

**CAREER  
PATHS**

# Agriculture

Book  
**3**

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**Express Publishing**

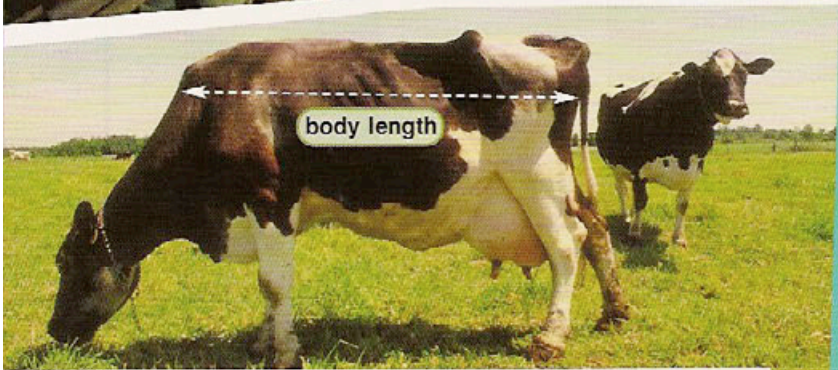
## Scope and sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Animal behavior	Job Posting	conditioning, handling, temperament, restraint, flight zone, squeeze chute, chute score, flighty, body length, crowd pen, point of balance, animal welfare	Asking about experience
2	Animal health	Magazine Article	veterinarian, diagnose, monitor, infectious, parasite, lice, tick, insecticide, deworm, respiration, lethargy, antibiotics, vaccination	Describing conditions
3	Animals and grain	Newspaper Article	feed grains, food grains, livestock, manure, land use, feedstuff-to-foodstuff, inefficient, inedible, consumption, roughage	Correcting a misconception
4	Bioengineering	Seminar Schedule	biotechnology, cloning, gene, gene enhancement, genetic engineering, transgenic, expression, regulation, prohibition, societal concerns	Changing topics
5	Cropping systems	Industry Publication	diversify, cropping system, conventional tillage, conservation tillage, crop residue, zero tillage, crop rotation, fallow, polyculture, winter wheat, spring wheat, burn down herbicide	Describing a plan
6	Growing seasons	Magazine Article	growing season, growing degree day, base temperature, mean temperature, last frost date, elevation, photoperiod, greenhouse, hoop house, freeze protection, site selection, heaters	Making suggestions
7	Weeds, pests, and disease	Farmer's Guide	bacterial, fungal, pathogen, blight, fungicide, sanitize, pest management, suppression, biological control, pesticide, weed, herbicide, weed map, mulching	Disagreeing with an opinion
8	Diagnosing crop problems	Webpage	agricultural advisor, symptom, symptom pattern, field pattern, wilt, brown, stippled, stunted, biotic, abiotic, symptomology key	Explaining steps
9	Agribusiness management	Business Letter	net farm income, farm cash receipts, income, gross farm revenue, feed costs, interest payments, fixed cash expense, noncash expense, total production expenses, debt, loan	Pointing out an error
10	International trade	Trade Profiles	international trade, export, import, export dependent, import dependent, balance of trade, trade deficit, trade surplus, tariff, quota, World Trade Organization	Agreeing to do something
11	The futures market	Article	futures market, commodity, value, change, open, high, low, index, stocks-to-use ratio, ending stock, carryover, beginning stock	Talking about possibilities
12	Sustainable farming	Flyer	sustainable, systems perspective, non-renewable resource, soil amendment, compost, monoculture, biodiversity, intercropping, economic sustainability, off-farm impact	Asking for advice
13	Technological advances	Product Listing	technology, mechanized, auto-steer, GPS, automated bin management, self-propelled, air seeding, drip irrigation system, smart irrigation control, overwatering, overplanting	Expressing doubt
14	Organic farming	Industry Publication	compliance, organic, certifier, inspector, organic systems plan, material inputs, organic integrity, contamination, commingle, field activity log, audit trail documents	Asking for more information
15	GMOs	Products Webpage	genetically modified organism, conventional seed, biotech seed, trait, nitrogen efficiency, yield enhancement, herbicide-tolerant, insect-resistant, drought-tolerant, characterizing, analysis, animal performance assessment	Talking about future events

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# 1 Animal behavior



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How can you tell if an animal is safe to approach?
- 2 What are the average flight zones of different animals?

## Reading

2 Read the job posting. Then, mark the following statements as true (T) or false (F).

- 1  The lead handler always uses restraints when working with cattle.
- 2  The health and well-being of the cattle is recorded by the lead handler.
- 3  Applicants should have knowledge of different conditioning methods.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                      |  |
|--------------------------------------|--|
| 1 <input type="checkbox"/> handling  | 4 <input type="checkbox"/> squeeze chute |
| 2 <input type="checkbox"/> restraint | 5 <input type="checkbox"/> chute score   |
| 3 <input type="checkbox"/> crowd pen | 6 <input type="checkbox"/> flighty       |

- A a rating of how well an animal tolerates being forced through a chute  
 B a device that restricts movement  
 C prone to running away  
 D herding and caring for animals  
 E a fenced area used to gather and herd animals  
 F a narrow fenced passage

## Wanted: Lead Handler

Open Season Ranch is looking for a responsible and experienced cattle handler to join our team. Competitive applicants should have excellent references and at least three years of experience.

**Herding** - Open Season's Lead Handler will ensure proper herding techniques in our **crowd pens**, **squeeze chutes**, and other facilities. Since we work with several breeds, each with a different **temperament**, it's important that the Lead Handler be highly skilled in dealing with **flighty** animals. Restraints are used as needed, but exceptional **handling** skills are always preferable.

**Maintenance** - In addition to herding, the Lead Handler will also be responsible for collecting and recording data that is relevant to our beef cattle operation. This includes determining key characteristics of each herd such as average **body length** and **chute score**. The Lead Handler will direct our team of handlers in **conditioning** methods, such as regular walks among the herd or any other appropriate techniques. The lead Handler will instruct staff on managing animal **flight zones** and **points of balance**.

**Animal Welfare** - The Lead Handler will also be responsible for ensuring the health and well-being of our herds. This includes working with our veterinarian and any internal or external **animal welfare** personnel.

4 Write a word that is similar in meaning to the underlined part.

- 1 Each animal has a different level of emotional stability.    \_ e \_ \_ e \_ \_ \_ e \_ \_
- 2 Altering the behavior and temperament of cattle requires patience.  
c \_ n \_ \_ \_ \_ \_ n \_ \_ \_
- 3 The spot that determines which way animals will move in relation to a herder is usually around the shoulder.  
\_ o i \_ \_ \_ \_ b \_ \_ a \_ \_ e
- 4 Wild animals have a large area in which a human's presence will cause an animal to move away.    \_ \_ \_ g h \_ \_ \_ n e
- 5 The health and well-being of animals is a major concern for every rancher.  
\_ n \_ \_ a \_ \_ c \_ \_ a \_ \_
- 6 Philip is measuring the span from head to rear of all the livestock.  
b \_ \_ \_ \_ e n \_ \_ \_

- 5 🎧 Listen and read the job posting again. Why must the Lead Handler be skilled at handling breeds with different temperaments?

## Listening

- 6 🎧 Listen to a conversation between an interviewer and a job applicant. Check (✓) the items the prospective employee has experience of.

- 1  working with cattle
- 2  managing employees
- 3  conditioning cattle
- 4  training new employees

- 7 🎧 Listen again and complete the conversation.

**Interviewer:** So how much experience do you have?

**Applicant:** I 1 \_\_\_\_\_ ranch for about three years.

**Interviewer:** Did you work with cattle there?

**Applicant:** Yes, I worked with both pigs and cattle.

**Interviewer:** So, how would you deal with flighty animals?

**Applicant:** Well, 2 \_\_\_\_\_ if you get too close to them. I would try to stay near the edges of their flight zone.

**Interviewer:** Good. Do you have any experience with conditioning?

**Applicant:** Yes. I used to walk through the herds at least once a day so they'd get used to me.

**Interviewer:** Okay, so the last thing I want to ask you about is 3 \_\_\_\_\_.

**Applicant:** I've 4 \_\_\_\_\_ a management position.

**Interviewer:** Have you ever 5 \_\_\_\_\_ ?

**Applicant:** Oh, yes, definitely. I used to train all the 6 \_\_\_\_\_.

**Interviewer:** Well, that's most of what being a lead handler is about.

**Applicant:** Okay. I think I 7 \_\_\_\_\_.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*How much experience do you have?*

*How would you deal with flighty animals?*

*Do you have any experience with ...*

**Student A:** You are a rancher. Interview Student B about:

- experience with animals
- conditioning
- experience in management

**Student B:** You are in an interview. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 and the job posting to write a lead handler's resume. Include: experience, skills, and responsibilities.

# Resume

Name: \_\_\_\_\_

Experience: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Skills: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibilities: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are some common health problems livestock get?
- 2 How can farmers prevent the spread of disease in livestock?

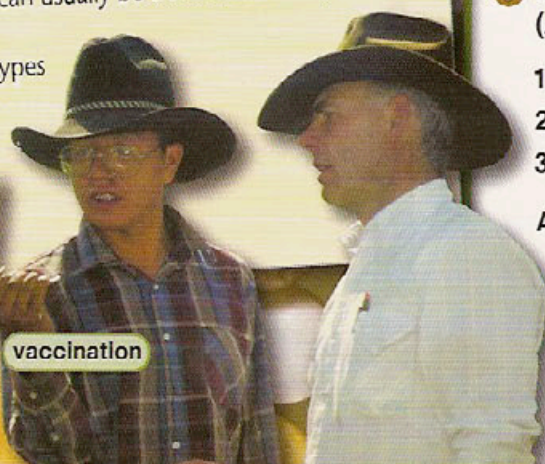
## Disease Control Modern Farmer Mar. Ed.

Proper health management involves much more than treating occasional infections. In fact, preventative care is probably the most important thing you can do to ensure the health of your livestock. While only a licensed **veterinarian** can **diagnose** your animals, there are plenty of ways that you can **monitor** your livestock for **infectious** diseases and prevent their spread.

Some of the most common health problems among livestock are the results of **parasites**. Common parasitic organisms include worms, **lice**, and **ticks**. You can help prevent the spread of these parasites by regularly cleaning your facilities. You may also consider treating the coats of your livestock with **insecticides**. If you suspect a parasitic infection among your livestock, seek professional help immediately. Your veterinarian may be able to treat your animals with drugs, dietary remedies, and **deworming** techniques.

Another major concern is respiratory disease. Although there are numerous causes, the symptoms of respiratory infections are always the same. If you notice labored **respiration**, fever, and **lethargy** among your livestock, contact your veterinarian right away. Respiratory infections can be deadly if ignored, but they can usually be treated effectively with **antibiotics**. More importantly, many types of infections can be prevented with **vaccinations**.

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### Reading

2 Read the magazine article. Then, choose the correct answers.

- 1 What is the article mainly about?
  - A choosing the right veterinarian for livestock
  - B identifying parasitic infections in livestock
  - C preventing infectious diseases in livestock
  - D diagnosing livestock illnesses at home
- 2 According to the article, what can prevent parasitic infections?
  - A having veterinarians check animals regularly
  - B cleaning areas frequented by livestock
  - C washing the coats of livestock
  - D feeding livestock a healthy diet
- 3 What is used to treat respiratory infections?
 

A antibiotics	C vaccinations
B dietary supplements	D isolation

### Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |                |               |
|----------------|---------------|
| 1 — lice       | 4 — deworming |
| 2 — tick       | 5 — lethargy  |
| 3 — infectious |               |

- A a parasitic arachnid
- B the act of killing or removing worms
- C a state of extreme exhaustion
- D a parasitic insect
- E easily spread

4 Read the sentence pair. Choose where the words best fit the blanks.

1 veterinarian / parasite

A A \_\_\_\_\_ infected several cows.

B The \_\_\_\_\_ gave the horse a shot.

2 respiration / antibiotics

A Check for labored \_\_\_\_\_.

B Use \_\_\_\_\_ to kill the infection.

3 diagnose / monitor

A Handlers should \_\_\_\_\_ their herds for health problems.

B Only a medical professional can \_\_\_\_\_ diseases.

4 vaccination / insecticide

A Use a(n) \_\_\_\_\_ to kill the lice.

B A(n) \_\_\_\_\_ can boost animals' immunity.

