mountains to the east. Here beef cattle graze among another valuable renewable resource, trees. Trees provide paper, pencils, furniture, and houses. This region also grows a variety of fruit trees.



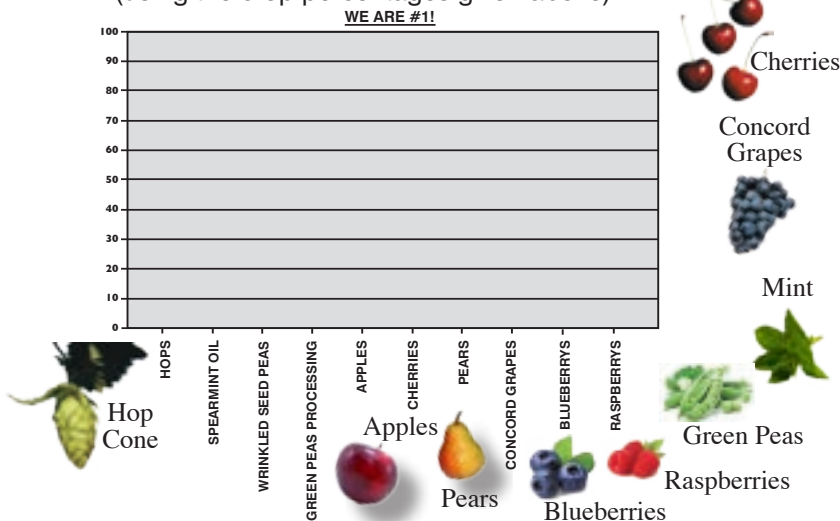
~ Hooray! Washington is #1~

Washington leads the nation in the production of several crops (2015 crop data). Identify the counties or regions that are named below.

- Hops - 75.4%** - Hops are used to flavor beer. The Yakima valley produces three-fourths of the state's hops. The dry climate along with lots of irrigation water from the Yakima River create ideal conditions for this crop. www.usahops.org
- Mint Oil - 72.2% spearmint oil** - Grant and Adams Counties lead the state in production of mint. Every pound of oil will flavor 30,000 sticks of gum or 1000 tubes of toothpaste.
- Peas - Wrinkled Seed Peas 59.9%, Green Peas for Processing 35.8%** - Wrinkled-seed peas are sweeter than smooth seeded peas. We grow the pea seed for next year's gardens and fields. Green peas are vegetables marketed fresh, canned, or frozen. Peas are grown in Whitman, Spokane, Garfield, Asotin, Grant, Adams, Benton, and Franklin Counties.
- Apples - 59.5%** - Apples are the crop that consumers most often link with Washington State. Five areas all share ideal growing conditions -- weather, soil, and water. These areas can be seen at www.bestapples.com/growers/regions/index.shtml (Okanogan, Lake Chelan, Wenatchee Valley, Columbia Basin, and Yakima Valley)
- Sweet Cherries - 65.8%** - Cherries are one of the fastest maturing fruits. In just 60 days blossoms mature into sweet and tasty fruit. They are picked, packed, and shipped to markets in the U.S. and more than 42 countries around the world. Leading cherry counties are Yakima, Grant, Chelan, Benton, and Okanogan. www.nwcherries.com
- Pears - 46.3%** - The pear has been grown by man for more than four thousand years. Washington pears are picked by hand and are prized for their flavor and long storage life. Yakima County has the most acres of pears, followed by Chelan, Okanogan, Grant, and Douglas Counties. www.usapears.com
- Grapes - Concord Grapes 43.6%** - Concord grapes are used to make grape juice, jams, and jellies. All these grapes are harvested by machine. Yakima, Benton, and Franklin Counties grow the most concord grapes.
- Blueberries - 18.6%** - Washington blueberry acreage has increased steadily in the last 10 years. We now grow 6 times more than 10 years ago. About 70% of the crop that is processed is picked by machine. The 30% fresh crop is picked by hand.
- Red Raspberries - 85%** - Washington leads the county in producing red raspberries for processing. The Puget sound lowlands provides the perfect climate for berry production.

Make Your Own Bar Graph:

(using the crop percentages given above)



BLUE MOUNTAINS

The Snake River skirts around the Blue Mountain Range in the southeast corner of our state before it feeds into the Columbia River. Cattle graze among sagebrush and timber. Wheat, barley, asparagus, onions, green peas, and grapes are grown here. This region also boasts the most inland seaport serving the **Pacific Rim** at Lewiston-Clarkston.

