Food, Land & People

Gross Green on Both Sides Or the Sides or th

Seeing, Being, and Reaping Green

Seeing green in the world Seeing green grass Being green means understanding the ecosystem Utah land ownership Reaping green means responsibility for the land and soil

Reaping green means respecting resources

Reaping green careers means an education Reaping green means buying local **Deservet News**



Seeing **Green** in the world

This issue of the Deseret News' Newspapers in Education, "Food, Land & People," has a color. Green. The "green language" is full of "eco" words: ecology, ecosystem, eco-conscious, ecofriendly, ecotourism, eco-agriculture, and yes, economics. "Eco" has become a commonly used suffix. The term "economics" comes from the Greek oikos "house(hold)" and nomos "custom or law," hence "rules of the house." With "eco" defined, can you define the other "eco" words?

GREEN LANGUAGE

The green language also includes some other "non-eco" words, including conservation, sustainability, stewardship, recycling, reusing, and reducing. Understanding these and other "eco" words will help you understand the content of this publication: Seeing, Being, and Reaping Green.

Biome: the major regional ecological community of plants and animals: desert, forest, swamp, etc.

Conservation: the protection, management, and responsible use of valued natural resources such as soil, water, plants, and animals

Ecology: the "scientific study of" the distribution and abundance of life and the interactions between plants and animals and their natural environment, or ecosystem

Ecosystem: the complete community of living organisms including plants, animals, and microorganisms; and nonliving elements including soil, rocks, and minerals; as well as surrounding water sources and the local atmosphere

Economics: the social science that studies the production, distribution, and consumption of goods and services

Forage: the plant species, usually grasses, consumed by herbivores (grass eaters)

Habitat: the place where plants or animals live

Multiple use: part of a federal law mandate (1976), defined as the "Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people"

Native: a plant or animal growing or living in the geographic area in which it originally evolved

Niche: functional role of a species in the community, including activities and relationships

Recycling: taking used materials and making them into new products in order to prevent the waste

Reducing: to make smaller, as applied to waste, shrink the amount of waste produced by a person or a society

Reusing: refers to using an item more than once

Stewardship: an attitude or a dedication to doing the best we can for the soil, water, plants, and animals. Being a good steward means leaving the land and other natural resources for use by future generations.

Sustainability: meeting the needs of the present without compromising the ability of future generations to meet their needs

Credits

Information for this educational section was provided by Utah Agriculture in the Classroom: Debra Spielmaker, director; Denise Stewardson, outreach coordinator; Yasuko Mitsuoka, graphic artist. The project was under the direction of Brenda Smith, Deseret News Newspapers in Education manager with page design by Lou Ann Reineke, Deseret News NIE senior designer.

Resources & Sources

Utah State University (www.usu.edu) Utah Agriculture in the Classroom (www.agclassroom.org/ut) USDA - Agricultural Research Service (www.usda.gov) Wikipedia (www.wikipedia.org) Junior Master Gardener (www.jmg.kids.us) National Atlas (www.nationalatlas.gov) Sustainable Agriculture Research and Education (www.sare.org)



Urban area roads, railroads and small bodies of water

> 7% is owned by the state.

2%

22% – is used for agriculture.

65%

Native American land

is owned by the federal government as national parks, military land and other users.

4%

Try your hand at ranching with this ranch starter grass growing experiment.

. Pour 1-2 Tablespoons of grass seed into the toe of a kneehigh stocking.

. Pour potting soil on top of the

seeds; add enough soil to form a baseball-sized shape. Tie a knot to hold in the soil. The seeds will eventually grow to form the hair of the plant person. Glue eyes to the head of the person.

- Once the glue has dried, submerge the head in water to allow it to penetrate the soil. Set the head aside. You may use various art supplies to decorate a cup. The cup will be the plant person's body and water supply. (In lieu of a nylon stocking, soil may be placed in a cup and grass planted in the top 1/4".)
- 5. Fill the decorated cup with water and set the plant person's head on top of the can. Push the excess stocking into the cup opening to help wick water to the soil of the plant person.
- 6. Once the seeds germinate, add water to the cup, and allow the grass to grow until it has reached one-half to three-quarters of its length before setting seed (usually 2-3 inches for grass seed). With scissors, cut half of your grass blades "hair" short (1") above the soil to simulate a cow grazing), and clip another quarter of the grass down to the crown or where the blades meet the roots. To simulate overgrazing, continue to clip the quarter cut area to the crown every couple of days.
- 7. Observe the grass for a few weeks and then make comparisons. What are the results of the overgrazed, grazed, lightly grazed, and non-grazed grasses?

