Ag Equipment Around the World

Agricultural equipment is used around the world. Some of the many countries where it is helping to improve ag productivity are: the United States, Canada, Australia, Great Britain, France, Germany, Hungary, Russia, the Ukraine, Argentina, Brazil, and Mexico. Can you find all of these countries on a world map? Research what is grown in these countries. What types of ag equipment do you think they use?

Horsepower (hp)

For nearly two hundred years, the horse was the only supply of power on the farm; thus the expression "horsepower." Until tractors were developed and used, the workhorse supplied the power to pull farm implements over every acre of soil planted. If farmers had to rely on horsepower to produce food today, our nation would need 20 times the number of existing horses, and five times the number of farm workers. The strength of farm equipment today is measured in a unit called horsepower.

Amazing FACTS

- A large silo can hold seven million pounds of silage.
- The number of tractors exceeded the number of horses and mules on farms for the first time in 1954.

Precision Farming

Precision farming is a system that uses satellite and computer technology to help farmers grow more and better crops. Many years ago, when farms were small, farmers knew each field very well. Because today's farms have grown larger, farmers need to use new technology to make maps and keep track of each field.

Farmers usually start with **yield maps** that show how much crop was grown in each area of the field. Then they might test **soil samples** from different places in the fields to find out if the soil needs special nutrients or fertilizers.

The **Global Positioning System (GPS)** is a group of satellites in space that sends signals to monitors in a farmer's tractor or combine. This tells the farmer, within inches, where they are in the field as they measure yield or take soil tests.

A **Geographic Information System (GIS)** is then used to make maps. GIS uses a computer to combine yield and soil information with other data, like water drainage, insect damage, and weed problems. Using these maps, the farmer decides what is needed to improve their crops in each field.

Farmers can then use **Variable Rate Technology (VRT)** to put just the right amount of seed, fertilizer, and crop protectants on a specific part of the field. The maps show what is needed, and GPS guides the farmer to the right location.

Combines

Farmers used to **harvest** crops by hand. They cut the stalks and stacked them in large piles, then the farmer had to separate the grain from the stalk by hand. It took many people to do these tasks until Cyrus McCormick invented the **reaper** in 1831. The reaper had a turning wheel that moved a blade back and forth to cut the stalks. The **thresher** came shortly after the reaper was invented. The thresher separated the grain from the stalks. Farmers then used a reaper to cut the stalks and a thresher to remove the grain. Farmers now use machines called **combines** to pick the grain from fields (also called harvesting). A combine cuts the stalks and separates the grain from the plant material. The word combine came about because the machine combines the job of a reaper and thresher.

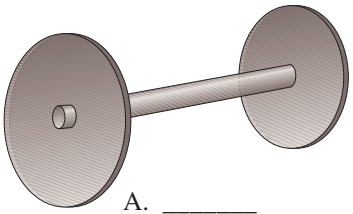
Tractors

A valuable piece of machinery that farmers use today is a tractor. Before tractors, farmers used horses and other animals to pull and work pieces of heavy equipment. The first types of tractors were called **traction engines**. They ran on steam and were hard to maneuver. By the 1920s a more practical and improved tractor was developed. Today, tractors are used for many different things. They are used to plant and cultivate. Tractors also pull heavy loads, such as wagons filled with grain. A tractor can pull these heavy machines and equipment because it has a powerful engine and excellent traction.

Simple Machines

Farm equipment design uses "simple machines" to help get heavy work done. Read the following definitions and then match each simple machine definition to its picture and write the number in the space provided.

1. An **inclined plane** spreads the amount of work needed to move an object over a larger distance so that less force is needed at any particular moment.
2. A **wedge** is two inclined planes attached to each other. Wedges make work easier by splitting something when force is applied.
3. A **screw** is an inclined plane rolled up. It concentrates the force applied on an object to a smaller area. It pushes a concentrated amount of force away from the user.
4. A **lever** allows a weight to be moved a short distance with a concentrated amount of force.
5. A **wheel and axle** reduces the amount of friction an object creates during its motion.
6. A **pulley** changes the direction of the force applied and makes work easier.
7. **Gears** are wheels with teeth. The teeth of one gear turn another gear. Gears are used to increase or decrease speed and power.



