

NORTH DAKOTA

Ag Mag

A Magazine about Agriculture for North Dakota Students



North Dakota's OILSEEDS

What do you think of when you hear the word *oil*? Maybe a fluid in your car? Or a liquid in a can that stops squeaks? What about an ingredient in cakes or in the skillet to make stir-fry?

Many oils come from crops grown in North Dakota. Some are edible oils (oils that people and animals can eat), and some are inedible oils (used for lubrication). These crops are called **oilseeds** because their major purpose is to produce oil.

What different kinds of cooking oils have you seen on grocery store shelves?

We're #1

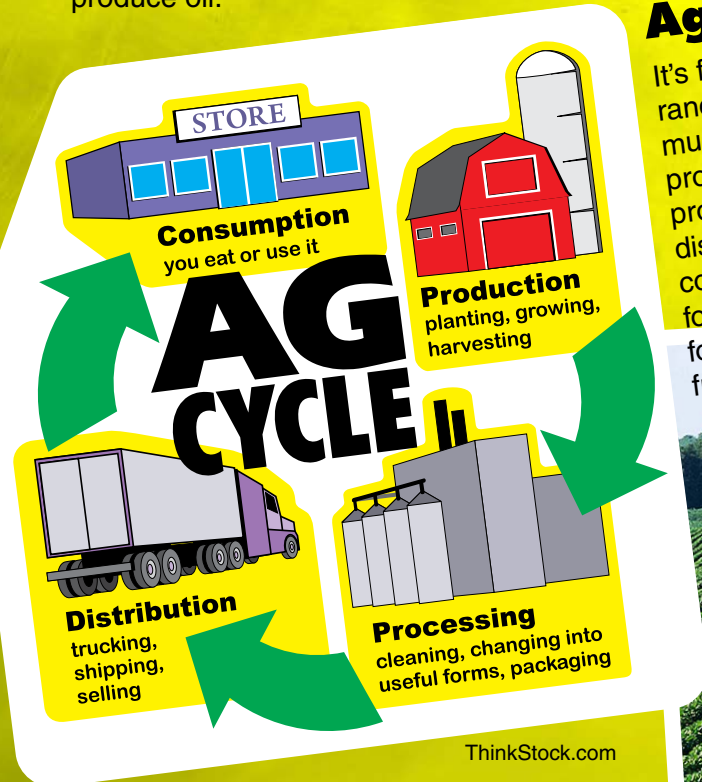
North Dakota usually ranks first or second in the nation in the production of 14 agricultural commodities:

- Spring Wheat
- Durum Wheat
- Flaxseed
- Pinto Beans
- Dry Edible Beans
- Dry Edible Peas
- Canola
- Honey
- Oil Sunflowers
- Non-oil Sunflowers
- Lentils
- Navy Beans
- Black Beans
- Great Northern Beans

Agriculture!

It's farming and ranching and much, much more. It's the production, processing, distribution and consumption of food, fiber, feed, forestry and fuel products.

Which three are oilseeds?



Oilseed Production

Soybeans, sunflowers, canola and flax are the major oilseed crops grown in North Dakota.

Soybeans grow in pods on the plants. Each plant may have 60 to 80 pods, and two to four pea-sized beans grow in each pod. The plant's stems, leaves and pods are covered with short, fine hairs. The soybean plant is called a legume because its roots have nodules (small rounded bumps). These nodules absorb nitrogen from the air and make it available for the plant's growth. After harvest, some of the nitrogen is released back into the soil for use by the next crop.

Sunflowers come in two types: striped (non-oil) seeds and black (oil) seeds. Each head has about 1,000 sunflower seeds surrounded by big, bright yellow flower petals. Near harvest time, the heavy heads droop toward the ground. Sunflowers grow very tall, up to 10 feet high. The roots may grow 6 feet into the ground.

Canola grows 3 to 6 feet tall and blooms with a cluster of bright yellow flowers at the top of each stem in early summer. The flowers produce seed pods about 3 inches long. Each pod turns brown as it ripens and contains 20 or more tiny round black or brownish-yellow seeds.

