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Кафедра англійської мови для технічних та агробіологічних спеціальностей

Тузюк М.О.

Методичні вказівки до самостійної роботи з дисципліни «Англійська мова» для студентів заочної форми навчання ОС «Бакалавр» спеціальності 208 Агроінженерія (ОПП «Агроінженерія»)

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Укладач: **ТУЗЮК МИХАЙЛО ОЛЕКСАНДРОВИЧ**, асистент кафедри англійської мови для технічних та агробіологічних спеціальностей НУБіП України

Пропонується опрацювання фахових тем майбутніх спеціалістів з агроінженерії заочної форми навчання з проекцією на закріплення спеціалізованих лексичних одиниць, граматичних одиниць, розмовного та письмового мовлення у творчих вправах та тестових завданнях. (*Затверджено Протоколом Вченої ради гуманітарно-педагогічного факультету Національного університету біоресурсів і природокористування України 5 від 19.11.2024 р.*)

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Зміст

Introduction

Welcome students,

This guide is designed specifically for part-time students in the specialty of Agricultural Engineering, to provide a concise and practical resource for mastering the essential English skills needed in this field. The guide includes texts, exercises, grammatical notes, and reading guidelines tailored to technical English, focusing on specific vocabulary, its real-world applications, and opportunities for practice.

The units and topics in this guide are organized to introduce concepts gradually and build on each other in an interconnected manner. Each unit focuses on a key aspect of agricultural engineering, beginning with foundational topics like the basics of agricultural machinery and tractors, and progressing to advanced topics such as harvesting techniques, storage methods, and farm safety. The aim is to provide a comprehensive understanding of technical English while connecting it directly to practical applications in agricultural engineering.

This guide is divided into two primary parts, three units each, followed by control tests to help you assess your mastery of the material. These tests allow you to identify areas where you may need additional practice, ensuring you build a solid foundation in technical English for your field.

Each unit follows a clear and straightforward structure, starting with a detailed text that introduces the topic and highlights essential vocabulary. Vocabulary terms are accompanied by translations and explanations to help you understand their meaning and usage in specific contexts. Exercises follow each text, testing your comprehension and ability to apply the vocabulary and concepts presented.

The last parts of this book provide an outline of how to use key grammar and reading rules for technical English which may not be generally obvious at first glance.

We hope you find this guide both engaging and useful as you advance your English skills for your specialty. Best of luck in your learning journey!

Unit 1: Agricultural Machinery

Agricultural **machinery** plays a critical role in modern farming, enhancing productivity and reducing the labor required in many essential tasks. The term "agricultural machinery" encompasses a range of **equipment** used for various functions such as soil preparation, planting, irrigation, and harvesting. Each piece of machinery is designed to perform specific tasks with efficiency, ensuring that crops are planted, watered, and harvested at optimal times to maximize yield.

One of the most fundamental pieces of equipment is the **tractor**. Tractors serve as the primary workhorse on most farms, powering a variety of **attachments** and implements. These machines are versatile and can be used for **plowing**, **tilling**, and even **transporting** harvested crops. With different attachments, such as **cultivators** and **harrows**, tractors can prepare the soil for planting by loosening it and removing weeds. This process improves soil **aeration** and **drainage**, which are essential for healthy plant growth.

Another key machine in agriculture is the **seeder**. Seeders are used to **sow** seeds evenly across fields, ensuring that each plant has enough space to grow. Modern seeders are equipped with **precision** technology, allowing farmers to control the depth and spacing of seeds. This precision not only conserves seeds but also leads to better plant health and increased yields. For smaller farms, **broadcast seeders** are often used, which distribute seeds in a scattered manner across the surface of the field.

Harvesters are crucial in the crop collection process. Among these, the **combine harvester** is one of the most widely used machines. Combines are designed to **cut**, **thresh**, and **clean** crops like wheat, corn, and rice in a single operation, saving both time and labor. The term "combine" refers to the combination of these three functions into one machine. By streamlining the harvesting process, combines allow farmers to bring in crops more efficiently and at peak ripeness, reducing losses due to weather or pests.

Irrigation is another critical component of farming, especially in arid regions, and is supported by specialized machinery like **sprinkler systems** and **drip irrigation** systems. Sprinkler systems distribute water evenly across large areas, while drip irrigation delivers water directly to the plant roots, conserving water and promoting efficient **nutrient** absorption. These systems ensure that crops receive the appropriate amount of water to thrive, even in regions with limited rainfall.

Finally, **balers** are essential for farms that produce hay, straw, or other crop residues. Balers compress these materials into compact, easy-to-transport **bales**, making it simpler for farmers to store or sell them. This equipment is particularly valuable for livestock farmers who rely on hay as animal feed. By efficiently collecting and packaging leftover crop materials, balers help farmers make the most of their resources.

Machinery — Машини
Large machines or systems used for specific tasks in agriculture.

Equipment — Обладнання

Tools or machinery used to perform various functions on the farm.

Tractor — Трактор

A powerful vehicle used to pull other agricultural implements.

Attachments — Прикріплення

Additional tools or implements connected to tractors for specific tasks.

Plowing — Орання

The process of turning over the soil to prepare it for planting.

Tilling — Рихлення

The process of loosening soil to make it more suitable for planting.

Transporting — Перевезення

Moving harvested crops or other materials around the farm.

Cultivator — Культиватор

A machine used to loosen soil and remove weeds before planting.

Harrow — Борона

An implement used to break up soil clods and level the field after plowing.

Aeration — Аерація

The process of adding air to the soil to improve its quality.

Drainage — Дренаж

The ability of soil to manage water flow and prevent waterlogging.

Seeder — Сівалка

A machine used for planting seeds in even rows.

Sow — Сіяти

To plant seeds in the soil.

Precision — Точність

The quality of being exact in operations, such as seed planting.

Broadcast Seeder — Розкидач насіння

A seeder that spreads seeds evenly over the surface of the soil.

Harvester — Збиральний комбайн

A machine used to gather crops from the fields.

Combine Harvester — Комбайн

A machine that cuts, threshes, and cleans crops in one operation.

Thresh — Молотити

To separate grains from the rest of the crop, usually performed by a combine.

Sprinkler System — Система зрошення

An irrigation system that sprays water over crops.

Drip Irrigation — Крапельне зрошення

A system that delivers water directly to the roots of plants, conserving water.

Nutrient — Поживна речовина

A substance that provides nourishment essential for growth.

Baler — Прес-підбирач

A machine used to compress crop residues into compact bales.

Bale — Копиця

A compact bundle of hay, straw, or other material for storage or transport.

Control Exercises

Exercise 1. Comprehension Questions

Answer the following questions based on the text:

1. What is the main purpose of agricultural machinery on modern farms?
2. What are the primary uses of a tractor on a farm?
3. How does a seeder help in the planting process, and what is its benefit?
4. Describe the role of a combine harvester and the three functions it performs.
5. How do sprinkler and drip irrigation systems benefit farming in dry areas?

Exercise 2. Vocabulary Test: Fill in the Blanks

Use the vocabulary words from the list to fill in the blanks:

1. A _____ is used to plant seeds in rows with precise spacing and depth.
2. The _____ harvester can cut, thresh, and clean crops all in one operation.
3. After plowing, a _____ is often used to break up soil clods and level the field.
4. Farmers use _____ systems to water crops over large areas, while

_____ irrigation delivers water directly to the roots.

5. A _____ compresses hay or straw into compact bundles, making it easy to store or transport.

Exercise 3. Translation Exercise

Translate the following sentences into Ukrainian:

1. Tractors are essential for plowing, tilling, and transporting crops on the farm.
2. Combine harvesters save time by cutting, threshing, and cleaning crops in one operation.
3. Drip irrigation helps conserve water by delivering it directly to the plant roots.
4. Seeders ensure that seeds are planted with the correct spacing, improving crop health.
5. Balers are useful for packing hay and crop residues into compact bales.