5 Listen and read the magazine article again. How can a veterinarian treat your animals if they have parasites?

## Listening

6 Listen to a conversation between a farmer and a veterinarian. Check (✓) the items the veterinarian suggests doing to the sick cattle.

- 1  isolating the infected animals
- 2  taking them to the vet's office
- 3  giving the animals antibiotics
- 4  cleaning the facilities

7 Listen again and complete the conversation.

Farmer: 1 \_\_\_\_\_, doc?  
 Veterinarian: 2 \_\_\_\_\_. When did you first noticed these symptoms?  
 Farmer: Well, last week a few of them 4 \_\_\_\_\_ some trouble breathing.  
 Veterinarian: Was there anything else?  
 Farmer: Yes, they seemed, well, really tired. Basically, they 4 \_\_\_\_\_ to want to move.  
 Veterinarian: Those symptoms, lethargy and difficulty breathing, are 5 \_\_\_\_\_ a respiratory infection.  
 Farmer: So, what can we do? Can you treat them?  
 Veterinarian: Well, fortunately, I think they'll recover if we treat them with 6 \_\_\_\_\_. You need to keep this herd away from your other livestock. We don't want this spreading.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

*When did you notice these symptoms?*

*What can we do?*

*You need to ...*

**Student A:** You are a veterinarian. Interview Student B about:

- cattle's symptoms
- a diagnosis
- treatment

**Student B:** You are a farmer. Answer Student A's questions about your cattle.

## Writing

9 Use the conversation from Task 8 to write a treatment plan. Include: animal symptoms, the diagnosis, and how they will be treated.

### Treatment Plan

Symptoms: \_\_\_\_\_

\_\_\_\_\_

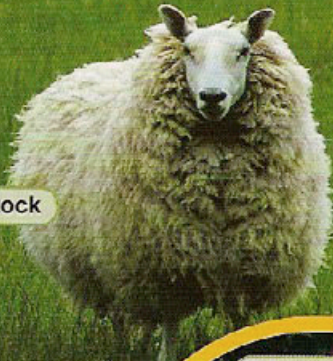
Diagnosis: \_\_\_\_\_

\_\_\_\_\_

Treatment: \_\_\_\_\_

\_\_\_\_\_

livestock



feed grain



food grain



roughage



### Get ready!

1 Before you read the passage, talk about these questions.

- 1 Do farmers in your country grow grain mainly for people or animals?
- 2 Do you think that animals should eat less grain? Why or why not?

### Reading

2 Read the newspaper article. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ Mr. Prinz's cattle eat 12 tons of roughage each year.
- 2 \_\_\_ Most grain is grown for animals to eat.
- 3 \_\_\_ Animal grain consumption affects the export of grain.



Plains Herald - Nebraska's oldest daily newspaper,  
est. 1889

## Who should get the grain?

OMAHA - Carl Prinz wakes up at 4 am daily to feed to his **livestock**. Each year, Prinz's cattle eat 12 tons of **feed grains** and hay. For the most part, this is corn and barley he grows. He also occasionally feeds them **roughage**, which is **inedible** to humans.

Mary Baker lives ten miles down the road from Prinz. She refuses to eat meat. She says that the **feed-to-food** agricultural process is highly **inefficient** and environmentally destructive. It is much better, she argues, to adopt a vegetarian diet.

US farms produce 189 billion tons of grain a year, with most being used for animal feed. Just a portion is grown for human **consumption**, and much of that is exported. This means that the majority of our agricultural land is used to produce meat.

It is a **land use** policy choice that has several negative consequences. Animals produce vast quantities of **manure** that pollute the environment if improperly disposed of. And feeding grain to animals means that fewer **food grains** are exported. On the other hand, the economic and dietary benefits of livestock cannot and should not be ignored.

### Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                    |                   |
|--------------------|-------------------|
| 1 ___ food grain   | 4 ___ consumption |
| 2 ___ manure       | 5 ___ roughage    |
| 3 ___ feed-to-food | 6 ___ inefficient |

- A the act of eating
- B the process of feeding grain to animals that will be used for meat
- C tough plant matter
- D waste from livestock
- E crops that are grown for human food
- F wasteful



**4** Write a word that is similar in meaning to the underlined part.

- Plants that are unable to be eaten by humans can feed animals. i \_ \_ \_ i \_ \_ \_
- Raising animals intended for food or other products is difficult, but profitable. l \_ \_ \_ \_ \_ o \_ \_ \_
- There are numerous concerns over the current state of human transformation of land. \_ a \_ \_ \_ \_ e
- Grain intended for livestock is much more plentiful than food grain. \_ e \_ d g \_ \_ \_ \_

**5** Listen and read the newspaper article again. What are the negative effects of using the majority of farm lands to raise animals?

**Listening**

**6** Listen to a conversation between a reporter and a farmer. Choose the correct answers.

- Why does the farmer grow corn?
  - A to feed pigs
  - B to sell to people
  - C to make corn syrup
  - D to manufacture fuel
- How does the farmer defend growing corn?
  - A The corn is inedible for people to eat.
  - B People can not eat the corn.
  - C People eat the pigs that ate his corn.
  - D Starving people get some of the corn.

**7** Listen again and complete the conversation.

**Reporter:** Mr. Tepper, Is it true that livestock today 1 \_\_\_\_\_ that could be feeding starving people?

**Farmer:** That's just not true.

**Reporter:** Can you elaborate on that?

**Farmer:** Well, take 2 \_\_\_\_\_. We grow corn for local pig producers.

**Reporter:** But couldn't you feed that corn directly to people?

**Farmer:** I wouldn't 3 \_\_\_\_\_.

**Reporter:** You mean to say your 4 \_\_\_\_\_ to humans?

**Farmer:** No, it's just people 5 \_\_\_\_\_ eat it. They tend to prefer sweet corn. And I don't grow that. I 6 \_\_\_\_\_.

**Speaking**

**8** With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*Is it true that livestock eat grain that could feed ...*

*That's just not true.*

*Can you elaborate on that?*

**Student A:** You are reporter.

Ask Student B questions:

- animals and grain
- your crops
- feed-to-food

**Student B:** You are farmer.

Answer student A's questions.

**Writing**

**9** Use the conversation from Task 8 and the newspaper article to write an article about animals, grain, and food. Include the types of crops animals eat and the feed-to-food process.

**Animals, grain and food**

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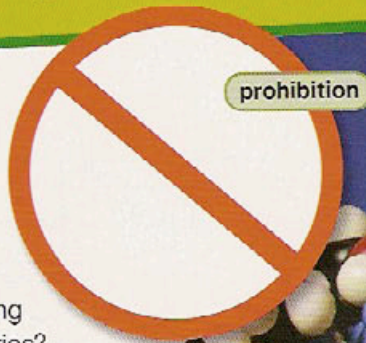
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# 4 Bioengineering

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How can bioengineering improve animal industries?
- 2 What are some concerns about bioengineering?



genes

biotechnology

## Animal Bioengineering

National Association of Bioengineers (NAB) Westphalia University

### Friday March 18

4:30 pm Registration • Parker Hall lobby

5:30 pm Keynote Address

Chapman Ballroom. Keynote speaker Dr. Mary Gilbertson will describe her research in **genetic engineering**.

### Saturday March 19

8:30 am – 12:00 pm Presentations, Parker Hall

Group A: Room 119  
**Transgenic** organisms. Dr. Meyers White talks about current research and newly developed transgenic organisms and their benefits.

Group B: Room 106  
**Biotechnology** applications in agriculture. Dr. Francis Gray discusses three promising new directions for biotechnology in agriculture.

2:00 pm – 4:00 pm Poster Session  
Rorschach Exhibition Area

### Sunday March 18

8:30 am – 12:00 pm Presentations, Parker Hall

Group A: Room 119  
**Cloning** bacteria and other microorganisms: engineering applications. Dr. Ursula Prsybysic and Dr. William Shawcross present on the latest engineering applications.

Group B: Room 106  
**Genes**, **gene expression**, and **gene enhancement**: new techniques for producing favorable outcomes. Dr. Samel Perez discusses a set of techniques developed by Camber University.

2:00 pm – 3:00 pm Closing Remarks  
Chapman Ballroom. Dr Whitaker will discuss **societal concerns** about bioengineering. How might we face greater **regulation** of our research and even **prohibition**?



cloning

## Reading

2 Read the conference schedule. Then, mark the following statements as true (T) or false (F).

- 1  The keynote speaker will address biotechnology in agriculture.
- 2  On Sunday, group B attends a presentation on cloning bacteria.
- 3  The closing remarks will discuss concerns with bioengineering.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                       |  |
|---------------------------------------|--|
| 1 <input type="checkbox"/> cloning    | 4 <input type="checkbox"/> prohibition         |
| 2 <input type="checkbox"/> gene       | 5 <input type="checkbox"/> expression          |
| 3 <input type="checkbox"/> transgenic | 6 <input type="checkbox"/> genetic engineering |

- A the appearance of a trait
- B making a copy of an organism
- C a segment of DNA
- D banning something
- E altering genetic material
- F having artificially introduced genetic material

4 Read the sentence pair. Choose where the words best fit the blanks.

1 **gene enhancement / regulation**

- A \_\_\_\_\_ can create stronger animals.
- B There is strict \_\_\_\_\_ of genetic research.

2 **biotechnology / societal concerns**

- A There are many \_\_\_\_\_ about cloning.
- B Robert wants to work in the \_\_\_\_\_ field.

- 5 🎧 Listen and read the conference schedule again. What is Dr. Meyers White going to talk about?

## Listening

- 6 🎧 Listen to a conversation between an interviewer and a speaker. Choose the correct answers.

- What is the interview mostly about?
  - the benefits of bioengineering in agriculture
  - the government's support of biotechnology
  - the health risks of bioengineered foods
  - the impact of consumer's concerns
- What does the speaker suggest as a solution?
  - opposing government regulations
  - communicating better with consumers
  - publishing the latest scientific discoveries
  - testing transgenic products more often

- 7 🎧 Listen again and complete the conversation.

**Interviewer:** So, what are the challenges of agricultural bioengineering?

**Speaker:** Well consumers fear that genetically modified 1 \_\_\_\_\_

**Interviewer:** Shouldn't people be worried about eating genetically modified food?

**Speaker:** Not at all. 2 \_\_\_\_\_ genetically modified food is safe to eat. We just need to do a better job of communicating this with the public.

**Interviewer:** What do you think will happen if you don't 3 \_\_\_\_\_ about genetically modified foods?

**Speaker:** 4 \_\_\_\_\_ consumers have been very vocal. Governments there have responded by 5 \_\_\_\_\_ of agriculture. In some cases, they have responded by prohibiting all genetically modified products. This is not what we want to happen.

**Interviewer:** 6 \_\_\_\_\_

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*What are the challenges of bioengineering ...*  
*Consumers fear that ...*  
*Some governments have ...*

**Student A:** You are a reporter. Interview student B. Talk about:

- challenges
- consumer opinion
- government response

**Student B:** You are a speaker at a conference, answer student A's questions.

## Writing

- 9 Use the conversation from Task 8 to write notes about the challenges of bioengineering. Include the challenges and consequences.

### Bioengineering

Challenges: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Consequences: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Get ready!

### 1 Before you read the passage, talk about these questions.

- 1 How can conventional tilling damage soil?
- 2 What are some types of cropping systems? What are their strengths and weaknesses?

## Reading

### 2 Read the publication on cropping systems. Then, choose the correct answers.

- 1 What is the passage mostly about?
  - A the price of conventional tillage
  - B the environmental effects of fertilizer
  - C the diversification of crop systems
  - D the market price for various crops
- 2 Which is NOT advice given in the passage?
  - A research the market for crops
  - B select a method of crop diversification
  - C contact the agricultural extension office
  - D use herbicides after diversification
- 3 What is the drawback to a fallow field?
  - A It results in loss available land for crops.
  - B It has herbicide residues that harm crops.
  - C It becomes less suitable for polyculture.
  - D It must be fertilized before planting again.

## Diversification

### Overview -

Farmers benefit from understanding diversification. This section outlines benefits of diversifying and some ways to do it.

**Why diversify?** - Diversifying a crop system offers farmers economic and environmental benefits.

Many farmers use **conventional tillage** because they think it is cheaper. That is not always true in the long term.

**Conservation tillage** methods that rely on diversification can be more expensive at first. However, they protect the long-term health of the soil.

There are environmental benefits as well. Diversified fields are healthier. Farmers often find they use fewer fertilizers and **burn-down herbicides** after they diversify.

