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FUNDAMENTALS OF AGRONOMY IN ENGLISH

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ОСНОВЫ АГРОНОМИИ НА АНГЛИЙСКОМ ЯЗЫКЕ

Учебное пособие

Учебное пособие содержит сведения, необходимые для формирования универсальных и общепрофессиональных компетенций при подготовке бакалавров, магистрантов и рекомендуется Федеральным УМО в системе ВО по укрупненной группе специальностей и направлений подготовки 35.00.00 Сельское, лесное и рыбное хозяйство

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Цель пособия – формирование у обучающихся практических умений и навыков, необходимых для чтения специализированной литературы, устного и письменного общения в сфере профессиональной коммуникации на английском языке.

В издании, подготовленном в соответствии с Федеральным государственным образовательным стандартом, учтены особенности преподавания иностранного языка в неязыковых вузах.

Учебное пособие рассчитано на 50 часов аудиторной работы.

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The purpose of the manual is to form students' practical skills and abilities necessary for reading specialized literature, oral and written communication in the field of professional communication in English.

The publication, prepared in accordance with the Federal State Educational Standard, takes into account the peculiarities of teaching a foreign language in non-linguistic universities.

The textbook is designed for 50 hours of classroom work.

It is intended for bachelor students studying under the Federal State Educational Standard in the areas of 35.03.04 "Agronomy", 35.03.03 "Agrochemistry and Agrosoil Science", 19.03.01 "Biotechnology", 35.04.04 "Agronomy", 35.04.03 "Agrochemistry and Agrosoil Science", 19.04.01 "Biotechnology"

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Предисловие

Данное учебное пособие предназначено для студентов 1 курса бакалавриата и содержит текстовые и аудио-видео материалы по основам агрономии, растениеводства, селекции, почвоведения и смежным темам, а также лексико-грамматические задания, направленные на развитие навыков чтения и перевода специальной литературы, аудирования и устной речи для подготовки к профессиональному общению на иностранном языке.

Данный материал служит важным инструментом для создания требуемого лексического запаса для перевода научных текстов с английского языка на русский и с русского на английский, а также для устной и письменной коммуникации в будущей научной и академической деятельности студентов.

Учебное пособие состоит из 21 раздела (Units), каждый из которых состоит из двух уроков (Lessons) и включает материал как для самостоятельной, так и для аудиторной работы. Количество и последовательность выполнения заданий определяется преподавателем в зависимости от уровня владения иностранным языком в группе.

Структура разделов:

I. Урок №1 включает грамматические и предтекстовые упражнения с использованием знакомой лексики, изучение новых терминов, перевод текста А. Далее следуют упражнения на новый грамматический и лексический материал, контроль чтения и перевода текста А, ссылки на аутентичные аудио- и видеоматериалы для отработки лексики.

II. Урок №2 включает в основном упражнения по закреплению новой лексики и задания по смысловой обработке текстов, в том числе, без словаря.

В упражнениях на перевод и смысловую обработку текстов раздел «а» предназначен для начинающих групп, раздел «б» – средних и продолжающих. Для средних и продолжающих групп возможно дополнить задания к уроку пересказом текста А, подготовкой сообщения или презентации на смежную тему с использованием новых лексических единиц.

Задания по смысловой обработке аутентичных видеоматериалов предназначены для средних и продолжающих групп.


ОГЛАВЛЕНИЕ

UNIT 1.....	5
UNIT 2.....	14
UNIT 3.....	21
UNIT 4.....	33
UNIT 5.....	42
UNIT 6.....	50
UNIT 7.....	58
UNIT 8.....	68
UNIT 9.....	76
UNIT 10.....	84
UNIT 11.....	91
UNIT 12.....	98
UNIT 13.....	105
UNIT 14.....	112
UNIT 15.....	118
UNIT 16.....	124
UNIT 17.....	130
UNIT 18.....	136
UNIT 19.....	146
UNIT 20.....	157
UNIT 21.....	165

UNIT 1. CROP

In this unit you will learn:	Grammar focus: - Verb Forms. Tense forms of verbs (revision). - Nouns in Common Case Used as Attribute to Noun. - Construction <i>to be + of + noun</i> . - Word meaning <i>some, the same</i> . - Correlative conjunctions: <i>either ... or, both ... and</i> . Vocabulary focus Reading and comprehension focus: - Text A. Crop production. - Text B. Crop varieties. Listening and speaking focus
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Grammar Focus



Verb Forms:

Simple – Past – Participle II – Participle I

e.g. ask – asked – asked – asking
 speak – spoke – spoken – speaking.

Tense forms of verbs (revision).

Таблица временных форм глагола в действительном залоге (Active Form)
 (на примере правильного глагола)

	Indefinite/Simple (to ask)	Continuous (to be asking)	Perfect/ (to have asked)
Present	Ask Asks (he, she, it)	Am } Is } asking Are }	Have } Has } asked
Past	Asked*	Was } were }	Had } asked
Future	Will } Shall* (I, we) } ask	Will } Shall } be asking	Will } Shall } have asked

*shall – устаревая форма выражения будущего действия для глаголов в 1 лице; встречается в современной научной литературе.

Таблица временных форм глагола в страдательном залоге (Passive Form)
 (на примере правильного глагола)



Passive Forms:

To be в соответствующем времени + причастие II

	Indefinite/Simple (to ask)	Continuous (to be asking)	Perfect (to have asked)
Present	Am Is are } asked	Am Is asked Are } being	Have asked Has } been
Past	Was were } asked	Was asked were } being	Had been asked
Future	Will Shall } be asked	–	Will Shall } have been asked

Сказуемое в действительном залоге показывает, что действие, обозначенное им, **выполняется лицом или предметом, обозначенным подлежащим** данного предложения.

In summer many students **work** Летом многие студенты **работают** на фермах.
on farms.

We **have increased** the yield of Мы **повысили** урожай
some crops. некоторых культур.

