

Ag@School

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Stewardship: Protecting Agriculture's Tools

Farmers depend on the same tools which have been used since farming began more than 10,000 years ago. These basic tools are essential for plant life. Plant life is the source of food for every living thing. Farmers in America are among the best in the world. American farmers practice good **stewardship**, protect their tools, and use their tools wisely to produce **sustainable agriculture**.

A FARMERS TOOLBOX CONTAINS THE TOOLS THAT WORK TOGETHER TO GROW PLANTS.

Fill in the blanks with the correct resource:

1. The sun provides _____ which plants need to grow.
2. Healthy _____ provides nutrients and minerals that are taken up by plant roots.
3. People, crops, animals, industry, and aquatic life all must share the _____ supply.
4. Trees and crops use carbon dioxide and produce oxygen, making the _____ healthier for people.



Today's Children... Tomorrow's Leaders

Sustainable Agriculture: Using technology and resources to keep farms profitable, improve human lives, yet respect the environment.





Farmers are Environmentalists

Farmers were environmentalists long before it became popular to be one. Farmers care about **natural resources** because their business depends on them. They work at keeping water and soil clean and healthy because they will eventually pass the farm on to their children.

Good **conservation** practices are part of a sustainable agricultural system. Sustainable agriculture is growing food, fiber and forestry products that are:

- 1) Environmentally friendly now and in the future;
- 2) Profitable enough to keep farmers in business;
- 3) Acceptable to society.

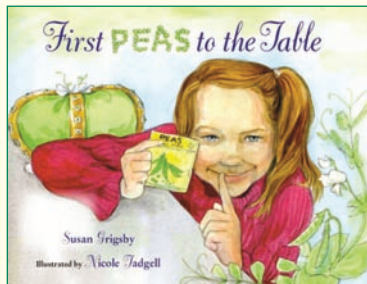
Think and Discuss:

- Why is conservation important to a farmer?
- Why must farmers make a profit?



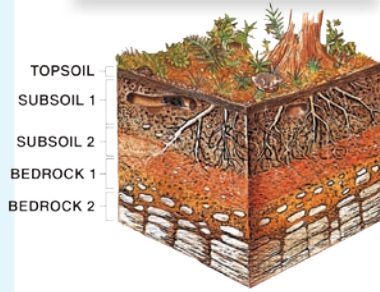
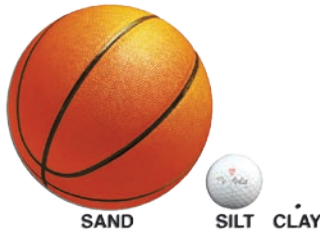
Farmers and ranchers provide habitat for 75% of our nation's wildlife. Trees on farms and ranches provide shelter for ducks, geese, and many other animals. Fish live in the freshwater streams that run through the farmland. Many animals survive winter by eating excess crops left in the fields after harvest.

Suggested Reading



Maya enters a contest to see whose planted pea seed makes it to the table first. Her friend Shakayla is also in the contest. Who will the winner be? This award-winning, light-hearted story also presents scientific and historical information.

3 Basic Soil Particle Sizes



CAN YOU DIG IT?

Soils are made of three basic particles called sand, silt, and clay. The difference in size between the three would be like comparing a basketball (sand), a golf ball (silt), and the tip of a ballpoint pen (clay). Soils from different locations vary in their amounts of each of the three particles. The amount of each type of particle is important because that determines the capacity of the soil to hold water and air. In the Columbia Basin, soil can be very sandy. Whereas near Mica, WA the soil is nearly all clay. In fact, there is a business in Mica that uses the soil to make bricks.



Ideally soil is:

- 45% particles (sand, silt, and clay)
- 5% organic matter (dead plants and animals)
- 50% empty space (pores) half filled with air, and half filled with water

Without decayed organic matter, **humus**, the soil loses its capacity to retain the water and air that soil organisms need.

Sheep are Stewards Too!