**How to diversify** - We suggest you start by contacting your local agricultural extension office. They can help you make informed decisions about which crops are most suitable.

Next, you need to research the market for those crops. Determine which crops are economical.

Finally, consider if you want to use **crop rotation** or **polyculture**.

With the former, farmers often leave a section of their fields **fallow**. If they also use **zero tillage** methods, they will leave **crop residues** in place. Unfortunately, fallow fields mean less available cropland at a given time. On the other hand, many popular crops, such as **winter wheat** and **spring wheat**, are not suitable for polyculture. So making this decision requires careful thought.

## Vocabulary

### 3 Match the words (1-6) with the definitions (A-F).

- |                  |                          |
|------------------|--------------------------|
| 1 — fallow       | 4 — conventional tillage |
| 2 — zero tillage | 5 — crop residue         |
| 3 — polyculture  | 6 — spring wheat         |

- A parts of plants left in the field after harvest
- B growing different plants in the same field
- C having no crops
- D the standard cropping system
- E a crop that is harvested in summer or fall
- F a technique for growing crops without tilling

**4** Write a word that is similar in meaning to the underlined part.

- 1 A practice that prevents water and soil loss protects fields.  
\_ o \_ \_ \_ \_ \_ t \_ \_ n t \_ \_ \_ \_ e
- 2 Wheat that is planted in the fall is harvested in the spring.  
w \_ \_ \_ \_ \_ w \_ \_ \_ \_ \_
- 3 Use the weedkiller before planting.  
\_ \_ \_ n-d \_ \_ \_ e \_ \_ \_ \_ \_ e
- 4 The process of growing different crops one after the other on a field improves soil quality. c \_ \_ \_ r \_ \_ \_ \_ \_ n
- 5 There are several methods of growing crops.  
\_ \_ \_ p s \_ s \_ \_ \_ s
- 6 Increase the variety of your crops to reduce fertilizer use.  
d \_ \_ \_ r \_ \_ \_ \_

**5** Listen to the publication on cropping systems again. What is a negative effect of crop rotation?

**Listening**

**6** Listen to a conversation between a farmer and an assistant. Mark the following statements as true (T) or false (F).

- 1  Rotating crops will require less fertilizer.
- 2  They plan to plant crops in all five fields.
- 3  Planting peanuts will deplete the soil.

**7** Listen again and complete the conversation.

**Farmer:** We're going to 1 \_\_\_\_\_ our crops in the spring.

**Assistant:** Why do you want to do that?

**Farmer:** Well, it'll allow us to 2 \_\_\_\_\_ more and to use less 3 \_\_\_\_\_.

**Assistant:** So, 4 \_\_\_\_\_ do we do this?

**Farmer:** First, we 5 \_\_\_\_\_ five separate sections. One each for wheat, corn, soybeans, and peanuts.

**Assistant:** Peanuts?

**Farmer:** Wheat takes 6 \_\_\_\_\_ the soil. Once we plant a crop of peanuts in that field, the nitrates will be replenished. So we can grow wheat there again.

**Assistant:** Now you said five sections, but there are only four crops.

**Farmer:** That's because the fifth section will be left fallow. 7 \_\_\_\_\_.

**Assistant:** Let me guess, that helps the soil replenish too.

**Speaking**

**8** With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*We're going to start ... in the spring.*

*Wheat depletes the soil.*

*The fifth section will be fallow.*

**Student A:** You are a farmer. Talk to Student B about:

- crop rotation
- wheat and peanuts
- fallow fields

**Student B:** You are a farmer's assistant. Talk to Student A about next year's cropping system.

**Writing**

**9** Use the conversation from Task 8 and the publication and dialogue to write a schedule for next year's cropping system. Include: the type of system, crops, and field.

**Crops schedule**

System: \_\_\_\_\_

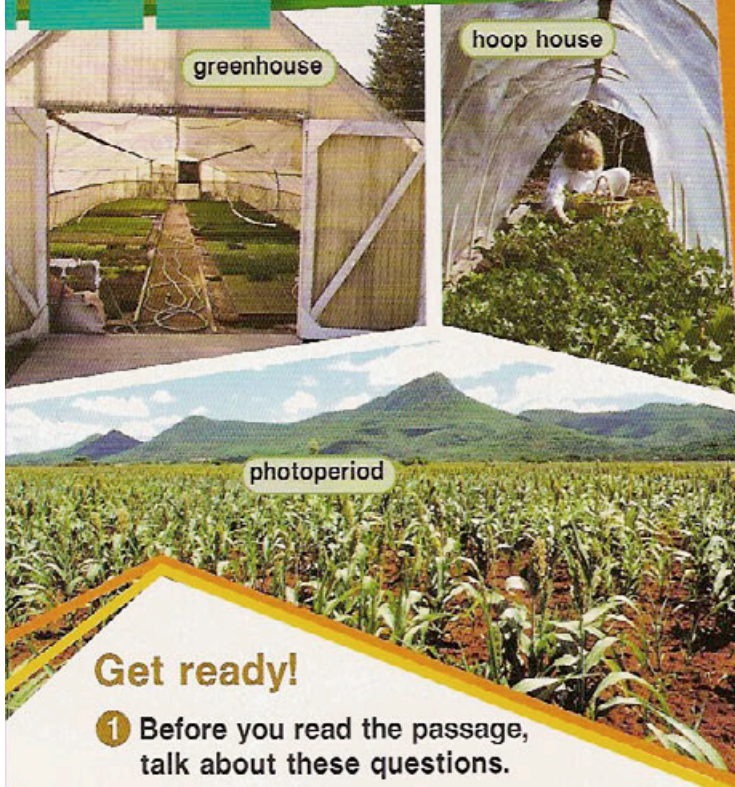
\_\_\_\_\_

Crops: \_\_\_\_\_

\_\_\_\_\_

Fields: \_\_\_\_\_

\_\_\_\_\_



### Get ready!

1 Before you read the passage, talk about these questions.

- 1 How long are the growing seasons in your country?
- 2 How can farmers extend growing seasons?

### Reading

2 Read the magazine article. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ The author believes site selection is the most important aspect of planting crops.
- 2 \_\_\_ Areas with short photoperiods have colder temperatures.
- 3 \_\_\_ Hoop houses increase air temperature.

### Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                        |                          |
|------------------------|--------------------------|
| 1 ___ base temperature | 4 ___ site selection     |
| 2 ___ last frost date  | 5 ___ mean temperature   |
| 3 ___ greenhouse       | 6 ___ growing degree day |

- A the act of choosing a place to plant crops  
 B the last day during which plants may freeze  
 C the minimum temperature at which plants may grow  
 D a structure that retains solar energy  
 E the average temperature in an area  
 F a measure of how much heat a plant will receive in a day

Aggie Trends Magazine • Summer Edition

## The Challenges of Growing Seasons

One of the most critical concerns for any agriculturist is the changing of seasons. Specifically, the decline in temperature, often sharp and precipitous, that occurs as each fall turns to winter. Plants have varying degrees of tolerance for cold, so different strategies for coping with the cold may be used with each type of crop. Next to the characteristics of the plants themselves, the most important issue to consider is **site selection**.

Each agricultural site has its own unique characteristics. Different sites have differing growing seasons based on **elevation, growing degree days, and last frost dates**. For example, one site may have very high growing degree days, while in another area, the **mean temperature** may barely rise over the **base temperature**. Agriculturists can protect their crops from the cold by selecting sites with long **photoperiods** and higher mean temperatures.

Of course, selecting a new site isn't always an option. After all, humans have cultivated crops in nearly every region on Earth. Less favorable sites may require special care. For example, there are several methods of **freeze protection** that an agriculturist can use. **Greenhouses** and **hoop houses** can be used to absorb and trap whatever heat the region does receive. Additionally, **heaters** can be used to raise the temperature of the air around tree crops.

4 Write a word that is similar in meaning to the underlined part.

- 1 Long amounts of time that plants are exposed to light produce strong plants.

p \_ \_ \_ \_ p \_ \_ \_ \_ s

- 2 The structure with a curved roof that traps heat allows farmers to grow in cold seasons.

\_ o \_ \_ \_ o \_ \_ \_

- 3 Janet's farm is at a higher height of an area relative to the ocean level.

\_ l \_ \_ \_ \_ \_ n

- 4 Preventing crops from freezing saved the harvest last winter.

\_ r e \_ \_ \_ p \_ \_ \_ \_ t \_ \_ \_

- 5 Norman wants to start a farm in an area with a long period during which plants grow.

g \_ \_ \_ \_ \_ g \_ e \_ \_ \_ \_

- 6 Get a device that burns fuel to create heat to keep the plants from freezing.

\_ \_ a \_ \_ \_

- 5 🎧 Listen and read the magazine article again. What do heaters do?

## Listening

- 6 🎧 Listen to a conversation between two farmers. Choose the correct answers.

- What does the man want to do?
  - A reduce fuel costs
  - B extend the growing season
  - C construct a second hoop house
  - D purchase less expensive heaters
- When does the man suggest they use heaters?
  - A in the fall
  - B in the winter
  - C in the spring
  - D in the summer

- 7 🎧 Listen again and complete the conversation.

- Farmer 1:** I want to try to extend our growing season.
- Farmer 2:** How would we do that?
- Farmer 1:** Well, we could plant our tomatoes, radishes, and spinach a month or two early if we used a hoop house.
- Farmer 2:** Perhaps. It would be nice to plant early.
- Farmer 1:** I'm trying to figure how we could extend our season into the late fall.
- Farmer 2:** Well, what about heaters?
- Farmer 1:** Oh, I see. When it starts to 1 \_\_\_\_\_ in the fall, we could use heaters at night.
- Farmer 2:** Exactly. We could probably have 2 \_\_\_\_\_ in a year.
- Farmer 1:** Hmm ... We could plant early, before the 3 \_\_\_\_\_ . Then we could plant again in the late summer after harvest.
- Farmer 2:** Right. The only problem is size. The hoop house can't hold that many plants.
- Farmer 1:** That's a 4 \_\_\_\_\_ .
- Farmer 2:** Let's 5 \_\_\_\_\_ the spinach and 6 \_\_\_\_\_ .

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I want to try to ...*

*It would be nice to plant early.*

*We could use the heaters at night.*

**Student A:** You are a farmer. Talk to Student B about:

- longer growing seasons
- hoop houses
- heaters

**Student B:** You are a farmer. Talk to Student A about growing seasons.

## Writing

- 9 Use the conversation from Task 8 to write a letter to a farm owner. Include: how to extend the growing season, equipment needed, and the benefits.

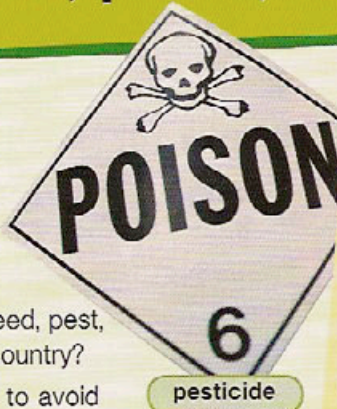
Dear \_\_\_\_\_

Regards \_\_\_\_\_

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 Name a damaging weed, pest, and disease in your country?
- 2 What are some ways to avoid crop damage from weeds, pests, and disease?



pesticide



biological control

## Reading

2 Read the page from the farmer's guide. Then, mark the following statements as true (T) or false (F).

- 1  The guide advises against applying herbicides directly to fields.
- 2  Biological controls pose fewer safety risks than chemical controls.
- 3  Fungal diseases are easier to prevent than bacterial diseases.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                      |  |
|--------------------------------------|--|
| 1 <input type="checkbox"/> sanitize  | 4 <input type="checkbox"/> pathogen        |
| 2 <input type="checkbox"/> fungal    | 5 <input type="checkbox"/> weed            |
| 3 <input type="checkbox"/> bacterial | 6 <input type="checkbox"/> pest management |

- A preventing organisms from harming crops  
 B being or related to fungus  
 C an unwanted wild plant  
 D being or related to bacteria  
 E to kill bacteria  
 F an organism that causes disease

## Simple's Guide to Farming

Three of the greatest threats to farmers are weeds, pests, and diseases. Nevertheless, an informed farmer can develop effective strategies for dealing with these problems.

**Weeds,  
Pests,  
and  
Disease**

### Weeds

Weeds grow everywhere, but they seem to prefer farmer's fields. Use a **weed map** to identify problem areas. Then apply **herbicides** as needed for **suppression**. If **mulching** weeds, it is not advised to apply mulch directly to your fields.