Сказуемое в страдательном залоге показывает, что **лицо или предмет, обозначенный подлежащим, испытывает на себе действие**, обозначенное сказуемым.

Higher yields **were obtained** В прошлом году **были**
last year. **получены** более высокие
урожаи.

Many new crop varieties **have been developed** by Много новых сортов культур
выведено работниками
agriculturists. сельского хозяйства.

Nouns in Common Case Used as Attribute to Noun

Существительное в функции определения

Если употребляются подряд два и более существительных без предлогов, образуя так называемую «цепочку существительных», то все предшествующие существительные являются определениями к последнему в «цепочке». В русском языке существительному в функции определения может соответствовать либо прилагательное (university library – университетская библиотека), либо существительное в родительном падеже (crop yield – урожай

2. Determine by suffix the part of speech the following international words belong to, and give their Russian equivalents.

1. tradition, traditional, traditionally;
2. nature, natural, naturally, naturalist;
3. experiment, experimental, experimentally;
4. popularity, popularly, popularization;
5. region, regional, regionally;
6. geography, geographical.

3. Give the dictionary form of the following words.

1. Smallest, harvested, higher, developing, economically.
2. Greater, planting, cultivated, differently, traditional.
3. Producing, provided, agricultural, constantly, better.



Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

Agriculture, crop, to grow, to harvest, farm, land, yield, plant, planting, food, cultivation, practice, cultural practice, variety, to develop, to depend (on), to increase, to improve, quality, to produce, to provide, different, some, the same, either ... or, both ... and, as ... as, as.



4. Read and translate text A.

Text A

Crop production

Crops are plants which have been carefully selected and developed by man. They produce food for people and animals. In all countries of the world crop production has been and will always be an important branch of economy.

There are different practices of crop cultivation on farms, and it depends on many factors **in what way*** the crop should be grown and harvested. But the aim is always **the same***: to produce high yields of farm crops as economically as possible. This is of great importance nowadays, as the world population is constantly growing **at a rapid rate***. Agriculturists of all countries must solve the problem how to provide the increasing supplies of high-quality food for people.

Food production can be raised in two ways: either by cultivation of new lands or by the increase in yields on **the same*** agricultural area. In traditional agriculture the first way was more popular. Nowadays yield increases are mostly obtained by introduction of new and improved varieties, by better use of fertilizers, better control of pests and diseases, chemical weed control. Yields may also be increased by application of improved cultural practices, irrigation and drainage, by rapid improvements in mechanization of such operations as seedbed preparation, planting, harvesting, and storage. In **some*** cases a combination of these factors is necessary.

These methods of yield increases have been developed both from the achievements of natural and biological sciences and from practical experience and experiments.

Notes to the text

***in what way** – как, каким образом;

***at a rapid rate** – быстрыми темпами.

***some** – какой-то, несколько

***the same** – тот же самый

Grammar and vocabulary activities

5. Identify the voice of the predicate in the following sentences.

1. Next year this farm will produce more high quality food products.
2. Last year our biologists produced some improved crop varieties which are of great importance for agriculture.
3. In this area, higher yields are produced by application of improved irrigation practices.
4. Next year more fertilizers will be produced in our country.
5. Our farm produces food products of high quality;
6. Some new chemicals for control of pests have been produced.
7. Many years ago higher yields were produced by cultivation of new lands.
8. Our industry has produced farm machinery for mechanization of different agricultural processes.
9. New machines for drainage are being produced in many countries.

6. Identify in which sentences the action refers to: a) **the present**; b) **the past**; c) **the future**. Translate the sentences from English into Russian.

1. Many improved crop varieties have been developed in our country.
2. This variety was developed some years ago.
3. Our agronomist is working at a very important problem.
4. Yields are often increased by application of fertilizers.
5. Many years ago higher yields were mostly obtained by cultivation of new agricultural areas.
6. We shall begin a new experiment on our farm next month.
7. Different methods of yield increases are used in agriculture.
8. These areas will be irrigated next week.
9. We do not use drainage in this area.
10. Last spring farmers used more fertilizers than this year.
11. We have greatly raised food production in our area.
12. Intensive methods of crop growing are being developed now.

13. Agriculture supplies people with food products.
14. Crops may be grown by different methods.
15. Not all operations of crop cultivation have been mechanized.
16. There are many problems in agriculture which should be solved.
17. Achievements of biology are used on many farms.
18. New methods of weed control have been used on this farm, and good results have been obtained.

Comprehension activities

7. In text A find the sentence that talks about two ways of increasing yields.

8. Answer the following questions to text A.

1. Why is crop production important for man?
2. What is the most important aim of all agriculturists now?
3. How can crop production be increased?
4. In what way are higher yields obtained nowadays?
Is the development of natural sciences important for agriculture?

9. Continue the statements.

1. Crops are plants which ...
2. They produce ...
3. In all countries of the world an important branch of economy is ...
4. Different practices of crop cultivation on farms depend on ...
5. The aim of crop cultivation is ...
6. As the world population is constantly growing at a rapid rate, this is of ...
7. Agriculturists of all countries must solve ...
8. Food production can be raised in ...
9. In traditional agriculture ...
10. Nowadays yield increases are mostly obtained by ...
11. Yields may also be increased by ...
12. These methods of yield increases have been developed both ...

Listening and Speaking Focus

10. Watch the video. Try to understand as much as you can, take notes and write down the words and phrases related to this lesson.

Food Crops <https://www.youtube.com/watch?v=HwI7A6g196A>

11. Answer the following questions.

1. What crops that you know are mentioned in the video?
2. What is Irish potatoes?
3. What country is the speaker from?



LESSON 1.2. CROP VARIETIES



Grammar and vocabulary activities

1. Translate the following sentences with the construction “to be + of + noun”.

1. This method of crop selection is of great interest.
2. Fertilizers are of great value in such areas.
3. The increase in food production is of great importance for all countries.
4. This farm machine is of great use on our farm.

