



Arizona depends on the 5Cs...YOU depend on them

Cattle, Cotton, Citrus, Copper and Climate: The Arizona Five C's were the backbone of Arizona's economy. This year we are celebrating Arizona's Centennial, 100 years as a State. And you cannot celebrate statehood without talking about the Five C's and the role they played and the role they continue to play in Arizona's economy. Cattle, Cotton, Citrus, Copper and Climate have been the driving forces behind Arizona's economy and have traditionally been what made our towns and communities grow. They provide jobs and opportunity. Today, Arizona's agriculture industry is a \$10.3 billion industry while Arizona's copper industry is a \$9.3 billion industry!

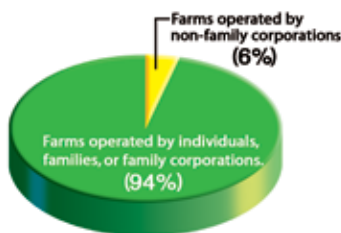


Cotton farmer, Kevin Rogers, is a 4th generation farmer.

Nearly everything you do from the time you wake up in the morning until the time you go to bed is possible because of agriculture and the Five C's. The mattress you sleep on, the sheet you cover up with, the pajamas you wear, the pillow you lay your head on, and the towel you dry off with are all possible because of a little plant called cotton. The lights you flip on run currents through copper wires. The toothpaste, shampoo, soap, deodorant, lotion, and make-up you use are created with by-products from cattle. How about the vehicle you ride around in: the rubber tires are possible because of cotton and cattle. And let's not forget all of the beverages, meals and snacks you consume throughout the day!

Producing Food...it's a Family Thing

You have probably heard the phrase "family farm." Did you know that 94% of farms and ranches in Arizona are operated by families?



Though some farms are much larger than in the past, they are still operated by families.

Hickman's Family Farm has been raising laying hens since 1944 when Grandma Hickman began raising hens in her backyard. As her business and family grew so did her flock of hens. Today, Grandma Hickman's children and grand children work for the family business. Hickman's Family Farms cares for over 5 million hens, providing nearly 4 million eggs to Arizona families each day.



Andy and Stefanie Smallhouse have been ranching in Pima County on Carlink Ranch which has been providing quality food to Arizona families since 1884. Andy is a 5th Generation Rancher. That means his Great Great Grandpa, Great Grandpa, Grandpa, and Dad were all ranchers.



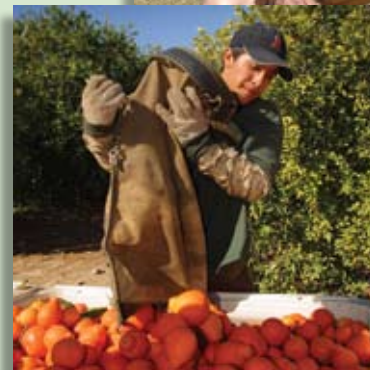
Producing Food & Fiber in Different Ways

When you imagine a farm, what do you think of? You might imagine a big red barn and some chickens, pigs and cows. Maybe you think of the song "Old MacDonald had a Farm" that you sang when you were young. As you may remember, the make-believe farmer, Old MacDonald, had every farm animal you could imagine.

In the 1900s, almost one in three people in our country lived on a farm or ranch. In those days, families had to raise most of their own food. There were no grocery stores or fast food restaurants. If you wanted eggs you had to raise chickens. If you wanted ham you had to raise a pig. If you wanted hamburger you had to raise a beef animal. If you wanted fruits and vegetables you had to grow them in your garden or fields. These farms were like Old MacDonald's Farms.

Today, farmers rarely raise a variety of crops and livestock. Instead, they specialize in just a few things that do well in the soil, climate and facilities they have. This makes modern farmers able to efficiently and more easily produce food for more people. In 1940 one farmer could produce enough food and fiber for 19 people for the entire year. Today, each U. S. farmer produces enough food and fiber for 154 people. Pretty important when you realize that only 2-percent of our population is feeding the other 98-percent including themselves!

Farms are as different as farmers themselves. Some farmers enjoy raising livestock and specializing in dairy cattle, beef cattle, sheep, and other animals. Others would rather work the soil and raise only crops. Some farmers expand their farms and employ family members and other help, while others prefer to keep their farms smaller. There is no "right" way to farm. Small, medium and large farms are needed to produce enough safe and nutritious food to feed your family.

