



# Ag@School

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## FOOD – NEEDED FOR LIFE Brought to you by...AGRICULTURE

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 ranks 12<sup>th</sup> in total value of agricultural products in the United States.



Today's Children... Tomorrow's Leaders

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



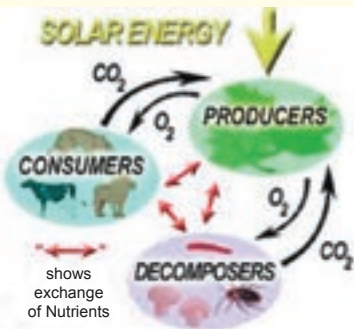


# AGRICULTURE IS EVERYWHERE

## 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.

## IT'S ALL RELATED



**Food Web**

**Q:**

What is our most essential industry?

**A:**

**YES...IT'S AGRICULTURE!**

# What is Agriculture?

Agriculture is a long word so it is often shortened to "ag". Agriculture starts with the growing and harvesting of food, fibers, forests, and flowers. It ends with almost everything we eat, wear and use.



## Agriculture: More Than "Cows and Plows"

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](http://www.agriculture.purdue.edu/USDA/careers)

## Your Food For Life Make Wise Choices... Be Healthy



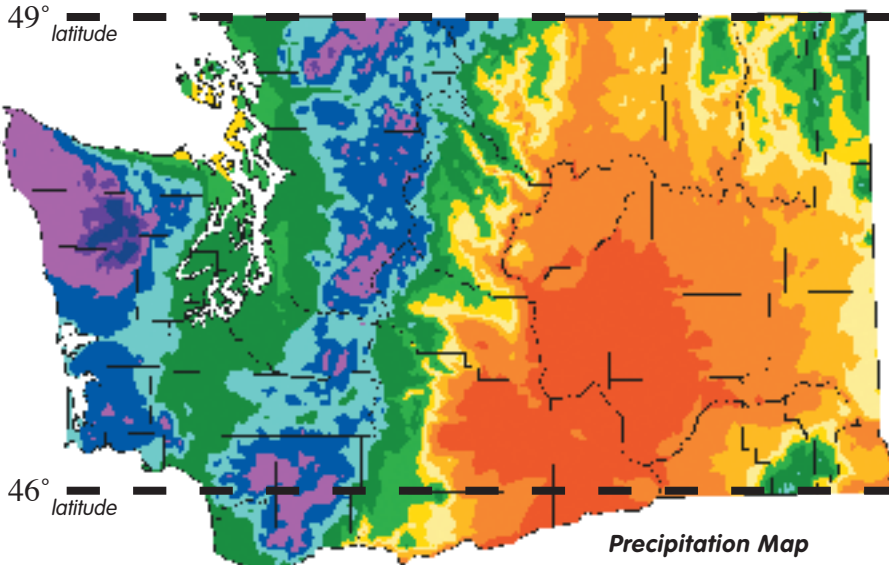
- ✓ Make half your plate fruits and vegetables
- ✓ Make at least half your grains whole grains
- ✓ Know how big a "serving" is
- ✓ Avoid oversized portions
- ✓ Drink water instead of sugary drinks
- ✓ Avoid "empty calories" (excess fat & sugar with few nutrients)
- ✓ Get at least 60 minutes of physical activity each day
- ✓ Read nutritional info on label

Get more ideas and find activities at [www.choosemyplate.gov](http://www.choosemyplate.gov)

# 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.



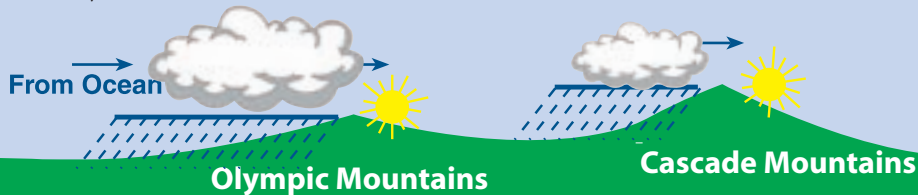
1. Outline Washington's wettest area. It is really a rain forest!
2. Which side of the Cascade Mountains gets the most rain? West or East?
3. Where is the Maritime Zone? Where is the Steppe Zone?
4. Most of the wheat is grown in Eastern Washington. Does that crop need a lot of rain?
5. Draw a circle 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?