Sheep are one of the most environmentally friendly animals on the planet. Sheep are eager to eat woody and broadleaf plants as well as tall weeds. Sheep are raised for food and fiber.

Forest-Friendly Sheep: The US Forest Service uses sheep as "living herbicides" to eat brush and weeds that might crowd out young trees. They also use sheep as "fire-fighters", grazing them in areas where there is lots of underbrush that might increase the risk of a forest fire.

Farmer Friendly Sheep: Sheep eat plants that cows often avoid. Sheep can be useful in controlling weeds in agriculture. Sheep are kept on growing schedules and graze in herds.

Friends of Watersheds: Grazing sheep in **watershed** areas with lots of shrubs helps to manage vegetation and decrease soil erosion. The pointed hooves of the sheep poke holes into the soil. This creates the perfect setting for new seeds and root systems to thrive.

Unscramble the words below (all are found above) and copy the letters in the numbered cells to other cells with the same number!

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Grazing Benefits Animals and Soil Alike



Beef cattle is one commodity that is produced in all 39 of the counties in Washington State.

Cattle and other grazers such as sheep and goats are able to utilize land that is not useful for growing crops. This land may be too steep, too rocky, or even too wet to grow other crops. Grazers convert solar energy (in the form of grass and other plants) into nutritious high-protein foods for the human diet.

Some of the many environmental benefits of well-managed grazing land are: plant growth is promoted, soil ero-

sion is reduced, brush is controlled, and at the same time the ground is fertilized with manure. Grazers can clear excess vegetation from forest undergrowth which reduces the fuel load for wildfires.

Grazing along streams removes excess plant matter that would otherwise decompose into the water (think about how water in a vase of flowers looks and smells after a few days). Grazing animals are also used in cities to control overgrowth. Well-managed grazing utilizes land which is not good for growing crops and it can also improve the water quality and habitat for fish and wildlife.

Contributed by Robyn Meenach



FIRE

Did you know that fire can be beneficial? Prescribed or controlled burning of land is planned, monitored, and has a specific purpose. Controlled fires are used to reduce the buildup of fuel which could lead to uncontrolled, more serious, and possibly devastating fires. Fire is a natural part of the forest and grassland ecology. Controlling the extent and intensity of a fire can better promote the growth of trees, wildflowers, and other plants. **Controlled burning** also benefits the soil by returning more readily available nutrients.

Uncontrolled fires are usually unplanned and threaten to destroy lives, property, or natural resources. **Wildfires** are uncontrolled fires that destroy large areas of land and can cause damage to the soil and the environment. Wildfires burn so hot that they kill organic matter in the soil. Wildfires can be started by humans or by nature. Think of three ways people could be responsible for starting a wildfire and three ways nature may start a wildfire.



THE SWINE INDUSTRY IN



Washington's Swine Industry represents many niche production opportunities compared to the major pork producing states. In Washington, there are many pork producers ranging from small hobby farms to commercial farms.

There is not a standard production system in our state. Many pig farmers direct market their pork. There is a group of pork producers in Washington whose primary focus is to produce pigs for youth to show at state fairs, county fairs, and Junior Shows.

Pig farms work hard to match their local environmental conditions, labor resources, market demands, and feed sources for their own farms. In Washington, as much as possible, the pigs are fed with local grains. Less pork is exported than in past years and more is sold directly to consumers.

Pork producers take pride in how they care for their animals and their land.



We are Free Range, Never Administrated also raise some USDA Organic Certified hog

Our pigs are born and raised just outside our state. The grain our pigs eat is also raised We make their feed fresh daily on our farm, proper vitamins and minerals that are adjust

The meat that is produced is sold at the F Season's Markets in Portland and Vancouve