Did you know?

Washington's 37,000+ farms power a diverse agricultural economy! The state's food processing industry generates 20.1 billion dollars and the agriculture production generates 10.7 billion (a record high!) and provides 160,000 jobs in Washington! 95% of Washington farms are family owned. More than \$15.1 billion in food and agricultural products are exported through Washington ports, the third largest total in the U.S.

TWO MAJOR RIVERS IN WASHINGTON

- █ COLUMBIA RIVER
- █ SNAKE RIVER

Washington is blessed with great soil and climate for growing diverse agricultural products. That's not all! Our river resources and ocean ports help us move agricultural and other materials throughout the Pacific Rim at an affordable cost. That means that wheat trucked from Montana and potatoes grown in Idaho, as well as products from our own state, can travel by water to ports around the globe.

A Water Stairway

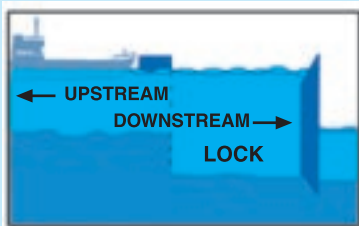
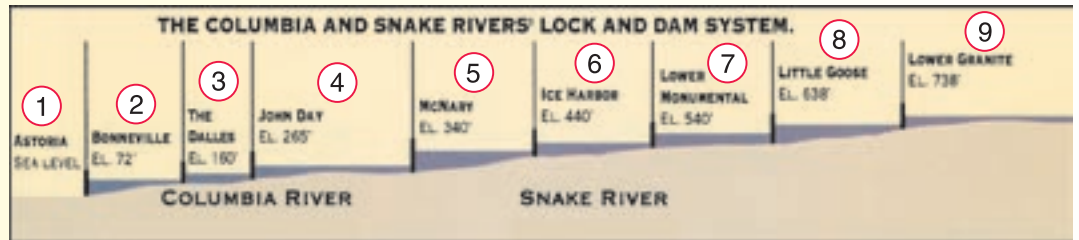
The Columbia and Snake Rivers form a highway for boats and barges. This could not happen without a series of 8 locks and dams that make a stairway in the river. Between the port of Clarkston and the Pacific Ocean the rivers drop over 700 feet. Like a water stairway, the locks allow boats to move up and down the rivers.



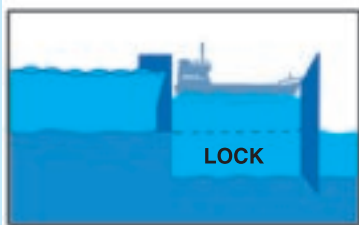
GATEWAY TO THE PACIFIC



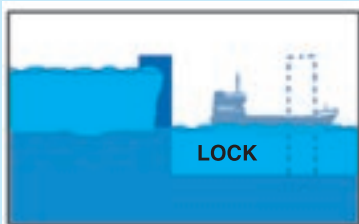
★ = DEEP WATER PORT



(Fig. 1)



(Fig. 2)



(Fig. 3)

A lock and dam work together. The dam holds back water, creating a pool. The lock is a rectangular water chamber near the dam with watertight gates at each end.

To lower a boat or barge, the lock is filled with water to the upstream level. The barge moves into the lock. The upstream gate closes and water is drained out of the lock, lowering the barge to the downstream level. The downstream gate opens and the barge leaves the lock.

Boats can travel the other direction, too, moving from lower to higher water levels. Through locks, boats can travel past dams, waterfalls and other obstacles.

Rivers Also Provide Power, Irrigation and Recreation



The dams numbered 10-16 on the map do not have locks for boat passage but they do provide very important benefits. Clean, inexpensive, renewable hydro-electric power is produced as water moves through the dams. Dams are also important for irrigation, flood control, recreation, and fish passage.

- 10 Priest Rapids
- 11 Wanapum
- 12 Rock Island
- 13 Rocky Reach
- 14 Wells
- 15 Chief Joseph

16 - Grand Coulee Dam

No dam is more important to agriculture than the Grand Coulee Dam. It provides water to the huge Columbia Basin Project that irrigates over half a million acres. In addition to watering land that was formerly desert, the project created another half million acres of wetlands, wildlife habitat, and lakes for recreation. Amazingly the project uses less than 2% of the yearly flow of the Columbia.

