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**АНГЛИЙСКИЙ ЯЗЫК**

**INTRODUCTORY AGRONOMY**

*Сборник текстов и упражнений для студентов,*

*обучающихся по специальностям 1-74 02 01 Агрономия,*

*1-74 02 02 Селекция и семеноводство*

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Приведены тексты для чтения по специальности из оригинальных источников. Лексико-грамматические упражнения способствуют расширению словаря и углубленному пониманию прочитанного.

Для студентов, обучающихся по специальностям 1-74 02 01 Агрономия, 1-74 02 02 Се-лекция и семеноводство.

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ВВЕДЕНИЕ

Сборник текстов и упражнений предназначен для студентов aгрономического факультета УО БГСХА.

Все задания объединены в 6 уроков, каждый урок вклю­чает в себя текст А с предтекстовыми и послетекстовыми упражнениями и текст Б для дополнительного аудиторного или внеаудиторного чтения.

Текст А предназначен для развития навыков изучающего чтения. Тематика текстов тесно связана с будущей специаль­ностью студентов. Тексты подобраны с учетом изученного и изучаемого грамматического и лексического материала. Но­вый лексический материал отрабатывается в предтекстовых упражнениях. В каждом уроке даны также упражнения на повторение грамматического материала, представленного в тексте А. Кроме того, предтекстовые упражнения направлены на развитие умений определения логической связи слов в предложении.

Текст Б предназначен главным образом для развития навыков поискового чтения и умения извлечь из текста нужную информацию. При этом рекомендуются такие виды работы: передача содержания на русском или английском языках, ответы на вопросы, составление плана, аннотирование, реферирование и т. д. Некоторые тексты (например, такие, как текст «Фотосинтез» из урока 3) содержат в себе допол­нительную информацию к основному тексту урока и могут быть рекомендованы для индивидуального (внеаудиторного или аудиторного) чтения.

Учебные тексты взяты из оригинальных источников, их объем составляет 1500–2000 печатных знаков.

**LESSON 1**

**Active vocabulary**

|  |  |  |
| --- | --- | --- |
| 1. rock  remains  texture  vegetation  fungus  surface  clay | 2. fine  abundant  entire  coarse  variable | 3. to sustain  to weather  to accumulate  to percolate  to require |

**Exercise 1. Arrange the words in 2 columns according to the rules of reading suffixes -tion and -ture (nouns).**

Proportion, mixture, accumulation, vegetation, texture, stabilization, direction, feature, percolation, consideration) nature, composition, moisture, aeration, temperature, portion, fraction, structure.

**Exercise 2. Point out the words, not coinciding with the meaning of the whole group.**

Soil, texture, surface, clay, erosion, agriculture, rock, ground, minerals, biological, to weather, fine, coarse, layer, land.

Exercise 3. Fill in the blanks with the words, given below.

1. Knowledge of the soil ... the study of its physical, chemical and biological properties.
2. The biological properties of the soil deal with the soil bacteria and ... .
3. Only relatively fertile soil is capable to ... the plantlife.
4. Water quickly ... through the dry soil layer. (fungi, to percolate, to require, to sustain).

**Exercise 4. Find the words, forming the family of the verb to vary** – **изменяться, разниться, варьировать.**

Vegetation, variable, weathering, variability, water, variant, variety, vegetables, variation, vapour.

**Exercise 5.** Translate the international words without a dictionary.

Mineral, chemical, physical, biological, characteristic, mass, million, element, result, erosion, tendency, aspect, material, bacterium-bacteria, to stark, to form, to stabilize.

**Exercise 6. Choose the adjectives in the comparative degree, give their initial form, translate them.**

High, finer, common, coarser, important, lower, natural, easy.

**Exercise 7. Point out the sentences with passive construc­tions.**

1. Fundamental knowledge of soil requires three approaches.
2. Many chemical elements are required by plants.
3. Plants take oxygen and nitrogen from mineral and or­ganic components of the soil solution.
4. Carbon and hydrogen are taken by plants from the air and water.
5. As soils develop with time organic matter has been accu­mulated on and in the surface of the soil.
6. Clay is usually accumulated in the subsoil.
7. The weathering of rocks and minerals has been going on for millions of years.

**Exercise 8. Restore the link-words, missed in the. following sentences**

The minerals arid rocks ... compose the earth surface has a common origin … the elements, required by plants are found … the entire surface … the earth, in highly variable proportions. (although, that, of, over, and).

**Exercise 9. Read the last passage of the text, point out the sentence, expressing the main idea of the passage.**

**Exercise 10. Read the 3d passage of the text and state what is the 2nd passage about.**

**TEXT A**

**What is soil**

Soil is the mixture of mineral and organic material at the land surface that is capable of sustaining plant life. The mine­rals and rocks that compose the earth surface had a common origin, and the elements required by plants are found over the entire surface of the earth, although in highly variable propor­tions The weathering of the rocks-and minerals has been going on for millions of years, until most of the earth's surface is now a mass of finely divided mineral matter.

As plants cover the land, the roots are abundant near the surface, and as the plants die, their remains fall on the surface of the ground. As a result, organic matter accumulates on and in the surface of the soil. This feature is characteristic of soils over the entire earth.

Another important characteristic is that plant cover stabili­zes the soil against erosion, and as water percolates through the soil, there is a movement of the finer particles to lower depths. Therefore as soils develop with time, there is a ten­dency toward a development of a layer of clay beneath a layer of coarser textured top soil. These two characteristics, accumu­lation of organic matter and accumulation of clay in the sub­soil, provide us with a starting point in the study of soils.