Exercise 4. Speaking Task: Dialogue Between Two Farmers

Imagine a conversation between two farmers discussing agricultural machinery. Use the vocabulary words provided to create a dialogue about the following:

The machinery each farmer uses on their farm and why it is essential.

The benefits of using specific equipment like tractors, seeders, or harvesters.

Challenges they face with the machinery and how they address them.

Example Starting Line: Farmer 1: "I just upgraded to a new combine harvester. It’s amazing how much faster we can get the crops in with it."

Farmer 2: "That sounds great! I’ve been thinking about getting a drip irrigation system for my fields…"

Exercise 5. Written Task: Importance of Agricultural Machinery

Write a short paragraph (5-7 sentences) on the importance of agricultural machinery in the modern world. Consider the following points:

How agricultural machinery increases productivity.

The role of machinery in reducing labor on farms.

Specific examples of how machinery improves farming efficiency and crop yield.

Unit 2: Tractors, types of tractors, their uses

Welcome to AgriPower, where innovation meets reliability in agricultural **machinery**. Our **tractors** are designed with one goal in mind: to make your farming operations as efficient and productive as possible. From compact models to heavy-duty machines, AgriPower tractors are built to handle any task, whether it's tilling the soil, **transporting** heavy loads, or preparing the land for planting. With powerful engines and advanced technology, our tractors can help you achieve a more successful harvest season after season.

At AgriPower, we offer a range of tractor models suited to various agricultural needs. Our **utility tractors** are perfect for small to medium-sized farms, handling tasks like **plowing**, **harrowing**, and **towing**. These tractors come with **versatile attachments** that make them highly adaptable, enabling farmers to use one machine for multiple tasks. Designed for simplicity and durability, utility tractors are the backbone of any efficient farm.

For larger farms or more intensive tasks, our **row crop tractors** offer the **precision** and power needed for specialized operations, such as **planting** and **cultivating** rows of crops. Row crop tractors feature **adjustable wheels** and **hydraulic systems** that

allow for easy navigation between rows without damaging plants. This adaptability makes them ideal for farms focusing on crops like corn, wheat, or soybeans, where precise row spacing is critical.

If you're working in challenging terrain or dealing with heavy loads, consider our **four-wheel-drive tractors**. These heavy-duty machines are built for **rough terrain** and provide excellent **traction** in muddy, hilly, or uneven fields. Four-wheel-drive tractors are equipped with robust **axles** and larger **tires**, ensuring stability and power, even under difficult conditions. With their powerful **engines** and durable design, these tractors are the best choice for farms facing diverse landscapes.

Our **specialty tractors** are designed for unique tasks, such as orchard and vineyard management. These tractors have a narrower **chassis**, allowing them to navigate between trees and vines without disturbing delicate crops. Additionally, we offer compact models that are easy to maneuver in confined spaces, providing excellent results in specialized environments.

Each AgriPower tractor is built with **fuel efficiency** and **sustainability** in mind, helping farmers reduce costs and environmental impact. Our **automatic transmission** systems make operation smoother and more accessible for all skill levels, allowing you to focus on what matters most: your crops. With AgriPower tractors, you're not just investing in a machine; you're investing in a reliable partner that will drive your farm's success.

Tractor — Трактор
A powerful vehicle used for pulling other agricultural tools and equipment.
Transporting — Перевезення
Moving goods or materials, often heavy loads, from one place to another.
Utility Tractor — Універсальний трактор
A general-purpose tractor used for various medium-duty tasks on a farm.
Plowing — Орання
The process of turning over soil to prepare it for planting.

Harrowing — Боронування

Breaking up and smoothing the soil after plowing to prepare the seedbed.

Towing — Буксирування

Pulling heavy equipment or trailers across the farm.

Versatile Attachments — Універсальні насадки

Equipment added to a tractor to allow it to perform different tasks.

Row Crop Tractor — Трактор для рядкових культур

A tractor designed specifically for handling crops planted in rows.

Precision — Точність

The quality of being accurate and exact, especially in farming processes.

Planting — Посадка

The process of placing seeds or seedlings into the soil for growth.

Cultivating — Обробіток

The act of preparing and working on the soil to help crops grow.

Adjustable Wheels — Регульовані колеса

Wheels that can be moved or adjusted for different row spacing.

Hydraulic System — Гідравлічна система

A system in a tractor that uses pressurized liquid to perform various functions, enhancing efficiency.

Four-Wheel-Drive Tractor — Чотириколісний привідний трактор

A tractor that powers all four wheels, making it suitable for tough terrains.

Rough Terrain — Складна місцевість

Challenging landscapes like muddy, uneven, or hilly ground.

Traction — Тяга

The grip a tractor has on the ground, important for stability in difficult conditions.

Axle — Вісь

A shaft on which wheels rotate, providing support and stability.

Tires — Шини

The rubber coverings on wheels that provide grip and support.

Engine — Двигун

The machine part that provides power for the tractor.

Specialty Tractor — Спеціалізований трактор

A tractor designed for specific tasks, such as orchard or vineyard work.

Chassis — Шасі

The frame of the tractor that supports its parts and allows it to move.

Fuel Efficiency — Економія палива

Using fuel in a way that maximizes productivity while minimizing waste.

Sustainability — Стійкість

The practice of maintaining productive use of resources in an environmentally friendly way.

Automatic Transmission — Автоматична коробка передач

A transmission that changes gears automatically for easier tractor operation.

Control Exercises

1. Comprehension Questions

Answer the following questions based on the text:

1. What types of tractors does AgriPower offer, and what are they used for?
2. How are utility tractors beneficial for small to medium-sized farms?
3. Why are row crop tractors suitable for farms focusing on crops like corn, wheat, or soybeans?
4. What advantages do four-wheel-drive tractors provide in challenging terrain?
5. How do AgriPower tractors support environmental sustainability?

2. Types of Tractors: Matching Exercise

Match each type of tractor with its primary use and setting by connecting the appropriate "Where It Operates" and "Primary Use" descriptions to each type.

Type of Tractor	Ukrainian Translation	Where It Operates	Primary Use
1. **Vineyard Tractor**	**Виноградний трактор**	Farms with tall crops	Moving earth and large materials
2. **Garden Tractor**	**Садовий трактор**	In industrial and construction areas	Allows work over tall plants

3. **Industrial Tractor**	**Промисловий трактор**	Small farms or confined spaces	Harvests and clears trees
4. **Orchard Tractor**	**Садовий(фруктовий) трактор**	In vineyards	Performs light duties, such as mowing lawns
5. **Compact Tractor**	**Компактний трактор**	In forests	Provides stability in rough terrain
6. **Earth-Moving Tractor**	**Трактор для земляних робіт**	In orchards	Hauling heavy loads
7. **Forestry Tractor**	**Лісовий трактор**	Small farms and gardens	Navigates narrow spaces between vines
8. **Two-Wheel Tractor**	**Двоколісний трактор**	On muddy or unstable land	Light farming tasks like plowing
9. **Track Tractor**	**Трактор на гусеничному ходу**	In home gardens or small farms	Moving between trees without disturbing crops
10. **High-Clearance Tractor**	**Трактор з високим просвітом**	On construction sites	General-purpose tasks

3. Translation Exercise

Translate the following sentences into Ukrainian:

1. Utility tractors are perfect for small to medium-sized farms and can handle tasks like plowing and towing.
2. Row crop tractors have adjustable wheels that allow them to work between rows.
3. FWD tractors are ideal for rough terrain because they provide excellent traction.
4. Our specialty tractors are designed to work in orchards and vineyards without damaging plants.
5. AgriPower tractors are built with fuel efficiency and sustainability in mind, helping farmers save on costs and reduce environmental impact.