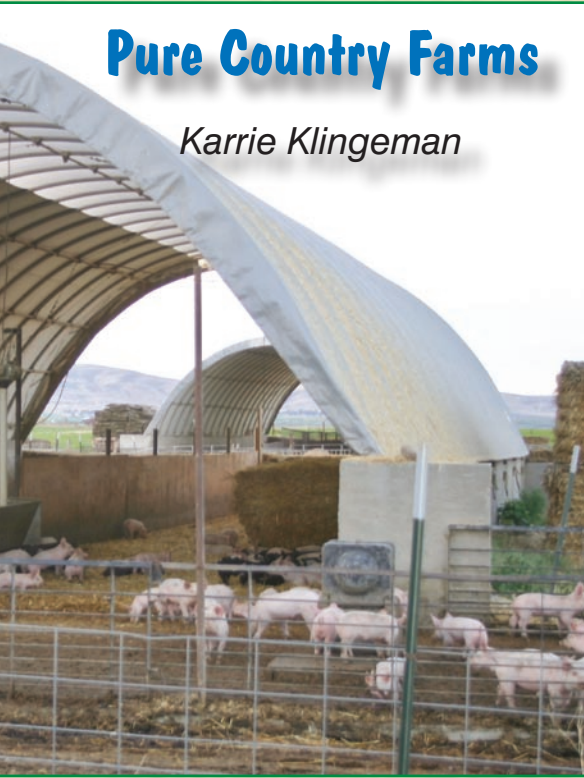
-piglets weigh about 2# at birth

-at 6 months will weigh 265+##

WASHINGTON IS UNIQUE

Pure Country Farms

Karrie Klingeman



Antibiotics, Non GMO Verified and

Ephrata Washington; the central part of

ed in Washington not far from the farm!
first we grind the grain; mix it with

ted for the pigs growth needs.
PCC Markets in Seattle and the New

-average about 10 pigs/litter



-eat about 650# of feed in that 6 months



“Our farm includes a few **sows** (mother pigs). Having grown up on a hog farm, I enjoy working with pigs and giving our kids the opportunity to raise pigs. The main goal with our sows is to provide local youth (4-H & FFA) with pigs for county fairs. We plan **farrowing** (birth) of piglets so they will be the correct age and size for fairs. We feed primarily local grains to our pigs and rely on our family’s labor to keep pigs fed, clean, assist in birthing and vaccination. Pigs go home with students at about 8 weeks old. If you get to go to a fair enjoy the pigs and other animals the students have worked hard to get ready for the big event.”

Jaime Sackmann



Weeds - Agriculture's #1 Pest

A weed is a plant growing in the wrong place. A rose bush growing on a football field is a weed. **Noxious weeds** are the worst. These weeds are non-native plants that were



introduced into the US through human action. They arrived without the natural enemies that keep them in check in their native lands. They steal moisture, nutrients and sunlight and can be poisonous to both humans and animals. Noxious weeds are so damaging that Washington adopted a weed law in 1881, before we even became a state.

How Do Weeds Travel?

Weeds are able to spread and grow without human help and they are pretty sneaky about spreading their seeds. Seeds travel by wind, water, animals and humans. They stick on cars, boats, shoes, pets and bike tires. Some weed plants can even "throw" their seeds as far as 15 feet.



How Are Weeds Controlled?

Weeds can be controlled by planting other plants to compete with them, by mowing them down, or by introducing insects or diseases to control the plant. Also, farmers carefully and responsibly use chemical herbicides. The best control is achieved by using a combination of all those methods, called Integrated Pest Management.



WANTED DEAD NOT ALIVE!

Noxious Weeds



Yellow Star thistle

This weed arrived from Europe in soil carried in ships. It crowds out native plants that animals depend on for food. It has sharp spines that can hurt people and animals. It is especially bad for

horses, causing chewing disease which can kill them.



Scotch Broom

This flowering shrub is a serious problem in western WA, growing in open, dry meadows and along roadsides. It crowds out native plants, leaving nothing for wildlife to eat. It

also alters the soil so that even after removal, native plants will not grow there for many years.

WORD SEARCH

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| U | P | C | A | T | T | L | E | T | H | I | S | T | L | E |



"I am Poison Ivy.
Stay away from me.
I'll make you miserable!"

