



PULSE CROPS AND DRY EDIBLE BEANS

Legumes are plants that have bumps (called nodules) on their roots. The nodules contain bacteria that can “catch” nitrogen gas from the air pores in the soil and transform the gas into a form the plant can use. Nitrogen is a nutrient all plants need to grow.

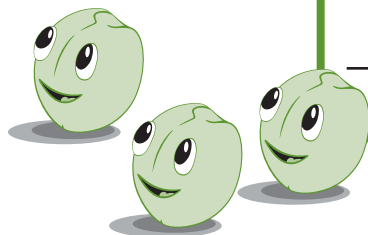
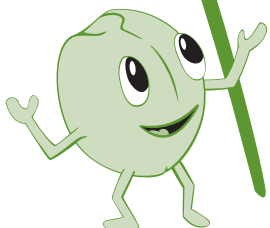
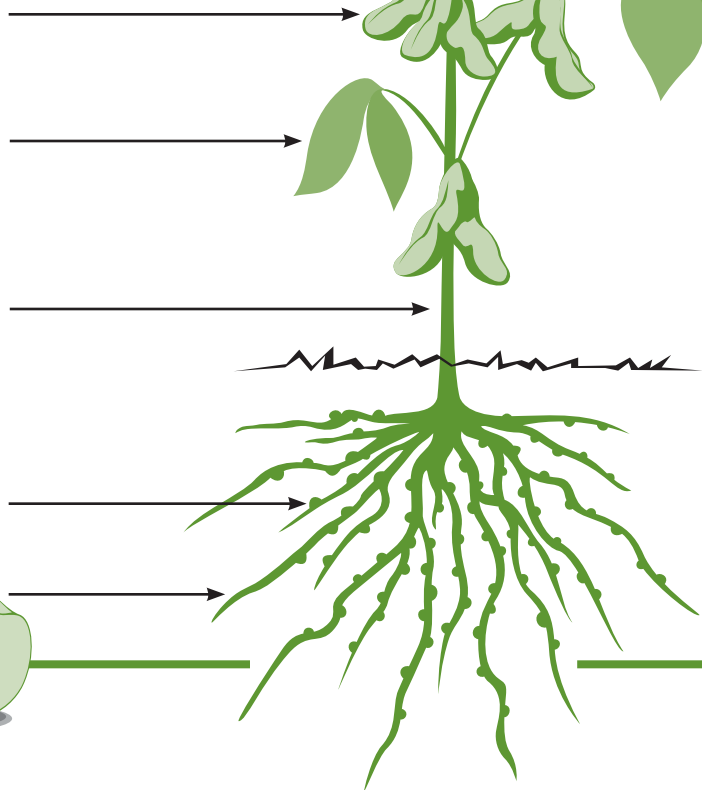


Pulse crops and dry edible beans are two kinds of legumes.

North Dakota ranks #1 among the states in production of dry edible beans, dry peas and lentils.

On this plant, identify the:

- Roots
- Stalk
- Leaves
- Nodules
- Pods



PRODUCTION

Pulse crops are legumes that grow for one year (so are called annuals) and are harvested for the dry grain or seed inside the pod.

“Pulse” comes from a Latin word for a thick soup.

North Dakota produces three major kinds of pulse crops:

Dry peas – Sweet peas are the small, round green vegetable you probably often eat. They are harvested when they’re still immature and soft. Dry peas become hard, mature seeds inside the plant’s pod. The green or yellow dry peas are usually split and soaked for faster cooking in soups and stews.

Lentils – The size and appearance of lentils varies depending on the class, but the grain can have different colors, such as red, green or yellow. Lentils are used primarily in soups and stews, but also in casseroles, side dishes, baked goods and salads.

Chickpeas – You may know these as garbanzo beans. They’re ground and made into hummus, a Middle Eastern dip, or cooked for use in salads and soups.

Name That Crop

Beans are usually kidney-shaped or oval, while peas are round. Lentils are shaped like a lens, and chickpeas look like the beak of a baby chick. From the descriptions, identify the bean, pea, lentil and chickpea.









North Dakota produces nine different classes of dry beans.