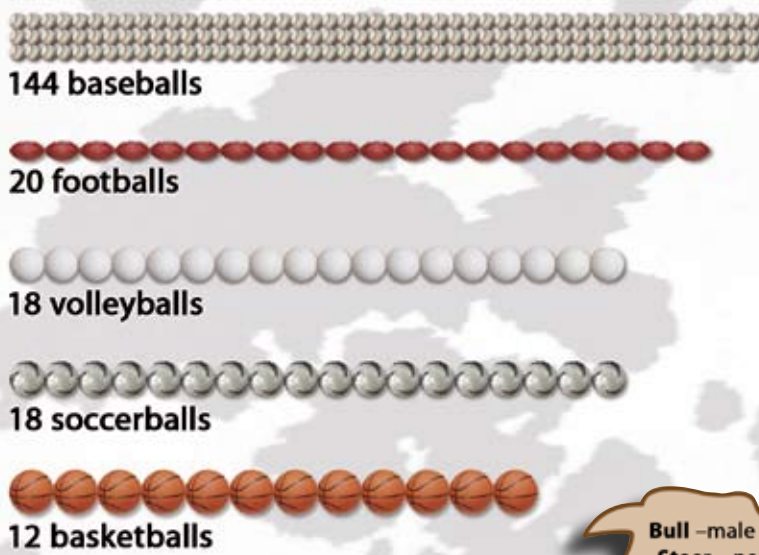


CATTLE

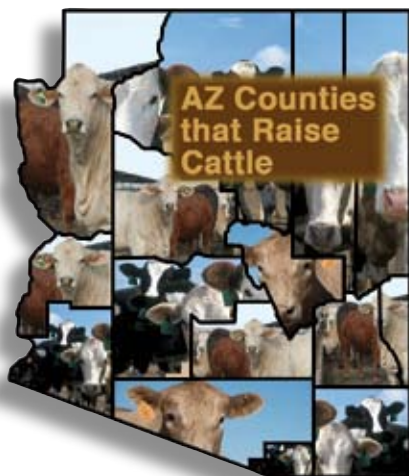
In 1912, Arizona had 915,000 head of cattle. Today, Arizona ranchers care for over 930,000 cattle and calves producing 386 million pounds of beef annually keeping cattle and calves as one of Arizona's most valued farm products. Arizona ranches produce enough beef to feed over 4.6 million Americans each year.

Though most people think of hamburgers as coming from beef cattle and milk coming from dairy cows, we actually get more than meat and milk from cattle. You may also be surprised to hear that chewing gum is made from

Number of balls made from one cow hide

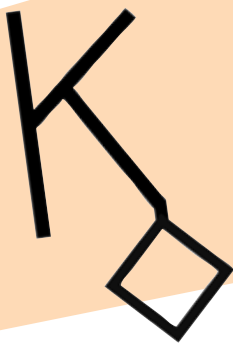


Since ranchers do not name their cattle, they have to use ear tags to identify each individual animal. To identify the animal as theirs, ranchers brand their cattle. Don't worry. It only hurts for a minute. A cow's skin is twice as thick as human skin (3mm)!



cattle as well as many other products. These products are called by-products and because of them we are able to use 99% of every animal. A beef steer on average will supply us with 400 pounds of beef. The remaining parts are used for making marshmallows, jello, yogurt, ice cream, pasta, candles, crayons, plastics, deodorant, paint, baseballs, piano keys and much more!

- Bull** – male
- Steer** – neutered male
- Calf** – young cattle
- Cow** – female that has had a calf
- Heifer** – female that has not yet had a calf
- Polled** – without horns
- Cloven Hooves** – hooves split in the center or a two-toed hoof
- Cud** – Cattle graze or eat quickly and then bring up a small amount of food to chew into very tiny pieces. They spend many hours chewing this food, which is called cud
- Wean** – process of removing a mammal from nursing on milk



HOW DO YOU READ A BRAND?

- Left to Right
- Top to Bottom
- Outside to Inside

Answer: K diamond

COTTON

Cotton has been an important part of Arizona since before its Statehood in 1912. Have you ever heard of the town Good-year, Arizona? Well, Goodyear got its name because of cotton.

