

# IOWA ag TODAY

ISSUE 3

EXPLORING THE CONNECTION BETWEEN AGRICULTURE AND YOU!

## IOWA'S INVALUABLE NATURAL RESOURCES

**Just like us, plants and animals on farms need natural resources to live! How many relationships can you find between natural resources and agriculture in this issue?**

**Sun:** A source of energy for all life. Plants capture sunlight to make food and energy to grow. Farm animals eat plants. By eating food from

plants and animals, the sun gives us energy!

**Soil:** Soil holds water and nutrients

plants need. Animals and people depend on plants for food, so we need soil too!

**Water:** Plants drink water just like we do! Plant roots absorb water from the soil. Farm animals also need clean water to grow and stay healthy.

**Air:** Plants and animals need clean air to live.

Plants take in carbon dioxide that we breathe out. Animals and humans breathe in oxygen that plants release.



## CLIMATE OR WEATHER

Look out a window. Is it hot and sunny? Is it cloudy and rainy? Is there snow on the ground? When we look out a window, we see the weather. Weather is temporary. In contrast, **climate** describes the typical weather patterns in an entire region over time.

Farmers keep an eye on the weather to help them know when a frost may occur or when the temperature will be perfect to plant. Climate helps farmers know what to plant or raise. For example, Iowa has a growing season that is long and warm enough to grow corn and soybeans well. Rainfall is usually decent and regular.

**THINK & DISCUSS - Iowa farmers are experimenting with new crops. Crops that grow in warmer temperatures can now be grown in Iowa. Why do you think this is? How might it affect you?**



**DIGGING DEEPER** We all have a responsibility to take care of the water on Earth. Keep a journal of your water use. Compare your journal with a friend. Where might you reduce your water use?

# A SPECIAL WATERSHED

Look at the map below. What relationships between cities and bodies of water do you see?

All living things need water to grow and reproduce. Earth is covered in water but only 1% can be used for drinking and growing food. Sometimes water is far away from those that need it. Homes have pipes and water towers to help bring water to people. Farmers can use **irrigation** to move water for crops and livestock.

Iowa is unique because it is bordered by two rivers. The Mississippi and Missouri Rivers make up the two largest **watersheds** in the U.S. A watershed is where water drains off land into rivers or streams and eventually to a larger body of water.

The Missouri River flows into the Mississippi River. The Mississippi River flows into the Gulf of Mexico. Everyone on Earth is affected by a watershed, and everyone affects watersheds. As water flows, it interacts with landforms causing **erosion**. Through erosion water can pick up soil and nutrients like nitrogen. This can pollute water and cause algae blooms that harm fish.

Farmers that work next to water use conservation methods like buffer strips to slow field run-off. This helps remove extra nutrients from water. Too many nutrients in water can harm plants, animals, and people. The next time you drive by a field see if you can spot a buffer strip.

**Career Corner:** Sara Carmichael is a watershed coordinator. She uses her passion for water to take action on water quality issues. Sara uses interpersonal skills to talk with many different people including private landowners like farmers. She uses science and mapping to choose the best location for edge of field practices. Water that interacts with the field impacts the whole watershed!



Missouri River

Mississippi River

Chica

Des Moines

Davenport

Council Bluffs

**DID YOU KNOW?** In 2019, Iowa farmers planted more than 2.2 million acres of cover crops, and this number continues to grow!

# WHERE'D THAT SOIL COME FROM?

**Iowa is known for its rich soil that is used to raise crops.** But where did that soil come from? Soil has five formation factors: parent material, topography, organisms, climate, and time.