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DESERET NEWS

Land use in Utah

Twenty-two percent of Utah's land is used for agriculture. Only about 2 percent of agricultural land is cropland; the other 20 percent is pasture or private rangeland used for livestock grazing.

Seeing green

SCORE: Cows - 7 Grass - 7 We tend to take grass for granted because there seems to be so much of it. In fact, there is a lot of grass. It is one of our most important available renewable resources. Grass is important to

It's a tie!

America's environmental quality. Grass prevents runoff of rain, helps control flooding, and keeps the soil from eroding. Grass holds the soil in place and helps keep the air clean. Grass filters and cleans the water and helps it percolate through the soil and back into streams and ground water. Grass also produces oxygen.

Cattle and sheep are like rangeland lawn mowers that can help care for the grass. Imagine what your lawn would look like if you didn't mow it! At first glance when we see animals grazing, it seems like the animal "wins all:" Cows - 14, Grass - 0. However, the moment the grass is shorn, it seeks to restore a balance between its roots and leaves. The grass sheds nearly the same root amount as it lost. When the shed roots die, the soil's population of bacteria, fungi, and earthworms gets to work breaking down the dying roots. This creates a fertile organic matter that enriches the soil making it easier for water to move through the soil speeding up the creation of new topsoil. In this manner, when managed properly, grazing animals actually build new soil from the bottom up. In a grassland area, decaying roots are the biggest source of new organic matter. In the absence of grazers, the soil-building process would be nowhere near as swift or productive. Cows - 7 Grass - 7: an even relationship.

In Utah, most of the private land is owned by ranchers. Ranchers may use their own private land to graze their animals or pay a fee to the government to lease public rangeland. Private rangelands in combination with public rangeland are usually mountainous, rocky, or dry lands that can't be used to grow the usual farm crops. However, grass and other plants on this rangeland can be used for grazing animals. People can't eat grass but cattle and sheep can turn grass into beef and lamb. Proper grazing can be extremely useful for keeping rangelands and the grass healthy. Compared with harvested feeds like corn and wheat, ranges and pastures provide a relatively inexpensive feed source for livestock. With only 3% of the Earth's resources suitable for growing crops, it is nice to know we have another resource that can provide food. When properly managed, grazing cattle aerate the soil with their hooves, scatter seeds, and trim wild grasses. Wildfires have a harder time taking hold on shorter, cropped grass than on longer vegetation. Properly grazed or "mowed" grass can help create healthy green grass!

Being Green means understanding the ecosystem

Ecosystems are made of many parts, all interacting with each other. Plants, animals, bacteria, fungi, water, air, and soil are all parts of whole dynamic ecosystems. People are part of ecosystems too! We interact with all the other parts of our ecosystem every day, though we may not realize it.

Sometimes people only "see" one part of an ecosystem. That is, they become keenly aware of only the one part of the ecosystem that's most important to them. Frequently, they assume that everyone else sees — and values — the ecosystem in the same way they do. Of course, this isn't true. People have different perspectives about ecosystems and their management.

Sometimes people disagree about how an ecosystem should be managed. But if people would take a moment to understand the science and viewpoints of others, perhaps better decisions can be made. See what you think by reading and thinking about the old Indian parable, "The Blind Men and the Elephant."



Most of Utah's land is too rocky, cold, hot, or dry to grow crops. But it can support livestock.

In all, about 80% of the feed consumed by cattle, sheep, goats, and horses could not be eaten or digested by humans.

Animals convert low-energy and otherwise indigestible plant matter into nutrient-dense, protein rich food, while returning organic matter (manure) to the soil—the original recycling program.

The Blind Men and the Elephant

nce upon a time, six blind men lived together in India. They had often heard about elephants, but because they were blind, they had never seen one. The Rajah had many elephants. So, the blind men went to the Rajah's palace to "see" an elephant first-hand. They traveled together, walking one behind the other, communicating with each other so they wouldn't fall down. Each man put his hand on the shoulder of the man in front.