### Pests

Pests, primarily insects but also small mammals and birds, destroy countless crops every year. This is why farmers need a sound **pest management** strategy. These can be chemical or biological. Chemical controls refer to **pesticides**. They tend to be very effective but carry safety risks. Less risky, though sometimes less effective, are **biological controls**. An example is the predatory ground beetle, which feeds on crop-eating ground worms.

### Disease

Disease arrives from one of three types of **pathogens**: **bacterial**, **viral**, and **fungal**. The first two are rather difficult to fight. The best defense is maintaining good soil and growing conditions to keep plants strong. Prevent fungal diseases with **fungicides**. Finally, simply **sanitizing** equipment can sometimes prevent the spread of **blight**.

4 Read the sentence pair. Choose where the words best fit the blanks.

1 **weed maps / biological controls**

- A \_\_\_\_\_ show where to apply herbicides.  
 B \_\_\_\_\_ give farmers an alternative to pesticides.

2 **herbicide / blight**

- A The \_\_\_\_\_ destroyed the entire crop.  
 B Most weeds can be controlled with \_\_\_\_\_.

3 **fungicide / suppression**

- A Wendy used a \_\_\_\_\_ to protect her crops.  
 B \_\_\_\_\_ of pests is a concern for farmers.

4 **mulching / pesticide**

- A \_\_\_\_\_ plant waste can enrich soil.  
 B \_\_\_\_\_ effectively controls insects.





- 5 Listen and read the page from the farmer's guide again. What does it suggest is the best defence against diseases?

## Listening

- 6 Listen to a conversation between two farmers. Choose the correct answers.

- 1 What did the man use on his crop?  
A Biological controls  
B Insects  
C Chemical pesticides  
D Herbicides
- 2 Which biological control will the man use?  
A other plants      C wasps  
B borers              D bollworms

- 7 Listen again and complete the conversation.

Farmer 1: I just discovered that I have corn borers in my cornfields. I have to do something before they ruin my crop.

Farmer 2: I had a similar problem last year.

Farmer 1: What did you 1 \_\_\_\_\_ ?

Farmer 2: I 2 \_\_\_\_\_ . I sprayed my fields with pesticides.

Farmer 1: I'd prefer to try a biological control rather than 3 \_\_\_\_\_ .

Farmer 2: What do you mean, use other insects or something like that?

Farmer 1: Exactly. I 4 \_\_\_\_\_ wasps. Apparently, they eat the borers.

Farmer 2: How can insects be better than chemical pesticides?

Farmer 1: 5 \_\_\_\_\_ that shows they're very effective. And I wouldn't have to worry about chemical side-effects.

Farmer 1: Hmm. 6 \_\_\_\_\_ if it works. I'm starting to have a problem with bollworms.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I just discovered that I have ... in my fields.  
I sprayed my fields with pesticides.  
How can insects be better than pesticides?*

**Student A:** Student A: You are a farmer. Talk to Student B about:

- a problem with crops
- chemical controls
- biological controls

**Student B:** You are a farmer. Talk to Student A about controlling crop problems.

## Writing

- 9 Use the conversation from Task 8 and the farmer's guide to write a farmer's memo to staff about a crop problem. Include the type of problem and the controls to be used.

# MEMO

To: All staff

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---

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stunted



wilted

browning

stippled

## University of Jacksonville

### Extension Office: Crop and Field Problems

#### Who we are

We are **agricultural advisors** with extensive experience in diagnosing crop and field problems. Our services are available to the general public.

*What we can do for you* - We can provide technical assistance in a variety of ways ranging from advice on crop selection to on-site and laboratory diagnosis.

#### On site diagnosis

Give us a call if your plants are **stippled**, **stunted**, **wilting**, or **browning**. We attempt to establish **symptom patterns** for small groups of plants. For larger problems, we attempt to identify the **field pattern**. Once this information has been gathered, we can usually provide a definitive diagnosis using our **symptomology keys**.

#### Laboratory diagnosis

When a symptomology key does not provide a definitive diagnosis, we usually turn to lab analyses. These tests can identify if a **symptom** is caused by **biotic** or **abiotic** factors.

#### How to contact us

If you'd like to get our advice, or set up an appointment for a field or crop diagnosis, please call 888-555-0505 or send an email to [diagnosis@extension.ur.edu](mailto:diagnosis@extension.ur.edu).

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### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are some signs that crops are failing?
- 2 What are some ways to save failing crops?

### Reading

2 Read the webpage from an agricultural extension office. Then, choose the correct answers.

- 1 What is the purpose of the webpage?
  - A to explain a diagnostic technique
  - B to offer advice on diagnosing problems
  - C to give information about services
  - D to list common causes of crop problems
- 2 Who does the office provide assistance for?
  - A college students
  - B the general public
  - C laboratory scientists
  - D agriculture professors
- 3 Which service is NOT provided?
  - A advice on growing crops
  - B on-site diagnosis of problems
  - C laboratory analysis of samples
  - D preparation of new fields

### Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |                     |                        |
|---------------------|------------------------|
| 1 ___ abiotic       | 4 ___ symptomology key |
| 2 ___ brown         | 5 ___ symptom          |
| 3 ___ field pattern |                        |

- A to change color
- B non-living
- C a sign that indicates disease
- D a tool used to diagnose diseases
- E a sign of disease that occurs throughout an area



4 Fill in the blanks with the correct words and phrases from the word bank.

**Word BANK**

biotic    stunted    wilt  
stippled    symptom    pattern

- \_\_\_\_\_ leaves are covered with spots.
- A \_\_\_\_\_ plant will be much smaller than others.
- Many crop problems have \_\_\_\_\_ causes.
- The crops started to \_\_\_\_\_ in the heat.
- Researchers are analyzing the \_\_\_\_\_.

5 Listen and read the webpage from an agricultural extension office again. What happens when a symptomology key doesn't provide a definite diagnosis?

### Listening

6 Listen to a conversation between an agricultural advisor and a farmer. Check (✓) the symptoms of the farmer's corn.

- wilting
- drying out
- browning tops
- blackened roots
- stunted growth

7 Listen again and complete the conversation.

**Advisor:** Mr. Fussel, what's the problem with your corn?  
**Farmer:** Well, 1 \_\_\_\_\_ even though I gave them plenty of water and fertilizer.  
**Advisor:** 2 \_\_\_\_\_ first noticed the problem.  
**Farmer:** That would have been 3 \_\_\_\_\_. First, I noticed the tops of some of the plants were browning.  
**Advisor:** What happened next? 4 \_\_\_\_\_?  
**Farmer:** Not that. Next, they 5 \_\_\_\_\_ slightly. That's when I 6 \_\_\_\_\_ water.

### Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*What's the problem with your corn?*

*I noticed the tops of some of the plants were ...*

*And what happened next?*

**Student A:** You are an agricultural advisor. Ask Student B about:

- crop problems
- symptoms
- changes

**Student B:** You are a farmer. Answer Student A's questions.

### Writing

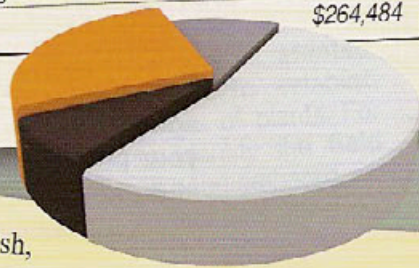
9 Use the conversation from Task 8 to write an email to an agricultural advisor. Include: your problem, crop symptoms, and changes you've seen.

To: Farmadvisor@farmsite.com  
 From: THernandez@Hfarm.com

To \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Sincerely \_\_\_\_\_

## Financial Summary

<b>Revenue</b>	
Farm cash receipts	\$355,960
Investment income	\$12,435
Miscellaneous income	-
<b>Gross farm revenue</b>	<b>\$368,395</b>
<b>Expenses</b>	
<b>Total Production expenses</b>	<b>(\$168,745)</b>
Wages	(\$43,992)
<b>Feed costs</b>	<b>(\$22,081)</b>
Fuel costs	(\$79,554)
Other materials	(\$23,118)
<b>Fixed cash expenses</b>	<b>(\$34,248)</b>
Depreciation	(\$20,889)
Insurance	(\$13,359)
<b>Interest payments on loan</b>	<b>(\$70,038)</b>
<b>Non-cash expenses</b>	<b>(\$11,578)</b>
<b>Gross farm expenses</b>	<b>(\$284,609)</b>
<b>Net farm income</b>	<b>\$83,786</b>
Total farm assets	\$587,995
Total non-farm assets	\$125,877
Total outstanding debt	\$467,388
<b>Net worth</b>	<b>\$264,484</b>



Dear Mr. Walsh,

As per your request, I have prepared a summary of your financial position. The attached summary is based on the information you provided to Mason and Howard, LLC. It includes a summary of your revenues minus expenses. We have also calculated your net worth. The information contained in this summary will be used to prepare your federal and state income taxes. Please review to ensure that it accurately matches your records.

Should you have any questions, feel free to contact me at any time.

Sincerely,

Glenda Mason  
Senior Accountant  
Mason and Howard, LLC

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are the main costs and expenses of farming?
- 2 Do you think it is wiser to manage your own finances or to get professional help?

## Reading

2 Read the letter from an accountant to a farmer. Then, mark the following statements as true (T) or false (F).

- 1  The farmer earned \$168,745 last year.
- 2  The farmer has over \$450,000 in debt.
- 3  The farmer has a negative net worth.

## Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |  |                                   |
|--|-----------------------------------|
| 1 <input type="checkbox"/> interest payments         | 4 <input type="checkbox"/> income |
| 2 <input type="checkbox"/> gross farm revenue        | 5 <input type="checkbox"/> loan   |
| 3 <input type="checkbox"/> total production expenses |                                   |

- A the total of all costs
- B the sum of all money from sales
- C money that a person earns
- D money that is paid to a lender
- E money that is borrowed

4 Write a word that is similar in meaning to the underlined part.

- 1 Record all cash income from sales of farm produce and government subsidies.  
f \_ \_ \_ c \_ \_ \_ r \_ c \_ \_ \_ s
- 2 Avoid taking on money owed to a lender.  
\_ b \_
- 3 When equipment loses value, it is called a cost not due to spending.  
n \_ n - \_ \_ \_ \_ \_ x \_ \_ \_ \_ e
- 4 The expenses of feeding livestock went up.  
\_ e \_ \_ c \_ \_ \_ \_
- 5 What are your expenses that don't change?  
\_ \_ x \_ \_ \_ \_ \_ h \_ x \_ \_ \_ \_ s
- 6 Expenses increased, so gross revenue minus expenses decreased.  
n \_ \_ \_ f \_ \_ \_ \_ n \_ \_ \_ o

- 5 Listen and read the letter from an accountant to a farmer again. What will the information in the summary be used for?

## Listening

- 6 Listen to a conversation between a farmer and an accountant. Choose the correct answers.

- 1 Why does the farmer call the accountant?
- A to address an error
  - B to request a summary
  - C to make an appointment
  - D to ask for assistance
- 2 What will the farmer do tomorrow?
- A create a financial summary
  - B correct the expenses section
  - C recalculate the wages information
  - D deliver information to the accountant

- 7 Listen again and complete the conversation.

**Accountant (W):** Hello, Glenda Mason speaking.

**Farmer (M):** Hi, Glenda, this is Peter Walsh. I need to talk to you about the financial summary you just sent me.

**Accountant:** Sure, I'd be glad to go over it with you.

**Farmer:** Okay, well some of the figures in the summary don't match my records.

**Accountant:** Where have you found discrepancies?

**Farmer:** Well, 1 \_\_\_\_\_ with the numbers in the expenses section.

**Accountant:** Which ones 2 \_\_\_\_\_ to you?

**Farmer:** Well, you 3 \_\_\_\_\_ \$43,992 for wages. And I have \$43,292.

**Accountant:** Okay, I've 4 \_\_\_\_\_. I'll need to review the original documents. 5 \_\_\_\_\_?

**Farmer:** Unfortunately, no.

**Accountant:** 6 \_\_\_\_\_ did you find?

**Farmer:** Your insurance figures are too low. I forgot to 7 \_\_\_\_\_ some documentation.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Sure, I'd be glad to go over it with you.*

*Where have you found discrepancies?*

*Your insurance figures are too low.*

**Student A:** You are a farmer. Talk to Student B about:

- your financial summary
- expense figures
- insurance figures

**Student B:** You are a farmer's accountant. Talk to Student A about a financial summary.

## Writing

- 9 Use the conversation from Task 8 and the financial summary to write a farmer's financial summary. Include: income, expenses, and debt.