4. Speaking Task: Create Your Own Tractor Advertisement

Imagine that you work for AgriPower and have just developed a new type of tractor. Your task is to create a short advertisement introducing this new tractor to potential customers.

5. Written Task: Why Do We Need Different Tractors for Different Tasks?

Write a short paragraph (5-7 sentences) about why it’s important to use different types of tractors for different farming tasks.

Unit 3: Irrigation

Good afternoon, class. Today, we'll be discussing one of the most essential components in agriculture: **irrigation**. Irrigation is the process of applying controlled amounts of water to crops at necessary intervals to aid in their growth and maintain soil **moisture**. This is especially important in regions with limited rainfall, as it ensures that crops receive a steady supply of water even in dry periods. Proper irrigation not only boosts **yield** but also helps maintain the health and quality of plants.

There are several types of irrigation systems, each suited to different crops, landscapes, and climate conditions. One of the most common systems is **surface irrigation**, which involves spreading water across the surface of the field. This method relies on **gravity** to distribute water naturally, making it a cost-effective solution. However, it requires level fields to work efficiently and can lead to **runoff** and **erosion** if not properly managed.

Another widely used system is **sprinkler irrigation**. As the name suggests, this method sprays water over the crops in a way that mimics natural rainfall. **Sprinkler systems** can cover large areas and are effective for a variety of crops. They are especially beneficial in areas where the soil doesn't allow water to seep in quickly. However, due to **evaporation**, they may not be the most water-efficient system in very hot climates.

In regions where water conservation is a priority, **drip irrigation** is often the preferred choice. This system delivers water directly to the roots of plants through a series of **tubes** and **emitters**. By targeting the root zone, drip irrigation minimizes water loss from evaporation and reduces the risk of **weed** growth in other areas. Though it can be expensive to install initially, it is highly efficient and effective for high-value crops.

Subsurface irrigation is another specialized method, where water is applied below the soil surface. This system involves **buried** pipes or tubes that distribute water directly to the root zone. It is commonly used for **sensitive** crops that don't tolerate wet foliage, as it keeps the leaves dry. Subsurface irrigation requires careful planning and is generally more complex to install, but it can significantly improve water efficiency and reduce the chance of disease.

Irrigation is vital not only for growing crops but also for managing **salinity** levels in the soil. In dry areas, salt can build up in the soil, which can harm plants. By regularly applying water, irrigation helps wash away these salts, promoting healthier soil conditions. Each irrigation system has its advantages and challenges, so choosing the right one depends on factors like crop type, soil condition, and local climate.

Irrigation — Зрошення
The process of applying water to land or crops to aid in growth.
Moisture — Вологість
The presence of water in the soil, essential for plant health.
Yield — Врожайність
The amount of crop produced per unit area.
Surface Irrigation — Поверхневе зрошення
An irrigation method that spreads water over the surface of the field.
Gravity — Гравітація
The natural force that pulls water across the surface in surface irrigation.
Runoff — Стік
Water that flows over the land surface instead of being absorbed by the soil.

Erosion — Ерозія

The process by which soil is worn away by water or wind, often accelerated by improper irrigation.

Sprinkler Irrigation — Спринклерне зрошення

An irrigation system that sprays water over crops to mimic rainfall.

Evaporation — Випаровування

The process of water turning into vapor and being lost to the atmosphere.

Drip Irrigation — Крапельне зрошення

A water-efficient irrigation system that delivers water directly to the plant roots.

Tubes — Трубки

Pipes used in drip irrigation to transport water to emitters near plant roots.

Emitters — Емітери

Devices in drip irrigation systems that release water directly to the soil near the plant roots.

Weed — Бур'ян

Unwanted plants that grow in fields and compete with crops for nutrients.

Subsurface Irrigation — Підповерхневе зрошення

An irrigation method that delivers water below the soil surface directly to the roots.

Buried — Закопаний

Placed underground, often referring to pipes or tubes in subsurface irrigation.

Sensitive — Чутливий

Easily affected by certain conditions, such as crops that can't tolerate wet leaves.

Salinity — Солоність

The concentration of salts in the soil, which can be harmful to plants if too high.

Soil Condition — Стан ґрунту

The quality and properties of soil, such as moisture level, salinity, and nutrient content.

Root Zone — Зона коренів

The area of soil where a plant's roots grow and absorb water and nutrients.

Disease — Хвороба

A condition that affects plant health, often due to excess moisture or poor soil quality.

Control Exercises

1. Comprehension Questions

Answer the following questions based on the text:

1. What is irrigation, and why is it essential in agriculture?
2. How does surface irrigation work, and what challenges does it have?
3. In what situations is sprinkler irrigation most beneficial?
4. Why is drip irrigation particularly effective for conserving water?
5. What is subsurface irrigation, and which crops benefit from it the most?

2. Vocabulary Test: Multiple Choice Questions

Choose the correct answer for each question:

1. What is surface irrigation primarily reliant on?

a) Sprinklers b) Gravity

c) Emitters d) Pumps

2. Drip irrigation delivers water directly to:

a) The leaves of plants b) The roots of plants

c) The surrounding air d) Surface puddles

3. Moisture in the soil is essential for:

a) Weed growth b) Gravity

c) Plant health d) Salinity control

4. Sprinkler irrigation is designed to:

a) Cover small areas only b) Replicate natural rainfall

c) Prevent erosion completely d) Target only the roots of plants

5. The process of evaporation in hot climates can reduce:

a) Crop yield b) Soil moisture

c) Gravity d) Soil erosion

6. Subsurface irrigation applies water:

a) Directly to plant leaves b) Below the soil surface

c) Through air moisture d) By runoff only

7. Salinity in soil can be managed by:

a) Allowing water to evaporate b) Applying regular irrigation

c) Increasing weed growth d) Adding more soil erosion

8. Tubes in drip irrigation systems are used to:

a) Apply water to leaves b) Transport water to emitters

c) Increase salinity d) Absorb moisture from the soil

9. Sensitive crops benefit from which irrigation system?

a) Surface irrigation b) Subsurface irrigation

c) Sprinkler irrigation d) Runoff systems

10. Runoff is best described as:

a) Water that stays in the soil b) Water that flows over the surface

c) The root zone d) Controlled evaporation

3. Translation Exercise

Translate the following sentences into Ukrainian:

1. Drip irrigation is a water-efficient method that delivers water directly to the roots.
2. Surface irrigation uses gravity to spread water across the field.
3. Sprinkler systems mimic natural rainfall and are effective for many types of crops.
4. Managing soil salinity is essential for maintaining healthy crop growth.
5. Subsurface irrigation is beneficial for sensitive plants as it keeps their leaves dry.

4. Speaking Task: Explaining Irrigation Systems

Discuss with a partner the differences between the various types of irrigation systems (surface, sprinkler, drip, and subsurface irrigation).

5. Written Task: Dialogue Creation

Write a dialogue between two farmers discussing their irrigation challenges and potential solutions. Each farmer should describe their specific problem, such as water scarcity or soil erosion, and suggest or inquire about different irrigation methods that might solve their issues.

Control Test 1

Exercise 1: Matching Definitions with Terms

Match each term from the list below to its correct definition. Write the letter of the correct definition next to each term.