## Cranberries Are Climate Specific

Cranberries need an acid soil, an adequate supply of fresh water, and a prolonged growing season that stretches from April to November. Cranberries grow on vines in beds layered with sand, peat (partially decayed plants), gravel, and clay. These beds, commonly known as bogs were originally made by glacial deposits. They are wetlands and strict environmental laws make it extremely difficult to establish new bogs.

### Why do they bounce?

Cranberries have pockets of air inside them that make them float and bounce. If a cranberry is damaged or spoiled, it will not bounce. Cranberries are sorted using a bounceboard separator.

Learn more at [www.cranberries.org](http://www.cranberries.org) or watch YouTube videos on cranberry harvest





# Grown In W

## PUGET SOUND LOWLANDS

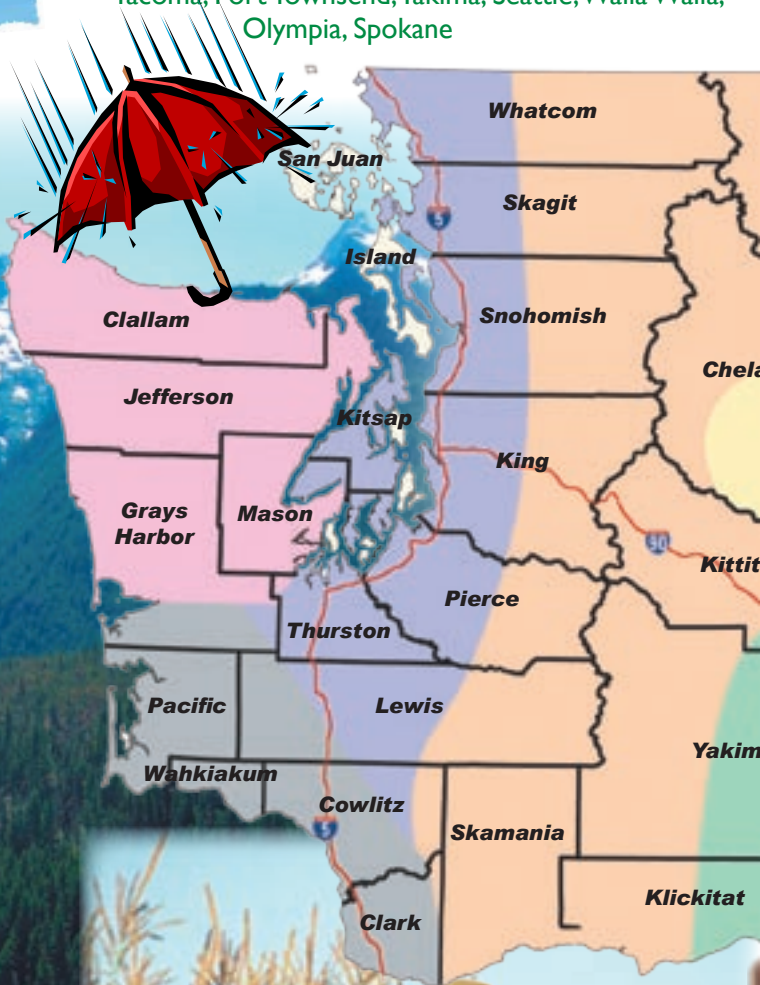
Most of our urban population is concentrated in this region, but there is rich soil in these lowlands that stretch from the Puget Sound to the base of the Cascades. This area is perfect for that fabulous milk maker, the dairy cow, as well as for raspberries, vegetable seed, produce, tulips, nursery products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



## OUR STATE IS DIVIDED INTO SEVEN GROWING REGIONS

Based on the climate; physical features, and geography. We have colored each region for you. Can you place the 39 county seats?