### Financial Summary

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Get ready!

1 Before you read the passage, talk about these questions.

- 1 How does international trade affect what farmers plant?
- 2 Does your country import or export more agricultural products?

Canada

- Agricultural companies looking to start selling in global markets may look to Canada.

Canada is one of the leading exporters of agricultural goods such as wheat and other grains. But it also receives significant yearly imports of organic fruits and vegetables. With one of the world's healthiest economies, Canada is a major player in the **World Trade Organization** (WTO). It is an advocate of liberalized trade. Canada charges very minimal **tariffs** on imported goods. The country also applies little or no trade restriction **quotas**. One setback to sending goods to Canada is the requirement of dual language labeling, in both English and French.

Chile

- The Republic of Chile thrives as one of South America's strongest economies based largely on **international trade**. While Chile remains **import dependent** with respect to energy related goods, it is **export dependent** overall. Recent increases in the price of copper, Chile's leading **export**, have fueled the country's financial growth. Since 2006, Chile has enjoyed a positive **balance of trade**. Despite its **trade surpluses** the country still imports large amounts of agricultural goods such as soybeans and corn. Companies importing to Chile will find a six percent tariff on all imported goods. All products imported to Chile must have labels printed in Spanish.



Reading

2 Read the trade profile summaries. Then, mark the following statements as true (T) or false (F).

- 1  High tariffs are a setback to exporting to Canada.
- 2  Chile exports more than it imports.
- 3  Both nations require labels in two languages.

Vocabulary

3 Fill in the blanks with the correct words and phrases from the word bank.

Word BANK

export trade surplus  
quota import dependent

- 1 A(n) \_\_\_\_\_ country purchases more than it sells internationally.
- 2 Wheat is a major \_\_\_\_\_ to other countries.
- 3 The government may impose a new \_\_\_\_\_.
- 4 Fewer imports led to a(n) \_\_\_\_\_.

4 Write a word that is similar in meaning to the underlined part.

- 1 Countries interact through the exchange of products across borders.  
i n \_\_\_\_\_ a \_ \_ r \_ \_ \_
- 2 The organization that oversees trade among nations is considering some new regulations.  
\_ \_ \_ \_ \_
- 3 Increases in exports alter the difference between the value of exports and imports.  
b \_ \_ \_ \_ e \_ \_ t \_ \_ \_ \_
- 4 High fees on imported or exported goods protect domestic farmers. \_ a \_ \_ \_ \_ s
- 5 Many countries depend on products brought in from other countries. \_ m p \_ \_ \_ \_
- 6 Countries that have surpluses are often reliant on selling products internationally.  
\_ x \_ \_ \_ \_ d \_ p \_ \_ \_ \_



# 11 The futures market

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 Are investments in futures markets popular in your country?
- 2 How do changes in the futures market impact farmers?

## Falling Price of Wheat Futures

Index	Value	Change	Open	High	Low	Time
S&G	752.50	-3.00	755.50	758.00	751.50	11:34 a.m.
FRE 100	2,737.00	-43.00	2,780.00	2,788.00	2,737.00	11:35 a.m.

At week's end, **values** in the March wheat **futures market** appear to be **falling**. Prices fluctuated greatly throughout the week. But, Friday's values closed twelve to fifteen cents lower than when the market **opened** on Monday. This **change** is interesting news for those wishing to sell the **commodity** in the coming season.

This new **high** may be better for those who have wheat ready to sell.

But a **low** could set off a run of wheat sales in coming weeks. Last year was marked by surplus wheat production across the board, and most major wheat producers began the year with a heavy **carryover** of last year's **ending stocks**. With **beginning stock** running well above normal, the industry has suffered from unusually high **stocks-to-use ratios**. With the sudden fall of the wheat prices in every **index**, we may

see a surge in wheat purchases. This could be good news for growers of wheat.

Expected changes in weather patterns, however, may begin to affect this trend. The predicted two inches of diminished rainfall could significantly affect the year's crop yield. The first signs of such a dry season will almost certainly lead to an increase in wheat futures purchases.

## Reading

2 Read the article from a financial newspaper. Then, choose the correct answers.

- 1 What is the article mainly about?  
A the effects of price changes  
B the causes of crop damage  
C the best markets to invest in  
D the expected carryover for the year
- 2 Why is the stocks-to-use ratio high?  
A Ending stocks were low.  
B Beginning stocks were high.  
C Wheat purchases increased.  
D Carryover was lower than usual.
- 3 What can you infer about futures purchases?  
A They limit crop production.  
B They create low carryovers.  
C They decrease when prices drop.  
D They are impacted by weather patterns.



## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |              |                       |
|--------------|-----------------------|
| 1 ___ value  | 4 ___ high            |
| 2 ___ change | 5 ___ low             |
| 3 ___ open   | 6 ___ beginning stock |

- A the amount at the beginning of a year  
B a smaller amount or value  
C a larger amount or value  
D to begin a market for the day  
E monetary worth  
F difference occurring over time



**4** Write a word that is similar in meaning to the underlined part.

- 1 What is today's figure that describes average value?  
\_ n \_ \_ \_
- 2 This year's amount of stocks remaining has been unusually high. e \_ \_ \_ \_ g s \_ \_ \_ \_
- 3 Anything of value can be considered a thing that is bought, sold, or traded. c \_ \_ \_ o \_ \_ \_ \_
- 4 Last year, the amount of the previous year's stocks remaining was unusually low. c \_ \_ \_ y \_ \_ \_ \_
- 5 Carric made a lot of money on the exchange where contracts are bought and sold.  
f \_ \_ \_ \_ c \_ \_ \_ \_ r k \_ \_
- 6 Mark was very impressed with the carryover stock divided by total use. \_ \_ o c \_ - t \_ - \_ \_ \_ r \_ \_ \_ o

**5** Listen and read the article from a financial newspaper again. How will dryer weather affect futures purchases?

### Listening

**6** Listen to a conversation between a farmer and an investment analyst. Mark the following statements as true (T) or false (F).

- 1  Wheat prices have increased.
- 2  The man had carryover last year.
- 3  The woman suggests planting less wheat.

**7** Listen again and complete the conversation.

**Farmer:** I heard the March wheat prices are falling.  
**Analyst:** You heard correctly, fifteen cents in one week.  
**Farmer:** That can't be good for us.  
**Analyst:** It might not be so bad, actually.  
**Farmer:** What do you mean? Lower prices means I make less money. I mean, I already planted a thousand acres of wheat. I was going to plant three thousand more. But I don't know if it's worth it now.  
**Analyst:** I'd plant it 1 \_\_\_\_\_ you.  
**Farmer:** With all of last year's surplus, I don't want to 2 \_\_\_\_\_. But if you think it's a good idea, I 3 \_\_\_\_\_ grow it.  
**Analyst:** You did have a 4 \_\_\_\_\_ last year. But with prices so far below the index, futures will sell. Trust me.  
**Farmer:** Okay. 5 \_\_\_\_\_ the three thousand acres.  
**Analyst:** 6 \_\_\_\_\_. I think this trend is going to last awhile.

### Speaking

**8** With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*I heard ... prices are ...  
 With prices so low, futures will sell.  
 I think this trend is going to last a while.*

**Student A:** Student A: You are an investment analyst. Talk to Student B about:

- wheat prices
- planting crops
- confidence

**Student B:** You are a farmer. Talk to Student A about prices and planting crops.

### Writing

**9** Use the conversation from Task 8 and the article to write a letter to a farmer. Include: changes to crop prices, how it will affect the futures market, and your recommendations for planting crops.

Dear \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Regards

\_\_\_\_\_

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What sustainable farming practices are common in your country?
- 2 What challenges does sustainable farming present?

## Reading

2 Read the flyer for a discussion on sustainable farming. Then, mark the following statements as true (T) or false (F).

- 1  The focus of the event is farming basics.
- 2  Mr. Arnold will receive an award at the event.
- 3  JFCA speakers will address soil amendments.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |  |   |
|--|---|
| 1 <input type="checkbox"/> sustainable   | 4 <input type="checkbox"/> off-farm impact        |
| 2 <input type="checkbox"/> biodiversity  | 5 <input type="checkbox"/> systems perspective    |
| 3 <input type="checkbox"/> intercropping | 6 <input type="checkbox"/> non-renewable resource |

- A able to last a long time  
 B the effect of farm activities on other areas  
 C something that exists in a limited amount  
 D a broad view of the effects of agriculture  
 E the existence of a variety of organisms  
 F planting multiple crops in the same field

non-renewable resource

compost

intercropping

monoculture

## FARMING IN YOUR BACKYARD



Join the Johnson County Farmer's Association (JCFA) for a discussion on **sustainable** farming. Several experts will give lectures and answer questions. Come and enjoy free food from local farms and learn about agriculture in your community.

When: April 10th at 6:00 PM  
 Where: Johnson County Community Center  
 Admission: Free

- Fred Arnold, author of *Modern Farming*, will talk about reducing dependence on **non-renewable resources** like petroleum. The talk will cover the importance of expanding the whole community's **systems perspective**. Mr. Arnold won the JCFA's Excellence Award for improving local **economic sustainability** through alternative energy sources.
- Lisa Perry, Professor of Agriculture, will discuss methods for successful farming. Her lecture will focus on ways to make crops stronger and more reliable. Topics include the benefits of **intercropping** and the advantages of **biodiversity** over **monoculture**. Ms. Perry teaches a class on farming basics at Johnson University.

Members of the JCFA will give advice on limiting negative **off-farm impact**. The presentation will cover tips for producing your own **soil amendments** like **compost** and manure. The JCFA encourages audience members to ask questions and share their own farming techniques.

4 Read the sentence pair. Choose where the words best fit the blanks.

1 compost / monoculture

A \_\_\_\_\_ is disappearing as more farmers embrace biodiversity.

B Using \_\_\_\_\_ is a great way to fertilize soil.

2 economic sustainability / soil amendments

A A farm will fail if it lacks \_\_\_\_\_.

B Most farmers add \_\_\_\_\_ to fields.

5 Listen and read the flyer for a discussion on sustainable farming again. What will Lisa Perry's lecture focus on?

## Listening

6 Listen to a conversation between a farmer and a sustainable farming expert. Choose the correct answers.

1 What is the man seeking advice about?

- A preparing fields for the growing season
- B planting two kinds of vegetables together
- C using pesticides to get rid of flies
- D giving a presentation on agriculture

2 How do onions protect carrots?

- A pests will attack the onions instead
- B pests do not like how the onions smell
- C carrots' smell is masked by the onions
- D onion leaves hide the carrot tops

7 Listen again and complete the conversation.

Farmer: Professor Perry, I 1 \_\_\_\_\_, if you don't mind?

Speaker: 2 \_\_\_\_\_.

Farmer: Well, I grow onions and carrots, but I've always 3 \_\_\_\_\_ fields. Do you think I should try intercropping?

Speaker: Absolutely, Ed. Onions and carrots grow 4 \_\_\_\_\_. Onions are perfect for protecting carrots from pests.

Farmer: Really? How does that work?

Speaker: Well, 5 \_\_\_\_\_ different types of crops. You've 6 \_\_\_\_\_ attacking your carrots.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I have a question for you, if you don't mind.*

*Do you think I should try intercropping?*

*Really? How does that work?*

**Student A:** You are a farmer. Ask Student B about:

- intercropping
- crops you grow
- avoiding pesticides

**Student B:** You are a sustainable farming expert. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 to write notes on a talk about sustainable farming. Include information about intercropping and its benefits.

### Sustainable farming

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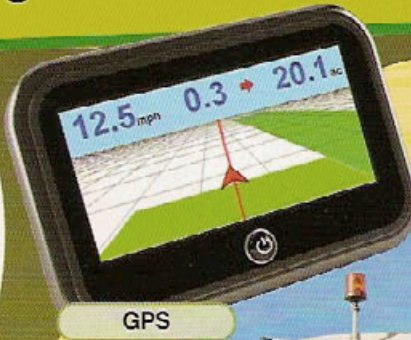
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## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How has technology improved farming in your country?
- 2 What are the negative effects of technology in farming?



GPS



overwatering

## Revolution Farm Equipment

Save time and labor by letting our mechanized solutions work for you. Call for pricing.

### Magic Dripper

Save water with this **drip irrigation system**. It features **smart irrigation control** to prevent **over watering** during rain or high wind. The Magic Dripper promotes healthy plants while using 25% less water than other leading irrigation systems.