Pinto Bean – was the first bean planted in North Dakota about 50 years ago. This bean is medium sized with small brown spots on it. It is used in Mexican foods like burritos and tacos.

Small Red Bean – is just that – a small, dark red bean that is used in a variety of soups.

Black Bean – is medium-sized and often called a turtle bean.

Great Northern Bean – is a medium-sized, white oval bean that is used in soups and stews.

Pink Bean – is a small, pale, pink-colored bean that turns reddish-brown when cooked.

Light Red Kidney Bean – is a large, kidney-shaped bean used in chili.

Dark Red Kidney Bean – also is a large, kidney-shaped bean used to make chili and salads, but is a darker color than the Light Red Kidney Bean.

Cranberry Bean – is a medium-sized tan bean with red spots that is found in some Italian foods.

Navy Bean – is a small, white bean used in soups or baked bean dishes.

From the Field to the Fork

Determine the order in which each bean production event happens. Label them 1-9.

- _____ The farmer plants the bean seed using special equipment called a drill or row planter.
- _____ Trucks take the beans to a processing plant where the beans are tested to determine the quality and the price the farmer receives.
- _____ When the plant has grown to its full height, small flowers begin to develop on the plant.
- _____ With soil, sunlight and rain, the bean plant grows for 12-14 weeks.
- _____ The beans are transferred into rail cars or bagged and sent by truck to canners and packagers all around the world.
- _____ The bean plant, including the pods, turns from a green color to yellow, indicating that harvest time is near.
- _____ The flowers turn into pods, and bean seeds begin to grow in the pods.
- _____ The beans are sorted by color, size and quality at the processing plant.
- _____ The farmer harvests the beans and augers them into trucks.