Flax also comes in two types: seed flax for the oil in its seed and fiber flax for the fiber in its stem. Today most Midwestern producers grow seed flax. Its stems each have a single pretty purplish-blue flower at the top when it blooms. The plant may grow up to 3 feet high. The tap root may extend 3 feet into the ground. The tiny seeds are in a boll or capsule containing 6, 8 or 10 brown or yellow seeds.



Name That Oilseed Plant

From the descriptions above, identify the different North Dakota oilseed plants.



Acres and Acres of Oilseeds

Soybean Photo Credits:
North Dakota Soybean Council

An acre is an area of land about the size of a football field. Use this table to answer the questions about North Dakota's oilseeds crops.

Which oilseed had the most acres planted in 2017?

Which oilseed had the fewest acres planted in 2017?

How many acres of flaxseed were "lost" from the time the crops were planted until they were harvested?

Challenge: Figure out which oilseed had the fewest acres of crop lost from planting to harvest.

Crop	Acres Planted in ND in 2017	Acres Harvested in ND in 2017
Canola	1,590,000	1,560,000
Flaxseed	245,000	229,000
Soybeans	7,100,000	7,050,000
Oil Sunflowers	438,000	426,000

Source: USDA National Agricultural Statistics Service

7,050,000 acres of soybeans! That's more acres than the entire state of Maryland.

Why do you think that none of the crops harvested as many acres as were planted?

Soybean Producers!

In 2017, five North Dakota counties ranked in the top 10 for acres of soybeans harvested in the entire U.S.

- # 1 Cass County
- # 2 Stutsman County
- # 3 Barnes County
- # 6 Richland County
- # 8 LaMoure County

Oil Processing

Where Does That Oil Come From?

They may not feel oily, but oilseeds may be up to 50 percent oil. Oil sunflower seeds are about 44 percent oil, canola 42 percent and soybeans 20 percent.

The oil usually is removed by pressing – literally squeezing the oil out. Sometimes chemicals also are used to extract the oil. The product that's left after pressing is called meal, and it's an excellent protein source for livestock. Look at a bag of dog food and you'll probably see soybean meal as an ingredient.

Many oilseeds are processed in North Dakota. Write the number from the map in front of the processing plant that is located there.

_____ **Heartland Flax, Valley City** – flaxseed

_____ **Cargill, West Fargo** – oil sunflowers, flaxseed, canola

_____ **ADM, Velva** – canola

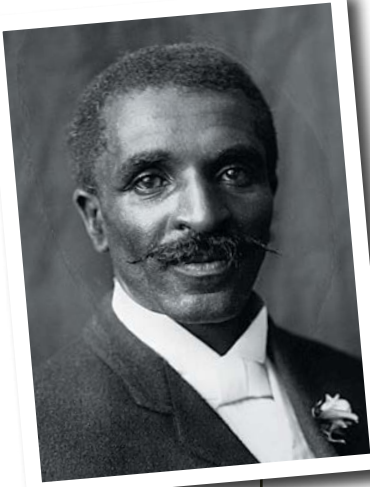
_____ **ADM Northern Sun, Enderlin** – oil sunflowers, crambe, canola, soybeans

_____ **17Thistles, Bowman** – safflower



Oilseeds Then and Now

Use these words to fill in the blanks: **car, human, lubricants, hay, east, abdominal, stems, linens**



Johnston, Frances Benjamin. Prints and Photographs Division from the Library of Congress.

While at Tuskegee Institute in Alabama, I taught farmers to plant soybeans to replenish the soil with nitrogen and developed hundreds of products from soybeans, such as paints, stains, soap, dye and glue.