THINK AND DISCUSS

Name three renewable energy sources. Why is hydroelectric energy the most reliable? Should we add more hydropower generators to reduce our dependence on fossil fuels?

We Need Plants and Animals

WE DEPEND ON LIVESTOCK!

Livestock are very important to humans and the environment! That's why we need to learn about them, including what they provide for us and how we can best care for them. We also need to manage them correctly so their eating, urination, and defecation have minimal effects on the environment. You already know cattle, pigs, sheep, goats, and poultry provide us with meat and eggs. We also harvest milk from cattle, sheep, and goats. This milk can be made into cheese, yogurt, butter, ice cream, sour cream, cream cheese, condensed milk, cottage cheese, sauces, egg nog, half and half, whipping cream, cheese spreads, soup, buttermilk, baby formula, smoothies, milk shakes, protein bars, whey, and other products.

Livestock also provide us with fiber and leather. Many breeds of sheep produce wool; some goat breeds grow cashmere and mohair; and some poultry supply down feathers. We use these fibers to create fabric, clothing, carpets, insulation, packaging material, felt, hats, mulch, yarn, scarves, upholstery, rug pads, blankets, mattress fill, tennis ball covers, baseballs, hanging basket liners, pads to soak up spilled oil, and pool table covers. One company even makes eco-friendly caskets out of wool!

Leather comes from animal hides and is made into clothing, shoes, car upholstery, briefcases, wallets, purses, baseballs, footballs, tennis balls, basketballs, belts, gloves, hats, saddles, bridles, halters, lead lines, luggage, slippers, book bindings, and drum heads. Pelts (animal hide with fiber still attached) can be



Adhesive tape
Agar (bacterial culture media)
Antifreeze
Bone charcoal for high-grade steel
Bone china
Bone meal
Bullets
Burn dressings
Buttons
Charcoal
Charcoal pencils

Chewing gum
Combs
Crochet needles
Dice
Emery Boards
Explosives
Fabric softener
Feather meal
Felt tip pens
Filters
Gelatin capsules

Gelatin desserts
Glass
Glycerin
Hooves for decoration, musical instruments, pet treats
Horned skulls for decorations
Horse bits
Linoleum
Marshmallows
Mink oil
Motor oil

Mouthwash
Paper
Paraffin
Photographic film
Plywood and paneling
Powder horns
Puddings
Rattlesnake anti-venom
Records
Runway foam
Sheetrock



Shepard's crooks
Steel ball bearings
Syringes
Tennis racquet strings
Toothbrushes
Toothpaste
Valves for human heart surgery
Violin strings
Vitamin capsules
Walking sticks
Wax paper

made into coats, slippers, rugs, furniture covers, bed pads, and decorative clothing and other items.

You might not be aware of the hundreds of other products livestock provide us with besides meat, milk, eggs, and fiber. Whether you know it or not, you benefit from at least some of these products every day!

Besides providing us with food, clothing, and all the important by-products listed above, livestock also help humans and the environment by:

- helping us manage land (grass, weed, and wildfire fuel control)
- producing medicines for humans
- assisting in scientific research
- serving as cart and pack animals (oxen and goats)
- acting as disease sentinels (chickens)
- hunting for valuable truffles (pigs)
- being companions to humans

By-products from Cattle, Sheep, Goats, Pigs, and/or Poultry (used directly or when making other products)

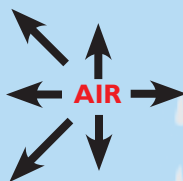
Dr. Susan Kerr, WSU NW Regional Livestock & Dairy Extension Specialist

WHAT A PLANT NEEDS TO GROW

SUN • AIR • WATER • SPACE • NUTRIENTS

How Do Farmers Decide Which Crops to Raise?