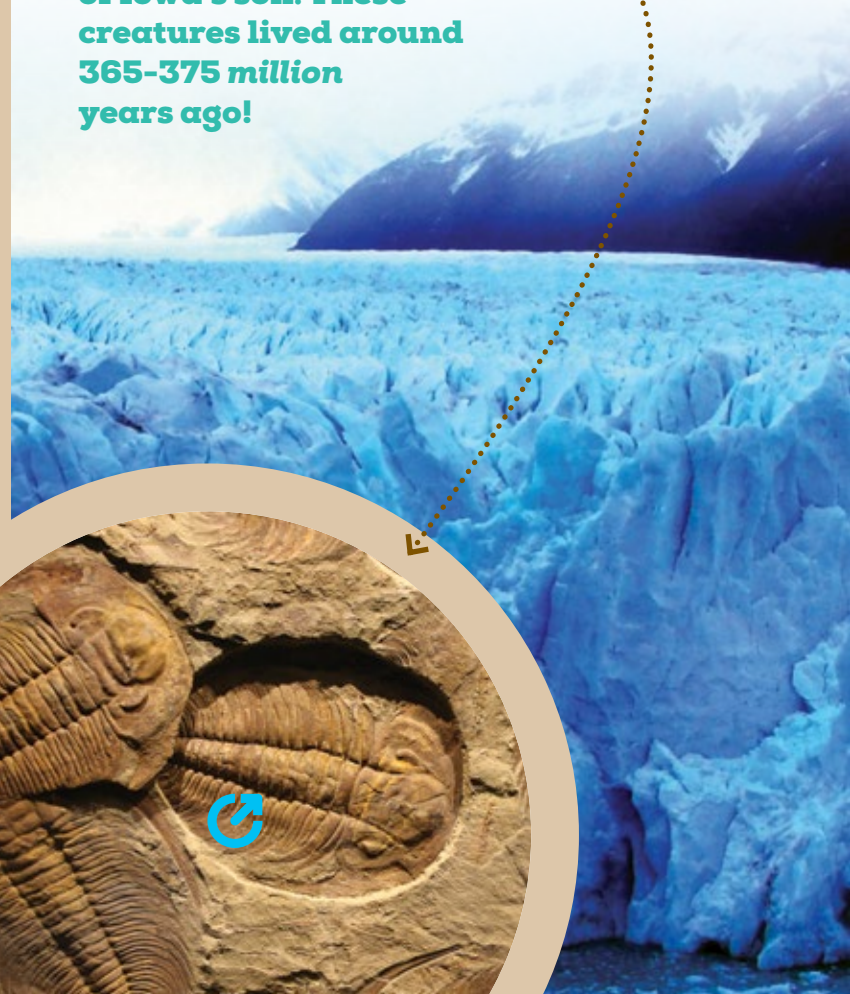
All of Iowa was once covered by glaciers. In fact, there were two different glaciers that were in Iowa! From 500,000 to 2.5 million years ago, there was a huge glacier that pushed through Iowa. It moved slowly and cut big hills across the state. It also deposited **sediment**, called **glacial till**. Glacial till is a parent material of Iowa soil! Glaciers also made The Des Moines Lobe in north-central Iowa.

The Loess Hills are steep hills on the western side of the state. Loess means wind-blown soil. The soil in the hills was blown out of the Missouri riverbed a long time ago! This soil is very **fertile**, which means it is easy for plants to grow in it.

The glacial till deposited in Iowa gave plants a place to grow. Iowa was once covered in native prairies. Prairies have grasses and lots of small mammals and birds. The deep roots of Iowa's native prairie helped make Iowa's soil deep and rich.

Over time, landforms erode. Wind and rain can make hills steeper or cut floodplains near rivers. All of these factors have led to Iowa having some of the best soil for agriculture.

**DID YOU KNOW?** Iowa has fossil beds that paleontologists and geologists study. They show us that Iowa was once covered in water! The sea creatures that died built the foundation for some of Iowa's soil. These creatures lived around 365-375 million years ago!





# SOIL AND WATER QUALITY SOLUTIONS

Soil and water are precious resources. Farmers are always learning more about how to protect them from wind and water erosion. Here are a few ways that farmers work to keep soil in the fields and keep water clean.

## Career Corner:

**Shaffer Ridgeway** is a District Conservationist with the Natural Resources Conservation Service (NRCS). He helps farmers meet their conservation goals. Different farms have different issues and Shaffer helps farmers solve them. He uses math, physics, and biology to choose the best practices for each problem. The practices on these pages are some of the solutions he can help farmers implement!

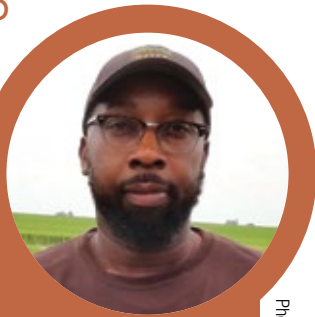


Photo Courtesy of Practical Farmers of Iowa



Photo courtesy of Iowa Learning Farms.

## COVER CROPS

Cover crops grow on the field from fall until spring. The extra plants protect the soil surface from wind and water erosion. The roots of cover crops help keep soil in place. Plus, growing plants give the soil extra organic material. This is great for soil health!