Ritzville, Prosser, Wenatchee, Waterville, Dayton, Pomeroy, Pasco, Ephrata, Montesano, Coupeville, Ellensburg, Dayton, Enport, Colville, Colfax, Everett, Cathlamet, Bellingham, Stevenson, Mount Vernon, Friday Harbor, Asotin, Port Angeles, Vancouver, Kelso, Republic, Port Orchard, Goldendale, Shelton, Chehalis, Okanogan, South Bend, Newport, Tacoma, Port Townsend, Yakima, Seattle, Walla Walla, Olympia, Spokane



## 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.



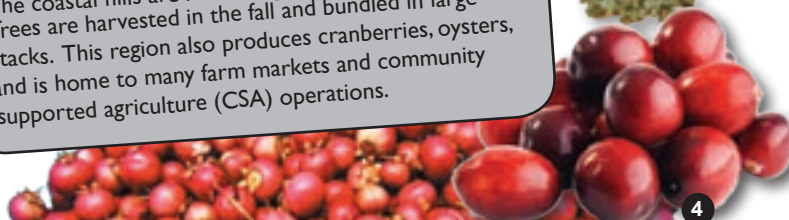
## CASCADE MOUNTAINS

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 farm 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.



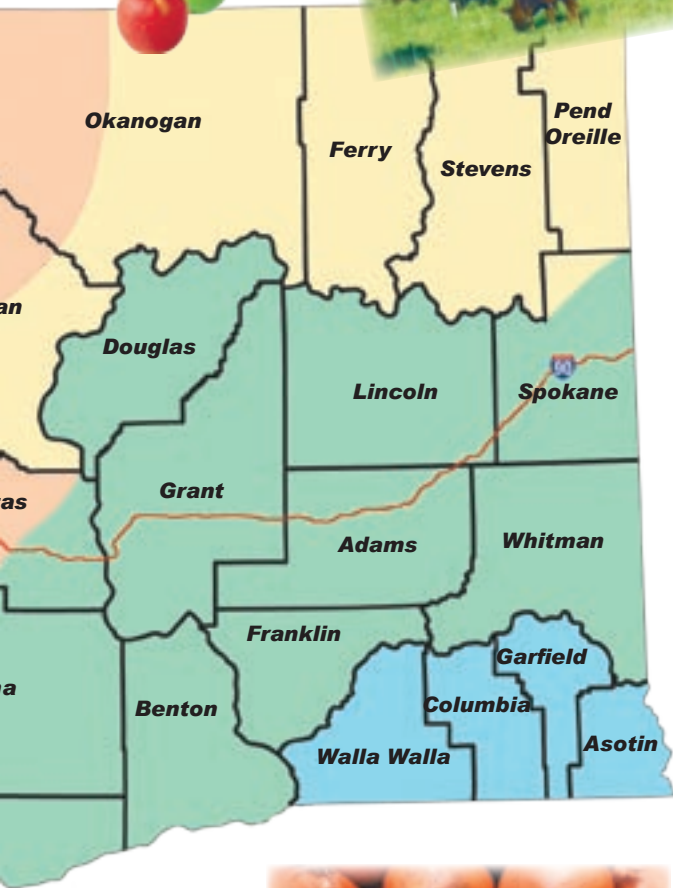


# Washington

## GROWING REGIONS

### OKANOGAN HIGHLANDS

The Okanogan Highlands are rugged foothills between the Cascades lying 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 (2009 crop data). Identify the counties or regions that are named below.

① **Red Raspberries – 92.4% of US supply** – Delicious and nutritious, grown for eating fresh, or in jams, jellies, and pies, raspberries can be harvested mechanically. Whatcom county leads the state with over 90% of this crop. [www.red-raspberry.org](http://www.red-raspberry.org)

② **Hops – 79.2%** – 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. However, Washington hop acreage is expected to drop by 30% in the next few years because of a world-wide oversupply of hops. [www.usahops.org](http://www.usahops.org)

③ **Mint 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. Of the total US supply, Washington produces:

76.7% Spearmint Oil 30.3% Peppermint Oil

④ **Sweet Cherries – 57%** – Cherries are one of the fastest maturing fruits. In just 60 days blossoms mature into sweet, 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 counties. [www.nwcherries.com](http://www.nwcherries.com)