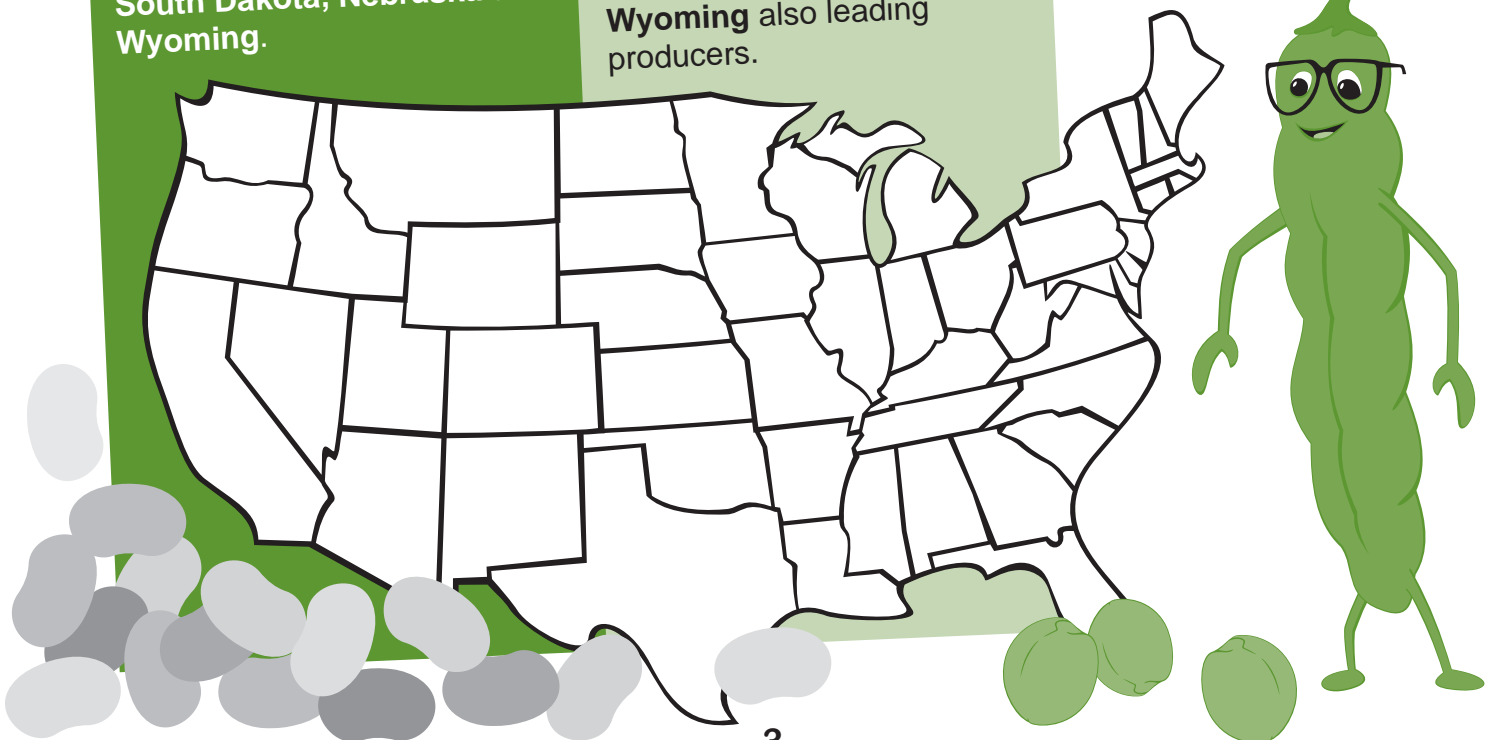


U.S. Bean and Pulse Production

Nearly all U.S. dry peas, lentils and chickpeas are grown in **Idaho, Washington, Oregon, Montana, North Dakota, South Dakota, Nebraska and Wyoming.**

North Dakota and Michigan grow about half of the U.S. beans with **Minnesota, Nebraska, Idaho, California, Washington, Colorado and Wyoming** also leading producers.

On the U.S. map, write the names of the bolded states that produce the most dry peas, lentils, chickpeas and beans.



Food from Way Back

Some archeologists think pulse crops have been grown for more than 20,000 years. Lentils, peas and chickpeas were found in pyramids in **Egypt** that were built more than 4,000 years ago. Peas more than 11,000 years old were found in caves in **Thailand**.

Growing beans for food dates back to 7,000 years ago in **Peru** and **Mexico**. Mexican Indian tribes planted small-seeded beans, while tribes in Peru planted large-seeded beans. As Indian groups explored, migrated and traded with other tribes, many types of beans and native farming practices spread over North America and South America.

When explorers from **Portugal** and **Spain** discovered America, Indian tribes were already planting beans. Early explorers shared American beans around the world, and soon beans were popular in Europe, Africa and Asia.



U.S. Bean and Pulse Exports

The **United States** is the sixth-leading producer of dry beans, behind **Brazil, India, China, Myanmar** (formerly Burma) and **Mexico**.

About 20 percent of the beans produced in the U.S. are exported to other countries. Major importers of U.S. beans are:

Mexico	Canada	Cuba	Angola	United Kingdom
Haiti	Japan	Iraq	Guatemala	Dominican Republic

About 75 percent of dry peas and lentils grown in the U.S. are exported to other countries. **India, the Philippines** and **Cuba** buy most of the dry peas, and **Spain, Peru** and **Mexico** buy most of the lentils. **Spain** buys most of the chickpeas.