During World War I an embargo was placed on Egypt. This meant that the United States could no longer participate in commerce or trade with the country. At the time, Egypt was the main supplier of industrial strength cotton used for airplane wings, fabrics, and tires. Good-year Tire Company soon realized that Arizona's

Pima Cotton could replace the cotton once purchased from Egypt and

opened a factory in what is now known as Goodyear, Arizona. By 1920 there were 230,000 acres of cotton in the state of Arizona. Cotton had become so valuable that farmers had stopped producing almost all other crops to concentrate on cotton. However, after WWII the Arizona cotton boom ended. Today, Arizona has 259,000 acres of cotton, which makes it part of the Cotton Belt.

One of the reasons that cotton farmers can grow more cotton today than in the past is because of advancements in technology. The invention of the cotton gin in 1793 helped farmers clean more cotton faster. The invention and continued advancements in cotton pickers has allowed farmers to plant and harvest more cotton in less time.



Cotton ginning over the years...

- By hand a person could clean 1 pound of cotton a day.
- Eli Whitney Cotton Gin could clean 50 pounds of cotton a day.
- Today's Cotton Gin can clean 190,000 pounds of cotton a day.

Cotton picking over the years...

1800s – A good cotton picker could pick almost 1 bale of cotton a day.

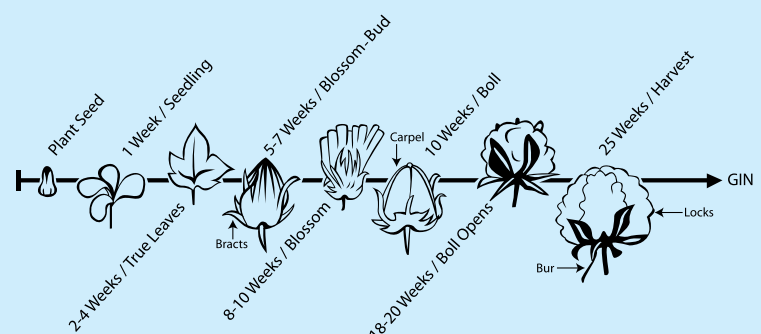
1890 – A cotton picker pulled by two mules could harvest 6 bales of cotton a day.

1930 – A 1-row gasoline engine cotton picker could pick 16 bales of cotton a day.

2006 - A 6-row cotton picker can pick 150-200 bales of cotton a day.



LIFE CYCLE OF COTTON



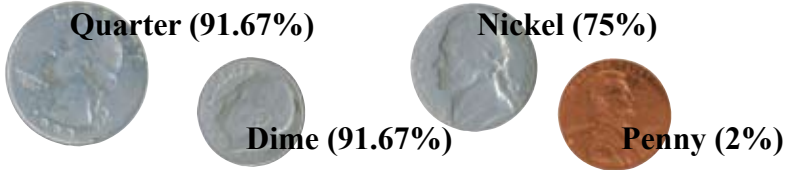
THE COPPER STATE



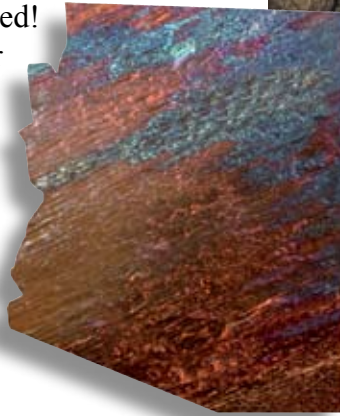
Ever wonder why Arizona has been referred to as the Copper State or why the Arizona Flag has a copper star? Well, since 1910, Arizona has been the nation's top copper producer, producing more copper than the other 49 states combined. Remember, if it can't be grown it has to be mined!

In 1863 about one in every four people in the state were miners. Today, 12,500, or one in every 480 men and women are employed by Arizona's eleven copper mines.

Why is copper mining so important? Without copper, we would not have electricity! Did you know that a child born today will use approximately 1,398 pounds of copper in their lifetime? Copper is used in construction, telephones, TVs, computers, radios, video games, cars, airplanes, space shuttles, pots and pans, and coins. That's right, coins.



(Bisbee, AZ 1912)



(Morenci, AZ) Today

Fast FACT

When the demand and price for copper dropped during the great depression, Arizona started making its license plates from copper to increase the demand and keep miners in the state employed.