Words can run all ways: up, down, across, backwards, diagonally.

| | | | | | |
|------|------|------------|--------------|---------|----------|
| AIR | SEA | NATURE | STEWARDSHIP | THISTLE | OCEAN |
| ELK | SUN | IRRIGATION | AGRICULTURE | FARMER | WILDLIFE |
| DEER | EAT | GROCERIES | KNAPWEED | ENERGY | APPLES |
| LOG | LAKE | RUMINANTS | CONSERVATION | CATTLE | SOLAR |
| RAIN | COW | TOADFLAX | RECYCLE | WATER | EAGLE |
| CUD | | | WATERSHED | SOIL | TREES |



What insect helps you the most?

The honeybee. If it weren't for bees carrying pollen between the male and female flower parts, there wouldn't be any apples, almonds, or cherries. One-third of all our food - fruits and vegetables - would not exist without bees visiting plants.

Take some guesses on this "Bee Trivia" quiz:

1. How fast can a honeybee fly? _____
2. How many eggs does a queen bee lay in a day? _____
3. How many times does a honeybee need to visit an apple blossom to help create a perfect apple? _____
4. How much honey (fuel) would it take for a honeybee to fly one trip around the world? _____



Protecting Crops

Weeds are a farmer's #1 pest but insects are also a problem. It is often said that the pioneers planted 4 kernels of corn for every plant they hoped to harvest:

- ✓ 1 for the maggot
- ✓ 1 for the crow,
- ✓ 1 for the cutworm,
- ✓ and 1 to grow

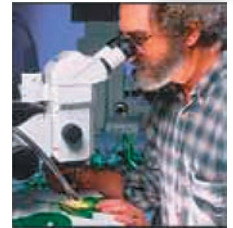


This may look like a pretty flower, but it is actually Canada thistle, a bad weed.

Liquid herbicides such as this are sprayed on the bad weeds (like Canada thistle) to kill them.



This scientist studies ragweed leaves under the microscope. He is searching for a biological way to control this bad weed using natural fungi.



Protecting Crops From Pests

What's a pest?

A pest is anything someone doesn't want around. It can be a weed, a bug, a germ or your neighbor's dog. Pests aren't necessarily bad; we just wish they'd go someplace else.

Pests are a big concern for farmers and weeds are the biggest problem. More than 1,800 kinds of weeds compete with crops for nutrients, water and sunlight. There are about 10,000 insect species that can attack crops and animals.

Why do we need pest control?

If weeds are not controlled, harmful insects and diseases could cut crop yields in half. This would result in needing twice as much land to meet today's food needs. As the population grows, even more food will be needed. In order to save land for things such as: wildlife, forests, and recreation, we must grow our food on the least amount of land possible.

What's a pesticide?

The word pesticide is like an umbrella. Under this umbrella are various classes of chemicals that work on different pests – things like weeds, insects, fungus, germs and disease.

Pesticides are not bad or scary. We use them every day in our homes without even thinking about it. They kill germs in the kitchen, molds in the bathroom, and bacteria in our mouths. That's right! Mouthwash is a pesticide; it kills germs.

Pest control in agriculture

In the past, farmers relied mainly on chemical pesticides to kill pests. This method often killed good bugs like ladybugs, lacewings, and praying mantises that feed on harmful bugs. Today, farmers use a whole "toolbox" of pest control methods, called **Integrated Pest Management** or IPM. These tools include cultural, mechanical, biological and chemical methods (definition on Page 6). IPM systems are kinder to both the environment and are beneficial to insects. Agricultural pesticide use has been dropping for over 20 years. This is due, in part, to the use of IPM. Newer pesticides are used in very tiny amounts. Pesticides are very expensive and farmers can't afford not to use them wisely.

What Did You Learn ?

What is the #1 pest in agriculture?

What is the most important insect to agriculture? _____

Name four ways that weed seeds can spread:

1. _____

2. _____

3. _____

4. _____

Name three beneficial insects that help farmers by eating harmful insects:

1. _____

2. _____

3. _____



Every Day is Earth Day for Agriculture!