Where in the World

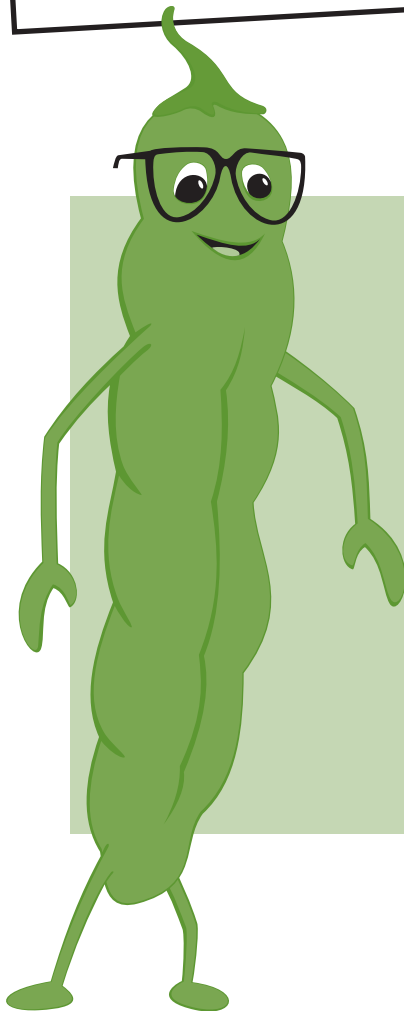
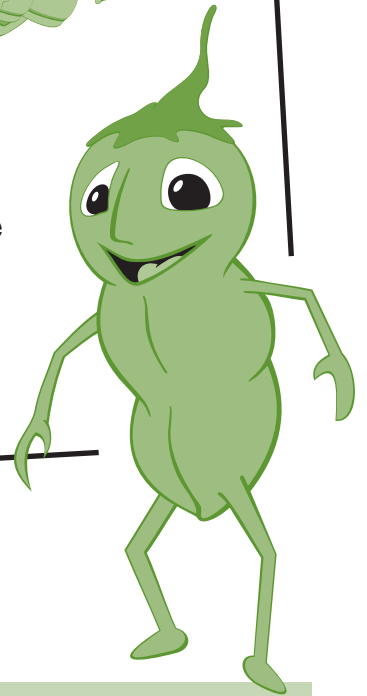
On the map, color each country bolded in Food from Way Back and U.S. Bean and Pulse Exports. Draw routes to show how beans may have spread throughout the world.

PROCESSING

Canned vs. Dry

Pulse crops and beans can be purchased either dry in a bag or already cooked in a can. Dry pulse crops and beans absorb lots of water when soaked or cooked. Use twice as much water as dry product.

1. Kenyon's recipe calls for 1 1/2 cups of lentils. How much water should he add to cook them? _____
2. One cup of dry peas yields two cups of cooked peas. How many cups of dry peas should Amanda start with to have 6 cups of cooked peas? _____
3. A can of light red kidney beans is 16 ounces, and Raghav's chili recipe calls for 40 ounces. How many cans does he need? _____
4. Emily's hummus recipe calls for 3 cups of chickpeas. The label says each can contains about 1 1/2 cups. How many cans does she need to make the hummus? _____



The Many Uses of Peas

Even though peas are eaten in soups, casseroles and other dishes, they also are used as an ingredient in several other products. Circle what you think can be made with peas.

Baby Food

Cookies

Bird Food

Flour

Chips

Livestock Feed

Bread

Drinks

Fuel

Pasta

Pet Food



DISTRIBUTION

Career Corner

Jennifer Tesch – Marketing/Sales Director
SK Food International, Fargo, North Dakota

Jennifer Tesch travels all over the world to sell the crops U.S. farmers grow.

“I travel overseas as well as attend trade shows to educate people in those countries about our products,” says Jennifer. “I also oversee our domestic and overseas marketing, such as advertising and public relations.”

SK Food International is an import/export trading company, which means they buy crops like soybeans, dry beans and peas and sell them to countries such as Japan, Taiwan, Hong Kong, the Philippines, Singapore, Malaysia, Australia, New Zealand, Canada, Austria, Switzerland, Germany, France, Italy, Poland, Sweden, Norway, Denmark and the Netherlands.

A farmer signs a contract, or an agreement, with the company that says the farmer will deliver a certain amount of a particular quality of crop to SK Food International after it is harvested.

“After farmers harvest their crop, they haul it to our processing plant where we clean and process the crop to our customer’s specifications,” says Jennifer. “The product is then packed in bulk or bags and shipped all over the world.”

All the products are labeled as identity preserved, meaning each bag can be traced back to the farmer who planted that seed.

The company also supplies many kinds of organic crops. Crops are classified as organic when no chemicals or artificial fertilizer are used in production. SK Food International sells organic beans like black turtle, great northern, navy, pinto, dark red kidney, fava and azuki beans, and chickpeas for use in soups, canning and frozen foods.