## BUFFER STRIPS

Buffer strips are pieces of land next to a waterway. They are full of native plants. These plants help slow runoff and filter out extra nutrients before the water reaches the waterway.



**THINK & DISCUSS**  
Which of these are permanent?  
Which are not?  
Could a farmer implement all of these at once?

## DRAINAGEWAYS

When it rains on a field, the water will collect in low areas. This means that the valley between two slopes is susceptible to water erosion. Grassed drainageways can help protect the soil using perennial plants!



## TERRACES

Terraces are man-made mounds. They are built on hillsides to slow down rainwater. This can reduce erosion by letting soil settle out of rainwater before it runs off the field.



Photo Courtesy of USDA-NRCS, Iowa

## NO-TILL

Farmers used to always plow or till their fields. Today, more farmers don't till their fields. This can make the soil stronger and healthier. No-till can also make the soil better at holding water, so it doesn't run off the field.



## GRAZING SYSTEMS

Cattle and other animals often live on pastures, or grass fields. If the pastures aren't managed well, the cattle can eat too much of the grass. This can cause soil erosion. Cattle farmers that use pastures move cattle from one place to another so the grass can grow and the soil is safer!





# TECHNOLOGY IN AGRICULTURE

**Satellites might be in outer space, but they are helping you and farmers.**

You use satellites to get directions through the global positioning system (GPS). Farmers use satellites to drive tractors through fields, which is like getting directions to a spot.

**Autonomous tractors** are a new invention that use GPS. These tractors don't need a person in the tractor cab. They run using a computer that has been programmed to respond to GPS! Together they tell the tractor to move through the field to avoid creeks, fences, and turn around at the end of a row. The computer makes the tractor more precise when applying fertilizer and pesticides. This reduces the chance of run-off. Reducing fuel use through more accurate planting is another

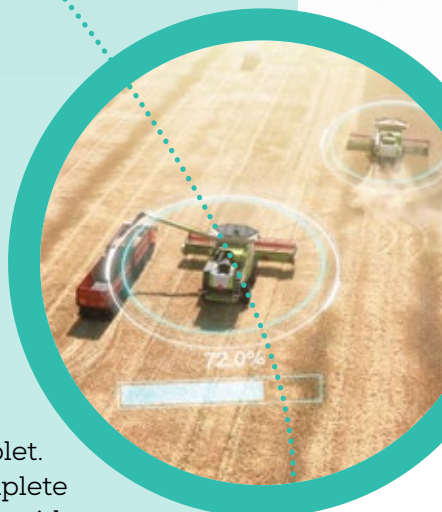
way computers and GPS help the environment.

Autonomous tractors can be run from a phone or tablet. This allows farmers to complete more tasks and spend time with their families. They can run their tractor from their phone and work on a different task all at the same time.

Drones are small remote-controlled flying devices. **Drones** can be used to check crops after they have been planted. They can be used to spot spray in fields, monitor crops, and find areas with erosion.

Animal agriculture uses drones for checking on livestock in pastures. A drone could spot animals that have gotten sick, out of the pasture, or that need help.

What do you think the next technology for farmers will be?



## Career Corner:

**Erin Boote** operates drones to help crop scientists collect data. She surveys a field and gathers pictures of the crops with a drone. Using computer software, her team analyzes the images so scientists can make informed decisions.

Erin's curiosity, time management, and problem-solving skills help her be a leader!



# URBAN FARMING

**2% of Earth's surface can be used to grow crops.**

As the human population grows, we must find new ways to grow food with limited resources. Cities are a new frontier for farming. Agriculture engineers and scientists are working together to make it possible to grow food in buildings.

**Urban farming** is a way to grow lots of food in cities. Urban farms can be in vacant buildings or even

shipping crates! Growing food indoors means you need to create the environment for crops and livestock. Many urban farms have solar panels on their buildings to help heat and light the inside. Urban farms don't always use soil. Instead, they add nutrients crops need to water and recycle the extra for future use.

Because cities have buildings close together, urban farms grow up! This is called **vertical farming**. Sometimes urban farms raise vegetables and livestock together. This is called **aquaponics**. In an aquaponics system fish provide nutrients

to plants, and plants provide oxygen to fish. Growing food where people are can make it easier to feed the world.