Term	Definitions
1. Broadcast Seeder	a) A machine designed to lift root crops from the soil, minimizing damage to the crops.
2. Combine Harvester	b) Distributes water directly to the plant roots, reducing water waste.
3. Drip Irrigation	c) A tool that disperses seeds or fertilizer across a field evenly.
4. Four-Wheel-Drive	d) A method of applying water across a large area, imitating rainfall.
5. Sprinkler System	e) Tractor that delivers power to all four wheels for traction on rough terrain.
6. Crop Rotation	f) The machine that cuts, threshes, and cleans grain crops in a single operation.
7. Soil Depletion	g) Growing different types of crops in sequence to improve soil health and prevent erosion.
8. Hydraulic System	h) Loss of nutrients in the soil due to continuous planting of the same crop.
9. Irrigation	i) The use of mechanical components to move pressurized fluid, powering attachments.
10. Cultivator	j) Equipment used to loosen soil and remove weeds before planting.

Exercise 2: Fill-in-the-Blanks

Complete the sentences below by filling in the blanks with the appropriate vocabulary words from the units.

1. The _____ is essential for loosening soil and clearing weeds before planting, improving soil aeration.

2. _____ systems are ideal for conserving water, as they deliver water directly to plant roots.

3. The _____ on a tractor helps distribute power evenly to both wheels, especially important on uneven terrain.

4. _____ helps prevent soil depletion by alternating different crops in the same field each season.

5. By using a _____, farmers can avoid overlapping and distribute seeds uniformly across the field.

6. The _____ uses pressurized fluid to power attachments, allowing the tractor to lift or move heavy tools.

7. A _____ tractor has improved traction, making it suitable for rough and muddy terrain.

8. _____ irrigation spreads water evenly over crops, imitating natural rainfall but using a controlled system.

9. _____ occurs when soil is used repeatedly without replenishing its nutrients, often corrected by crop rotation.

10. A _____ performs multiple steps in grain harvesting by cutting, threshing, and winnowing in a single pass.

Exercise 3: Translation Exercise

Translate the following sentences into Ukrainian, using specific vocabulary terms accurately.

1. The combine harvester reduces labor by performing reaping, threshing, and cleaning all in one operation.

2. Four-wheel-drive tractors are effective on rough terrain, providing better stability and traction.

3. Drip irrigation conserves water by delivering it directly to the plant roots, reducing water waste.

4. Crop rotation helps prevent soil depletion, improving soil health for future plantings.

5. The hydraulic system allows the tractor to lift heavy equipment and attachments with ease.

Exercise 4: Short-Answer Questions

Answer each question in 2-3 sentences, using relevant vocabulary from the units.

1. Describe the benefits of using a four-wheel-drive tractor on uneven farmland.

2. What are the advantages of drip irrigation compared to a sprinkler system, particularly in areas with limited water resources?
3. Explain how crop rotation helps maintain soil health and prevent soil depletion.
4. Why is a broadcast seeder useful for planting crops, and how does it differ from traditional planting methods?
5. How does a hydraulic system increase a tractor's versatility when working with heavy attachments?

Exercise 5: Written Task - Detailed Explanation

Write a short essay (150-200 words) about the various types of irrigation systems and their applications on a farm. Include an explanation of sprinkler irrigation, drip irrigation, and surface irrigation, detailing the benefits and potential challenges of each method. Make sure to use at least 5 vocabulary words from the units.

Example:

Introduction: Briefly introduce the purpose of irrigation in farming.
Body: Describe each irrigation type, highlighting its unique advantages.
Conclusion: Summarize which irrigation method might be most suitable for specific farm conditions.

Unit 4: Soil Management and Fertilization

Welcome to our introduction to modern methods of **soil management** and **fertilization**, which are essential for maintaining healthy crops and maximizing **yield**. Proper soil management involves a range of practices to enhance the **structure**, **fertility**, and **nutrient content** of the soil, ensuring that it provides an optimal environment for plant growth. With the advancement of **agronomy**, farmers now have more efficient tools and techniques to care for the soil and keep it productive over the long term.

One of the primary goals in soil management is improving **soil structure**. Good structure means the soil has the right balance of **pores** and particles, allowing it to retain water while also promoting **aeration**. To achieve this, farmers often use **tillage** equipment, which helps break up compacted soil layers and incorporates organic matter. In conservation tillage, minimal disturbance is made to the soil, preserving the natural **microbial** life that supports plant growth.

Another important aspect of soil management is maintaining proper **pH levels**. Soil pH affects how well plants can absorb nutrients; certain crops need a slightly acidic or neutral environment to thrive. **Lime** is commonly used to raise soil pH, while **sulfur** is added to lower it. Farmers often conduct **soil testing** to monitor these levels and determine the appropriate treatments.

Fertilization is equally crucial for crop health, providing the **essential nutrients** that plants need to grow. The three primary **macronutrients** are nitrogen (N), phosphorus (P), and potassium (K), often referred to as **NPK**. Nitrogen promotes leafy growth, phosphorus encourages root development, and potassium strengthens plant resistance. Fertilizers can be applied through different methods, including **broadcasting**, **banding**, and **fertigation**—the latter involves applying fertilizers through irrigation systems for even distribution.

Modern farming also emphasizes the use of **organic matter** as a natural fertilizer. Materials like compost and **manure** enrich the soil with nutrients and improve its texture and water retention. These materials support the growth of beneficial soil organisms, including **earthworms** and **bacteria**, which break down organic matter and release nutrients over time. Adding organic matter is a sustainable way to enhance soil quality without relying solely on chemical fertilizers.

Finally, **crop rotation** and **cover crops** play an essential role in maintaining soil health. Crop rotation helps prevent **soil depletion** by alternating the types of crops grown in each field, reducing the buildup of pests and diseases. Cover crops, such as clover and rye, are planted between main crops to protect the soil from erosion and add organic matter when they decompose. Together, these techniques form a comprehensive soil management system that ensures long-term soil fertility and health.

Soil Management — Управління ґрунтом
Practices aimed at maintaining soil health, structure, and fertility.
Fertilization — Удобрення
The process of adding nutrients to the soil to enhance plant growth.
Yield — Урожайність
The total production of crops per unit area.
Structure — Структура
The arrangement of soil particles and pores, affecting water retention and aeration.
Nutrient Content — Вміст поживних речовин

The level of essential nutrients in the soil for plant growth.

Agronomy — Агрономія

The science of soil management and crop production.

Soil Structure — Структура ґрунту

The arrangement of soil particles that affects its porosity and aeration.

Pores — Пори

Small spaces in the soil that hold air and water, necessary for root growth.

Aeration — Аерація

The process of introducing air into the soil to improve root health.

Tillage — Обробка ґрунту

The preparation of soil by mechanical means, such as plowing or harrowing.

Microbial — Мікробний

Related to microorganisms that aid in soil health and nutrient breakdown.

pH Levels — Рівні pH

A measure of soil acidity or alkalinity, influencing nutrient absorption.

Lime — Вапно

A material added to soil to increase its pH level and reduce acidity.

Sulfur — Сірка

A nutrient used to lower soil pH, making it more acidic.

Soil Testing — Аналіз ґрунту

The process of assessing soil properties, including pH and nutrient content.

Macronutrients — Макроелементи

Essential nutrients needed in large amounts by plants, such as NPK.

Broadcasting — Розсіювання

Spreading fertilizers evenly over the soil surface.

Banding — Смугове внесення

Placing fertilizer in bands near the plant roots for efficient uptake.

Fertigation — Фертигація

Applying fertilizers through irrigation systems for even distribution.

Organic Matter — Органічна речовина

Natural materials, like compost or manure, added to improve soil fertility.

Manure — Гній

Animal waste used as a natural fertilizer.

Earthworms — Дощові черв'яки

Soil organisms that enhance soil structure by aerating and enriching it.

Bacteria — Бактерії

Microorganisms in the soil that decompose organic matter and release nutrients.