Fundamental knowledge of the soil must be. sought in three main directions: the chemical, the physical and the biological. Questions relating to the nature and proportions of soil mate­rial generally require the chemical approach. Considerations such as the movements of water in soil, and the manner in which soil material is built up to form the soil body in the field, are examples of soil physics. The biological aspects include studies of soil bacteria, fungi and animals, and the relationship of soils to their natural vegetation.

**Exercise 11. Make up a plan of the text.**

**Questions**

1. What do we call „the soil”?
2. Where are the elements required by plants found?
3. For how long has the weathering of the rock been go­ing on?
4. What is the earth surface now?
5. How does the organic matter accumulate in and on the surface of the soil?
6. What is important about the. plant cover of the soil?
7. Why does a layer of clay accumulate beneath a layer of coarser textured top soil?
8. What are the three main approaches in the study of soils?

**TEXT В**

**The formation of soil**

Soil is that part of the earth's surface in which plants may be grown. A fertile soil contains the following five essential components:

1. Inorganic matter, that is material which has never been alive – the inorganic constituents are known as sand, silt and clay.
2. Organic matter – material, derived from the more or less complete decomposition of plants and animals.
3. Bacteria – simple forms of plant life.
4. Moisture.
5. Air.

A characteristic common to all soils is the development of distinct layers from the surface downward. A vertical section of soil is called a profile. The surface layer is usually dark in colour and relatively high in organic, matter. This layer is called the A horison. Below the dark-coloured surface soil is аnother layer, which may contain more clay than the topsoil and may be greatly different in colour. This layer is called the subsoil. or В horison. Below the В horison is the lighter coloured parent material, or С horison.

Soils are porous. In the pore spaces, which may occupy more than half the volume of soil, there are variable proportions of water and air.

**LESSON 2**

**Active vocabulary**

|  |  |  |
| --- | --- | --- |
| 1. moisture | 2. various | 3. to harm |
| sand | bare | to aggregate |
| impact | vigorous | to maintain |
| sample | medium | to facilitate |
| slope | evident | to diminish |
| 4. the more ... the better |  |  |

**Exercise 1. Look through the words and find the one, given at the beginning of the row.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. bare | 1. slope | 1. harm | 1. facilitate | 1. medium |
| 2. base | 2. slow | 2. hard | 2. facility | 2. meaning |
| 3. bore | 3. slough | 3. half | 3. faculty | 3. measure |
| 4. bern | 4. slouch | 4. harm | 4. facsimile | 4. medium |
| 5. bear | 5. slops | 5. hand | 5. factitious | 5. median |
| 6. bare | 6. slop | 6. have | 6. factitive | 6. medial |
| 7. beer | 7. sloop | 7. haul | 7. facultative | 7. mediate |
| 8. beam | 8. slope | 8. harp | 8. fascinate | 8. medical |
| 9. bath | 9. slogan | 9. hart | 9. facilitate | 9. meaning |

**Exercise 2. Combine the beginning and the end of the sen­tences.**

1. The larger is the amount of moisture in the soil ...
2. The better is the structural condition of the soil ... .
3. The finer is the soil ... .
4. The richer is the soil ... .
5. ... the easier will the roots penetrate into it.
6. ... the higher is aeration.
7. ... the better is the harvest.
8. ... the better is the growth of the plant.

**Exercise 3. Arrange synonyms in pairs.**

Soil, importance, impact, bad, to provide, evident, influen­ce, to give, to obtain, significance, to get, poor, first of all, primarily, clear, ground, sustain, maintain.

**Exercise 4. Arrange antonyms in pairs.**

Coarse, to exceed, more, ease, weak. To diminish, difficul­ty, vigorous, fine, less.

**Exercise 5. Find the word with the negative suffix and give the word with the opposite meaning.**

Medium, bare, handless, various, vigorous, abundant, va­riable.

**Exercise 6. Read and translate the international words.**

Composition, organic, temperature, aeration, structure, cli­mate, function, organism, to examine, analytical, type, diame­ter, fraction, series, aggregate, practical, to restore, defect, in­dustrial, information.

**Exercise 7. Translate the sentences with Participle I. Con­sult the model.**

Model: moving air – движущийся воздух.

Air, moving in "this direction ... – Воздух, движущийся в этом направлении ... .

When moving, air ... – При движении воздух... . Двигаясь, воздух... . Когда (в то время как) воздух двигался ....

1. In studying the physical properties of the soil, it is ne­cessary to consider the composition of its mineral and organic portions
2. In a fertile soil there are millions of extremely small li­ving organisms – bacteria.
3. Erosion can be serious on sloping ground.
4. While examining the aggregates of the soil one obtains the information about soil structure.

**Exercise 8. Read the passage and point out the sentence, which does not coincide with the meaning of the whole pas­sage.**

Soil is the part of the earth's surface. It is capable to main­tain plant life. Temperature, aeration, texture, moisture – those are physical characteristics of the soil. Any soil sample contains sand, silt, clay. Bacteria – simple forms of plant life. A soil of good structure is to provide a good medium for vigorous root growth of the plant.

**Exercise 9. Omit the 4th sentence (Ex. 8) and point out the one, expressing the main idea of the passage.**

**Exercise 10. Rewrite the passage given in Ex. 8 and unite simple sentences into complex (omitting the 4th sentence).**

**Exercise 11. Choose the sentence, by which you can finish the passage, given in Ex. 8.**

1. There is a tendency toward a development of a layer of clay beneath a layer of coarser textured top soil.
2. It can also restore itself quickly after it has been disturbed.
3. On this type of land proper growth of crops cannot be obtained.
4. Organic matter – material, derived from decomposition of remains of plants and animals.

**Exercise 12. Look at the title of the text and the keywords, given below, and state its possible content.**

Composition, texture, soil climate, particle size, to harm, to restore, tillage operations.