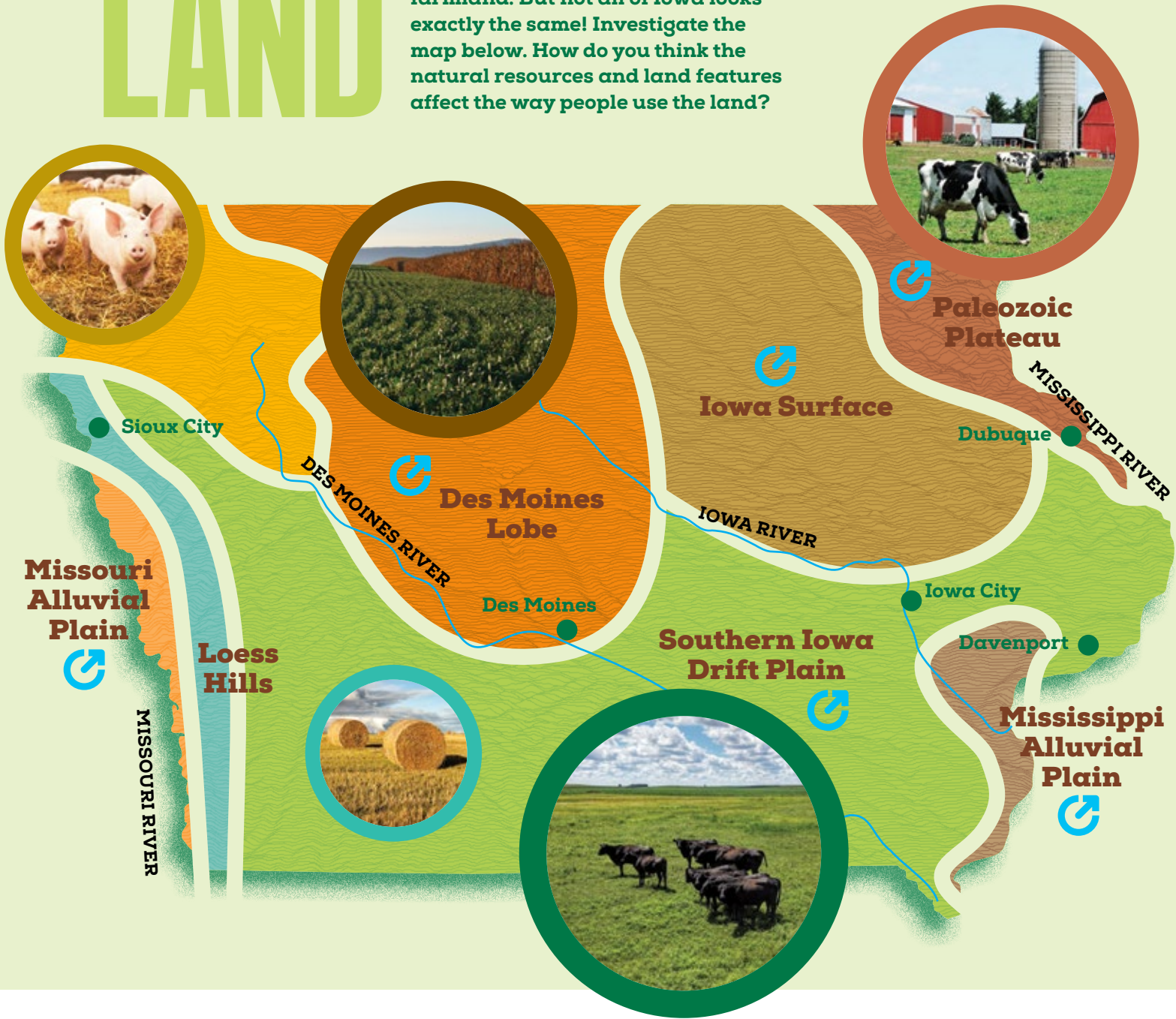
Schools across Iowa have been working to build their own aquaponic systems. Others have built a school garden to grow food for their school cafeterias. What would you grow in your own school?

**THINK & DISCUSS**  
Growing food in a city isn't always large scale. Sometimes it's in a vacant lot, on a roof top, or in a pot. How would you grow food in a city?



# USING IOWA'S LAND

Iowa is known for its rich soil and farmland. But not all of Iowa looks exactly the same! Investigate the map below. How do you think the natural resources and land features affect the way people use the land?



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