Crop Rotation — Сівозміна

Growing different types of crops in sequence to maintain soil health.

Cover Crops — Покривні культури

Plants grown to protect and enrich the soil between main crops.

Soil Depletion — Виснаження ґрунту

The loss of soil nutrients due to continuous cropping without replenishment.

Control Exercises

1. Comprehension Questions

Answer the following questions based on the text:

1. Why is soil management important for crop growth?
2. How does soil structure impact plant health?
3. What role do pH levels play in soil management, and how can they be adjusted?
4. What are the three primary macronutrients required for plant growth, and what does each one do?
5. How does crop rotation contribute to maintaining soil health?

2. Vocabulary Test: Fill in the Blanks

Use the vocabulary words from the list to fill in the blanks:

1. Adding compost and other forms of _____ can enhance soil fertility.
2. Farmers use _____ to measure the acidity or alkalinity of their soil.
3. To avoid _____, farmers rotate crops and use cover crops.
4. _____ such as nitrogen, phosphorus, and potassium are essential for plant growth.

5. Proper _____ introduces air into the soil, promoting root health.

6. _____ is a method of applying fertilizer through irrigation systems for even distribution.

7. When soil is too acidic, adding _____ can help raise the pH level.

8. _____ in the soil help decompose organic matter and release nutrients.

9. Farmers use _____ to analyze the nutrient levels and structure of their soil.

10. A balanced soil _____ ensures it has the right mix of particles and pores for good root growth.

3. Translation Exercise

Translate the following sentences into Ukrainian:

1. Soil testing helps determine the nutrient levels and pH of the soil.

2. Farmers add manure and compost to enrich the soil with organic matter.

3. Fertilization provides essential nutrients like nitrogen, phosphorus, and potassium for healthy crops.

4. Crop rotation and cover crops prevent soil depletion and improve fertility.

5. Conservation tillage minimizes disturbance to the soil, helping to preserve microbial life.

4. Speaking Task: Role-Play as an Inspector

Imagine you are a soil health inspector, and a farmer has called you to discuss a problem with their soil.

5. Written Task: Formal Report Creation

Write a formal report on the soil problem from Task 4. Your report should include:

Introduction: Briefly describe the purpose of the inspection.

Problem: Clearly state the issue with the soil.

Analysis: Explain the potential impact of this problem on crops.

Recommendations: Provide solutions to address the issue and improve soil health.

Unit 5: Harvesting Techniques and Storage

Introduction

This report outlines the harvesting and storage techniques implemented on Greenwood Farms during the 2023 harvesting season. The farm uses advanced **harvesting equipment** and modern storage facilities to ensure the preservation of crop quality from field to market. By carefully selecting the right machinery and methods, Greenwood Farms aims to maximize **harvest efficiency** and minimize **post-harvest losses**.

Harvesting Machinery and Techniques

The primary machine used for harvesting grain crops on Greenwood Farms is the **combine harvester**, which combines **reaping**, **threshing**, and **winnowing** into one continuous operation. This process minimizes labor and accelerates the harvest by efficiently separating grain from chaff in the field. For root vegetables, such as potatoes and carrots, the farm uses a specialized **root crop harvester** that lifts the crops from the soil with minimal damage. This machine gently lifts the crops while removing excess soil, making them ready for transportation and storage.

For fruits, Greenwood Farms employs a combination of **mechanical harvesters** and manual labor, especially for delicate produce that requires careful handling.

Handpicking is used for crops like tomatoes and berries to prevent bruising. Mechanical harvesters, which use **shakers** to dislodge fruit from trees, are primarily used for hardier crops, such as apples and olives.

Transportation and Sorting

Once harvested, crops are loaded into **transport bins** and transported to a **sorting facility** on the farm. At this facility, a series of **conveyors** and sorting machines are used to classify produce based on size, weight, and quality. Proper sorting helps ensure that only the highest-quality crops proceed to storage or immediate sale, while lower-grade produce is directed to processing facilities or sold at a discount.

Storage Techniques

Greenwood Farms utilizes various **storage solutions** to preserve crop quality and reduce spoilage. Grain is stored in **silos** equipped with **aeration systems** to maintain optimal moisture levels and prevent mold growth. For fruits and vegetables, the farm uses **cold storage** rooms with **temperature control** to slow down ripening and reduce **respiration rates**, extending the shelf life of the produce. Additionally, crops sensitive to humidity are stored in **controlled atmosphere** storage, which maintains specific levels of oxygen, carbon dioxide, and humidity to prevent spoilage.

Post-Harvest Treatments

To further protect stored crops, post-harvest treatments such as **fumigation** and **wax coating** are applied when needed. Fumigation is used to eliminate any **pests** that may have survived harvesting or transport, while wax coating is applied to certain fruits to reduce moisture loss and enhance appearance. These treatments help maintain crop quality for extended periods, especially when produce is destined for distant markets.

Conclusion

The harvesting and storage techniques employed by Greenwood Farms are critical for ensuring that crops maintain their quality from field to market. By combining advanced machinery, precise sorting methods, and specialized storage facilities, the

farm is able to reduce losses, improve marketability, and deliver high-quality produce to consumers.

Harvesting Equipment — Збиральне обладнання

Machinery used to collect crops from the field.

Harvest Efficiency — Ефективність збирання врожаю

The ability to harvest crops quickly and with minimal waste.

Post-Harvest Losses — Втрати після збору врожаю

Losses that occur after harvest, often due to spoilage or damage.

Combine Harvester — Комбайн

A machine that combines reaping, threshing, and winnowing in one operation.

Reaping — Жнива

Cutting crops in the field, the first step in harvesting.

Threshing — Молотіння

Separating grains from the husks or chaff.

Winnowing — Віялення

Removing chaff from grain, typically by using air.

Root Crop Harvester — Збирач коренеплодів

A machine used for harvesting root crops, such as potatoes.

Mechanical Harvester — Механічний збирач

A machine that automates the process of harvesting, especially for fruits.

Handpicking — Ручний збір

Harvesting by hand, often used for delicate crops to avoid damage.

Shakers — Струшувачі

Mechanical devices that shake trees to dislodge fruits.

Transport Bins — Транспортні контейнери

Containers used to transport harvested crops.

Sorting Facility — Сортувальний цех

A place where crops are sorted based on size, quality, and weight.

Conveyors — Конвеєри

Machines that move crops along for sorting or packaging.

Storage Solutions — Рішення для зберігання

Methods or equipment used to keep crops fresh after harvesting.

Silos — Силоси

Tall structures used for storing bulk grains, equipped with aeration systems.

Aeration Systems — Системи аерації

Systems that introduce air to maintain the quality of stored grain.

Cold Storage — Холодне зберігання

Refrigerated rooms used to store perishable crops.

Temperature Control — Контроль температури

Regulation of temperature to maintain product quality in storage.

Respiration Rate — Рівень дихання

The rate at which produce uses oxygen and releases carbon dioxide, affecting ripening.

Controlled Atmosphere Storage — Зберігання в контрольованому середовищі

A storage method that controls oxygen, carbon dioxide, and humidity levels.

Fumigation — Фумігація

Treatment that uses chemicals to eliminate pests in stored produce.

Wax Coating — Воскове покриття

A coating applied to fruits to reduce moisture loss and improve appearance.

Pests — Шкідники

Insects or other organisms that damage crops.

Spoilage — Псування

The decay or degradation of crops due to improper storage or handling.

Control Exercises

1. Comprehension Questions

Answer the following questions based on the text:

1. What are the main functions of a combine harvester on Greenwood Farms?

2. Why does Greenwood Farms use a root crop harvester for vegetables like potatoes

and carrots?