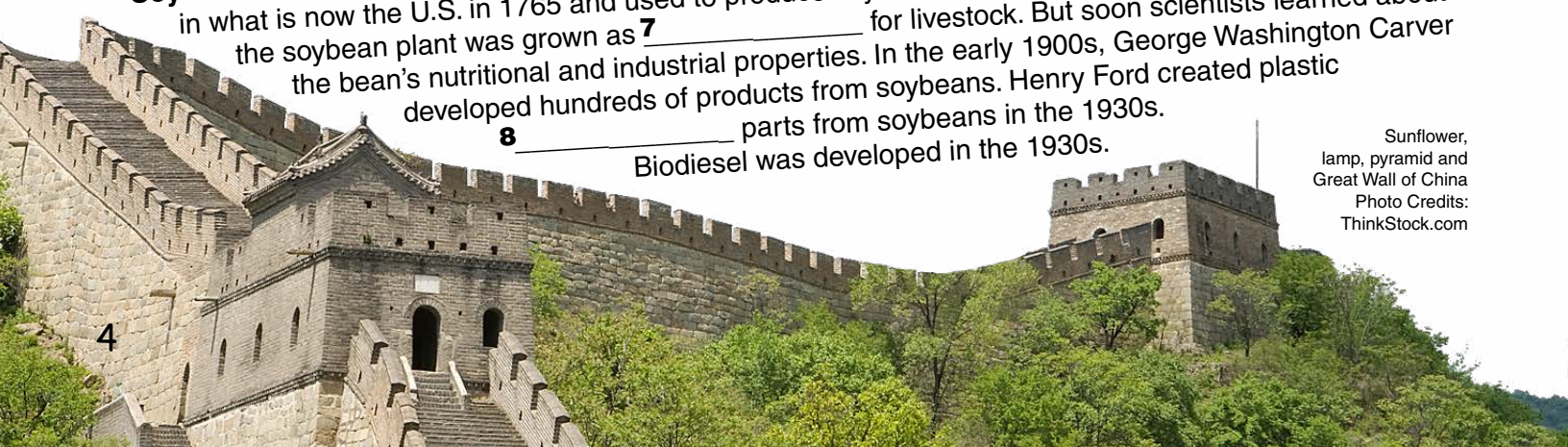
Who Am I?

Canola — The oil from rapeseed, canola's "parent," was used in lamps in ancient Asia and Europe. During the steam power era, the oil clung to metal surfaces washed with water or steam better than other **3** _____. Today's canola is a relatively new plant, developed by Canadian plant breeders in 1974 for its nutritional qualities. The word comes from "Canada oil." In 1985, the U.S. Food and Drug Administration approved canola as a safe oil for **4** _____ food. North Dakota produces more canola than any other state in the U.S.



Flax — Flax was cultivated in Babylon in 3000 B.C. Ancient Egyptians made fine **5** _____ from flax fiber. About 650 B.C., Hippocrates, the father of medicine, used flaxseed to relieve **6** _____ pains. With World War II, demand for flax increased as more oil was needed in homes and factories. Today some people eat flaxseed by itself and in baked goods for its nutrition and edible fiber. Linseed oil from flax is replacing some petroleum-based chemicals in paints, stains, flooring materials and other products.

Soybeans — Domesticated by Chinese farmers between 1700 and 1100 B.C., soybeans were first planted in what is now the U.S. in 1765 and used to produce soy sauce and soy noodles. Around World War II, the soybean plant was grown as **7** _____ for livestock. But soon scientists learned about the bean's nutritional and industrial properties. In the early 1900s, George Washington Carver developed hundreds of products from soybeans. Henry Ford created plastic **8** _____ parts from soybeans in the 1930s. Biodiesel was developed in the 1930s.



4

Sunflower, lamp, pyramid and Great Wall of China
Photo Credits: ThinkStock.com

Sunflowers — It's believed sunflowers were cultivated by Native Americans in present-day Arizona and New Mexico about 3000 B.C. The name "sunflower" was given because the heads of the plants turned during the day to follow the sun to get more energy. Each morning the plants turned their heads toward the **1** _____, and by evening they were facing west. But that turning weakened the **2** _____ that hold the heads heavy with sunflower seeds, so plant breeders developed sunflowers that, once the heads start blooming, stay facing to the east. Sunflowers come in two types. Striped seeds from non-oil sunflowers are eaten after being roasted in the shell or as kernels without the shell. Birds also love sunflower seeds. Black sunflower seeds are processed into oil for cooking and salads.

Career Corner

Sarah Lovas

Lovas Farms
Hillsboro, ND

Sarah owns and operates Lovas Farms with her father-in-law and husband. She is in charge of agronomy: the soil management and crop production of their farm. She says it's like being a doctor, but for plants.