HOW MUCH COPPER IS IN THERE?

Statue of Liberty	62,000 pounds
Space Shuttle	10,000 pounds
Average American Home	400 pounds
Automobile	50 pounds
Boeing 747 Jet	9,000 pounds

CLIMATE

Climate has always played an important role in Arizona's economy by drawing tourists and sightseers. But more important than bringing people to visit our state, climate also plays a key role in Arizona's agricultural industry. Arizona's dry semi-arid climate and

average rainfall of 12 inches allows farmers to be planting and harvesting crops every month of the year. How can little water be good for growing things? Well, by having little precipitation, farmers rely on irrigation rather than rain to water their

crops. This means that they can give their crops the exact amount of water they need when they need it. This is very different than the ways of the past.

In the early 1900s farmers along the Salt River Valley would plant their crops and see them die because of drought or wash away because of the flooding Salt River. In 1903 workers began building what is now known as the Roosevelt Dam to prevent flooding and allow for releasing water during times of drought. Roosevelt Dam was among the first of five water projects under the 1902 Reclamation Act, which allowed the federal government to lend money to help build dams. Farmers in the Salt River Valley knew how important the dam would be to the future of agriculture in the state and pledged their land as collateral for the loan. The dam was completed in 1911. Until its renovation in 1996, the Roosevelt Dam was listed as a National historic Landmark.

Although the dam was built by farmers to irrigate their crops and farmers continue to use water from the Salt River Project, Roosevelt Dam now provides water and electricity primarily to homes and businesses.



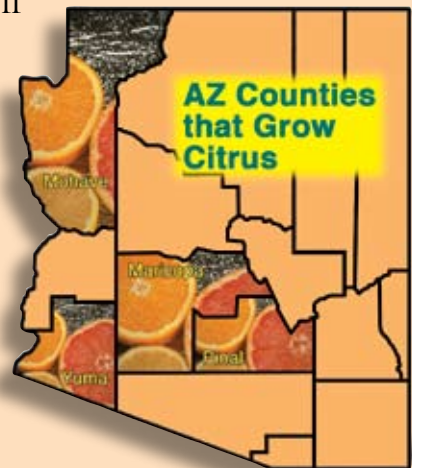
Photos courtesy of the U.S. Bureau of Reclamation

CITRUS

Commercial citrus production in Arizona began in 1889 when W.J. Murphy planted his experimental citrus orchard near what is now known as Phoenix. Murphy and his family planted over 1,800 young orange and other fruit trees they had brought from southern California. The trees proved so successful that other varieties of citrus were planted, including lemon trees. Because of Arizona's climate, Arizona citrus ripened prior to the orchards in Southern California, allowing Arizona farmers to sell their produce to the eastern markets first. By the mid 1890s over 150,000 citrus trees were growing on 1,500 acres.

Arizona citrus did not really take off until 1928 when the Arizona Citrus Growers Association was established and helped eliminate many costly transportation problems. By 1970 Arizona had 80,000 acres of citrus. Though citrus production has dropped and today consists of 20,000 acres, Arizona remains the 2nd largest producer of lemons in the United States. Why lemons? Lemons require a more temperate environment, one that Arizona is happy to provide.

Because plants grown from seed are all slightly different, citrus trees are not usually planted from seeds. Farmers will propagate citrus by grafting to ensure they always get the same high quality fruit. To graft, a single bud is taken from the branch of a high quality tree and inserted into the bark of a seedling. That bud becomes the part of the tree that produces the fruit. Not only do propagated trees produce a consistently higher quality fruit, they also produce fruit quicker than a seeded tree. A seeded tree will produce fruit after 6-7 years whereas a grafted tree will produce fruit after 3-4 years!



Fast FACT

Lemons were once so rare that kings presented them as gifts to one another. Citrus is one of the few fruits that can be left on the tree without becoming overripe, and unlike many other fruits, citrus does not continue to ripen after it is picked. Lemon trees can produce between 500 and 600 pounds of lemons in a year. California and Arizona produce 95% of the entire U.S. lemon crop.

Fast FACT

Did you know before the Roosevelt Dam was built, even the basement of Arizona's Capitol building was flooded.