3. Describe the role of transport bins and the sorting facility in the post-harvest process.

4. How does cold storage benefit fruits and vegetables, and what additional technology helps extend shelf life?

5. What are fumigation and wax coating, and how do they protect crops during storage?

2. Vocabulary Test: Multiple Choice Questions

Choose the correct answer for each question:

1. Reaping is primarily concerned with:

a) Sorting crops by quality b) Cutting crops in the field

c) Transporting crops to storage d) Applying fertilizer

2. A root crop harvester is specifically designed to:

a) Lift root vegetables from the soil b) Separate grains from chaff

c) Store grain in silos d) Apply wax coating to fruits

3. Winnowing is the process of:

a) Removing chaff from grain b) Cutting crops in the field

c) Cooling produce in storage d) Sorting crops by size

4. The purpose of aeration systems in silos is to:

a) Control the atmosphere by adjusting humidity

b) Introduce air to prevent mold in stored grain

c) Sort grains based on size

d) Shake trees for fruit harvesting

5. Controlled atmosphere storage adjusts the levels of:

a) Light and temperature b) Nitrogen and phosphorus

c) Oxygen, carbon dioxide, and humidity d) Water and fertilizer

6. Sorting facilities use conveyors to:

a) Transport crops to storage bins b) Move crops for sorting by size and quality

c) Apply pesticides to crops d) Harvest crops from the field

7. Cold storage is primarily used to:

a) Increase the respiration rate of produce b) Protect produce from pests

c) Extend the shelf life of perishable crops d) Sort crops based on quality

8. Post-harvest losses refer to:

a) Losses occurring during crop planting b) Losses occurring after harvest due to spoilage

c) Losses due to pests in the field d) Losses from low soil fertility

9. Wax coating is applied to certain fruits to:

a) Enhance appearance and reduce moisture loss

b) Increase the temperature in storage

c) Help fruits ripen faster

d) Protect fruits from freezing

10. Fumigation is a process used to:

a) Improve crop yield in the field b) Eliminate pests from stored produce

c) Control the temperature in silos d) Sort crops by quality

3. Translation Exercise

Translate the following sentences into Ukrainian:

1. The combine harvester performs reaping, threshing, and winnowing in a single operation.

2. Fruits and vegetables are stored in cold storage to reduce respiration rates and extend their freshness.

3. Transport bins move harvested crops to the sorting facility, where they are classified based on quality.

4. Fumigation is used in storage to protect crops from pests that might cause spoilage.

5. The root crop harvester lifts potatoes from the soil, carefully removing excess dirt.

4. Speaking Task: Explaining Harvesting and Storage Stages

Imagine you are explaining the different stages of the harvesting and storage process to a new farm worker.

5. Written Task: Step-by-Step Table of the Harvesting Process

Create a step-by-step table describing each part of the harvesting and storage process. Write one explanatory sentence for each step. Include the following elements:

Stage	Description
Harvesting	Describe the main harvesting methods, such as using a combine harvester or root crop harvester.
Transport	Explain how crops are moved from the field using transport bins.
Sorting	Detail the sorting process, including the use of conveyors and sorting machines.
Storage Preparation	Describe any necessary treatments before storage, such as fumigation or waxing for specific produce.
Storage	Discuss the storage options (e.g., silos, cold storage, controlled atmosphere) and their benefits.

Unit 6: Farm Safety and Machinery Maintenance

Introduction

Safety and regular **maintenance** are critical components of farm operations. This manual provides essential guidelines for safely operating and maintaining farm **machinery** to prevent **accidents** and extend the **lifespan** of equipment. By following these instructions, operators can ensure that their work environment remains safe and that machinery performs efficiently.

Safety Precautions Before Operation

Before using any equipment, always conduct a **pre-operation inspection**. This inspection should include checking for any **wear** or damage to key parts, including **hoses**, **belts**, and **filters**. Look for any **leaks** in the hydraulic or fuel systems and ensure all **safety guards** are in place. Always use **personal protective equipment (PPE)**, such as gloves, goggles, and ear protection, to reduce risk while operating machinery.

Operating Machinery Safely

When operating **heavy machinery**, keep a safe distance from other workers and obstacles. Always maintain a low speed when maneuvering in confined areas, and avoid sharp turns. Ensure that all **attachments** are securely fastened before starting. If an **operator** needs to leave the equipment, they should always engage the **parking brake** and turn off the **engine** to prevent unintended movement. Clear communication with others on the farm is essential to avoid **collisions** and other hazards.

Basic Maintenance Practices

Regular maintenance is necessary to keep equipment in top condition. Begin each maintenance session by cleaning dirt and debris from machinery parts, particularly around **air filters** and **radiators**. Lubricate all **moving parts** to reduce friction and wear. Check **fluid levels** in the engine, transmission, and hydraulic systems, and top up as necessary. Replace **worn-out** or damaged parts immediately to avoid further damage.

Seasonal Maintenance

Perform seasonal maintenance tasks based on the equipment's usage and the farm's specific needs. During the winter, for example, drain **fuel tanks** and remove batteries from machinery to prevent freezing. In summer, ensure that **cooling systems** are working effectively to prevent overheating. Seasonal maintenance reduces **downtime** and extends the functionality of all farm equipment, especially in extreme weather conditions.

Storage and Documentation

Proper storage is essential for protecting machinery from the elements. Store equipment in a **sheltered** area when not in use to prevent exposure to rain, sun, and wind. Always document each maintenance activity in a **maintenance log** to keep track of completed work and plan future tasks. Keeping thorough records helps identify recurring issues and maintain the machinery's value over time.

Maintenance — Обслуговування

The process of keeping machinery in good condition through regular checks and repairs.

Accidents — Аварії

Unplanned incidents that can result in damage or injury.

Lifespan — Термін служби

The duration for which equipment remains functional and in good condition.

Pre-operation Inspection — Передопераційна інспекція

A check conducted before using equipment to ensure it is in safe working order.

Wear — Знос

Damage caused by regular use over time.

Hoses — Шланги

Flexible tubes carrying fluids in machinery, such as hydraulic fluid or fuel.

Belts — Ремені

Loops of flexible material used to transmit power within machinery.

Filters — Фільтри

Devices that remove contaminants from fluids or air to protect machinery parts.

Leaks — Витікання

The escape of liquid or gas from a damaged part of the machinery.

Safety Guards — Захисні огорожі

Barriers that prevent access to dangerous parts of the machinery.

Personal Protective Equipment (PPE) — Засоби індивідуального захисту (ЗІЗ)

Gear like gloves, goggles, and ear protection that minimizes injury risk.

Attachments — Прикріплення

Additional tools connected to machinery, such as plows or harvesters.

Operator — Оператор

A person who operates or controls machinery.

Parking Brake — Стоянкове гальмо

A brake used to keep machinery stationary when not in use.

Engine — Двигун

The main component providing power to the machinery.

Collisions — Зіткнення

Incidents where machinery or equipment crashes into something.

Air Filters — Повітряні фільтри

Filters that remove dust and debris from the air entering the engine.

Radiators — Радіатори

Components that help cool the engine by releasing heat.

Moving Parts — Рухомі частини

Parts of machinery that move during operation and require lubrication.

Fluid Levels — Рівень рідини

The amount of fluid in machinery, such as oil or coolant.

Worn-out — Зношений

Parts that are damaged due to use and need replacement.

Fuel Tanks — Паливні баки

Containers that store fuel for machinery operation.

Cooling Systems — Системи охолодження

Systems that prevent machinery from overheating by regulating temperature.

Downtime — Час простою

Periods when machinery is not operational due to maintenance or repairs.

Sheltered — Під захистом

Covered areas where machinery is stored to protect it from weather.