An elephant was standing in the courtyard of the palace. The blind men touched the elephant with their hands.

The first blind man touched the side of the elephant. "An elephant is like a wall," he said.

The second blind man touched the trunk of the elephant and jumped back. "An elephant is like a snake!" he said.

The third blind man reached out and touched the tusk. "Sharp! An elephant is like a spear," he said.

The fourth blind man grasped the leg of the elephant. "How thick and tall,"

he said. "An elephant is like a tree." The fifth blind man touched the ear of be elephant. "An elephant is like a fan," he said.

The sixth blind man reached out and touched the tail of the elephant. "It is thin and tough. An elephant is like a rope."

The blind men were tired and sat down to talk about the elephant. "An elephant is like a wall," said the first blind man.

"What? A wall? You're wrong," said the second blind man. "An elephant is like a snake."

"A snake? You're wrong," said the third blind man. "An elephant is like a spear."

"A spear? You're wrong," said the fourth blind man. "An elephant is like a tree."

"A tree? You're wrong," said the fifth blind man. "An elephant is like a fan."

"A fan? You're wrong," said the sixth blind man. "An elephant is like a rope." The blind men could not agree. They

shouted and argued! Their argument

got louder and louder!

The Rajah was awakened by the shouting. He called out his palace window, "Stop!"

The blind men stopped arguing. The Rajah said, "The elephant is a very big animal. Each man only touched one part. You must put all the parts together to find out what an elephant really is like."

The blind men listened. They rested under a cool tree and talked quietly. "The Rajah is a very wise man. Each one of us knows only a part. To find out the whole truth, we must put all the parts together," said one blind man. And they did.

They left the courtyard traveling together, walking one behind the other, communicating with each other so they would not fall down. Each man put his hand on the shoulder of the man in front. What is the message?

How does the story relate to managing the ecosystems?

Utah Land Ownership



FEDERAL LANDS AND **INDIAN RESERVATIONS** Bureau of Indian Affairs Bureau of Land Management / Wilderness Bureau of Reclamation Department of Defense (includes Army Corps of Engineers lakes) Fish and Wildlife Service / Wilderness Forest Service / Wilderness National Park Service / Wilderness Some small sites are not shown, especially in urban areas. MILES 40 60 80 Albers equal area projection Abbreviations AFB Air Force Base IR Indian Reservation NF National Forest NM National Monument NP National Park NRA National Recreation Area National Wildlife Refuge NWR The National Atlas of the United States of America® U.S. Department of the Interior U.S. Geological Survey www.nationalatlas.gov

The map above indicates areas that are designated as federal lands and Indian reservations. Note that the white areas are privately owned land. Using your map-reading skills and a Utah road atlas, answer the following questions:

- 1. Geographically, in Utah where is most of the private land?
- 2. Which federal agency is responsible for most of the land management in Utah?
- 3. If you look closely at the map you can see small white squares. This land would be land.
- 4. Which counties include Indian reservations?
- 5. What biome best describes the Utah lands indicated in yellow? d. grassland a. savanna b. desert c. forest
- ACTIVITIY

land located?

8. What two geographical features in Utah are owned by the **Bureau of Reclamation?**

6. Along what geographical feature is most of Utah's forest

7. In what land area are most of Utah's water resources?

9. Using a Utah road atlas, draw and label the four major interstate highways in Utah.

Object of the game:

Before the game:

- a career title in your group.



SCIENTIFIC & ENGINEERING CAREERS



P eople all over the world define themselves by "their land." We each think we understand the familiar land around us, but do we? The landscape we see contains many different soils, plants, and other factors. We can see its surface—crops or trees, grass or houses. We see its shape—hills and valleys, mountains and flatlands.

No matter how we see it, however, each landscape rests on a thin skin of largely invisible life that separates this great ball of space rock from the surrounding atmosphere. That thin skin only a few inches to a few feet in depth—is called soil. To many people, soil is a pretty common and meaningless medium. Some call it dirt and do their best to avoid it. But to those who

Reaping Green means responsibility for the land and soil

. But to those who understand it, soil is a marvel—a living space that harbors vibrant life within it and supports all life above it.