Earth Day was first celebrated on April 22, 1970, and has been celebrated on the 22nd of April each year since. Farmers and ranchers celebrate earth every day by protecting and conserving the Earth's resources all year round. Farmers and ranchers know that with-

out plants - all humans, animals, and agriculture could not exist. Caring for the environment allows the needed renewable resources to continue to be produced now and into the future.

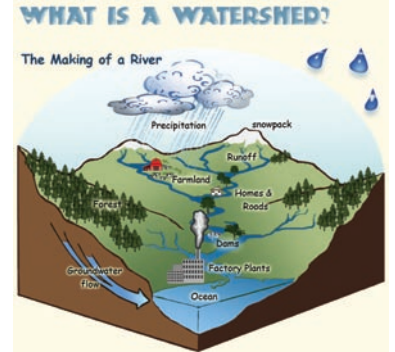
More than 90% of US farms are operated by individuals or families. Maintaining and improving the environment is necessary to keep the family business going. Today's farmers are restoring wetlands, reducing soil erosion, protecting wildlife, and generating far less waste than ever before. Every day is Earth Day for agriculture!

WORD BANK for the crossword puzzle
 recycling, weeds, stewardship, water, topsoil, habitat, erosion, wildlife, litter, conservation

What is a Watershed?

A watershed is the land area that delivers run-off water to the area's lowest point – a stream, river or lake. Small watersheds flow into bigger ones until they eventually reach the ocean. This water travels across and under fields, forests, cities, streets and lawns.

We all live in a watershed and everything we do in our watershed affects its water. Run-off from streets, yards, farms and forests eventually end up in our water.



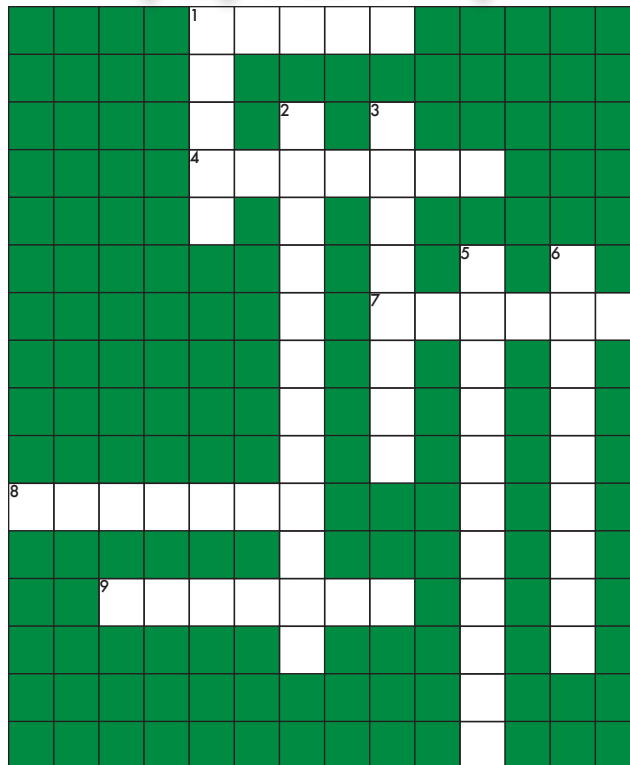
- Do you live in a watershed? _____
- Can you think of two actions you might take at home or school to help stop pollution in your watershed?

1. _____
2. _____

Every day is Earth Day Puzzle

Across

1. Unwanted or troublesome plants that can damage crops
4. Movement of soil from one place to another
7. To throw trash away carelessly
8. The environment where people, animals or plants live.
9. Fertile upper layer of soil used for growing crops



Down

1. This liquid is necessary for all living things
2. Protection, preservation and management of natural resources
3. Animals living in a natural, free setting
5. The management and care of tools of a trade
6. The process of making new products by reusing materials