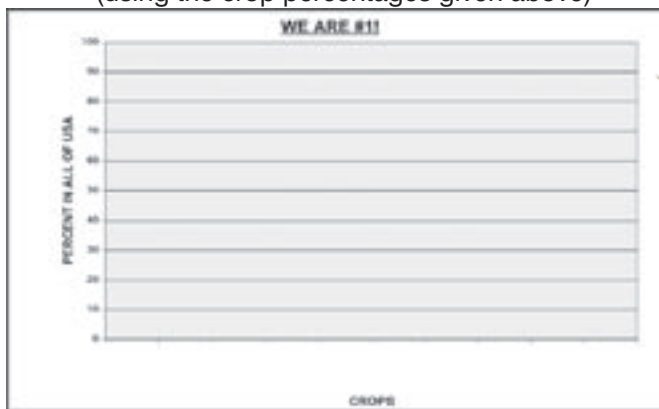
⑤ **Apples – 54.5%** – Apples are the crop that consumers most often link with Washington state. Five areas all share ideal growing conditions -- weather, soil and water. These areas can be seen at [www.bestapples.com/growers/regions/index.shtml](http://www.bestapples.com/growers/regions/index.shtml) (Okanogan, Lake Chelan, Wenatchee Valley, Columbia Basin, and Yakima Valley)

⑥ **Pears – 47.2%** 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. [www.usapears.com](http://www.usapears.com)

⑦ **Concord Grapes – 51.7%** – These are the grapes used to make grape juice and jams and jellies. We also grow 31.4% of Niagra grapes which are used to make white grape juice. All these grapes are harvested by machine. Yakima, Benton, and Franklin counties grow the most concord grapes.

## Make Your Own Bar Graph:

(using the crop percentages given above)



Hop Cone



Concord Grapes



Mint



Raspberries



Pears



Apples



Cherries

### 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.



## TWO MAJOR RIVERS IN WASHINGTON

- █ COLUMBIA RIVER
- █ SNAKE RIVER

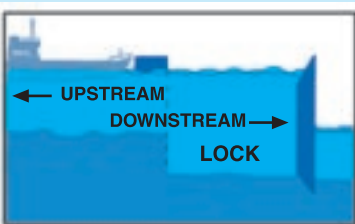
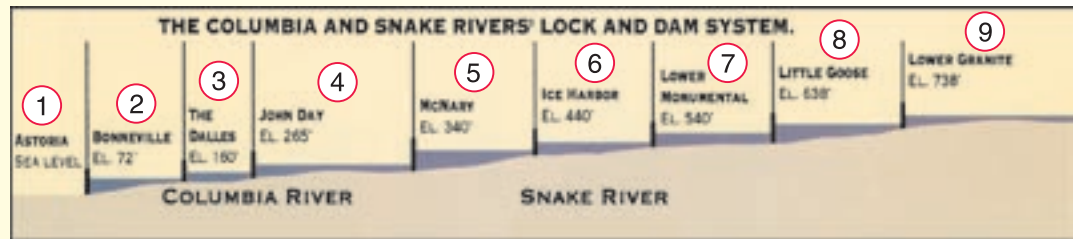
Washington is blessed with great soil and a climate for growing many different crops. That's not all! Our mighty rivers and ocean ports help us move all kinds of products throughout the Pacific Rim at an affordable cost. That means that wheat trucked from Montana and potatoes grown in Idaho, as well as items from our own state, can travel by water to ports around the globe.

# GATEWAY TO THE PACIFIC

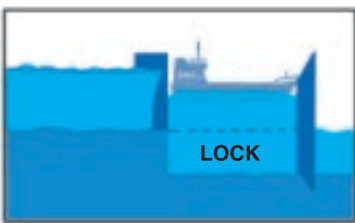


## A Water Stairway

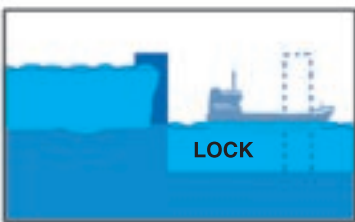
The Columbia and Snake Rivers form a highway for boats and barges. This could not happen without a series of 8 locks and dams that make a stairway in the river. Between the port of Clarkston and the Pacific Ocean the rivers drop over 700 feet. Like a water stairway, the locks allow boats to move up and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



(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.**

## Yikes!—New Panamax



The Panama Canal is a vital point in global shipping, offering the only shortcut through the Americas. A lock system limits the size of the ship able to pass through the canal. In 2014 a third

lock will be completed that will handle much larger ships. They will be longer, wider, and can extend up to 50 feet under water. It is the under waterline measurement that is especially important to us here in the Northwest. Currently the 103 mile Columbia River shipping channel is dredged to a depth of 43 feet to accommodate Panamax ships. Portland and Vancouver would not be able to handle the larger ships.