**TEXT A**

**Physical properties of soil and soil structure**

In studying the physical properties of soil it is necessary to consider the composition and properties of the mineral and organic portions: the internal conditions of moisture, tempera­ture and aeration, which constitute the soil climate and the na­ture and functions of the associated living organisms.

Texture is the property which largely determines the ease or difficulty of cultivations. Soil texture is due primarily to the nature and quantity of the various mineral particles present. If a handful of ordinary soil be examined closely it can be ob­served that the mineral particles are of all shapes and sizes.

To facilitate analytical comparisons between different soils a convention has been established with respect to particle size.

On this basis, particles with a diameter exceeding 2 mm are considered as stones, whereas those particles of less diameter than 0.002 mm are considered to have the properties of clay. In the natural condition soil particles may not all be separated from one another but may be aggregated into crumbs and clods of various sizes.

Any soil sample can be divided into a series of arbitrary fractions: coarse sand, medium sand, fine sand, silt, clay. The differing textual properties imparted by stones coarse sand, fi­ne sand and silt are largely the result of their diminishing particle size. Clay, on the other hand, is derived from the che­mical decomposition of larger mineral particles.

The study of the aggregates, their nature, stability and size gives information about structure. The study of soil structure is of importance of maintaining a good structural condition.

Tillage operations, the passage of heavy implements and the impact of rain on bare ground all tend to harm the soil so far as its structure is concerned., A soil of good structure will be well drained and aerated, will provide a good medium for vigorous root growth and will be resistant to harm, done by necessary tillage operations and will restore itself quickly to a satisfactory condition after it has been disturbed

Structural defects in the soil are particularly evident on newly restored land after industrial working has taken place. On this type of land proper growth of crops cannot be obtai­ned by use of manures and fertilizers alone. The land tends to be waterlogged in winter, and cracked and parched in sum mer because of poor movement of water through the soil. Aeration is poor and erosion can often be serious on sloping ground.

**Questions**

1. What must be considered in studying the physical pro­perties of the soil?
2. Why does texture of the soil determine ease or difficul­ty of cultivations?
3. How may soil particles be aggregated in the natural con­ditions?
4. What are the main fractions of any soil sample?
5. How can we get information about soil structure?
6. In what cases is the soil structure harmed?
7. What kind of soil restores itself quickly?
8. When are the structural defects particularly evident?
9. What tendency has this type of land?

**TEXT В**

**Soil texture**

The size of soil particles, large or small (coarse or heavy clay) determines the texture of a soil, and little can be done to change this texture except through admixture (as by adding sand or clay).

The crumb structure of a soil is something quite different. Each crumb represents a composite or aggregate of many in­dividual soil particles, and this soil condition is called aggrega­tion (or granulation). Soil aggregation is a very desirable con­dition for plant growth because air and water can circulate freely through the pore spaces, which are of just the right si­ze to allow surplus water to drain off and yet to retain sample, reserves. Plant roots can penetrate without hidrance. The loose composite structure of the crumbs permits free interchange of ions between the particles of the aggregate. Microorganisms find extremely favourable conditions for development in an aggregated soil.

**LESSON 3**

**Active vocabulary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. starch |  | 2. acid |  | 3. to tolerate |
| lime |  | alkaline |  | to absorb |
| manure |  | humid |  | to range |
| amount |  | essential |  | to contain |
|  |  | beneficial |  |  |

**Exercise 1. Point out the words in which the stressed letter is read as the letter in the first word.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. humid | 1. acid | 1. fine | 1. plant |
| 2. supply | 2. humid | 2. acidity | 2. parent |
| 3. sulphur | 3. impact | 3. alkalinity | 3. amount |
| 4. amount | 4. fine | 4. mixture | 4. starch |
| 5. manure | 5. time | 5. remains | 5. trace |
| 6. medium | 6. high | 6. simple | 6. water |
| 7. under | 7. variable | 7. minor | 7. leaf |
| 8. sunlight | 8. soil | 8. lime | 8. quantity |

**Exercise 2. Find out the words, in which the letter ,,a“ is read as in the model.**

change vary, greatly, animal, plant, sugar, range;

sustain variation, agriculture, contain chemical, maintain, cli­mate, quantity;

about heavy, bare, rain, adequate, matter, absorb.

**Exercise 3. Group the words, according to the rules of rea­ding the suffixes -tial, - cial (adjectives) and-ate (verbs).**

Accumulate, conditional, essential, aggregate, official, bene­ficial, differentiate, penetrate, partial, tolerate.

**Exercise 4. Give Russian equivalents to the following che­mical elements.**

Nitrogen, phosphorus, potassium, calcium, magnesium, sul­phur, iron, manganese, boron, copper, zinc, molybdenum, car­bon dioxide.

Сера, азот, кальций, молибден, фосфор, калий, железо, марганец, магний, медь, бор, цинк, двуокись углерода.

**Exercise 5. Translate the international words without a dictionary.**

Effect, adequate, form, process, to synthetize, energy, pho­tosynthesis, to neutralize, to classify, product.

**Exercise 6. Arrange synonyms in pairs.**

Amount, largerly,, adequate, range, humid.

Vary, quantity, greatly, sufficient, moist.

**Exercise 7. Arrange antonyms in pairs.**

Quality, acid, humid, small, major, directly.

Dry, quantity, large,minor, alkaline, indirectly.

**Exercise 8. Define the "meaning of the derivative words on the base of the known suffixes.**

to compose – composition – composing составлять – состав (-ление) – составляющий to decompose – decomposition – decomposing to cultivate – cultivation – cultivating to vary – variation – varying to classify – classification – classifying.