### Intelli-Farm Tractor

Make your life easier with the latest in tractor **technology**. Do you lose focus driving your tractor back and forth for hours at a time? Improve your precision with this **auto-steer** tractor. Let **GPS** guide your plows and planters with the **self-propelled** Intelli-Farm Tractor.

### Sow Better

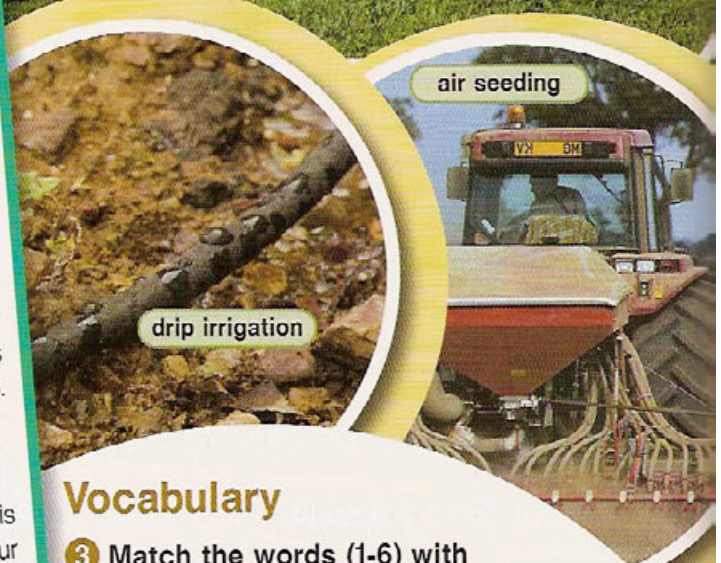
Planting seeds is quick and easy with the Sow Better system for **air seeding**, which accommodates a variety of seeds and bulbs. Relax and let the Sow Better start this year's crop. The Sow Better also prevents **overplanting**.

### Right-Bin

Never worry about misplacing your paperwork again. This **automated bin system** provides safe storage for your products and records. The Right-Bin keeps track of your past and current information in one easy-to-use computer database.



auto-steer system



air seeding



drip irrigation

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                    |                              |
|--------------------|------------------------------|
| 1 — auto-steer     | 5 — smart irrigation control |
| 2 — overplanting   | 6 — automated bin management |
| 3 — air seeding    |                              |
| 4 — self-propelled |                              |

- A a method for organizing harvests  
 B a method for planting seeds using compressed air  
 C planting too many seeds in an area  
 D a watering system that senses and adjusts to moisture levels  
 E able to move on its own power  
 F navigating without a human driver

## Reading

2 Read the product listing from an equipment manufacturer. Then, mark the following statements as true (T) or false (F).

- 1 — Smart irrigation control uses 25% less water than other irrigation systems.
- 2 — The Sow Better can plant seeds or bulbs.
- 3 — The Right-Bin stores information on a computer.

**4** Write a word that is similar in meaning to the underlined part.

- Giving plants more water than they need is wasteful and harmful to the plants.  
\_\_\_\_\_ a \_\_\_\_\_
- The science used to create new tools and methods is making farming more efficient.  
l \_\_\_\_\_ o \_\_\_\_\_
- New tractors have a system where the tractor navigates itself.  
a \_\_\_\_\_ t \_\_\_\_\_
- Using a system that drips water limits waste.  
d \_\_\_\_\_ i \_\_\_\_\_ i \_\_\_\_\_
- Some modern equipment is guided by a satellite navigation system. \_\_\_\_\_

**5** Listen and read the product listing from an equipment manufacturer again. What does the Magic Dripper prevent?

**Listening**

**6** Listen to a conversation between a farmer and a salesperson. Check (✓) the features of the irrigation system mentioned.

- |  |   |
|--|---|
| 1 <input type="checkbox"/> inexpensive   | 3 <input type="checkbox"/> timers             |
| 2 <input type="checkbox"/> water sensors | 4 <input type="checkbox"/> automatic shut-off |

**7** Listen again and complete the conversation.

**Salesman:** Ms. Silva, I think you'll be very impressed with this new irrigation technology.

**Farmer:** I don't know. We're happy with the 1 \_\_\_\_\_ we have now. What's so exciting about your one?

**Salesman:** Well, the Magic Dripper saves time and water. And that means it saves money, too. How often do you 2 \_\_\_\_\_ timers?

**Farmer:** Probably 3 \_\_\_\_\_ a week.

**Salesman:** This system will change that. It adjusts itself when it senses rain.

**Farmer:** That sounds nice, but that's not going to save all that much.

**Salesman:** The Magic Dripper will respond 4 \_\_\_\_\_ you or your workers can.

**Farmer:** That's 5 \_\_\_\_\_.

**Salesman:** It has sensors in the soil. So the machine knows exactly when to shut off the drippers. 6 \_\_\_\_\_ timers.

**Farmer:** Well, that does seem more effective than what we use now.

**Speaking**

**8** With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*I think you'll be impressed with this ...*  
*It saves time and water.*  
*Well, that does seem more effective than ...*

**Student A:** Student A: You are a salesman. Talk to Student B about:

- a new irrigation system
- system parts
- benefits of the system

**Student B:** You are a farmer. Talk to Student B about irrigation systems.

**Writing**

**9** Use the conversation from Task 8 and the product listings to write an advertisement for a new piece of agricultural equipment. Include the equipment's uses, methods, and benefits.

**MAGIC DRIPPER**

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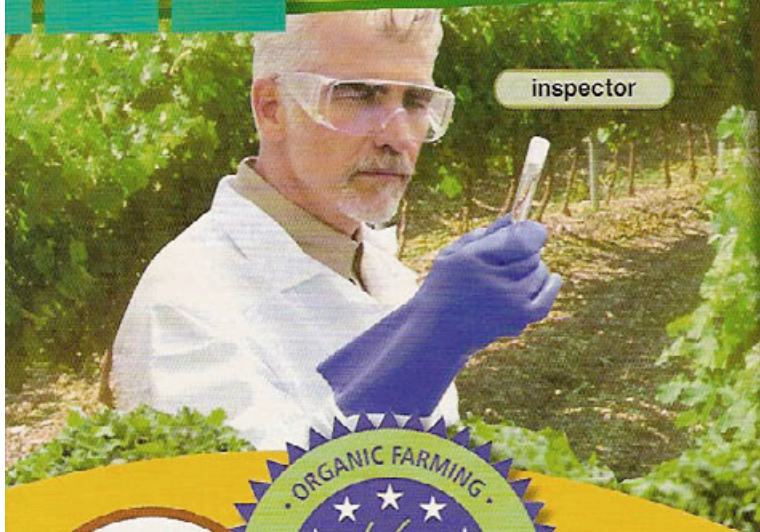


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# 14 Organic farming



inspector



organic



certifier



compliance

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are the challenges of organic farming?
- 2 Are organic products popular in your country?

## Reading

2 Read the publication on organic farming. Then, choose the correct answers.

- 1 What is the magazine article mainly about?  
A organic crop growers  
B organic farmer certification  
C organic pest control  
D organic farming standards
- 2 Which is NOT a type of inspector?  
A crop inspector  
B livestock inspector  
C documentation inspector  
D processing inspector
- 3 What can you infer about organic facilities?  
A They can also produce non-organic crops.  
B They must be inspected every year.  
C They must report changes in material inputs.  
D They pay membership fees to certifiers.

## Going Organic?

### What to do to get your certification

1. **Find a Certifier:** To be considered **organic**, you must comply with specified eco-friendly standards. Each **certifier** has its own guidelines, but all certifiers stress environmental sustainability and eco-friendly production practices.
2. **Apply:** Submit an application and **organic system plan** to a certifier. If the certifier approves your plan, an **inspector** will schedule a visit to observe your production facility.
3. **Prepare for Inspection:** Documentation of production must be accessible to the inspector. It is important to keep your **field activity log** up to date as the inspector will examine it.
4. **Inspection:** All inspections are performed onsite. There are three types of inspectors that specialize in examining different aspects of production.
  - Crop inspectors monitor the health of the plants, soil, and water. They also observe whether there is **compliance** with pest-control regulations.
  - Livestock inspectors judge the health of animals and their living conditions. Have vaccination reports prepared as well as a list of **material inputs**.
  - Processing inspectors check for **organic integrity** in production facilities. These inspectors assess whether there is **contamination** or **commingling** with crops from on-site non-organic fields or materials.
5. **Certification:** If your facility fulfills the organic standards you will be certified. Keep **audit trail documents** on file as proof of the organic authenticity of your products.

## Vocabulary

3 Fill in the blanks with the correct words from the word bank.

**Word** BANK

compliance    commingle  
contamination    certifier    organic

- 1 The farm maintains \_\_\_\_\_ with regulations.
- 2 The inspector is checking for \_\_\_\_\_ of organic crops with non-organic materials.
- 3 John is preparing for a visit from the \_\_\_\_\_.
- 4 The farm offers \_\_\_\_\_ produce.
- 5 Don't \_\_\_\_\_ organic and non-organic produce.

**4 Match the words (1-6) with the definitions (A-F).**

- 1 — organic system plan      4 — inspector  
2 — organic integrity      5 — material inputs  
3 — audit trail document      6 — field activity log

- A someone who examines facilities, crops, and animals  
B a written statement describing methods  
C adhering to certifier's rule for organic products  
D a record to prove organic authenticity  
E a record of additives and work in fields  
F supplies used in production

**5 Listen and read the publication on organic farming again. What are the three types of inspectors?**

### Listening

**6 Listen to a conversation between a farmer and an organic inspector. Mark the following statements as true (T) or false (F).**

- 1 — The man hopes organic labels will attract attention to his produce.  
2 — The woman certifies the farm as organic.  
3 — The farm received a random inspection.

**7 Listen again and complete the conversation.**

**Farmer:** So, Ms. Walton, what did you think of the tour?  
**Inspector:** It went well, Mr. Davis. You seemed prepared for our visit.  
**Farmer:** That's good to know. We're hoping 1 \_\_\_\_\_ attention with an organic label.  
**Inspector:** I understand. Organic goods are in high demand these days.  
**Farmer:** Do you think we'll be certified?  
**Inspector:** 2 \_\_\_\_\_. But your field activity logs showed your practices to be in compliance with our regulations.  
**Farmer:** 3 \_\_\_\_\_. We've worked very hard.  
**Inspector:** 4 \_\_\_\_\_. There didn't seem to be any contamination with non-organic produce.  
**Farmer:** Oh, we're very careful about that. So, 5 \_\_\_\_\_ to hear if we'll be certified?  
**Inspector:** 6 \_\_\_\_\_. The certifier needs to review the documents you supplied.

### Speaking

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*Do you think we'll be certified?*

*There didn't seem to be any contamination ...*

*The certifier needs to review the documents.*

**Student A:** You are a farmer. Ask Student B about:

- becoming certified
- time to respond
- what to do next

**Student B:** You are a crop inspector. Answer Student A's questions.

### Writing

**9 Use the conversation from Task 8 and the publication to write a crop inspector's report. Include information about: field activity logs, compliance and organic integrity.**

#### Report

Name: \_\_\_\_\_

organic inspector

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## SMITH'S SEEDS Inc.

### About Us

Smith's Seeds offers the best seeds that technology can produce. Each **biotech seed** contains favorable **traits** carefully selected by our genetic engineering team. Sustainability is important to us, and that's why we're producing more than a **conventional seed**.

### Available Seeds

**Soy #7:** This variety is characterized by both **herbicide-resistance** and **insect-resistance**. If pesky insects are affecting your crop yields, this is the seed for you. These plants will withstand many conventional herbicides.

**Wheat #5:** This variety is characterized by its incredible output. **Wheat #5** seeds can be planted more closely together than conventional wheat seeds. Because these plants occupy little space, you can expect marked **yield enhancement**.

**Corn #10:** This variety is characterized by its great yields that result from **nitrogen efficiency**. These seeds will grow even in compromised soil conditions. If soil quality has decreased your corn production, Corn #10 is your solution.

**Sorghum #2:** This variety is characterized by its **drought-resistance**. If you farm in a dry area that receives irregular rainfall, this is the perfect variety for you. Expect a hardy plant and big yields from this remarkable seed.

### Safety Concerns

All of our **genetically modified organisms** (GMOs) undergo extensive **analysis** before they are sold. Our **animal performance assessments** guarantee the safety of our products.

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How can genetically modified organisms help farmers?
- 2 How do consumers feel about genetically modified organisms in your country?