CAREER CORNER

Will you work in agriculture when you get older? The majority of us will not work on a farm or ranch, but we will work in agriculture. Whether you enjoy working with plants, animals, DNA, machines, computers or numbers, you may find yourself in one of the seven career pathways in Agriculture and Food and Natural Resources.

Agriculture and Food and Natural Resources is the production, processing, marketing, distribution, financing and development of agricultural commodities and resources including food, fuel, fiber, wood products, natural resources, horticulture, and other plant and animal products or resources.

FOOD PRODUCTS & PROCESSING SYSTEMS



People who work in this area discover new food sources, analyze food content and develop ways to process, preserve, package and or store food according to industry regulations. They create new food products to meet consumer needs and inspect food processing areas to ensure sanitation safety, quality and waste management standards are met: **Food scientist, Food and Drug Inspector, Biochemist, Produce Buyer, Meat Processor, Biochemist or Toxicologist.**

AGRIBUSINESS SYSTEMS



Agribusiness is the coordination of all activities that contribute to the production, processing, marketing, distribution, financing and development of agricultural commodities and resources. Agribusiness uses satellites systems, computer databases and spreadsheets, biotechnology and many other innovations to increase efficiency and profitability: **Agricultural Loan Officer, Commodity Broker, Economist, or salesperson.**

POWER STRUCTURAL & TECHNICAL SYSTEMS



This pathway applies knowledge of engineering, hydraulics, pneumatics, electronics, power, structures and controls to the field of agriculture. Individuals in this field design agricultural structures, machinery and equipment: **GPS Technician, Remote Sensing Technician, Agricultural Engineer, Recycling Technician, Communications Technician, Equipment Parts Manager, or Welder.**

NATURAL RESOURCE SYSTEMS



Individuals may help to develop, maintain and manage the forest and natural environment to catching and trapping various types of marine life for human consumption, animal feed, bait, and other uses. Forests and rangelands supply wood products, livestock forage, minerals and water. Conservation scientists help preserve these areas and protect these other natural resources: **Wildlife Manager, Fish and Game Officer, Forest Manager, Fishery Manager, Mining Engineer, Forest Worker or Logger, or Park Manager.**

PLANT SYSTEMS



Individuals who work in this pathway study plants and their growth, helping producers of food. Food and fiber crops continue to feed a growing population while conserving natural resources and maintaining the environment. Individuals use genetic engineering to develop crops resistant to pests and drought: **Plant Breeder, Geneticist, Botanist, Tree Surgeon, Greenhouse Manager, Forest Geneticist, or Golf Course Superintendent**

ANIMAL SYSTEMS



People who work in this pathway work to develop better, more efficient ways of producing and processing meat, poultry, eggs and dairy products. They study genetics, nutrition, reproduction, growth and development of domesticated farm animals: **Animal Geneticist, Aquaculturist, Animal Nutritionist, Poultry manager, Veterinarian, Embryo Technologist or Feed Sales Representative.**

ENVIRONMENTAL SERVICE SYSTEMS



People who work in this pathway are involved in water and air pollution control, recycling, waste disposal and public health issues. Environmental Engineers conduct hazardous waste management studies, evaluate the significance of the hazard, offer analysis and treatment and containment, and develop regulations to prevent mishaps: **Pollution Prevention Manager, Environmental Sampling Tech, Health and Safety Sanitarian, Hazardous Materials Handler, Toxicologist, or Water Quality Manager.**



To learn more about Agriculture in the Classroom and the other FREE classroom resources visit us at www.azfb.org/aitc, or contact Katie Aikins at 480-635-3608.

Information in this Ag Mag may be linked to the following Arizona State Learning Standards:

4th Grade

M2-C1-PO1
M3-C4-PO1
R1-C4-PO1
R1-C4-PO2
R3-C2-PO1
R3-C2-PO2
SS3-C1-PO3

SS4-C2-PO2
SS4-C4-PO1
SS4-C4-PO5
SS4-C5-PO1
SS1-C7-PO1
SS1-C7-PO2
SS1-C7-PO4

5th Grade

M2-C1-PO1
M3-C4-PO1
R1-C4-PO1
R1-C4-PO2
R3-C2-PO1
R3-C2-PO2

6th Grade

M2-C1-PO1
M3-C3-PO1
M3-C4-PO1
R1-C4-PO2
R3-C2-PO1
R3-C2-PO2