**Exercise 9. State what part of speech belong the following words to.**

Abundant, mineral, variable, finely, organic, accumulation, texture, physical, relationshipnature, consideration, generally, proportion, movement, moisture, sloping, essential.

**Exercise 10. Point out the sentences in which the verb ,,to be“ is an equivalent of the modal verb ,,must“.**

1. Soil is a highly organized physical, chemical and biolo­gical complex.
2. Nitrogen, calcium and phosphorus are taken by plants from soil.
3. This field is to be drained now because in winter it was waterlogged.
4. The study of soil structure here has been of great im­portance.
5. The climate is to be humid in this part of the country.
6. The soil of good structure is to be well drained and ae­rated.

**Exercise 11. Call the number of sentences in which the conjunctions „neither ... nor“ and „either ... or“ are to be used.**

1. ... silicon ... aluminium is essential for plant growth.
2. In the С horison (parent material) of the soil there are no remains ... plants ... animals.
3. ... subsoil ... parent material is fertile.
4. ... waterlogging ... overdrying is desirable for cultivation.
5. This land cannot be improved by ... drainage ... fertili­zation.
6. ... manure . . chemical fertilizers were not supplied un­der this crop last year.

**Exercise 12. Divide the sentences into the finished sense groups.**

1. Using energy from sunlight, the plant synthetizes starch and sugars from the water and the carbon dioxide by the pro­cess known as photosynthesis.
2. Since most agriculture is carried on in relatively humid climates, acidity is a troublesome and costly problem with ma­ny soils, so vast amount of lime are used to neutralize soil acidity.

**Exercise 13. Read the passage and write out the key-words.**

Any soil can be acid, alkaline and neutral. The soil beco­mes acid by absorbing carbon dioxide from the air and acid products from the decomposed mineral and organic matter. The soil is alkaline when its natrium reacts with carbonic acid and produces sodium. Neutral soil is neither acid nor alkaline.

**Exercise 14. Shorten the given passage to 1 sentence (Ex. 13).**

**Exercise 15. Hide the left part of the passage with a sheet and try to recall it from jour memory (Ex. 13)**

**TEXT A**

**Chemical and biological properties of soil**

Soils vary greatly in their chemical make-up. This variati­on is due to the chemical composition of the parent materials and to the climate and plant and animal life under which the soil developed.

Soils contain most, if not all, known elements in varying amounts and many forms. Nitrogen, phosphate, potash and li­me are the mineral substances needed in greatest amount by the growing plant. Other substances are needed also in much smaller quantities and it is usual to classify the essential plant nutrient elements as follows: 1) Major elements, or those nee­ded in relatively large amounts: nitrogen, phosphorus, potassi­um, calcium, magnesium, and Sulphur; 2) Trace or Minor ele­ments, or those needed in relatively small amounts: iron, man­ganese, boron, copper, zinc and molibdenum. A few other elements are taken up by plants with beneficial effects but do not seem to be essential for growth.

A growing plant needs an adequate supply of water, air

and sunlight. The plant absorbs water through its roots and carbon dioxide through its leaves. Using energy from sunlight it synthetizes starch and sugars from the water and the carbon dioxide by the process known as photosynthesis.

Soil conditions range from acidity to alkalinity. Acidity and alkalinity are directly opposite conditions of the soil. Neutral soils are neither acid nor alkaline. Soil water becomes acid by absorbing carbon dioxide from the air and by absorbing acid products formed by the decomposition of mineral and organic matter. In a broad sense, soils in humid climates tend toward acidity, whereas soils in dry climates tend toward alkalinity.

Most plants, particularly most cultivated crops, will not tolerate a high degree of either acidity or alkalinity. Since most agriculture is carried on in relatively humid climates, acidity is a troublesome and costly problem with many soils. Vast amounts of lime are used to neutralize soil acidity.

Most fertile soils are able to supply adequate amounts of nutrient elements except nitrogen, phosphorus, potassium and calcium, and it is usually necessary to supply these substances as manures or fertilizers.

**Questions**

1. Why do soils vary greatly in their chemical make-up?
2. What chemical elements does soil contain?
3. How is photosynthesis going on?
4. What soils do we call acid and alkaline?
5. Where do soils tend toward acidity?
6. How do plants tolerate acidity and alkalinity of the soil?
7. What are the methods of neutralization of soil acidity?

**Exercise 16. Translate in a written form.**

Почва – это природное тело с присущими ей характер­ными качествами. Почвой называют поверхностный слой зем­ли, который непрерывно развивается под воздействием био­логических, физических и химических процессов. Горная по­рода превращается в почву в результате выветривания и уменьшения ее частиц, а также жизнедеятельности растений и бактерий. Важнейшая черта почвы – плодородие. Плодо­родие – это способность почвы производить урожай расте­ний.

**ТEХТ B**

**Photosynthesis**

(Translate the text with the help of a dictionary).

In the daytime and especially in bright sunlight the assimilation of carbon dioxide from the atmosphere, where it is always present in small amounts, takes place. On the other side of a leaf are found numerous pores or stomata, leading into small internal cavities lined by the walls' of active living cells. The air containing carbon dioxide finds its way into these spaces and dissolves in the moisture in the cell walls. The green colouring matter in the cells, called chlorophyll, is able to utilize the energy of the sun‘s rays which fall upon it, to split up the compound carbon dioxide and build up the carbon so obtained into new substances of the nature of simple su­gars. At the same time the oxygen which has been split off is set free and finds its way, via the stomata, into the stomata, into the air once more.

It will be seen then that in the daytime a plant utilizes carbon dioxide from the atmosphere to build up its tissues more quickly than it produces that compound by respiration. The sugars produced are then distributed through the growing parts of the plant, and from them are elaborated many other com­pounds, mostly more complex, which play their part in the building up of its structure. Some of these compounds contain elements other than carbon, hydrogen and oxygen, the constituents of the sugars, and they are obtained from the soil by means of the root system.