Beans, peas and lentils also are made into instant powder and flakes at SK Food International. The seeds are ground, cooked and milled into a powder or flake to be used in bean dishes, dips, soups and other foods.

SK Food International works with more than 2,500 farmers throughout the U.S. Jennifer buys crops from these farmers and sells it to other countries so people all over the world can enjoy foods grown in North Dakota and throughout the United States.



CONSUMPTION

Meat or Vegetable?

Although they are vegetables, peas and beans have so much protein, they also are included in the meat and beans group. Your skin, bones, and muscles need protein to grow and stay healthy.

Write **M** by the foods in the meat and beans group and **V** by the vegetables. Circle the foods that are in both groups.

- | | | |
|---------------------------------------|--------------------------------------|-------------------------------------|
| <input type="checkbox"/> Cheese | <input type="checkbox"/> Bread | <input type="checkbox"/> Tomatoes |
| <input type="checkbox"/> Rice | <input type="checkbox"/> Potatoes | <input type="checkbox"/> Grapes |
| <input type="checkbox"/> Spaghetti | <input type="checkbox"/> Lentils | <input type="checkbox"/> Watermelon |
| <input type="checkbox"/> Chicken | <input type="checkbox"/> Pinto Beans | <input type="checkbox"/> Honey |
| <input type="checkbox"/> Yogurt | <input type="checkbox"/> Eggs | <input type="checkbox"/> Oats |
| <input type="checkbox"/> Wheat | <input type="checkbox"/> Broccoli | <input type="checkbox"/> Dry Peas |
| <input type="checkbox"/> Turtle Beans | <input type="checkbox"/> Carrots | <input type="checkbox"/> Fish |
| <input type="checkbox"/> Milk | <input type="checkbox"/> Cereal | |



Meat & Beans Group
Go lean with protein

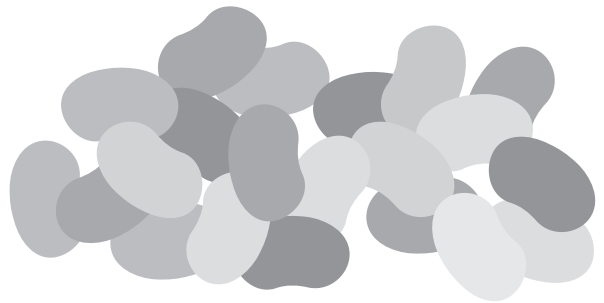


Vegetable Group
Vary your veggies

Math Challenge

- Jessica wants to buy 2 pounds of black beans. The 1-pound bag costs \$1.75, and the 2-pound bag costs \$2.50. How much money will Jessica save by purchasing the 2-pound bag instead of two 1-pound bags? _____
- Jessica wants to make a casserole with different kinds of beans. The sale at the grocery store is 3 cans for \$2.00. Jessica purchases 3 cans of pinto beans, 3 cans of kidney beans and 3 cans of navy beans. How much will Jessica pay for all the cans of beans? _____
- Jessica also decides to buy 3 cans of chickpeas. Each can costs \$.69. How much will Jessica pay for 3 cans of chickpeas? _____
- What will Jessica's total grocery store bill be for the black, pinto, kidney and navy beans, and chickpeas? _____
- Andrew's family is making a huge bean soup for a family get-together. Each can is 14 ounces. How many cans of each bean does he need to make the soup in this proportion?

- | | |
|-----------------------------|------------|
| 1/6 pinto beans | _____ cans |
| 1/12 dark red kidney beans | _____ cans |
| 1/3 black beans | _____ cans |
| 1/4 navy beans | _____ cans |
| 1/12 great northern beans | _____ cans |
| 1/12 light red kidney beans | _____ cans |
| Total | _____ cans |



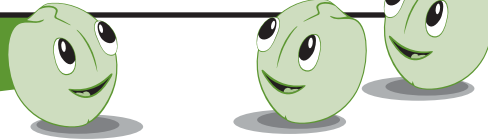
North Dakota Agriculture in the Classroom



Take this issue
of North Dakota
Ag Mag home
to share what
you've learned
about pulse
crops and dry
edible beans.

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