	Locks	Panamax	New Locks	New Panamax <sup>1</sup>
<b>Length</b>	1,050 ft (320.04 m)	965 ft (294.13 m)	1,400 ft (427 m)	1,200 ft (366 m)
<b>Width</b>	110 ft (33.53 m)	106 ft (32.31 m)	180.5 ft (55 m)	160.7 ft (49 m)
<b>Depth draft<sup>2</sup></b>	41.2 ft (12.56 m)	39.5 ft (12.04 m)	60 ft (18.3 m)	49.9 ft (15.2 m)
<b>TEU</b>		<b>5000</b>		<b>12000</b>

<sup>1</sup>New Panamax sizes are published in metric system



# TREES: A RENEWABLE RESOURCE

Trees are a crop too. It's just that it takes a long time between planting and harvesting. Part of managing a forest is keeping the tree stand healthy by removing mature trees. Older trees can be more sensitive to insect damage, disease, and decay. Keeping forests healthy today means we will have trees to harvest in the future.

When Captain George Vancouver explored the Washington coastline in 1792 he found thick forests growing nearly to the shoreline.



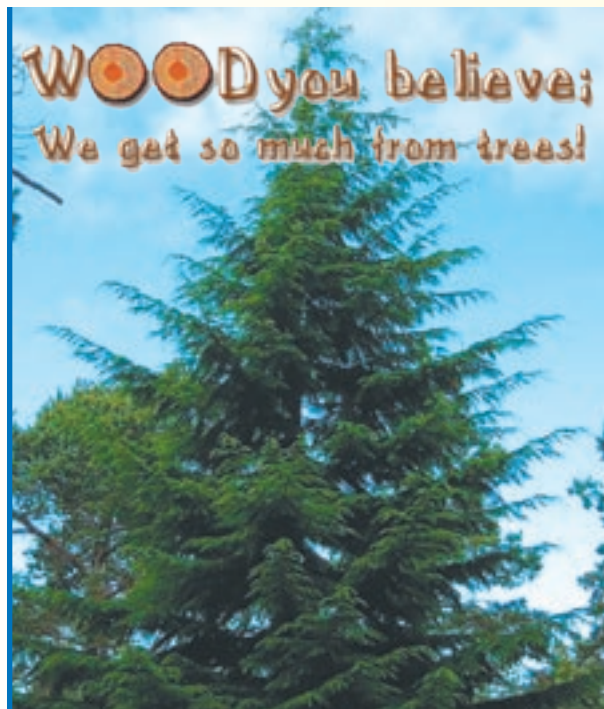
Although fur trappers came to the region first, loggers followed soon after. By 1889 when Wash-

ington became the 42nd state, logging companies were harvesting over a billion board feet of timber each year. Imagine what it was like to harvest trees without chain saws and logging trucks to haul them away! Logs were

often collected in larger rivers and lakes where they were tied together in rafts to be moved by water to the mill or export dock. (The sport of logrolling, where people compete to see who can remain standing the longest on a rolling log in the water, grew out of the logger's job of guiding the logs into rafts for transport.)



Trees are a renewable resource because we plant new trees after harvesting mature ones. In fact we plant three seedlings by hand for every tree removed. Where do these 35 million seedlings come from? Nearly all come from tree nurseries. Seed is collected from cones from the best trees in each seed zone or region. Choosing seedlings by seed zone helps land-owners replant trees that are best adapted to the environment in their area.



Every part of a harvested tree is used to make more than 5000 different products that we use daily! Check out:

[www.idahoforests.org/wood\\_you.htm](http://www.idahoforests.org/wood_you.htm) to learn what we get from trees besides wood and paper.

## Question: Does Bambi live in the forest?

Actually farmers and ranchers provide habitat for 75% of America's wildlife. Why do you suppose wildlife prefers to live on farms and ranches?

There are four habitat needs: food, water, shelter, and space. While forests might provide shelter and space, they may not provide food. An important part of shelter is called "edge". This is a term describing the border between two areas; it could be between the woods and a cropped field or perhaps be the fencerow between fields. Wildlife stays close to edge because farms usually have food (crops and pasture) and water, and the woods provide shelter.