**LESSON 4**

**Active vocabulary**

|  |  |  |
| --- | --- | --- |
| 1. impression | 2. to convey | 3. therefore |
| attempt | to stain | thereafter |
| content | to suggest |  |
| elaboration | to identify |  |

**Exercise 1. Point out the word, given at the beginning of the row.**

|  |  |  |
| --- | --- | --- |
| 1. content | 1. stain | 1.attempt |
| 2. context | 2. stair | 2.attach |
| 3. contempt | 3. staid | 3. attend |
| 4. content | 4. steal | 4. attire |
| 5. contend | 5. steam | 5. attract |
| 6. continue | 6. stem | 6. attack |
| 7. contour | 7. stain | 7. attain |
| 8. contract | 8. steel | 8. attention |
| 9. contrast | 9. steep | 9. attempt |

**Exercise 2. Point out the words, having the common stem with the word, given at the beginning of the row.**

|  |  |
| --- | --- |
| 1. convey | 1. identity |
| 2. convert | 2. indent |
| 3. conveyer | 3. indefinite |
| 4. convinient | 4. identical |
| 5. conveyance | 5. identification |
| 6. conventional | 6. indemnity |
| 7. converse | 7. indefinite |
| 8. conversation | 8. indentity |

|  |  |
| --- | --- |
| 1. impression | 1. suggest |
| 2. improve | 2. subject |
| 3. impress | 3. subjection |
| 4. impossible | 4. suggestion |
| 5. impressive | 5. suggestive |
| 6. improbable | 6. subjective |
| 7. impressionist | 7. subjugate |
| 8. impressible | 8. suggestional |

**Exercise 3. Form nouns out of the following verbs with the help of the suffix-tion and translate them.**

To suggest, to describe, to classify, to elaborate, to impress, to identify.

**Exercise 4. Translate the international words without a dictionary.**

Class, term, conception, basis, classification, per cent, hydration, concentration, aluminium oxide, practical, type.

**Exercise 5. In what sentence is the «Subjective Infinitive Con- struction» used.**

1. Heavy soils usually contain much clay.
2. Heavy soils are considered to contain much clay.
3. Heavy soil will contain much clay.

**Exercise 6. What English sentence coincides with the Russion «Считается, что темные почвы обеспечивают более высокую продуктивность».**

l. Dark-coloured soils are considered to produce higher productivity.

2. They consider that dark-coloured soils will be more productive.

**Exercise 7. What Russian sentence coincides with the English «Light soils are said to need less power to cultivate».**

1. Легкие почвы требуют меньших затрат труда на обработку.
2. Они говорят, что они затрачивают меньше труда на обработку легких почв.
3. Говорят, что легкие почвы требуют меньших затрат труда на обработку.

**Exercise 8. Fill in the blanks with the link-words, given below.**

1. Soil classification means giving various names, ... it serves to identify a particular class of soil.
2. In earliest times soils were classified according to their colour, … they were classified according to the texture of the «plow-layer».

(as, so, therefore, although, thereafter)

**Exercise 9. Read the passage, given below and answer the qutstion «Why are black soils not usually warm soils?»**

The colour of the soil has some influence on temperature. Black soils absorb heat, while light-coloured soils reflect heat. But black soils are not usually warm soils, because they are higher in clay content and therefore stay moist longer and warm up more slowly than light-coloured sandy soils.

**Exercise 10. Give the title to the passage in Ex. 9.**

**Exercise 11. Look at the title and key-words of the passage, retell its possible content in Russian. Then read the passage and define the correctness of your retelling.**

**The nature of soil constituents.**

Sand is produced largely from the physical disintegration of quartz. The grains vary in size, but even the finest are comparatively large in proportion to the size of clay particles.

Silt is composed mainly from quartz and felspars. The particles are intermediate in size between those of sand and clay.

Clay is extremely fine in texture, and represents the pro­duct of weathering of felspares and other minerals.

**TEXT A**

**Classification of soils**

Soil classification in its, essentials simply means giving various suitable names and descriptions, so that when these, particular terms are used they will convey a very definite meaning or impression, and so serve to identify a particular soil or class of soil.

The earliest attempts to classify soils were essentially elaborations of the farmer's conception of light, medium and heavy land; or sands, loams and clays. Thereafter, soils were classified upon the basis of their content of sand, silt and clay. The basis of the present classification is the loam, which con­tains very roughly 40 per cent sand, 35 per cent silt and 25 per cent clay. Soils with less clay and silt than the loam but more sand are called loamy sands and sandy loams, soils with more clay and less sand are clay loams and clays, and those with more silt and less sand are called silt loams.

In soil classification the texture of the surface soil seems more significant than that of deeper layers. Therefore, soils are usually classified according to the texture of a six-to eight inch thick surface layer, approximately the ,, plough layer.

Soils range in colour from white to black, but the most common colours are the different shades of red, yellow, and brown. These colours indicate the different degrees of hydra­tion and concentration of iron and aluminium oxides which stain the soil grains. Dark-coloured soils are considered to sug­gest higher productivity than light- coloured ones, though it is not always the case.

In practical farming the two main types of soil are light soils and heavy soils Light soils are easy to work, need less power to cultivate, can be worked at most times of the year, and do not hold water so much. Sands and gravels belong to this group. Heavy soils are more difficult to work, need much more power to cultivate, can only be worked at certain times when they are in the proper condition, and hold water. They are usually more productive and grow heavier crops. Heavy soils usually contain much clay.