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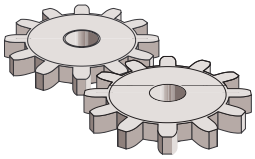

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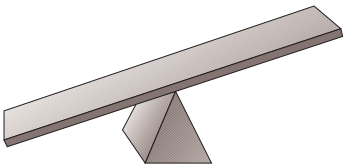

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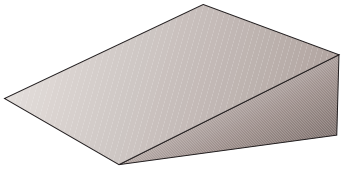

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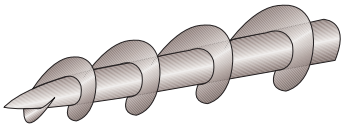

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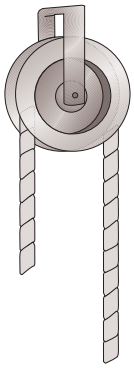

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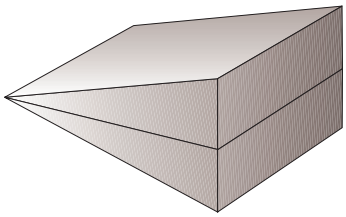

G. _____

Amazing FACTS

- Some hay bales may weigh more than 2,000 pounds!
- Some telescopic material handlers can reach 44 feet!
- The biggest piece of Caterpillar® ag equipment by capacity (how much it handles and holds) and dimension (the length, width, and height) is the Lexion® 485 combine.

Biotechnology

Biotechnology is the process of using biology to create, improve, or modify plants, animals, and microorganisms. Some examples of biotechnology are:

- The pinpointing of a gene which may help wheat grow in many new places worldwide. Wheat is unable to grow in some areas due to the soil or climate. Work with the pinpointed gene may help create more food for a hungry world.
- Bt cotton, which kills bugs that hurt the plant, helps farmers use less insecticide.

Career Corner

Lori Timberlake Porter

Marketing Project Engineer
Caterpillar Agricultural Products Inc.
DeKalb, Illinois

What is your role in the agricultural industry?
My job is to inform farmers about the features and benefits of Caterpillar agricultural equipment. My co-workers and I do this through a magazine that is mailed to our customers, and a newsletter for the dealers who sell our equipment. We also write articles for other farm newspapers, magazines, and broadcasters so they can share information about Cat products with their audiences. Plus we also organize events where farmers and our ag sales representatives can learn about our equipment.

How did you become interested in a job in agriculture?
Agriculture is one of our most important industries! I grew up in the city, but I had a chance to go to work for an agricultural seed company a few years after I graduated from college. I became very interested in the science and technology of farming.

What is your favorite part of the job?
I like working with farmers. They are very dedicated to growing quality crops, and to using new technologies to improve crop yields. I also like learning about how each different piece of farm equipment works, and how farmers use them to get their work done.

Larry Thurow

Associate Professor of Agriculture
Parkland College
Champaign, IL

Describe your job.
I am a teacher in the subject area of agriculture. The specific subjects I teach are Introduction to Soil Science, Agricultural Applications of the Computer, Precision Farming Technology, and Geographic Information Systems (GIS)/Global Positioning Systems (GPS). Labs are generally "hands-on" activities involving students solving everyday problems using GIS/GPS technology. I "coach" my students and provide help when needed. Students are encouraged to create solutions for the lab problems. I also spend much of my time exploring and researching new technologies involved in precision farming. I take advantage of every opportunity to try-out new equipment and software related to the areas I teach.

How did you become interested in GPS?
During the Gulf War, CNN had several news reports on GPS and how it was used to guide missiles and send directions to troops. Around 1992 I was able to actually see and try a GPS from the US Army. The first GPS we purchased for school use was in 1996. It was very expensive and had limited capabilities.

What subjects in school help you the most with your job?
Agriculture and Geography. I enjoyed both subjects as a student because they dealt with the real and physical world.

Technology on the Web

Yesterday's Tractors Magazine, Just for Kids:
www.ytmag.com/kids.htm

Tractor Games:
www.ytmag.com/games.htm

Caterpillar Ag Equipment:
www.CAT-ag.com

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