2. In the following sentences, use *as ... as*, *both ... and*, *either ... or*, *such as*, *as*. Translate the sentences.

1. ... practical experience ... the results of experiments are very important for the development of agricultural science.
2. Yields may be increased ... by cultivation of new areas ... by more intensive use of the same land.
3. It is important to increase the supplies of food products in our country... rapidly ... possible.
4. You must use ... chemical ... biological weed control.
5. This area was irrigated ... often ... it was necessary.
6. In this area combination of ... cultural practices ... introduction of improved varieties, application of fertilizers, and irrigation has been used.
7. These crops should be cultivated in this area ... they are used as food for animals on many farms.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Выращивание с.-х. культур – важная отрасль экономики.
2. С.-х. культуры используются как пища для человека и животных.
3. Урожай с.-х. культур должны быть выше.
4. В прошлом урожай повышался путем возделывания новых земель.
5. Сейчас урожай повышаются путем более интенсивного использования с.-х. площадей.

6. Для повышения урожаев используются достижения естественных наук и биологии.

7. Многие с.-х. операции уже механизированы, многие будут механизированы в ближайшие годы.

b)

1. Выращивание с.-х. культур – важная отрасль экономики, так как эти культуры дают пищу для человека и животных.

2. В настоящее время население во всем мире увеличивается.

3. С. х. должно обеспечивать всех людей высококачественными продуктами питания.

4. Цель работников с. х. всех стран одна и та же – повышать урожай с.-х. культур.

5. Урожайи могут быть повышены либо путем возделывания новых с.-х. площадей, либо путем более интенсивного использования земли.

6. В настоящее время более популярна вторая путь.

7. Внедрение улучшенных сортов, использование удобрений, борьба с сорняками и вредителями имеют большое значение для повышения урожаев.

8. Многие с.-х. операции механизированы.

9. Использование достижений биологической науки является важным фактором в повышении урожаев с.-х. культур.



4. Fill in the gaps with the word *some* where necessary.

1. Our agronomist has developed ... new crop varieties.

2. The increase in yield has been obtained by the ... methods as last year.

3. ... harvest operations are not mechanized on our farm.

4. Irrigation is of great importance in ... areas.

5. Agriculturists of different countries may have the ... problems.

6. The world population is not the ... now as it was ten years ago.

7. Drainage is not necessary on ... farms.

8. ... fertilizers may greatly increase the yields.

5. Translate the following word combinations with nouns in the common case used as attribute to the other noun.

Plant organism, animal products, food supplies, crop variety, weed control methods, drainage and irrigation practices, crop production factor, high quality food products, world population increase.



6. Translate from Russian into English. Complete the task in written form using the following words: *experiment, to plant, to develop, problem, experience, practice, plant cultivation, increase, to increase, control.*

1. У нас большой опыт в выращивании этой культуры.

2. В сельском хозяйстве используются химические и биологические методы борьбы с вредителями растений.

3. Возделывание улучшенных сортов – одна из важных задач нашего сельского хозяйства.

4. Последний опыт по выведению нового сорта этой культуры дал положительные результаты.

5. Увеличение урожая было достигнуто благодаря применению новых приемов выращивания данной культуры.

6. Очень важно посеять пшеницу вовремя.

7. Это растение требует много влаги.

8. В этом году нам удалось значительно повысить урожай зерновых.



8. Read and translate text B without a dictionary. Identify the meaning of the words in bold according to their Russian equivalents and to the context.

Text B **Crop varieties**

Crop production depends on different factors. Many of them cannot be controlled by man, but some of them can.

One of the important factors of high crop production depending on the farmer is **selection** of the best varieties. The most popular varieties for the area are those which produce high yields of high-quality product. These varieties should also be **resistant** to pests and diseases which are often a problem in many regions.

Information on the most important crops grown in the area may be obtained from **regional experiment stations**. They inform farm agronomists about yields, quality, disease resistance and other characteristics of different varieties. On the **base** of such information the agronomists select the varieties for their farms.

But as it is not possible to select **ideal** varieties, much work is done on their improvement. The aim of such improvement is development of a variety with combination of all the necessary characteristics.

Comprehension activities

9. Based on the contents of text B, tell us what are the main properties of crops to consider when selecting varieties for cultivation.

10. Formulate briefly the main idea of text B. Prepare a summary of text B in English.

Listening and Speaking Focus

11. Watch the video. Try to understand as much as you can, take notes and write down the words and phrases related to this lesson. Say what the main idea of the video is.

What are food crops? <https://www.youtube.com/watch?v=rCGPE6Y4m90>

12. Answer the following questions.

1. What are food crops?
2. What are wild plants?
3. What are non-food crops?
4. Give examples of each crop.
5. What is a nuisance plant?




13. Work in pairs or in a group. Discuss what factors are of the greatest importance in increasing yields of food crops? You may surf the Internet and find more details related to the topic of this unit, e.g. *Factors that influence crop yield* <https://www.fertilizer.co.za/en/public-relations/news/2017/259-factors-that-influence-crop-yield>

UNIT 2. CROP PLANTS AND ENVIRONMENT

<p>In this unit you will learn:</p>	<p>Grammar focus:</p> <ul style="list-style-type: none"> - Tense forms of verbs (revision). - Uses of Passive Voice Peculiar to English. - Degrees of Comparison of Adjectives and Adverbs (revision). - Word ‘as’; constructions with ‘as’. - Word ‘most’. <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Crop plants and environment. - Text B. Plants in ecosystem. <p>Listening and speaking focus</p>
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Grammar Focus

Таблица временных форм глагола в страдательном залоге (Passive Form)
(на примере неправильного глагола)



Passive Forms:
To be в соответствующем времени + причастие II

<p>Indefinite/Simple (to grow)</p>	<p>Continuous (to be growing)</p>	<p>Perfect (to have grown)</p>
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Present	Am Is are } grown	Am Is Are } being grown	Have Has } been grown
Past	Was were } grown	Was were } being grown	Had been grown
Future	Will Shall } be grown	—	Will Shall } have been grown

В английском языке сказуемое в страдательном залоге употребляется шире, чем в русском языке. Поэтому часто английскому предложению со сказуемым в страдательном залоге будет соответствовать русское предложение, в котором сказуемое употреблено в действительном залоге. При этом подлежащему английского предложения в русском предложении будет соответствовать дополнение.