Sarah brings the crops to life by choosing seed varieties for the soybeans, corn, wheat and other crops they plant. Though weather is out of her control, she provides the crops with nutrition by adding fertilizers when necessary. If the crops become infected with insects or overcome with weeds, she determines what, when and how much pesticide to apply. She continually studies the latest farm technologies to apply what might help their farm.

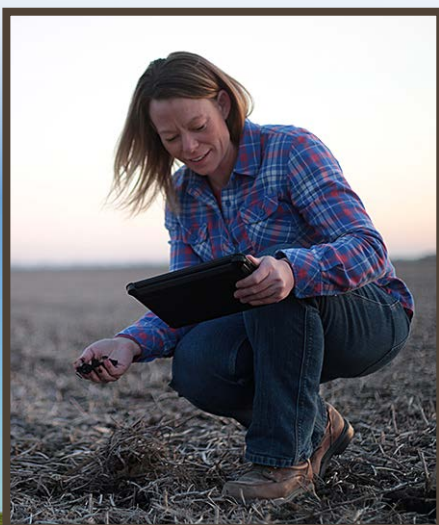
In addition, Sarah has her own company to advise other farmers on precision agriculture, data usage, soil sampling and soil fertility. She works with hard red spring wheat, malting barley, sugar beets, dry edible beans and sunflowers. Precision agriculture uses information technology to ensure that the crops and soil receive exactly what they need for optimum health and productivity.

At North Dakota State University, Sarah received her bachelor's degree in agricultural systems management and master's in soil science. She believes that the key to success is to never stop learning.

"To be an effective farmer, you have to be an agronomist, an economist, an accountant, a mechanic and an engineer, and you also have to be computer and technology savvy," Sarah says. "Since it is virtually impossible for any one person to do all of these things, farmers surround themselves with smart people who can help them. If you are interested in any one of these things, you can certainly create a job out of it.

"Farming is a great career and a wonderful calling," Sarah says. "I produce the safest, most nutritious and most affordable food in the world. This is done with sustainable practices to preserve our natural resources for future generations."

As a farmer and consulting agronomist, Sarah carries out their family's principle: work hard and take care of the land so it continues to take care of you.



Oilseed Distribution

Where in the World?

To export means to sell to another country, and to import means to bring into a country.

U.S. oilseed crops are exported to many countries around the world. On the world map, color in the countries that are major importers of U.S. oilseeds.

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Soybeans

Whole beans – China, Mexico, the Netherlands, Indonesia, Japan, Taiwan

Oil – China, Mexico, South Korea, Dominican Republic, Colombia

Canola

Seed – Japan, Mexico, Canada

Flaxseed

Seed – Belgium, Canada

Sunflower

Oil sunflowers – Canada, Japan, Mexico

Oil – Canada

Think About It

Are olive oil, sesame oil and peanut oil on your grocery store shelf? Why aren't olives, sesame plants and peanuts grown in North Dakota? Where are they grown?

Corn oil also is at your store. Corn isn't considered an oilseed since only the germ of the plant (the tiny part of the kernel that sprouts and grows into a new plant) is crushed for its oil. Most of the corn kernel is used for livestock feed, starch, sweeteners, corn flakes and other products.

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Oilseed Consumption

In addition to providing vegetable oils, North Dakota's oilseed plants provide other foods. Sunflower kernels are used in salads and baked goods. Flaxseeds are in some multigrain breads and cereals. Sunflower and flaxseeds can be used instead of nuts in most recipes and sprinkled on salads, soups and vegetables.

Soybeans can be made into soy sauce, soy nuts, sprouts, soy milk, tofu (a cheeselike food made from curdled soy milk), meat substitutes and many other products.

Like all foods that come from plants, North Dakota's vegetable oils have no cholesterol. They're liquid at room temperature rather than solid, which means they're healthier oils than solid fats.