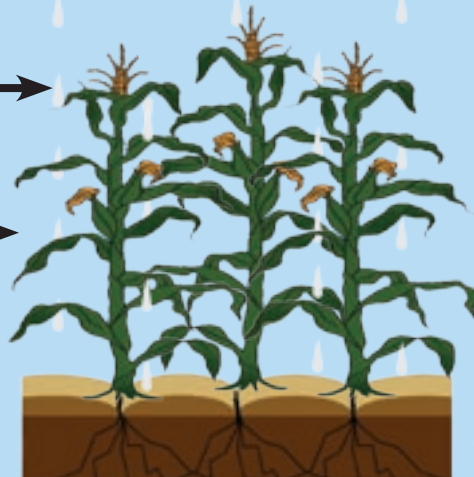
SUN
(for light & heat)



WATER

SPACE

NUTRIENTS
(usually from the soil)



It depends on the weather and the climate. What's the difference between these two terms? **Weather** is the short-term and local version of the climate, like a rainy day. It changes daily or even within the hour. **Climate** is the long-term average of all the conditions in an area's air, including temperature, humidity, precipitation (rain, snow, sleet, hail, or mist), windiness, cloudiness, and atmospheric pressure.

When choosing crops to raise, farmers must consider all these items in the climate, as well as the number of frostfree days and when and how precipitation comes to their land.



Do You Have Pulses In Your Diet?

Do you like to eat hummus or split pea soup? You're eating pulses and possibly ones grown here in Washington! They are easy to add to your diet and provide a source of protein and fiber.



Dried beans, chickpeas (garbanzo beans), lentils and peas are the most commonly known and consumed pulses. Pulses are part of the legume family, but the term "pulse" refers only to the dried seed.

A "legume" is a plant whose seed is enclosed in a pod and which adds nitrogen to the soil by nitrogen-fixing bacteria located in root nodules. This benefits the soil, reduces the need for chemical fertilizers, and works well for crop rotations. Well known legumes include the pulses named above, alfalfa, clover, fresh peas, soy and peanuts.



Pulses can be easily added to provide more nutrients to a meal. They come in a variety of shapes, sizes and colors and can be consumed in many forms including whole or split, or ground into flours.

Pulses are raised in dryland areas of Washington like the Palouse as well as in the irrigated areas of the Columbia Basin.



Career Corner

Crop Insurance Agent

Insurance is good to have in case something valuable is damaged and you need to replace it. For example, people can buy insurance for their homes, cars and family's health. If something bad happens, insurance will help cover the cost. Farmers can buy insurance for their crops and livestock.

People buy insurance with the help of an agent. A crop insurance agent meets with farmers to learn about what they raise, such as wheat, potatoes, apples, hazelnuts, cows or chickens (there's insurance for about 100 different crops!). Then the agent talks to the farmer about what kind of insurance will help protect their income if what they're raising is damaged.

If you'd like to be a crop insurance agent, you should learn about agriculture so you can understand the farmer's business. You should like to help people, too.



There's a lot of paperwork to fill out, so you should enjoy using a computer. And details are extremely important; rules for insurance change a lot from year to year.

Crop insurance agents are respected partners to farmers, and can help keep them farming in good years and bad. Do you know a crop insurance agent?

Company Highlight

What would you do without agriculture?

If you eat, you can thank a farmer, or rancher, or fisherman. If you use a pencil or write on paper, you can thank a forester. Was wood used to build your home? If so, you can thank a forester for that, too! More than 300,000 people in Washington state grow our food, protect our forests and process their harvest so that we can live well. Sales of agricultural products add almost \$59 billion to our state's economy. (For \$59 billion, you can build almost 509 Disneylands!)

To help farmers, ranchers, fishermen and foresters run and grow their businesses; Northwest Farm Credit Services supports them with reliable, consistent credit and financial services. Northwest FCS is part of the Farm Credit System, which was created to serve farmers and ranchers by the U.S. Congress more than 100 years ago. And because it's a cooperative, farmers, ranchers, fishermen and foresters are customer-members of Northwest FCS.

Do you know someone who works in agriculture?



Ag Library Corner

Visit the Washington Ag in the Classroom web site at: <http://www.waic.net/>

Visit: www.myamericanfarm.org

to play on-line games and explore fun family activities.



It's all about agriculture.

How Did That Get In My Lunchbox?

By Chris Butterworth

The best part of a young child's day is often opening a lunchbox and diving in. But how did all that delicious food get there? Who made the bread for the sandwich? What about the cheese inside? Who plucked the fruit? And where did the chocolate in that cookie get its start? From planting wheat to mixing flour into dough, climbing trees to machine-squeezing fruit, picking cocoa pods to stirring a vat of melted bliss, here is a clear, engaging look at the steps involved in producing some common foods. Healthy tips and a peek at basic food groups complete the menu.

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