I was given an interesting book last week. На прошлой неделе мне дали интересную книгу.

The agronomist is often asked about new high yielding varieties. Агронома часто спрашивают о новых высокоурожайных сортах.

Обратите внимание на глаголы, которые в русском языке требуют после себя предлога, а в английском – нет. Эти глаголы часто употребляются в страдательном залоге.

To influence

To affect

To follow

Spring **is followed** by summer.

The growth of plants **is influenced** by environmental conditions.

Влиять (на)

Воздействовать (на)

Следовать (за)

За весной **следует** лето.

На рост растений **влияют** условия окружающей среды.

Grammar Practice

Identify sentences with the predicate in the Passive:

1. Plant development is influenced by temperature conditions.
2. A new club has been built on our farm.
3. Planting should follow the seedbed preparation.
4. Progressive methods of crop production will influence the yields.
5. Crop improvement practices should be followed by higher yields.

Grammar Focus



Degrees of comparison Степени сравнения прилагательных Adjectives

	Положительная	Сравнительная	Превосходная
Односложные	strong – сильный clever – умный fast – быстрый	stronger – сильнее cleverer – умнее faster – быстрее	the strongest – самый сильный the cleverest – самый умный the fastest – самый быстрый
Многосложные	useful – полезный rapid – быстрый beautiful – красивый	more useful – полезнее more rapid – быстрее more beautiful – красивее	the most useful – самый полезный the most rapid – самый быстрый the most beautiful – самый красивый
Исключения	good – хороший bad – плохой little – маленький/мало many/much – много	better – лучше worse – хуже less – меньше more – больше	the best – лучший /наилучший the worst – худший/наихудший the least – наименьший the most – наибольший

LESSON 2.1 CROP PLANTS AND ENVIRONMENT

Grammar and vocabulary activities

1. Translate the sentences from English into Russian, pay attention to the voice of the predicate, guess the meaning of the words in bold:

- Our farm has been given some new crop varieties.
- The agronomist was asked about the methods of **weed control** which are used on the farm.
- The biologist will be shown the results of our **experiments**.
- Many important problems are being solved by **agriculturists** of different countries.
- Last week our farm was visited by a group of specialists in plant diseases.

2. Use the verb in brackets in the appropriate form.

- Nowadays crop production (to increase) mostly by the use of improved cultural practices.
- This plant (to grow) well on our farm.
- All crops (to plant) and (to harvest) by farm machines on this farm.
- Agriculturists of all countries (to work) much at the development of improved crop varieties.
- High yields (to obtain) last summer.
- Next year more food products (to produce).
- Farms of our area (to raise) the yield of the most important food crops.
- Many new achievements of biology (to use) in agriculture.

3. Form degrees of comparison from the following adjectives:

warm, favourable, small, necessary, good, little.

4. Determine by suffix the part of speech the following words belong to: environmental, condition, relatively, development, respiration, erosion, environment, useful, uniformly, importance, chemist, evolution, special, productive, culture, selection, combination, warmer, practical, mechanization, botanist, irrigation, temperature, favorable, growth.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

barley, corn, cotton, oats, potatoes, red clover, rye, wheat, sugar beets, small grains, grass, area, soil, climate, air, light, growth, growing season, humidity, environment, conditions, under conditions, to require, to influence, to supply, favourable, development, average, to affect, most, as, as well as.



5. Read and translate text A.

Text A

Crop plants and environment

The conditions in which an organism lives are known as environment.

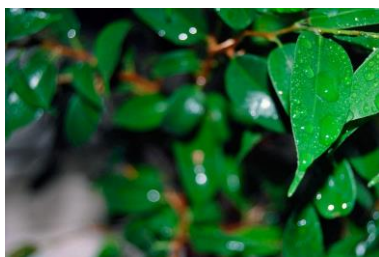
All plants require favourable environmental conditions for their better growth and development. Crops that are not well adapted to the region where they are cultivated will not produce high yields.



In crop selection climate is the most important environmental factor. The crops which grow best under relatively cool or moderate conditions¹ include wheat, oats, barley, rye, potatoes, sugar beets, red clover, and many grasses. Corn, cotton, sorghum, rice, soybeans do best² under warmer conditions.

Crops also differ in the length of the growing season required for the optimum development. A frost-free period³ less than 125 days is unfavourable for most crops.

Another factor influencing the growth of plants is humidity that is why⁴ the average annual rainfall is a very essential characteristic of an area.



Light is necessary for photosynthesis – the process by which plant food is manufactured. Life processes of many plants are influenced by the relative length of day and night. Long-day plants require long days for their better growth, while short-day plants produce flowers and fruit: when the days are short. Most small grains belong to the group of long-day crops, among short-day crops are corn, sorghum, rice, millet, and soybeans. There are also crops which are not affected by the length of day, these are cotton, sunflower, and buckwheat.

Air is an important environmental factor, too. It supplies carbon dioxide for plant growth and oxygen for respiration as well as for chemical and biological processes in the soil.



Notes to the text

- 1) under conditions – при условиях, в условиях;
- 2) do well (better, best) – растут хорошо (лучше, лучше всего);
- 3) a frost-free period – безморозный период;
- 4) that is why – поэтому, вот почему.