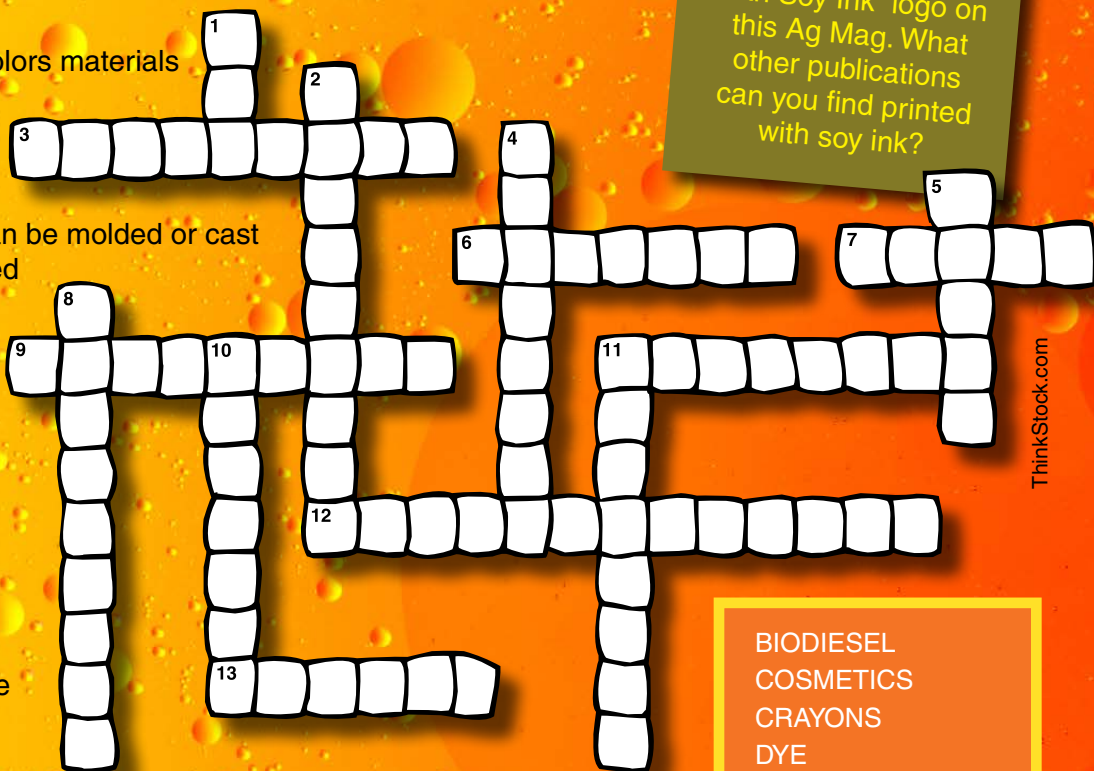
Oils provide vitamin E and other nutrients for your body. They also provide energy as calories. Physical activity allows you to balance the calories you eat with the calories you use. So you need to run and play to use up this energy and stay healthy.

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Oilseeds are More Than Oil

Down

1. A substance that colors materials
2. Biodegradable engine fuel made primarily from soybeans
4. Compounds that can be molded or cast
5. A liquid mixture used as a decorative or protective coating
8. Liquid or solid that reduces friction, heat and wear when applied as a surface coating to moving parts
10. Sticks of colored waxy material used for drawing
11. A durable, washable floor or countertop covering made by pressing linseed oil with other materials



Find the "Printed with Soy Ink" logo on this Ag Mag. What other publications can you find printed with soy ink?

Across

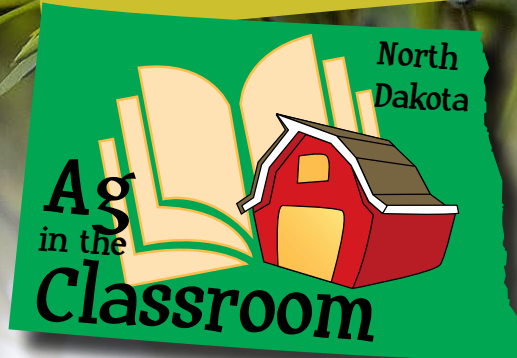
3. Lipstick, mascara, powder and other makeup
6. Coats surfaces with a hard, glossy, thin film
7. Liquid that adds color to wood's surface
9. A lotion or cream formulated to prevent sunburn, skin cancers and other conditions caused by excessive exposure to the sun
11. A soybean product that helps keep ingredients mixed
12. Meal from oilseeds usually is used for this
13. What this Ag Mag is printed with

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