Without soil, there would be no "us." In return, the soils that support our lives cannot be taken for granted; they must be nurtured. Healthy soils support healthy environments, and healthy environments support healthy life.

A growing urban society means fewer of us come into daily contact with the living soil and those working lands that produce food and fiber, clean water, clean air, wildlife, and scenic vistas. We eat the food, drink the water, breathe the air, and enjoy the views, but only a few of us walk the fields and forests on a regular basis and understand what those lands need from us in order to sustain that productivity for generations to come.



Shredders, such as beetles, work the surface, breaking down residue. Predators are the hunters of the soil world. Earthworms shred plant litter and improve soil structure. Soil grazers, like the springtail above, are arthropods, that feed on fungi and release nutrients. Herbivores feed on plant roots and slow plant growth. Bacteria and fungi give healthy soil its distinct smell. Nematodes feed on fungi and other organisms. Protozoa stimulate and control activity of bacterial populations. (Illustration courtesy of the The Furrow, John Deere.)

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What's living down there?

The soil organisms—from microscopic bacteria and fungi to bugs and worms and even larger animals like moles—that are in the soil are critical to the soil's ability to grow plants, recycle nutrients, stabilize water supplies, and support other life. Taken together, all these living parts are what make a fertile, productive soil very different from a pile of sand.

How can we keep the living soil alive?

First, protect the soil from damage by wind or water erosion. The best protection is a healthy plant community, whether that is crops, grass, or forest. Where the soil is growing healthy plants, it is generally protected and probably being improved, not damaged.

Second, restore and maintain organic matter in the soil. Organic matter—everything from crop residues to grass clippings to dead trees and animals—is the basic food for every organism in the process, and maintaining high levels of soil organic matter is a major contributor to soil health.

Third, protect and enhance soil life wherever possible. Good soil requires a thriving community of living organisms, so killing those soil inhabitants is a bad idea. There were times in the past when it was thought that we could kill the pests that were damaging crops without doing damage to overall soil life. Sadly, that has proven to be a false hope. Toxic materials too often kill what we don't want to kill.

So, good land managers know how to use the least amount of toxic materials available to meet a pest problem, treating the soil as the most important land asset, which it is.



Why does America need agriculture?

Write down all

the things you

have touched.

eaten, or used

today, that are

Agriculture —

it's everywhere!

agricultural

products.

Because we need food, clothing, and shelter.

hese are basic human needs. For most Americans, food is relatively inexpensive, readily available, and safe. We take it for granted that food will be in our local grocery store 24 hours a day, 7 days a week. Questions about how, where, or by whom food is grown is not generally discussed around the dinner table. But consider for a moment all the things you get from agriculture.

We use ag (short for agriculture) products while we sleep (cotton sheets), when we get dressed (clothes), when we take a bath (soap), when we eat (food), when we use paper (tree crops), and yes, even when we stop to smell the roses (floriculture). One of the best ways to remember what agriculture means is to remember the 5-Fs: farming, food, fabric, forestry, and yes, flowers. Those words bring to mind lots of images—the things you use every day.

Imagine a life without agriculture. You might be hungry, naked, or homeless. In addition to your food, clothing, and shelter, agricultural products, crops, and animals are used in numerous manufactured products such as: bike tires, toothpaste, disposable diapers, road de-icer, fuel, laundry



soap (corn); makeup, medicines, sports equipment (cattle); and paint, glue, ink, and fuel (soybeans), to name a few. Before agriculture, people were hunters

and gatherers. With 6.6 billion people on the planet, we need productive sustainable agriculture more than ever. Imagine depending on a farmer in a foreign land for your food. How "food secure" would you feel? You might imagine that when energy costs go up so does

food, both to produce it and to get it to your local grocery store. Energy costs are just one reason why America needs agriculture. If Americans rely on other countries for food, we may find that for political or environmental reasons (weather) we can't get the food we need. Both are reasons to support profitable, sustainable American farms.

How are you connected to agriculture?

PERSONAL CARE PRODUCTS Shampoo, soap, cosmetics, lotions, fingernail polish, toothpaste CONSTRUCTION Lumber, paints, brushes, tar paper, drywall, tool handles, particle board HEALTH CARE Pharmaceuticals, surgical sutures, ointments, latex gloves, x-ray film MANUFACTURING Adhesives, lubricants, solvents, detergents, polymers **ENTERTAINMENT** Film, strings for instruments EDUCATION Crayons, text books, chalk desks, pencils, paper PRINTING Paper, ink, film SPORTS Uniforms, baseball bats, leather equipment and balls, shoes

Are farmers reducing cropland erosion?