MIND THE DIFFERENCE:

most, most of

(перед существительными) — ***большинство***

the most

(перед прилагательными) — ***наиболее, самый***

Grammar and vocabulary activities

6. Identify the voice of the predicate in the following sentences, translate them:

They have planted

It is planted

We are planting

It has been planted

They were planted

They will plant... .

They plant... .

They will be planted

They are planted

We planted

It was planted

He plants

7. Translate sentences in the Passive Voice:

1. The growth of plants is greatly influenced by environmental conditions.
2. The seedbed preparation was followed by planting the crop.
3. The growth of cotton is badly affected by low temperature.
4. The development of some crops is not influenced by the length of the day.
5. This area was given good cultivation.
6. More intensive use of land will be followed by an increase in food production.
7. The development of this crop is highly favoured by rainfall.

8. Put the adjective in brackets in the correct form:

1. Corn requires (warm) climatic conditions than wheat.
2. Climate is the (important) environmental factor of all.
3. The growing season of this crop is (short) than that of corn.
4. Cotton requires (little) rainfall than many other crops.
5. Today is the (short) day in the year.
6. Environmental conditions of this area are (favourable) for the growth of potatoes than for small grains.
7. If you use fertilizers, you will obtain (high) yields.
8. It is the (good) soil for oats.

9. Read aloud the sentences in which the word *most* is equivalent to the Russian *большинство*.

1. Crops produce maximum yields under the most favorable conditions.
2. Most grasses are used as food for animals.
3. Irrigation is applied on most farms of this region.
4. The increase of food production is one of the most important problems of our days.
5. Most small grains require much light for their growth.

Listening and Speaking Focus

10. Watch the video and tell your groupmates the main idea of it:

https://www.youtube.com/watch?v=ha9ktZApaic&ab_channel=LudyAnnTouch

LESSON 2.2. PLANTS IN ECOSYSTEM

1. Translate the sentences paying special attention to the word *as* and word combinations containing this word:

1. Wheat as well as barley and rye grows best under cool climatic conditions.
2. Many crops are used as food for man and animals.
3. Some crops such as corn, cotton and soybeans require high temperature for good growth.
4. Air is required by plants as it supplies oxygen and carbon dioxide.

5. Improved cultivation practices are used on our farm and on other farms of our region as well.

6. Climate is as important for plant growth as soil.

2. Fill in the gaps with the words from text A in the appropriate form:

1. Environmental ... are a very important factor for good plant growth.

2. Soil humidity is influenced by the average annual

3. Most small grains ... to long-day crops.

4. Such crops as ... and ... do not require high temperature.

5. Plants obtain oxygen and carbon dioxide from the

6. The growth of cotton is not ... by the length of the day.

7. Many grasses ... cool climate for their development.

8. Cotton ... best under warm climatic conditions.

9. Different crops require the ... of different length.

10. Crops should be well ... to environmental conditions.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. На рост растений влияют условия окружающей среды.

2. Растения хорошо развиваются в благоприятных условиях.

3. Климат является важнейшим фактором окружающей среды.

4. Почва, свет и воздух также важные факторы окружающей среды, которые влияют на развитие растений.

5. Растения не могут хорошо расти в неблагоприятных условиях.

b)

6. Окружающая среда – это условия, в которых растения развиваются.

7. С.-х. культуры растут хорошо, если они приспособились к окружающей среде.

8. Одним из важнейших факторов окружающей среды является климат.

9. Некоторые растения требуют более теплых климатических условий, другие растут лучше в прохладном климате.

10. Пшеница, рожь, овес, ячмень, свекла, картофель растут лучше в прохладных климатических условиях.

11. Кукуруза, рис, соя и хлопок требуют более теплых условий.

12. Почва, свет и воздух также являются важными факторами окружающей среды.

13. Влажность почвы зависит от среднегодовых осадков.

14. Свет влияет на важные процессы в жизни растений.

15. Растения не развиваются в неблагоприятных условиях окружающей среды.

Listening and Speaking Focus

4. Watch the video and say which of the factors mentioned in text A are referred to:

https://www.youtube.com/watch?v=oKkfAW6TWg4&ab_cannel=MaribelleBreceda

Grammar and vocabulary activities

5. Arrange the questions so that they serve as a plan to text A, and answer them.

1. Why is air necessary for plants?
2. What is environment?
3. What environmental conditions are favourable for plants?
4. Which environmental factors are important for plant growth?
5. Do all crops require much light for their growth?
6. What crops develop under cool climatic conditions?
7. What crops require warmer climate?

6. Name the environmental factors that affect plant growth (in English).

7. Read and translate text B without a dictionary. Define the meaning of words in bold according to their Russian equivalents and to the context.

Text B

Plants in ecosystem

Ecosystem is the smallest unit (единица) in nature that can live independently. It includes all plants, all animals, and the non-living part of the environment, such as soil and climatic factors of a natural geographic area.

Plant is always part of an ecosystem. Different parts of a natural ecosystem should be always in balance. This **natural balance** must not be destroyed by man.

The environment is constantly developing, this process is known as evolution. In the process of evolution new plant varieties may be developed.

However, **natural evolution** is a very long process. Nowadays agriculturists of all countries have their programme of plant improvement. Under this programme the evolution of crop varieties may not require more than some years.

As a result, some new varieties well adapted to the environmental conditions will be developed, and crop production in the area will be higher.

Comprehension activities

8. Explain in Russian or in English why it is necessary for man to improve plants although there is natural evolution.

9. Specify sentences that do not correspond to text B. Correct them.

1. Natural evolution is the most important way of crop improvement.
2. Ecosystem includes both living and non-living parts of the environment.
3. Crop production is not influenced by evolution of the environment.