## Reading

2 Read the webpage from a seed company. Then, mark the following statements as true (T) or false (F).

- 1  Soy #7 is designed to thrive in poor soil.
- 2  Sorghum #2 grows well in dry climates.
- 3  The company tests their products on animals.

## Vocabulary

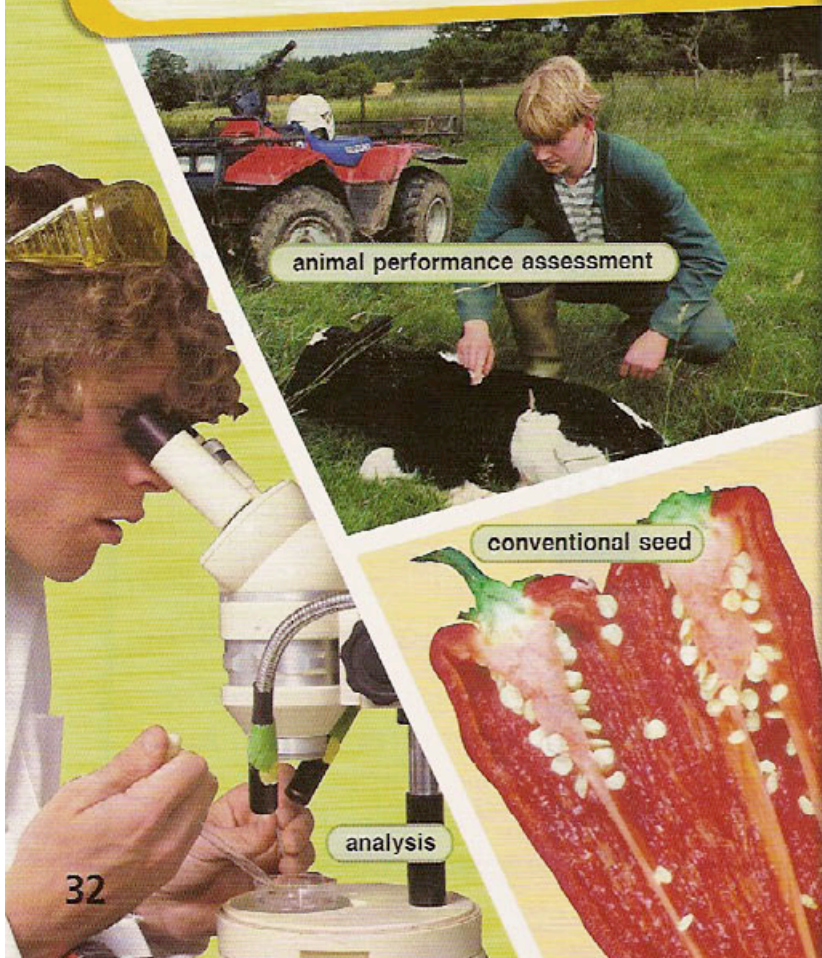
3 Match the words (1-5) with the definitions (A-E).

- 1  drought-tolerant
- 2  GMO
- 3  animal performance assessment
- 4  nitrogen efficiency
- 5  yield enhancement

- A increasing the size of a harvest
- B able to withstand dryness
- C the ability to use minimal nitrogen
- D organism produced by genetic engineering
- E a test of the effects of a product

4 Read the sentence pair. Choose where the words best fit the blanks.

- 1 **biotech seed / analysis**
  - A This \_\_\_\_\_ can resist herbicides.
  - B \_\_\_\_\_ suggests that the product is safe.
- 2 **herbicide tolerant / insect-resistant**
  - A \_\_\_\_\_ seeds counter pest populations.
  - B \_\_\_\_\_ seeds let farmers kill weeds.
- 3 **conventional seeds / traits**
  - A Scientists are enhancing desirable \_\_\_\_\_.
  - B Some farmers prefer \_\_\_\_\_ to GMOs.





- 5 Listen and read the webpage from a seed company again. Which variety will grow in compromised soil?

## Listening

- 6 Listen to a conversation between a seed developer and a salesman. Choose the correct answers.

- What is the main benefit of the seed?
  - nitrogen efficiency
  - drought-resistance
  - insect-resistance
  - herbicide-resistance
- Why does the woman believe the seed will benefit the environment?
  - Less land will be used per season.
  - More farmers will plant in dry regions.
  - Animals will have healthier feed.
  - Less irrigation will be needed.

- 7 Listen again and complete the conversation.

**Salesman:** Carol, please come in. 1 \_\_\_\_\_ your new seed is almost ready for marketing.

**Developer:** It is. After the animal performance assessments, it will be 2 \_\_\_\_\_.

**Salesman:** Wonderful. 3 \_\_\_\_\_ I want to know the best way to advertise it.

**Developer:** Well, the main benefit is that it's extremely 4 \_\_\_\_\_.

**Salesman:** Okay. So we'll 5 \_\_\_\_\_ it to farmers in dry regions.

**Developer:** Yes. We'll 6 \_\_\_\_\_ where rainfalls are unpredictable.

**Salesman:** Okay. What else?

**Developer:** We should emphasize the dependability of our seed. Tests showed that the yields produced during rainy seasons and those produced during droughts varied very little and they're better for the environment than conventional seeds.

**Salesman:** How?

**Developer:** With fewer crops failing during drought seasons, there'll be greater yields. That means 7 \_\_\_\_\_ per season.

**Salesman:** Excellent, Carol.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I want to know the best way to advertise it.*

*We should emphasize ...*

*Excellent point.*

**Student A:** You are a salesman. Ask Student B about:

- a new seed
- seed benefits and traits

**Student B:** You are a seed developer. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 and the web page to write product descriptions of two new seeds. Include the crop types, seed traits, and benefits.

Crop Type:	_____
Traits:	_____
Benefits:	_____
Crop Type:	_____
Traits:	_____
Benefits:	_____

# Glossary

**abiotic** [ADJ-U8] If something is **abiotic**, it is a non-living thing.

**agricultural advisor** [N-COUNT-U8] An **agricultural advisor** is a professional who provides advice and support to people working in agriculture.

**air seeding** [N-UNCOUNT-U13] **Air seeding** is a method of planting seeds that uses a machine to spread seeds with a flow of air.

**analysis** [N-COUNT-U15] An **analysis** is a careful study or examination.

**animal performance assessment** [N-COUNT-U15] An **animal performance assessment** is a test that examines the effects of biotech products on animals.

**animal welfare** [N-UNCOUNT-U1] **Animal welfare** is the health and well-being of animals.

**antibiotic** [N-COUNT-U2] An **antibiotic** is a drug that is used to kill bacteria.

**audit trail document** [N-COUNT-U14] An **audit trail document** is evidence that food or other products came from an organic source.

**automated bin management** [N-UNCOUNT-U13] **Automated bin management** is a method for efficiently organizing products and tracking quantities of stock.

**auto-steer** [ADJ-U13] If a vehicle is **auto-steer**, it moves through its designated area without requiring a person to steer it.

**bacterial** [ADJ-U7] If something is **bacterial** it has to do with bacteria.

**balance of trade** [N-UNCOUNT-U10] **Balance of trade** is the difference between the total value of a country's exports and the total value of its imports.

**base temperature** [N-COUNT-U6] A **base temperature** is the minimum temperature that will allow a plant to grow.

**beginning stock** [N-UNCOUNT-U11] **Beginning stock** is the amount of stock in a given commodity with which one begins the fiscal year.

**biodiversity** [N-UNCOUNT-U12] **Biodiversity** is the existence of a variety of plants on a particular area of land.

**biological control** [N-COUNT-U7] A **biological control** is an organism such as a predatory insect used for pest management.

**biotech seed** [N-COUNT-U15] A **biotech seed** is one that has been altered by genetic engineering.

**biotechnology** [N-UNCOUNT-U4] **Biotechnology** is a branch of biology that uses living things in applied technology fields such as engineering or medicine.

**biotic** [ADJ-U8] If something is **biotic**, it is living.

**blight** [N-COUNT-U7] **Blight** is a disease that kills plants.

**body length** [N-COUNT-U1] **Body length** is the span from an animal's head to its rear.

**brown** [V-I-U8] To brown is to become **brown** due to lack of water, too much heat, or disease.

**burn-down herbicide** [N-UNCOUNT-U5] A **burn-down herbicide** is a chemical used to kill weeds at the time a crop is planted.

**carryover** [N-UNCOUNT-U11] **Carryover** is what remains of a previous year's stock and the current year's production after total inventories have been depleted by use.

**certifier** [N-COUNT-U14] A **certifier** is someone who confirms that clients are meeting standards they agree to meet to be considered organic.

**change** [N-COUNT-U11] **Change** is a difference occurring over time, as in a change in position, appearance, or value.

**chute score** [N-COUNT-U1] A **chute score** is the subjective evaluation of how well an animal tolerates being forced through a chute.

**cloning** [N-UNCOUNT-U4] **Cloning** is the process of copying a biological organism or part of that organism.

**commingle** [V-I or T-U14] To **commingle** is to be mixed or sharing space.

**commodity** [N-COUNT-U11] A **commodity** is anything of monetary value to be bought sold or traded in an economic system.

**compliance** [N-UNCOUNT-U14] **Compliance** is the act of following regulations.

**compost** [N-UNCOUNT-U12] **Compost** is decaying plant material that is used as a soil amendment.

**conditioning** [N-UNCOUNT-U1] **Conditioning** is the act of altering an animal's behavior and temperament.

**conservation tillage** [N-UNCOUNT-U5] **Conservation tillage** is any practice that reduces water and soil loss associated with conventional tillage.

**consumption** [N-UNCOUNT-U3] **Consumption** is the processes of taking food into the body through the mouth.

**contamination** [N-UNCOUNT-U14] **Contamination** is when an undesirable substance mixes with a product to make it impure.

**conventional seed** [N-COUNT-U15] A **conventional seed** is one that has not been altered by genetic engineering.

**conventional tillage** [N-UNCOUNT-U5] **Conventional tillage** is the standard way of mixing and turning the soil to prepare for planting.

**crop residue** [N-COUNT-U5] **Crop residue** is the remainder of plants left in the field after farmers harvest their crops.

**crop rotation** [N-UNCOUNT-U5] **Crop rotation** is the process of growing different types of crops one after the other on the same space of land to improve soil quality.

**cropping system** [N-UNCOUNT-U5] A **cropping system** is the method a farmer uses to grow crops, such as conventional or conservation tillage.

**crowd pen** [N-COUNT-U1] A **crowd pen** is a fenced area that is used to herd animals through a squeeze chute.

**debt** [N-UNCOUNT-U9] **Debt** is the money that a person owes to a bank or other lender.

**deworming** [N-UNCOUNT-U2] **Deworming** is the act of killing or removing worms.

**diagnose** [V-T-U2] To **diagnose** an animal is to determine what is causing the animal's health problems.

**diversify** [V-I or T-U5] To **diversify** is to increase the different types of crops produced.

**drip irrigation system** [N COUNT-U13] A **drip irrigation system** is a system for watering plants that drips water slowly over the roots of the plants.

**drought-tolerant** [ADJ-U15] If a plant is **drought-tolerant**, it can withstand extremely dry conditions.

**economic sustainability** [N-UNCOUNT-U12] **Economic sustainability** is the state of being able to continue production with consistent profits and resources.

**elevation** [N-COUNT-U6] **Elevation** is the height of an area of land relative to the level of the ocean.

**ending stock** [N-UNCOUNT-U11] **Ending stock** is the same as carryover stock, or what remains of the previous year's stocks and the current year's production after total inventories have been depleted by use.

**export** [N-COUNT-U10] An **export** is a product that a nation provides to other nations in international trade.

**export dependent** [ADJ-U10] If a nation or industry is **export dependent** it relies more upon what it sells internationally than what it sells domestically.

**expression** [N-COUNT-U4] **Expression** is the process by which genes produce traits in an organism.

**fallow** [ADJ-U5] If a field is **fallow**, it does not have any crops growing on it.

**farm cash receipts** [N-COUNT-U9] **Farm cash receipts** include the cash income resulting from the direct sale of farm products plus government subsidies.