**Questions**

1. What does soil classification mean?
2. What is the basis of the earliest attempts to classify soils?
3. How do we classify soils now?
4. Is the texture of the plow layer more significant in soil classification?
5. How do soils range in colour?
6. Why do they differ in colour?
7. In practical farming light and heavy soils are usually considered, aren‘t they?
8. What soils are more productive?
9. What kind of soil is more easy to cultivate?

**Exercise 12. Read a short summary of the text «Classification of soils» and fill in the blanks.**

Soils are classified according to the ... of loam in the «plough-layer» Soils ... in colour from white to black. Dark-coloured or … soils are considered to grow heavier crops, but they

are difficult to work … . … need less power to ... , but they

are usually less productive.

**LESSON 5**

**Active vocabulary**

|  |  |  |
| --- | --- | --- |
| 1. mould | 2. to stick | 3.friable |
| harrow | to bound | firm |
| sponge | to adjust | smooth |
| roll |  |  |
| seed-bed |  |  |

**Exercise 1. Find out the words, in which the stressed letter-combination is read not as in the other words of the row.**

|  |  |
| --- | --- |
| 1. bound | 1. grow |
| 2. plough | 2. yellow |
| 3. mould | 3. harrow |
| 4. amount | 4. brown |
| 5. about | 5. known |

**Exercise 2. Find out the words, in which the stressed let­ter is read as in the first word.**

|  |  |
| --- | --- |
| Sponge | Firm |
| crop | tillage |
| roll | disc |
| money | give |
| long | first |
| convey | their |
| content | friable |
| colour | silt |
| absorb | while |
| moisture | various |
| some | spring |
| lost | suitable |
| contain | provide |
|  | still |

**Exercise 3. Find out the words, given at the beginning of the row.**

|  |  |  |
| --- | --- | --- |
| 1. stick | 1. adjust | 1. friable |
| 2. thick | 2. agile | 2. tribal |
| 3. stink | 3. object | 3. floatable |
| 4. sting | 4. adjust | 4. treable |
| 5. stick | 5. adult | 5. flexible |
| 6. slick | 6. abjure | 6. tremble |
| 7. shift | 7. aglet | 7. trifle |
| 8. stiff | 8. about | 8. friable |

**Exercise 4. Find out the word or combination of words, uniting all the words of the following two lists.**

1. Ploughing, to roll, preparation, to harrow, to cultivate.
2. To stick, firm, smooth, fine, friable, crumb-structured. (Seed-bed, sponge, to adjust, tillage operations, mould).

**Exercise 5. State what part of speech belong the following words to and translate them.**

Adjustment, preventive, friable, suitable, deeply, percola­tion, respiration, beneficial, evaporation, satisfactorily, penetra­tion.

**Exercise 6. Find out the words, forming the family of the verb «to prevent».**

Previous, preventive, prevail, prevention, previously, pre­vented.

**Exercise 7. Find out the words with the negative prefixes, and give the word with the opposite meaning.**

Uncultivated, understood, produced, used, restored, ensured, varied, covered, absorbed, unprepared, evaporated, undivided.

**Exercise 8. Translate the international words.**

Practice, operation, interval, disc, minimum, effect, aeration, system, aerobic, bacteria.

**Exercise 9. Point the sentences with Participle II as an at­tribute.**

|  |  |
| --- | --- |
| Cultivated soil | Обработанная почва |
| Soil, cultivated properly | Почва, обработанная правильно |

1. The implement chosen will give the desired effect
2. He has chosen the proper implement.
3. Deeply ploughed soil is said to be good moistered by winter rains.
4. This soil is to be deeply ploughed in autumn.
5. Finely divided crumb structure keeps any rain in the upper layers.
6. The soil on this seed-bed was finely divided by disc harrows.
7. The water absorbed influences the soil temperature.
8. Large amounts of heat are absorbed in the evaporation of moisture from the soil.

**Exercise 10. Translate the attributive word-combinations, remembering that the main word in such group is the last one and all the previous words are its attributes.**

Tillage operations, soil temperature, moisture control, soil moisture content, winter rains, land surface, ,,plow layer, land surface, six-inch thick surface layer, water percolation, crumb structure, seed germination, soil aeration, plant respiration, plant root system.

**Exercise 11. Join the pairs of sentences with the help of conjunctions.**

1. The soil particles become stuck together. The friable structure of the seed-bed is lost.
2. The land is deeply cultivated in autumn. Winter rains may easily penetrate.
3. The winter rain will cause the soil «to run together». The surface is left smooth in autumn.
4. A finely divided crumb structure acts like a sponge. It keeps any rain in the upper layers.
5. Some crops need a fine firm seed-bed. With others only sufficient fine mould ensures covering the seeds.
6. Tillage is bound with adjustment of soil moisture to the needs of crops. The control of soil moisture is of great im­portance.
7. Soils which are wet in spring are cold. Water absorbs much heat in warming up.

(that is why, thereafter, while, if, therefore, since, so, so as, in order to, because, that, which).

**Exercise 12. Read the passage and write out the key-words.**

The practice of field drainage is almost as old as that of agriculture itself. A proper supply of moisture is essential to the successful growth of crops. The problem is to preserve the best possible balance between the soil conditions and plant growth, to ensure an equable and constant supply of water and to avoid the presence of an excess. Left to herself nature produces a balance between soil conditions and plant growth which is a reasonable optimum for the seasonal cycle of the weather.

Answer the question: «What is field drainage used for?» Say, in what sentence the main idea of the passage is expres­sed.

**Exercise 13. Look at the title of the passage and define its possible content.**

**Disadvantages of wet land**

Wet land is late land. One of the main objects of field drainage is to remove this disability. Fields which lie wet in winter are slow to dry and warm up in spring. Implements cannot be got on to them soon enough. Cultivations are late and their results are less satisfactory. In the development of crops the early: stages of growth are of great importance. On this growth soil temperature has a potential influence. Its response to increasing sunshine in spring is greatly influenced by drainage conditions.