Listening and Speaking Focus

Watch the video and say with environmental factors influencing crop production are mentioned in it.


https://www.youtube.com/watch?v=i73PKiv4loA&ab_channel=CentralValleyAg

UNIT 3 CLASSIFICATION OF CROPS

In this unit you will learn:	Grammar focus: - Participle I and II (revision). - Participle II Used as Attribute in Post-position
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	(Post-position Participle II). - Word meaning: <i>one</i> . - Substitutes to Noun. Vocabulary focus Reading and comprehension focus: - Text A. Classification of field crops - Text B. Life cycle. Listening and speaking focus
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Grammar Focus



Participle I – причастие I (простая форма):

V+ ing

e.g. ask – asking
increase – increasing

Причастие I – причастие настоящего времени действительного залога. Образуется от формы инфинитива прибавлением суффикса **-ing**.

При переводе предложения причастие I соответствует русскому причастию с окончанием «щий» или деепричастию с окончанием «я».

Increasing $\left\langle \begin{array}{l} \text{увеличивающий} \\ \text{увеличивая} \end{array} \right.$

В предложении причастие I может быть:

1. **Определением** к существительному. В этом случае оно может употребляться перед определяемым словом (т.е. слева от определяемого существительного) и после него (т.е. справа). В последнем случае причастие вместе с относящимся к нему словом образует причастный оборот.

In the field we saw the **working** students.

Мы видели в поле **работающих** студентов.

We saw the students **working in the field**.

Мы видели студентов, **работающих в поле**.

2. **Обстоятельством**. В этом случае причастие с относящимся к нему словом употребляется в начале или в конце предложения и при переводе соответствует деепричастному обороту.

Working in the field the students discussed their plans for the next month.

Работая в поле, студенты обсуждали свои планы на следующий месяц.

The students discussed their plans for the next month, **working in the field**.

Студенты обсуждали свои планы на следующий месяц, **работая в поле**.

3. **Частью сказуемого**, употребленного во временной форме ‘Continuous’. При переводе соответствует личной форме глагола.

This student is working in the field now.
ИТАК:

Этот студент сейчас работает в поле.
ПРИЧАСТИЕ I

Позиция	Слева от существительного	Справа от существительного	В начале или в конце предложения	Входит в состав временных форма 'Continuous'
Соответствие в русском языке	Причастие в функции определения	Причастие в определительном причастном обороте	Деепричастный оборот	Глагол-сказуемое (в личной форме)

Grammar Practice

Specify sentences with Participle I as part of the predicate:

1. Crops growing on our farm are used as food for man and animals.
2. We are growing different crops on our farm.
3. Growing such crops, farmers obtain much food for their animals.
4. When we were growing these crops we had more food for our animals.

Grammar Focus



Participle II – причастие II:

V+ ed / V3

e.g. **harvest – harvested**
grow – grown

Причастие II – причастие прошедшего времени страдательного залога. Причастие II стандартных (правильных) глаголов образуется от формы инфинитива прибавлением суффикса **-ed**. Причастие II нестандартных (неправильных) глаголов является 3-ей формой таких глаголов (см. стр. ...).

В русском языке причастия II соответствуют причастия с окончанием «мый», «ный», «тый».

harvested – убранный, убираемый
grown – выращенный, выращиваемый

В предложении причастие II может быть:

1. **Определением** к существительному. При этом оно может употребляться перед определяемым словом (слева) и после него (справа). Во втором случае причастие II вместе с относящимся к нему словом образует причастный оборот.

The **harvested** crops will be used as feed for livestock.

Убранные культуры будут использованы как корм для скота.

The crops **harvested** last week will be used as feed for livestock.

Культуры, **убранные** на прошлой неделе, будут использованы как корм для скота.

2. **Частью сказуемого** в страдательном залоге (Passive Voice).

These crops are harvested late in summer.

Эти культуры убираются в конце лета.

3. Частью сказуемого во временной форме 'Perfect'.

We have finished our work in the field.

Мы закончили работу в поле.

ИТАК:

ПРИЧАСТИЕ II

Позиция	Слева от существительного	Справа от существительного	Входит в состав сказуемого в Passive	Входит в состав сказуемого временных форма 'Perfect'
Соответствие в русском языке	Причастие в функции определения	Причастие в определительном причастном обороте	Глагол-сказуемое	Глагол-сказуемое (в личной форме)

Grammar Practice

Highlight the sentences with Participle II as part of the predicate:

- The yields were increased by more intensive use of land.
- The increased yields are the result of the new method of cultivation.
- We have greatly increased the yields of grain crops on our farm.
- Fertilizers used for these grain crops greatly increased the yields.

Grammar Focus

Participle II Used as Attribute in Post-position (Post-position Participle II)

Причастие II в функции правого определения к существительному (причастие в постпозиции).

Причастие II без поясняющих слов также может употребляться справа от существительного. При переводе предложения такое причастие употребляется перед существительным.

The varieties grown are of very high quality.

Выращиваемые сорта очень хорошего качества.

MIND THE DIFFERENCE:

Причастие II в постпозиции следует отличать от причастия II в причастном обороте, которое тоже стоит справа от определяемого существительного, но имеет пояснительные слова (см. выше раздел Причастие II)

Grammar Practice

Highlight the sentences in which Participle II should be used before the defined noun when translating them into Russian:

1. The farmers discussed new methods of cultivation recommended for their area.
2. The new methods used produced good results.’
3. The yields of crops largely depend on the methods of cultivation used.
4. The grain crops grown on this farm produced high yields.

Grammar Focus

Word meaning: ONE

Значения слова “one”.

1. Числительное «один».

Wheat is one of the most important grain crops. Пшеница – одна из важнейших зерновых культур.

2. Заместитель ранее названного существительного. В этом случае “one” либо не переводится, либо переводится тем существительным, которое оно замещает.

This method did not give good results, let’s use another one. Этот метод не дал хороших результатов, давайте используем другой (метод).

3. Формальное подлежащее, употребляется перед глаголом в личной форме. В русском языке такому предложению соответствует безличное предложение (т.е. без подлежащего).

One should know different classifications of farm crops. Следует знать различные классификации с.-х. культур.