Maintenance Log — Журнал обслуговування

A record where maintenance tasks and repairs are documented.

Control Exercises

1. Comprehension Questions

Answer the following questions based on the text:

1. Why is a pre-operation inspection important before using farm machinery?

2. What types of personal protective equipment (PPE) are recommended for operating machinery?

3. Why is it essential to check and maintain fluid levels and moving parts during regular maintenance?

4. What are the benefits of conducting seasonal maintenance on farm equipment?

5. How does documenting each maintenance activity in a maintenance log help in managing machinery?

2. Vocabulary Test: Fill in the Blanks

Use the vocabulary terms from the list to fill in the blanks. Each word should only be used once.

Moving parts, parking brake, cooling systems, pre-operation inspection, personal protective equipment (PPE), hoses, maintenance log, sheltered, air filters, fuel tanks

1. Before starting the machinery, always perform a _____ to check for any visible issues.

2. Wearing _____ such as gloves and goggles can help protect operators from potential hazards.

3. It is essential to check the _____ in the hydraulic system to ensure no leaks are present.

4. Regular maintenance on _____ helps prevent damage due to friction and wear.

5. _____ are necessary to keep the air entering the engine clean and free from dust.

6. Seasonal maintenance in winter includes draining the _____ to avoid freezing.

7. Always use the _____ when leaving the tractor to prevent any unintended movement.

8. Storing equipment in a _____ location protects it from weather exposure.

9. During summer, ensure that the _____ are functioning to prevent the machinery from overheating.

10. Recording each repair in a _____ allows farmers to track recurring issues and maintain equipment properly.

3. Translation Exercise

Translate the following sentences into Ukrainian:

1. Perform regular maintenance on the machinery to extend its lifespan and reduce downtime.
2. The operator should always use personal protective equipment to ensure safety while using heavy equipment.
3. Before storing machinery for the winter, drain the fuel tanks and remove the battery.
4. Use the maintenance log to document each repair and check fluid levels frequently.
5. If the engine shows signs of wear, replace worn-out parts to avoid further damage.

4. Speaking Task: Farmer and Mechanic Dialogue

Imagine a conversation between a farmer and a mechanic discussing a problem with the farmer's machinery. The farmer should describe an issue, and the mechanic should recommend steps to fix it. Use at least five vocabulary words in your dialogue.

5. Written Task: Maintenance Report for a Tractor

Write a detailed report describing issues with a tractor and the maintenance actions taken. Include:

Introduction: Briefly describe the purpose of the report.

Problem Identification: Outline the problems observed (e.g., leaks, worn-out belts, unusual noises).

Maintenance Actions: Describe the steps taken to resolve the issues, such as replacing parts, checking fluid levels, or cleaning air filters.

Conclusion: Summarize the maintenance performed and any further recommendations.

Control Test 2

Exercise 1: Matching Terms with Definitions

Match each term from the list below to its correct definition. Write the letter of the correct definition next to each term.

Term	Definitions
1. Fertigation	a) The container at the bottom of an engine where oil is collected and stored.
2. Crop Rotation	b) The practice of applying fertilizer through an irrigation system for even distribution.
3. Soil Testing	c) Adding a layer of wax to fruits and vegetables to reduce moisture loss and improve appearance.
4. Oil Pan	d) A rotating part in the engine that opens and closes valves in synchronization with pistons.
5. Fumigation	e) The process of changing the types of crops grown in a field to maintain soil health.
6. Camshaft	f) A check performed to measure soil properties like pH, nutrient levels, and structure.
7. Downtime	g) Periods when machinery is not operational due to maintenance or repairs.
8. Wax Coating	h) The treatment of stored produce to eliminate pests that could cause spoilage.
9. Aeration	i) Introducing air into the soil to improve water infiltration and root health.
10. Maintenance Log	j) A record where maintenance tasks, repairs, and inspections of machinery are documented.

Exercise 2: Fill-in-the-Blanks

Use the vocabulary words from the units to fill in the blanks with the appropriate term.

1. _____ is a technique that introduces nutrients to the soil through an irrigation system, improving the efficiency of fertilization.

2. By performing _____, farmers can assess nutrient content, pH levels, and other key soil characteristics before planting.

3. _____ is the process of adding air to compacted soil, which improves its structure and root growth potential.

4. Fruits like apples often receive a _____ to retain moisture and improve appearance, especially for long-term storage.
5. Maintaining a _____ helps farmers keep track of all repairs and inspections, ensuring machinery operates safely.
6. Regular cleaning of the _____ is essential to prevent overheating by allowing heat to dissipate from the coolant.
7. _____ refers to periods when equipment is inactive, often due to necessary repairs or seasonal downtime.
8. The _____ in the engine ensures that the valves open and close in sync with the movement of the pistons.
9. To protect stored crops from pests, _____ is used to eliminate insects that might cause damage or spoilage.
10. _____ is a practice that alternates crops on the same land to help prevent soil depletion and pest buildup.

Exercise 3: Translation Exercise

Translate the following sentences into Ukrainian, using specific vocabulary terms accurately.

1. Fertigation allows farmers to apply fertilizers efficiently by combining it with the irrigation system.
2. The maintenance log includes details of all inspections and repairs conducted on farm machinery.
3. Crop rotation improves soil health by preventing nutrient depletion and controlling pest populations.
4. Wax coating is applied to fruits to reduce moisture loss and extend their shelf life.
5. Aeration helps loosen compacted soil, making it easier for roots to absorb water and nutrients.

Exercise 4: Short-Answer Questions

Answer each question in 2-3 sentences, using relevant vocabulary from the units.

1. Explain why soil testing is important before planting and what key information it provides to farmers.

2. Describe the benefits of using crop rotation as a soil management practice.

3. What is the role of fumigation in crop storage, and why is it important?

4. Why is it essential to document repairs and inspections in a maintenance log?

5. How does downtime affect farm productivity, and what are some strategies to reduce it?

Exercise 5: Written Task - Report on Farm Safety and Machinery Maintenance

Write a detailed report (150-200 words) describing essential safety and maintenance practices for machinery on a farm. Use specific vocabulary from the units and cover the following points:

Safety Checks: Describe the types of inspections and pre-operation checks that should be done to ensure safety.

Maintenance Tasks: Outline basic maintenance tasks, such as checking fluid levels, cleaning filters, and replacing worn parts.

Storage: Discuss why it's important to store machinery properly during downtime or the off-season.

Documentation: Explain the value of keeping a maintenance log to track all work done on machinery.

Example Structure:

Introduction: Briefly introduce the importance of machinery safety and maintenance on a farm.

Body: Describe each area of safety checks, maintenance tasks, storage, and documentation.

Conclusion: Summarize how these practices help maintain productivity and extend the lifespan of equipment.

Key Grammar Rules for Professionally Oriented English

In technical and professional English, clarity and formality are essential, especially in fields like agricultural engineering where precision in communication is key. Here are some important grammar rules that agricultural engineers should focus on, particularly regarding passive voice, reported speech, and formal conventions in technical speech.

Passive Voice

The passive voice is commonly used in technical and scientific writing to emphasize the action rather than the person performing it. This is useful when describing processes, findings, or instructions where the focus should be on the result or the procedure itself, rather than the subject carrying out the action.

Structure: [Object] + [form of "to be"] + [past participle of the verb] (+ by [agent, optional]).

Example:

Active: *"The technician calibrated the irrigation system."*

Passive: *"The irrigation system was calibrated by the technician."*

Usage in Agricultural Engineering:

Technical Instructions: *"The soil is tested for pH levels before planting."*

Process Descriptions: *"The seeds are distributed evenly across the field using a broadcast seeder."*

Research Findings: *"It was observed that water conservation improved with drip irrigation."*

Passive voice is especially appropriate in research papers, technical reports, and manuals, as it adds a level of formality and objectivity.