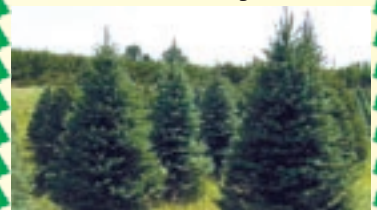


## What is a Board Foot?

A volume measurement that describes a piece of lumber that is 1 foot wide, 1 foot long and 1 inch thick, or its volumetric equivalent of 144 cubic inches

## Do Christmas Trees Come from the Forest?

No. Christmas trees are grown on farms. They are an agricultural product. Get more information at: [www.realtrees4kids.org](http://www.realtrees4kids.org)







Mint photos courtesy of Monti Cooper

## ASK BINGO

Bingo is one smart dog! We can ask Bingo any question about farming and he will find the answer for us. This time our question is: **How do we get butter from milk?**

Bingo says: When milk comes from the cow, it has more than 4% butterfat. If you let the milk stand for 12-24 hours, the butterfat (cream) will rise to the top of the container. Pioneers would skim off the cream and agitate it in a wooden churn to make butter. Later we developed machines that would separate the fat from the liquid milk. Today at modern



milk processing plants the cream is separated and then added back to make whole milk (3.25% fat), 2% and 1% milk (which is really 2% or 1% fat) and skim milk (which has almost no fat—it was “skimmed” off). Next the milk is **pasteurized** (heated to a precise temperature to kill germs). The milk is then **homogenized** (which means the

globules of fat are divided into very tiny particles that will no longer separate from the milk and rise to the top; they stay suspended). The extra cream can then be used to make butter, ice cream, sour cream, and other tasty foods. When you shake the cream, you break the membranes that surround each fat globule, allowing the particles of fat to stick together in larger and larger clusters. The result is butter and buttermilk.

**Do you have a question for Bingo?**  
Send it to: [bingoquestions@gmail.com](mailto:bingoquestions@gmail.com)



Consuming 3-Every-Day® of Dairy – three daily servings of milk, cheese, or yogurt – is an easy way for families to get a powerful punch of nutrients to help build stronger bones and healthy bodies.

## Minty Goodness!

Washington leads the nation in the production of both peppermint and spearmint. Mint roots can be purchased and dug from other mint fields or a farmer can buy mint plugs (baby plants). The farmer uses a mint planter to plant the roots, or the plugs are planted by hand. Mint is shallow-rooted and needs a lot of water and lots of hot weather. A farmer can get two cuttings usually in July and September. A swather cuts the mint and the rows are left on the ground to dry for a couple of days. The mint is then picked up, chopped, and blown into tanks on trucks. The tanks are taken to nearby distilleries where hot steam vaporizes the oil in the leaves. Then the steam and mint oil vapor are cooled and change back to liquid forms. The oil rises to the top and flows into large separating cans. It is strained through filters and stored in 55-gallon drums. About 45% of mint oil is used to flavor chewing gum. Just one pint of mint oil will flavor 30,000 sticks of gum.

Mint farmer Steve Cooper tells us that his crop is used for tea, not oil. When the mint swaths are dry a combine will pick the mint up, separate the leaves from the stems, and unload the leaves into a truck. The mint is then cleaned and sized at the cleaning plant and put in bulk bags and shipped to different companies to be blended into tea. Germany is one of the largest buyers of mint for tea.



## Career Highlight

Name: Steve Cooper

Career: farmer

Education: Technical course at Community College and experience

Job Description: A farmer wears many hats: machine operator, mechanic, marketer, crew boss, etc. He needs a working knowledge of plants, soils, chemicals, fertilizers, weather, irrigation, and much more.

Steve says: “To be a successful farmer you need to have a lot of patience and be very open-minded. Listening to other farmers’ experiences and a willingness to try new crops or use new technology are all important. What I like best is the challenge of planting a crop, watching it grow, and then harvesting; it’s very rewarding.”



## Don't Miss This



Visit:

[www.myamericanfarm.org](http://www.myamericanfarm.org)  
to play on-line games and explore fun family activities. It's all about agriculture.

## WANTED

**Artwork – Poems – Stories**  
Discuss what you have read in this issue of **Ag@School**, then investigate agriculture in your county

Write a story or poem or draw a picture about agriculture in your county.

Contest details at [www.waic.net](http://www.waic.net)

Send entries to: **Gaynor Edwards**  
443 Road T NE  
Warden, WA 98857

By **November 23, 2011**

Winning entries may be featured in future issues.