What is sustainable agriculture?

The main goals of sustainable agriculture are to:

- Provide a more profitable farm income
- Promote environmental stewardship by protecting and improving soil quality, reducing dependence on non-renewable resources, such as fuel and synthetic fertilizers and pesticides, and minimizing adverse impacts on safety, wildlife, water quality, and other environmental resources
- Promote stable, prosperous farm families and communities.

"The best way to communicate the meaning of sustainable agriculture is through real-life stories of farmers who are developing sustainable farming systems on their own farms." You can hear their voices and stories by visiting http://www.sare.org/about/what_is_sust_ag.htm.

Reaping Green means respecting resources

Natural resources grow food: These are the components of various interrelated systems of the planet, including weather cycles, mineral cycles, energy cycles, and the web of living organisms through which nutrients flow, from plants to the animals that eat them, through waste products, to decomposers and soil microbes, and back into plants.

Food production: The process of making food from sun, soil, water and seeds, or of feeding plant materials to domestic animals to create edible products. Food production requires inputs of energy, materials and labor.

Food processing: Creating new food products from basic food materials. Examples of processed foods are white sugar (refined from beet sugar or cane sugar) or a cake (made from a combination of basic food materials such as eggs and processed foods such as wheat flour).

Food distribution: The process by which food gets from producers to consumers, possibly with stops at processing sites along the way. Food distribution includes storing, shipping, advertising, and selling.

Food consumption: The eating or using up of food materials

Food waste and recycling: The material that remains after food is consumed or that is produced by food consumption. Food material becomes waste if no further productive use is made of it; however, food waste may be recycled back into the food system as, for example, compost or animal feed.



Inputs

compost	manure
pesticides	hericides
irrigation	tractor
gasoline	natural gas
chemical pla	ant
	pesticides irrigation gasoline

Natural Resources

land soil sunlight water trees seeds fungi climate micro-organisms

Waste and Recycling

chemical by-products table scraps landfill food processing waste manure non-biodegradable waste

Food Production

wheat fruit rice coffee milk eggs vegetables meat tea

Food Processing

processing plant processed foods (cerial, ice cream, bread, cheese, etc.) processing waste

Food Distribution

car wareh train restau truck farme plane super gasoline

warehouse restaurant farmers' market supermarket

Food Consumption

Who Owns American Farms?

Most American farms are still family farms! Today 98% of all U.S. farms are owned by individuals, family partnerships or family corporations. Just 2% of American farms and ranches are owned by non-family corporations.

In addition, 86% of U.S. farm products sold are produced on farms owned by individuals. Non-family corporation account for only 14% of the U.S. farm product sales. These majority family-owned and operated farms are often handed down from generation to generation. It's difficult to describe a "typical" farm or ranch in America because every one of them is unique.

Family farms come in several forms. Some are managed by families with one or more members having a job outside the farm to ensure an adequate family income. Some are "hobby" or "retirement" farms. And some are farms that often have several family members involved and possibly additional paid employees. These larger farms are still family-owned and operated.

People may long for the farms of the past—but the people who lived and worked on them talk about a very

challenging way of life. The farms of yesteryear didn't produce as much and supported a much smaller population. Food quality and quantity were also unpredictable.

Are you willing to go back to the farm, work long hours, and pay more for food? With only two percent of the American population feeding the rest of us, we need to figure out how to feed ourselves and help to feed a growing world population without damaging or depleting soil and other natural resources.



Seeing, Being, and Reaping Green

Reaping green careers

means an education

Looking for a Career?

xplore agricultural and natural resources careers that support the farmer and rancher. Take an inventory of the things you use every day; most have an agricultural or natural resource connection. That means there must be numerous careers related to farms, food, forestry, fabric, and flowers. Things we use every day are either grown or mined.

Most farm- and natural resource-related careers require post high school training; many require Bachelor of Science degrees. Every industry has entry-level positions, mid-level positions, and highly skilled/educated positions. For example, if you are going to work in the automotive industry, you can be a car detailer (entry level), sales person, auto plant worker, or mechanic (mid-level), or an automotive engineer who designs cars. What is the difference between these positions? Salary, yes, but educational requirements are also different. For the most part, you are paid for what you know.