LESSON 3.1 CLASSIFICATION OF FIELD CROPS

1. Identify the verbs which formed the following words. What do they mean?

classified; drier, dried, applied, easily; earliest, multiplies.

2. Form Participles I, II and translate them:

a) **regular verbs:**

to develop, to produce, to supply, to harvest, to obtain, to increase, to improve;

b) **irregular verbs:**

to grow, to know.

3. Translate the following sentences paying attention to (a) post –position participle, (b) participle clause:

a)

1. The quality of the grain harvested is high.

2. The quality of the grain depends on the method of harvest used.

3. The yield of all the farm crops grown has increased.

4. They spoke about the yield obtained;

b)

1. Some of the crops requiring cool conditions for their growth are wheat, rye and potatoes.

2. The growing period required by winter wheat is about 300 days.

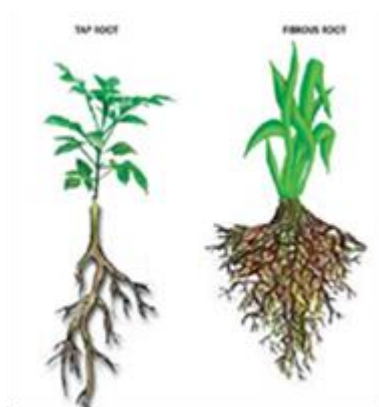
3. There are many factors influencing crop growth and development.
 4. Plants cultivated by man are known as farm crops.
 5. Using fertilizers, farmers increase the fertility of the soil.
 6. The cultural practices used in crop cultivation are different in different areas.
 7. Crops growing well under warm conditions are short-day crops.
 8. Growing improved varieties, we obtain higher yields.
- 4. Identify Participles and their functions in Text A**
5. Identify the word "one" (ones) and its meanings (7).

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

field, cultivated (row) crop, cereal, forage crop, annual, biennial, perennial, alfalfa, soybeans, flax, legume, stem, root, fibrous root, tap root, seed, life cycle, hay, pasture, soil fertility, nitrogen, content, to plough under, to belong (to), to contain, to complete, to include, to use, to vary in, one, only, the only.



6. Read and translate text A.

Text A

Classification of field crops

Crops are variously grouped and classified. For example, they may be classified as cultivated or row crops, such as corn, soybeans and cotton; non-cultivated crops, such as wheat and barley; and hay or pasture crops, such as clovers, alfalfa, and many other small-seeded legumes and grasses.

Crops are also grouped according to² the duration of their growth. Annual crops are those that complete their life cycle in one season. Biennials start their growth in one season but produce seed and die at the end of the second season. Perennials grow for more than two seasons, producing seed each year.

The most important and most often used classifications are botanical classification and agronomic classification.

Botanical classification.

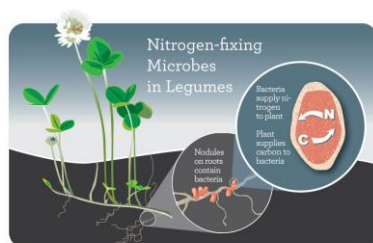


Botanical classification is based upon similarity of plant parts. Most of our field crops belong to one of the two botanical families, the grasses and the legumes.

The main food plants known belong to the grass family, including all cereal crops and about three fourths³ of the cultivated forage crops. Cereals are the world's leading food and feed crops. They are grain-bearing grasses such as wheat, corn, rye, barley, oats etc.⁴ Forage grasses are the ones that are highly essential for the economic production of livestock products.

Almost all grasses have hollow stems made up of nodes and internodes and varying greatly in length in different plants. The roots are fibrous. Grasses may be either annuals or perennials.

The legume family includes such large-seeded legumes as field beans, field peas, soybeans and such nutritious forage crops as alfalfa and clovers. The plants of this family are the only⁶ ones growing in a symbiotic relationship with rhizobia bacteria. Multiplying in the nodules on the roots of the legume crops raised bacteria are able to fix free atmospheric nitrogen in their bodies and eventually in the plant residues. Ploughing under⁷ these plant residues, one can increase soil fertility. Being high in protein content the legume crops are also valued as food both for man and farm animals.



Legumes may be annuals, biennials or perennials. The fruit is a pod containing from one to several seeds. Legumes have tap roots.

There are some other botanical families that include crop plants widely used by man. Such crops are potatoes, sugar beet, cotton, flax, buckwheat and others.

Notes to the text

1. for example – например;
2. according to — согласно, по;
3. three fourths – три четверти;
4. etc. [it'setre] — и так далее;
5. made up of – состоящий из;
6. to plough under – запахать.

Remember

only - ТОЛЬКО

the only — ЕДИНСТВЕННЫЙ

Grammar and vocabulary activities

7. Translate the following word combinations with nouns as attributes to other nouns:

soil fertility increase, soil air circulation, life cycle duration, mineral fertilizer application, higher protein content, most important plant parts, high-quality hay production, chemical weed control.

8. Identify by suffixes the parts of speech the following words belong to:

agronomically, hybridization, industrial, ventilation, economically, vegetative, characterize, function, intensity, transformation, special, specialist, actively, structure, statistically.

9. Translate the following word combinations containing participles:

leading cereal and forage crops, crops adapted to the conditions of the region, farms growing wheat, some crops grown by our farm, animals supplying people with food, soil supplied with nitrogen, one of the cereal crops raised, crops requiring much nitrogen, number of years required for growth, wheat varieties best known to people, the only crop producing high yields.