# Glossary

- feed costs** [N-COUNT-U9] **Feed costs** are the expenses associated with providing feed to livestock.
- feed grains** [N-UNCOUNT-U3] **Feed grains** are grains that are grown for livestock to eat such as corn, sorghum, or oats.
- feed-to-food** [ADJ-U3] If a process is **feed-to-food**, it involves growing grain to feed to animals in order to produce meat for human consumption.
- field activity log** [N-COUNT-U14] A **field activity log** is a document where producers record all of the operations performed on their fields.
- field pattern** [N-COUNT-U8] A **field pattern** is the regular and repeated way that a problem occurs in a field which is used to diagnose a problem.
- fixed cash expense** [N-COUNT-U9] A **fixed cash expense** is a cost due to cash spending that generally does not change such as insurance, interest, or rent.
- flight zone** [N-COUNT-U1] A **flight zone** is an area in which a human's presence will cause an animal to move away.
- flighty** [ADJ-U1] If an animal is **flighty**, it is prone to run away.
- food grains** [N-UNCOUNT-U3] **Food grains** are grains that are grown for humans to eat such as wheat, rice, or corn.
- freeze protection** [N-UNCOUNT-U6] **Freeze protection** is the act of preventing plants from freezing.
- fungal** [ADJ-U7] If something **fungal** is has to do with fungi.
- fungicide** [N-COUNT-U7] A **fungicide** is a chemical that kills fungi.
- futures market** [N-COUNT-U11] A **futures market** is a hub of financial exchange where contracts are bought and sold for the purchase of commodities at some specified price and time in the future.
- gene** [N-COUNT-U4] A **gene** is segment of DNA that determines which traits are inherited by offspring from their parents.
- gene enhancement** [N-UNCOUNT-U4] **Gene enhancement** is the use of genetic engineering to produce desired traits in an organism beyond what is considered normal.
- genetic engineering** [N-UNCOUNT-U4] **Genetic engineering** is the act of combining genetic material from two or more organisms to produce artificial changes in genes.
- genetically modified organism** [N-COUNT-U15] A **genetically modified organism** is an organism that was produced through genetic engineering.
- GPS** [N-UNCOUNT-U13] **GPS (Global Positioning System)** is a navigation system that can identify an exact location on the Earth.
- greenhouse** [N-COUNT-U6] A **greenhouse** is a structure that is designed to retain solar energy for plant growth.
- gross farm revenue** [N-UNCOUNT-U9] **Gross farm revenue** is the total of all income a farm receives from its normal business activities.
- growing degree day** [N-COUNT-U6] A **growing degree day** is a measure of the amount of heat that a plant will receive each day in a particular area.
- growing season** [N-COUNT-U6] A **growing season** is the period of the year during which plants grow.
- handling** [N-UNCOUNT-U1] **Handling** is the act of herding and caring for animals.
- heater** [N-COUNT-U6] A **heater** is a device that generates heat by consuming fuel.
- herbicide** [N-COUNT-U7] An **herbicide** is a chemical that kills weeds.
- herbicide-tolerant** [ADJ-U15] If a plant is **herbicide-tolerant**, it can withstand the application of herbicides.
- high** [N-COUNT-U11] A **high** is a price value up from what it was at some indicated point in time.
- hoop house** [N-COUNT-U6] A **hoop house** is a temporary structure featuring a curved plastic roof that is designed to hold in heat for plant growth.

**import** [N-COUNT-U10] An **import** is a product that a nation receives from other nations in international trade.

**import dependent** [ADJ-U10] If a country or industry is **import dependent** it relies upon goods from other countries to operate effectively.

**Income** [N-UNCOUNT/COUNT-U9] **Income** is the money a person earns for working or investing their money.

**index** [N-COUNT-U11] An **index** is a single figure derived from several variables in order to determine average values of given commodities at given times and in given areas.

**Inedible** [ADJ-U3] If something is **inedible** it cannot be eaten.

**inefficient** [ADJ-U3] If something is **inefficient** it wastes energy.

**infectious** [ADJ-U2] If a disease is **infectious**, it is easily spread.

**insecticide** [N-COUNT-U2] An **insecticide** is a chemical that is toxic to insects.

**insect-resistant** [ADJ-U15] If a plant is **insect-resistant**, it can withstand the damages of insects.

**inspector** [N-COUNT-U14] An **inspector** is someone who examines farm facilities, crops, and animals to verify compliance with organic codes.

**intercropping** [N-UNCOUNT-U12] **Intercropping** is the process of planting two or more crops close to each other.

**interest payments** [N-COUNT-U9] **Interest payments** are money paid to a lender above the amount that has been borrowed.

**International trade** [N-UNCOUNT-U10] **International trade** is the exchange of products and services across international borders.

**land use** [N-UNCOUNT-U3] **Land use** is the human transformation of the environment to make agricultural or living areas.

**last frost date** [N-COUNT-U6] The **last frost date** is the last day in spring during which a frost may occur.

**lethargy** [N-UNCOUNT-U2] **Lethargy** is a condition of extreme weariness.

**lice** [N-COUNT-U2] **Lice** are a type of parasitic insect.

**livestock** [N-UNCOUNT-U3] **Livestock** are animals that are raised for food, labor, or to make a product such as wool.

**loan** [N-COUNT-U9] A **loan** is money that a person borrows from a bank or other lender.

**low** [N-COUNT-U11] A **low** is a price value down from what it was at some indicated point in time.

**manure** [N-UNCOUNT-U3] **Manure** is the solid waste produced by livestock that is often used for fertilizer.

**material inputs** [N-COUNT-U14] **Material inputs** are the supplies used in the production of crops or raising of livestock.

**mean temperature** [N-COUNT U6] A **mean temperature** is the average temperature in an area.

**mechanized** [ADJ-U13] If something is **mechanized**, it is operated by machine instead of by a person.

**monitor** [V-T-U2] To **monitor** something is to check it regularly, looking for problems.

**monoculture** [N-UNCOUNT-U12] **Monoculture** is the farming of only one crop on a particular area of land.

**mulching** [N-UNCOUNT-U7] **Mulching** is the process of cutting plants into small pieces usually to put on the ground as a cover to hold in moisture.

**net farm income** [N-UNCOUNT-U9] **Net farm income** is the total gross farm income minus all expenses.

**nitrogen efficiency** [N-UNCOUNT-U15] **Nitrogen efficiency** is the ability of a plant to use little nitrogen and grow to its full potential.

**noncash expense** [N-COUNT-U9] A **noncash expense** is a cost not due to cash spending, such as amortization, depletion of supply, or depreciation.

# Glossary

- non-renewable resource** [N-COUNT-U12] A **non-renewable resource** is something that exists in fixed quantities and cannot be reproduced.
- off-farm impact** [N-UNCOUNT-U12] **Off-farm impact** is the effect of farming materials and actions on areas other than the farm.
- open** [V-T-U11] To **open** a stocks trading market is to begin it for the day.
- organic** [ADJ-U14] If food is **organic**, it is produced without unnatural fertilizers or pesticides.
- organic integrity** [N-UNCOUNT-U14] **Organic integrity** is a verification that a product is organic and not contaminated.
- organic system plan** [N-COUNT-U14] An **organic system plan** is a written statement which describes the organic methods a producer will use.
- overplanting** [N-UNCOUNT-U13] **Overplanting** is the act of planting too many seeds in an area.
- overwatering** [N-UNCOUNT-U13] **Overwatering** is the act of giving plants more water than they need.
- parasite** [N-COUNT-U2] A **parasite** is an organism that lives on or in another organism.
- pathogen** [N-COUNT-U7] A **pathogen** is any organism that causes illness or disease.
- pest management** [N-UNCOUNT-U7] **Pest management** is the practice of preventing, suppressing, or destroying organisms that harm crops.
- pesticide** [N-COUNT-U7] A **pesticide** is a chemical that kills insects and other pests harmful to crops.
- photoperiod** [N-COUNT-U6] A **photoperiod** is the amount of time each day that a plant is exposed to light.
- point of balance** [N-COUNT-U1] A **point of balance** is the spot on an animal's body that determines which way it will move in relation to the position of a herder.
- polyculture** [N-UNCOUNT-U5] **Polyculture** is a method of farming in which farmers grow several different crops together on the same piece of land.
- prohibition** [N-COUNT-U4] **Prohibition** is the act of forbidding something.
- quota** [N-COUNT-U10] A **quota** is trade restriction by which a government limits the amount or number of goods imported into a country.
- regulation** [N-COUNT-U4] A **regulation** is something that limits or controls something else.
- respiration** [N-UNCOUNT-U2] **Respiration** is the act of breathing.
- restraint** [N-COUNT-U1] A **restraint** is a device that is used to restrict movement.
- roughage** [N-UNCOUNT-U3] **Roughage** is tough plant material that animals, but not humans, can eat.
- sanitize** [V-T-U7] To **sanitize** is to clean something so that no bacteria remains.
- self-propelled** [ADJ-U13] If something is **self-propelled**, it moves by its own power.
- site selection** [N-UNCOUNT-U6] **Site selection** is the act of choosing an area to plant crops in.
- smart irrigation control** [N-UNCOUNT-U13] **Smart irrigation control** is a system for watering plants that adjusts watering based on environmental conditions.
- societal concerns** [N-UNCOUNT-U4] **Societal concerns** are worries about the potentially negative effects of new technologies.
- soil amendment** [N-COUNT-U12] A **soil amendment** is a material added to soil to improve plant growth.
- spring wheat** [N-UNCOUNT-U5] **Spring wheat** is a type of wheat that farmers plant in spring and harvest in late summer or early fall.
- squeeze chute** [N-COUNT-U1] A **squeeze chute** is a narrow fenced passage designed for passing animals through single file.

**stippled** [ADJ-U8] If a plant's leaves are **stippled**, they are covered with many little colored dots.

**stocks-to-use ratio** [N-COUNT-U11] A **stocks-to-use ratio** is the carryover stock divided by the total use.

**stunted** [ADJ-U8] If a plant is **stunted**, it is not growing as large as it should.

**suppression** [N-UNCOUNT-U7] **Suppression** is the act of reducing the amount of a pest so that it is no longer a threat.

**sustainable** [ADJ-U12] If something is **sustainable**, it can be used or continued for a long time without running out of resources.

**symptom** [N-COUNT-U8] A **symptom** is change in a plant or animal that indicates the presence of disease.

**symptom pattern** [N-COUNT-U8] A **symptom pattern** is the regular and repeated way that symptoms occur in a plant.

**symptomology key** [N-COUNT-U8] A **symptomology key** is a tool that contains potential causes of symptoms that is used in diagnosing a problem.

**systems perspective** [N-COUNT-U12] A **systems perspective** is a broad view of how farming practices affect people and the environment throughout each step of the production process.

**tariff** [N-COUNT-U10] A **tariff** is a fee applied by a national government on the import of goods in order to aid domestic industries.

**technology** [N-UNCOUNT-U13] **Technology** is the use of science to create machines or other items that increase speed and productivity.

**temperament** [N-COUNT-U1] **Temperament** is an animal's level of emotional stability.

**tick** [N-COUNT-U2] A **tick** is a type of parasitic arachnid.

**total production expenses** [N-COUNT-U9] **Total production expenses** are the combined expenses of money, time, and labor used in producing a product.

**trade surplus** [N-UNCOUNT-U10] A **trade surplus** is a positive balance of trade that occurs when the total value of a country's exports exceeds the value of its imports.

**trait** [N-COUNT-U15] A **trait** is a genetic characteristic.

**transgenic** [ADJ-U4] If a plant or animal is **transgenic** it has one or more genes artificially introduced from another plant or animal.

**vaccination** [N-COUNT-U2] A **vaccination** is an injection that gives an animal immunity to a disease.

**value** [N-UNCOUNT-U11] **Value** is how much something is worth.

**veterinarian** [N-COUNT-U2] A **veterinarian** is a doctor who specializes in animal medicine.

**weed** [N-COUNT-U7] A **weed** is an unwanted wild plant that interferes with crops growing in a field.

**weed map** [N-COUNT-U7] A **weed map** is a diagram showing the location of weeds that is used for planning a weed management program.

**wilt** [V-I U8] (Of plants) To **wilt** is to grow weak and droop.

**winter wheat** [N-UNCOUNT-U5] **Winter wheat** is a type of wheat that farmers plant in fall and harvest in spring or summer.

**World Trade Organization** [N-UNCOUNT-U10] The **World Trade Organization (WTO)** is a global organization that oversees trade interactions between its participating nations with the intention of fostering negotiations and settling disputes.

**yield enhancement** [N-UNCOUNT-U15] **Yield enhancement** is an increase in the size of a harvest.

**zero tillage** [N-UNCOUNT-U5] **Zero tillage** is technique for growing crops without tilling the soil to improve soil moisture and reduce erosion.