This isn't always the case, but training or education usually pays off. The other part of your salary may be determined by how much or how hard you work. Here is a table to compare entry-level wages with higher paying wages. If you earn:

\$7/hour — \$14,560 per year \$10/hour — \$20,800 \$12/hour — \$24,960 \$18,810: current poverty level in America

The average U.S. household earns \$43,318. The average in Utah is \$48,537. (A household may include two wage earners.) Looking at the hourly figures and your interest, what career will you choose?

Agricultural and natural resource careers help societies

and their people to meet basic needs. The people who work in these careers help to determine the sustainability of our environment and our quality of life.

A lot of people get involved in getting our food from the farm to our fork. Everyone from the actual



farmer to the research scientists who help develop new seeds, safer crop protection, and more efficient machines is part of a large complex system that provides us with the things we use everyday. Opportunities have expanded in the field of agriculture to include unique positions in sustainable farm management systems, biotechnology, forestry, marketing, engineering, and more. Take an online field trip and explore some of the careers awaiting you. Visit www.agriculture.purdue.edu/ usda/careers/index.html and www.ffa.org/index.cfm?method=c_job.CareerSearch.





Interested in agricultural or natural resource careers? Think about Utah State University. Check out these degree programs:

Agribusiness International Agribusiness Agricultural Communication and Journalism Agricultural Economics Agricultural Education Agricultural Systems Technology Animal Science - Bioveterinary Science Animal Science - Dairy Emphasis Animal Science - Equine Emphasis Animal Science - Industry Emphasis Crop Science - Agronomy Crop Science - Research/Biotechnology Environment, Soil & Water Science Family and Consumer Sciences Education Horticulture - Business Horticulture - Landscape Maintenance and Construction Horticulture - Ornamental Horticulture Horticulture - Science Horticulture - Turfgrass Nutrition and Food Sciences - Biotechnology Nutrition and Food Sciences - Dietetics Nutrition and Food Sciences - Food Science Nutrition and Food Sciences - Food Technology Management Nutrition and Food Sciences - Nutrition Sciences

For more information about agricultural careers, visit www.ag.usu.edu.



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Reaping **Green** means buying local



Why buy local?

When Utah consumers purchase locally produced products, it builds the Utah economy since a dollar spent on a Utah product creates the effect of adding \$4 to \$6 to the Utah economy.

How does buying local enhance the environment?

Most produce in the U.S. is picked four to seven days before being placed on supermarket shelves, and is shipped for an average of 1500 miles before being sold. And, this is when taking into account only U.S.- grown



products! Those distances are substantially longer when we take into consideration produce imported from Mexico, Asia, Canada, South America, and other places.

With energy prices rising, we all need to consider energy-efficient agricultural methods and local production when possible.

Only 19 cents of every dollar, when buying at a large supermarket, goes to the grower. Eighty-one cents goes to processing and transportation. Buying your food from your local farmers and instate businesses is good for communities, the economy, and the



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Here are just some of the numerous Utah's Own companies. Check your food labels and visit www.utahsown.gov to see more Utah's Own companies.

Barb's Goodies and Gifts - Kaysville (gourmet snacks) Beehive Cheese Co. - Uintah (cheese) Boulder Mountain Beef - Castle Dale (beef) Central Milling - Logan (flour) Gossner Foods, Inc. - Logan (cheese) Happy Trowels - Ogden (cut flowers) Lehi Roller Mills - Lehi (flour) Mountainland Apples - Santaquin (apples) Mountainview Mushrooms - Fillmore (mushrooms) Norbest, Inc. - Moroni (turkeys) Oakdell Eggs - Lewiston (eggs) Rockhill Creamery - (cheese) Slide Ridge Farm - Mendon (honey) South Ridge Farms - Payson (cherries and other fruits) Starkey Orchards- Kaysville (organic peaches) Volker's Bakery - Kamas (bread, pictured) Winder Farms - West Valley (dairy products)



Learn more about what products are produced in Utah by going on a Utah's Own WebQuest. www.agclassroom.org/ webquests/utahsown.htm.

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