Rewrite the passage, combine simple sentences into complex- one.

Hide the left part of the passage with a sheet of paper and try to restore it in your memory.

**TEXT A**

**Tillage. Part 1**

Tillage is the practice of working the soil with implements in order to provide conditions favourable to the growth of crops.

When soils are left uncultivated for long periods, the soil particles become stuck. together, the air spaces become small, and the friable structure of the soil is lost. In such conditions it is impossible to sow seeds satisfactorily, and tillage imple­ments must first be used to restore a tilth favourable to the crop. The tilth required and the implements used vary accor­ding to the type of crop, some crops needing a fine firm seed­bed, while others do best where there are clods, and only sufficient fine mould to ensure covering the seeds.

In the preparation of seed-beds, ploughing is usually, but not always, the first tillage operation. There may be a consi­derable interval before the next operation, but later on the land is generally cultivated by one or more of the implements, by disc harrows, by rolls, etc. You must choose those imple­ments which will give you the desired tilth with minimum of effort.

Tillage is concerned in many respects with adjustment of soil moisture content to the needs of the crop. For example, the land may be deeply cultivated and left rough at the sur­face in autumn, so that winter rains may easily penetrate. On some soils, if the surface is left too fine and smooth in autumn, the winter rains will cause the soil to «run together» on the surface and prevent the percolation of water.

On the other hand, at seeding time in spring it is often necessary to produce at the surface a finely divided crumb structure which will act like a sponge and keep any rain that falls in the upper layers, so that the seed will germinate.

Aeration of the soil, like many other effects of tillage, is still not perfectly understood. It is well known that oxygen is required for the germination of seeds, the respiration of plant root systems and the activity of beneficial aerobic bacteria in the soil.

Soil temperature is closely bound up with soil moisture.

Soils which are wet in spring are cold because water absorbs much heat in warming up, while large amounts of heat are absorbed in the evaporation of moisture from the soil.

**Exercise 14. Divide the text into two logically finished parts and say what of them can you entitle as:**

1. The control of soil moisture, aeration and temperature.
2. The production of tilth.

**Questions**

1. What do we understand under the practice of tillage?
2. Why is it undesirable to leave soil uncultivated for long periods?
3. How do the tilth and the implements vary according to the type of crop?
4. What operations are used in the preparation of seed-beds?
5. How does moisture influence the production of tilth?
6. What is known about aeration of the soil?
7. Why is soil temperature closely connected with soil moisture?

**TEXT В**

**Field drainage**

Soils which are perennially water-logged are structureless, their subsoils in particular are tight-packed, and the water in them is stagnant. Soils which are seasonally water-logged, such as clay land and heavy land in general, have the same disabi­lities except that the summer, especially in droughty years, causes substantial drying-out from the surface downwards The effect of this becomes evident in the shrinkage, racking and structuring of the soil mass the agreggation of the soil partic­les into larger units, and the appearance in the soil of a sys­tem of larger interspaces than were there before. This is the essence of permeability.

Clay land drains better after a dry year than after a wet one. In drainage one thing leads to another.

The removal of stagnant surplus water allows root systems to develop in greater depth. The simultaneous improvement in soil structure and permeability also helps, the pore space is increased and aeration benefits accordingly. At the same time, in spite of the removal of much water, the amount of moisture available to the growing plant is substantially increased becau­se the roots can derive their supply from a much greater depth of soil, in much more healthy conditions.

**LESSON 6**

**Active vocabulary**

|  |  |  |
| --- | --- | --- |
| 1. rubbish | 2. to bury | 3. subsequent |
| drill | to drag |  |
| tine | to expose |  |
| hoe | to combat |  |
|  | to incorporate |  |
|  | to interfere |  |

**Exercise 1. Find out the word, in which the vowel is read as in the first word of the row.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. friable | 1. stick | 1. harrow | 1. expose |
| 2. tillage | 2. wild | 2. manure | 2. sponge |
| 3. rubbish | 3. drill | 3. combat | 3. convey |
| 4. tine | 4. design | 4. almost | 4. roll |
| 5. firm | 5. quite | 5. vary | 5. hoe |
| 6. kill | 6. soil | 6. drag | 6. crop |

**Exercise 2. Point out the words, in which the letter ,,u“ is read not as in all the other words of the row.**

Rubbish, adjust, crumb, must, bury, structure, subsequent, substitute, suggest, surface, but, stuck, run, distruction, upper, much, understand, cultivate.

**Exercise 3. Find out all the forms of the word, given at the beginning of the row.**

|  |  |  |
| --- | --- | --- |
| 1. combat | 1. incorporate | 1. interfere |
| 2. combine | 2. incorrect | 2. interfuse |
| 3. combative | 3. incorporeal | 3. internal |
| 4. combination | 4. incorporated | 4. interference |
| 5. combatant | 5. inconvenient | 5. interfered |
| 6. combustion | 6. incorporating | 6. interject |
| 7. content | 7. increase | 7. interested |
| 8. combustible | 8. incorporative | 8. interdict |
| 9. condition | 9. incorporation | 9. entirely |
| 10. convey | 10. incubation | 10. interfering |

**Exercise 4. Define the meaning of the unknown derivative nouns on the basis of the known suffix-tion.**

Exposition, incorporation, destruction, creation, germination, vegetation, distribution, implementation, satisfaction, operation, combation.

**Exercise 5. Find the English word, uniting all the Russian words, according to their meaning.**

Вероника, овсюг, лисохвост полевой, мак, пырей ползучий.