Reported Speech

Reported speech (or indirect speech) is used to relay what someone has said without quoting their exact words. In professional and technical contexts, reported speech is helpful when summarizing findings, instructions, or comments from team members or experts.

Structure: [Subject] + [reporting verb] + that + [subject] + [verb].

Example:

Direct Speech: "The inspector said, 'The equipment needs maintenance.'"

Reported Speech: "The inspector said that the equipment needed maintenance."

Changes in Tense:

When reporting in the past, shift tenses back (present to past, past to past perfect).

Changes in Time forms:

When reporting in the past, use less direct words when referring to time (that day instead of today, the following day instead of tomorrow, the previous day instead of yesterday).

Usage in Agricultural Engineering:

Summarizing Findings: *"The study concluded that soil moisture levels must be regularly monitored."*

Relaying Instructions: *"The engineer recommended that the pump be inspected before the next irrigation cycle."*

Reporting Feedback: *"The manager noted that the tractor's hydraulic system was due for a check."*

Using reported speech in formal contexts avoids unnecessary direct quotes and allows for concise, accurate summaries.

Formal Language Conventions

In professionally oriented English, especially in technical fields, language needs to be precise, objective, and formal. Here are key conventions that agricultural engineers should observe:

Use of Impersonal Language: Avoid personal pronouns (I, we, you) in technical reports and instructions. Instead, use impersonal structures.

Example: Instead of *"We adjusted the soil pH,"* use *"The soil pH was adjusted."*

Avoidance of Contractions: Contractions like "can't," "won't," and "doesn't" are too informal for technical writing. Use the full form instead.

Example: *"Do not adjust the pressure until the system has been calibrated."*

Specific and Concise Language: In technical speech, being specific and avoiding vague language is crucial.

Example: Instead of *"The machine was checked,"* specify which part of the machine and why: *"The oil filter in the tractor was inspected to ensure efficient lubrication."*

Correct Use of Technical Terms: Ensure that technical terms are used accurately and consistently throughout the document. For agricultural engineers, this might include terms like "fertilization," "hydraulic system," "irrigation," and "nutrient absorption."

Use of Passive Voice for Objectivity: In technical reports, the passive voice helps maintain an objective tone.

Example: *"The crop yield was measured and recorded"* is more formal than *"We measured and recorded the crop yield."*

Precision with Numbers and Units

Accuracy with numbers and units is critical in electrical engineering. Measurements, specifications, and quantities must be presented correctly to avoid misunderstandings and ensure safety and precision.

Standardized Units: Always use the International System of Units (SI) or other industry-standard units (e.g., volts, watts, amperes) and avoid mixing unit systems.

Example: Use “120 V” instead of “120 volts” for consistency.

Decimals and Significant Figures: Be consistent with the number of decimal places or significant figures according to the required precision.

Example: Report “15.75 A” instead of “about 16 A” when specific data is required.

Spacing and Abbreviations: Use a space between the number and unit abbreviation and avoid adding an “s” to plural units.

Correct: “50 Hz” or “20 W”

Incorrect: “50Hz” or “20 Ws”

Ranges and Tolerances: When listing ranges, use “to” or a hyphen and specify the tolerance where applicable.

Example: “Operating voltage: 220-240 V” or “Resistance tolerance: ±5%”

Rules and Tips for Reading Technical English Texts

Reading technical English texts in agricultural engineering requires a strategic approach to comprehend complex information efficiently. Here are some key rules and tips designed to help you understand technical texts accurately.

1. Understand the Structure of Technical Texts

Technical texts in agricultural engineering, like reports, manuals, and research articles, generally follow a structured format. Familiarizing yourself with this structure can help you locate and interpret information more easily.

Abstract or Summary: This section provides a concise overview of the main points, objectives, and findings. Always start by reading this to get a quick understanding of the content.

Introduction: Often includes background information, objectives, and relevance. Pay attention to this section for the context of the study or procedure.

Methods and Materials: Describes the equipment, materials, and techniques used. This is crucial for understanding the procedural steps or experimental setup.

Results and Discussion: The findings and analysis are presented here. Focus on data interpretation and conclusions related to agricultural processes, machinery efficiency, or crop impact.

Conclusion: Summarizes the main findings and often suggests practical applications.

2. Focus on Key Terminology

Agricultural engineering texts are often filled with specific terms that may be unfamiliar. Building a strong vocabulary of key technical terms will improve comprehension.

Look for Definitions: Many technical texts will define complex terms in the text or provide a glossary. Note these definitions as you read.

Use Context Clues: Even if a term isn't defined, the surrounding text often provides enough information to infer its meaning. Pay attention to explanations, examples, or related terms.

Create a Vocabulary Log: Keeping a personal list of key terms and definitions

specific to agricultural engineering (e.g., "irrigation systems," "soil aeration," "variable rate technology") will help reinforce your understanding and improve reading fluency.

3. Identify Passive Voice and Impersonal Language

Technical texts frequently use passive voice and impersonal structures to maintain an objective tone, which can sometimes make reading more challenging. Understanding this style will help you interpret the text more accurately.

Passive Voice Recognition: Passive structures (e.g., “The soil was tested for pH levels”) often indicate actions taken without emphasizing the subject. Recognize that the focus is on what was done, not who did it.

Impersonal Constructions: Look for impersonal phrases like “It was observed that…” or “Studies show…,” which indicate that the findings or actions are general and not tied to a specific person.

4. Analyze Diagrams, Graphs, and Tables

Technical texts in agricultural engineering frequently include diagrams, graphs, and tables to present data visually. These elements are often essential to understanding the information.

Study Diagrams Carefully: Diagrams often break down machinery parts, irrigation layouts, or experimental setups. Reviewing these can clarify the function of each part or process described in the text.

Read Graphs and Tables for Data: Quantitative information is typically presented in graphs or tables. Look for trends, comparisons, or key data points that relate to the text.

Refer Back to Text: Diagrams and data are usually explained in the text, so cross-reference these elements for a complete understanding.

5. Use Skimming and Scanning Techniques

Technical texts can be dense, so skimming and scanning are helpful techniques for locating specific information without reading every word.

Skim for Main Ideas: Skim sections for general ideas, looking at headings,

subheadings, and any **bolded** or *italicized* terms. This will help you understand the main topics and organization.

Scan for Specific Information: Use scanning to locate specific data points, terms, or instructions within the text. Scanning is particularly useful in procedural texts, like equipment manuals or protocols, where you may need to find specific steps or instructions.

6. Take Notes and Summarize

Effective note-taking and summarization improve comprehension and retention of complex information.

Highlight Key Points: As you read, highlight or underline essential terms, data points, or conclusions.

Write Summaries: After reading a section, try summarizing the main points in your own words. This reinforces your understanding and helps you remember important information.

Make Diagrams or Flowcharts: For processes like machinery operation or irrigation cycles, visual summaries can be very helpful. Creating a flowchart or diagram based on the text will allow you to see the entire process at a glance.

7. Review and Reflect on Application

After reading a technical text, take a few moments to reflect on how the information might apply to real-world agricultural engineering scenarios.

Identify Practical Applications: Think about how the information can be applied practically, such as in machinery maintenance, soil management, or irrigation planning.

Consider Impact on Practices: Reflect on how new methods or technologies described in the text could improve efficiency, sustainability, or crop yield on a farm.

Ask Questions for Deeper Understanding: Consider questions like, “How could this technology improve resource use?” or “What additional data would enhance this study?” Asking these questions will deepen your comprehension and encourage critical thinking.

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