**Exercise 6. Define, what part of speech (verb or noun) belongs the stressed word to. Translate the sentences.**

1. In order to kill the annual weed you are to drag them out.
2. A drag is known to be the most effective implement in the combat with annual weeds.
3. Perennial weeds need to be combated by special methods.
4. Rubbish on the surface of the land would interfere with the action of drills and hoes.
5. The farmer hoed the soil before planting the seeds.
6. This planting machine not only drills the seeds, but also distributes fertilizer along the rows of the crop.

**Exercise 7. Point out the sentences in which the verb «to make» is used in the meaning of „делать and in which – «заставлять».**

1. Certain conditions of the soil make weed seeds to germinate.
2. Autumn cleaning makes it possible to germinate the seeds of annual weeds.
3. Well-planned use of chemical herbicides has made it practicable to do without any cultivation.
4. Very often only weed control makes the farmer to use intercultivation of root crops.

**Exercise 8. Arrange synonymous words and word-combinations into pairs.**

Subsequent, tined, drag, to interfere, intercultivation, to combat, to destruct, moist, covered by the soil, drill, chief, to incorporate, to change.

Main, planting machine, to unite, following, sharpened, wet, to kill, tillage between the rows, to resist, to prevent, harrow, after, to substitute, buried.

**Exercise 9. Translate the attributive word-combinations.**

Crop-remains, weed destruction, drill action, well-planned use, weed control, soil pests, bird attacks, soil conditions, annual weed seeds, plant growth, root-crops, intercultivation, manure.

**Exercise 10. Say what English sentence corresponds to the Russian:**

Мы бы уничтожили сорняки в стадии прорастания.

1. We shall destroy weeds at the seedling stage.
2. He has already destroyed weeds at the seedling stage.
3. We should destroy weeds at the seedling stage.

Они бы уничтожили сорняки полностью, зарывая их.

1. They would kill the weeds by completely burying them.
2. They‘11 kill the weeds by completely burying them.
3. They have killed the weeds by completely burying them.

**Exercise 11. Look at the pairs of sentences and point out the one, in which the Subjunctive Mood is used. Translate them.**

|  |  |
| --- | --- |
| Фермер заставил бы семена растений прорасти. | The farmer should make plant seeds germinate. |
| Они бы уничтожили сеянцы до того, как сеять культуру. | They would destroy the seedlings before the crop is sown. |
| Требуется, чтобы вся расти­тельность покрывалась почвой. | It is required that all vegetation should be covered by soil. |
| Остатки культуры должны быть зарыты, чтобы мусор не мешал последующей обработ­ке. | Crop remains must be buried in order the rubbish would not interfere with subsequent cultivation. |

1. Cultivator would mix fertilizer with soil. Cultivator mi­xed fertilizer with soil.
2. You have substitute tined implements for ploughs. You should substitute tined implements for ploughs.
3. It is necessary that the weeds should be destroyed comp­letely. They will destroy the weeds completely.
4. Special methods are required in order perennial weeds would be combated. Perennial weeds need to be combated by special methods.

**TEXT A**

**Tillage. Part II**

Weed destruction is one of the most important of all the objects of tillage, and the methods employed vary widely ac­cording to the type and condition of both soil and weeds. Annual weeds can be killed by completely burying them, or by dragging them out and leaving the roots exposed in dry weather. Most weeds are quite easily destroyed in the seed­ling stage, and one more object of tillage is to create soil conditions which will make weed seeds germinate, so that the seedlings may be destroyed by subsequent cultivations before the crop is sown. One of the objects of autumn cleaning is to germinate the seeds of such weeds as speedwells, wild oats, black grass, poppy, etc.

Some perennial weeds, such as couch grass, need to be combated by special methods.

Many experiments on the inter-cultivation of root crops show that benefits of tillage between the rows are almost enti­rely due to weed control.

Crops remains and farmyard manure must be buried in or­der that the organic matter may be incorporated in the soil, and that the surface of the land may be cleaned of rubbish which would interfere with the action of drills and hoes. The plough is usually used for burying rubbish and one of the chief requirements of good ploughing is that all vegetation should be effectively covered by soil. Well-planned use of chemical herbicides has made it practicable to substitute tined implements for ploughs, or even to do without any cultivation.

Cultivators and harrows are often used for mixing fertilizers with the soil before crops are sown. In other cases drills and planting machines are so designed as to distribute the fertilizer in baunds alongside the rows of the crop.

While tillage sometimes react directly on soil pests by ex­posing them to the attacks of birds, by drying them out, or by crushing them, it is more generally employed to resist pest attacks indirectly, by improving conditions for plant growth.

**Questions**

1. How do the methods of weed destruction vary?
2. What are the methods of annual weeds combat?
3. When can most weeds be quite easily destroyed?
4. What is the object of autumn cleaning?
5. Why must crop remains and farmyard manure be buried?
6. What is the chief requirement of ploughing?
7. What are the benefits of well-planned use of herbicides?
8. How are fertilizers mixed with soil?
9. How is the control of soil pests practised?

**Exercise 12. Divide Text A into three logically finished parts and say which of them you can entitle as:**

1. The control of soil pests.
2. The distruction of weeds.
3. Burying rubbish and incorporating manures in the soil.

**Exercise 13. Look through the two parts of the text „Tillage" and write down a plan, illustrating the main objects of the concept of tillage.**

**Exercise 14. Translate the last passage of the text and compare with the translation given below.**

В то время как иногда обработка ночвы воздействует на почвенных паразитов, непосредственно подвергая их налетам птиц, высушивая или раздавливая их, она более часто ис­пользуется для того, чтобы противостоять нападениям пара­зитов косвенно, путем улучшения условий для роста расте­ний.