10. Highlight the participles in post-position and participle constructions in the following sentences. Translate them:

1. Of the cereal crops grown wheat, corn and rice are the three most important for man.
2. Biennials are plants growing for two years.
3. Similarity of plant parts is the basis used for botanical classification.
4. Growing forage crops, farmers not only increase soil fertility but also supply their animals with highly nutritious feed.
5. Gaseous nitrogen fixed by bacteria living in the roots of legumes increases nitrogen content of the soil.
6. Crops growing best under cool conditions, include wheat, oats, barley, rye and potatoes.
7. The farms obtaining high yields of potatoes every year are known to all agricultural specialists of our region.
8. Of the crops known as cultivated crops our farm grows corn and potatoes.
9. Classifying field crops according to their use, scientists name such groups as grain crops, root crops, forage crops, fiber crops and some others.
10. Completing their growth by the end of the first season, all annual plants die.
11. Almost all small-seeded legumes raised are used for hay on our farm.

12. Some crops are biennials starting their growth in one season and producing the seed in the second season.

11. Highlight in different colours and read aloud sentences containing the word 'one' with the following functions:

a) substitutes a noun – **yellow**, b) is not translated being the subject of the sentence – **green**, B) is equivalent to the Russian numeral "one" – **blue**:

1. Temperature is one of the most important environmental factors affecting crop growth.

2. Botanical classification is the one based on the similarity of plants.

3. One can group plants according to the duration of their growth.

4. Most important field crops belong to the grass family and corn is one of them.

5. One can improve soil fertility by application of fertilizers.

6. Perennial crops are the ones that grow for more than two years.

7. Rainfall cannot be influenced by man, but one can grow crops by application of irrigation.

8. One should know the crops belonging to the grass family.

9. They use traditional cultural practices in corn production but we use the improved ones and obtain higher yields.

12. Highlight the words that substitute nouns translate the sentences:

1. The optimum temperature for cotton is higher than that for small grains.

2. Some crops do best under warm conditions; these are corn, cotton, rice and some others.

3. Cereal crops are known as the most important ones for man.

4. Row crops are those that are cultivated during their growth.

5. This soil is better than that one.

6. The growth of corn is more affected by good soil conditions than that of rye.

7. One should know the difference between the roots of grasses and those of legumes.

8. There are many different cultural practices of crop production, this one is traditional.

13. Basing on text A say how field crops can be classified (in Russian and in English).

14. Say what the difference between legumes and cereals is.



Listening and Speaking Focus

Watch the video and answer the following questions:

1. What are the three main groups of crops one can see in the video?

2. What are the major food crops? Which of them grow in our country?
3. Name the fiber crops mentioned in the video.
4. What are beverage crops referred to in the video? Where are they grown?

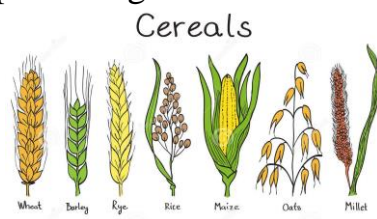
https://www.youtube.com/watch?v=nF4IOcQaD-U&ab_channel=BlueprintDigital

LESSON 3.2 LIFE CYCLE

Grammar and vocabulary activities

1. Fill in the gaps with the the vocabulary items from Lesson 3.1. in the appropriate form (in writing).

1. Some crops are not harvested but, increasing soil fertility.
2. All crops belonging to the grass family have ... roots.
3. Potatoes are cultivated during their growth, and are known as a ...crop.
4. Grasses grown for grain belong to ... crops.
5. Bacteria living on the roots of crops fix ... from the soil air.
6. Soybeans are the crop having the highest protein ... of all farm crops grown.
7. Sugar beets do not... to the grass family.
8. Grain may be ... either as human food or as feed for livestock.
9. Clover is a ... plant, producing seed for more than two seasons.



2. Choose the appropriate participle. Translate the sentences.

1. In our region there are some farms (grown, growing) wheat.
2. These are the crops (grown, growing) by our farm at present.
3. Small grains are the crops (harvesting, harvested) with combines.
4. This crop will grow well on soil (supplying, supplied) with nitrogen.
5. The environmental conditions (required, requiring) by crops for their best development should be favourable.
6. Crops such as wheat, oats, rye and barley are the ones (required, requiring) relatively cool conditions for their growth.
7. Humidity is one of the most important factors (influenced, influencing) the crop growth.
8. Plants (producing, produced) flowers and fruit when days are short are known as short-day plants.
9. The crops (including, included) in the grass family are all cereals and most of forage grasses.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Имеются пропашные и не пропашные культуры.
2. Кукуруза растет в течение одного сезона.

3. Двулетние культуры не производят семена в первый год.
4. Кормовые культуры выращиваются как корм для скота.
5. Выращивая бобовые, мы можем повысить плодородие почвы.
6. Азот фиксируется бобовыми культурами.



b)

1. По продолжительности роста культуры классифицируются как однолетние, двулетние и многолетние.
2. Зерновые культуры, принадлежащие к семейству злаковых, являются ведущими пищевыми культурами.
3. Сходство частей растений используется как основа для ботанической классификации.
4. Азот фиксируется клубеньковыми бактериями, живущими на корнях бобовых.
5. Когда растительные остатки бобовых запахиваются, они повышают плодородие почвы.
6. Злаковые отличаются от бобовых видом корней.

4. Translate the following word combinations.

an important branch of economy, new and improved varieties, cultural practices, from the same area, control of pests and diseases, the only method used, seedbed preparation, achievements of biological sciences, practical experience, favourable environmental conditions, under warm conditions, growing season, frost-free period, average annual rainfall, world's leading cereal crops, cultivated crops, large-seeded legumes, plant residues, protein content, fibrous and tap roots.

5. Identify the function of the words ending in -ed. Translate the sentences.

1. The methods of yield increases used are effective.
2. The methods of yield increases used on our farm are highly effective.
3. The methods of yield increases are effectively used on most of our farms.
4. The improved methods of yield increases have been developed and are now being used on our collective farms.
5. Last year the farmers used new methods of yield increases.
6. The soil analyzed contained much nitrogen.

6. Answer the following questions to text A.

1. How can farm crops be classified?
2. What is an annual plant?
3. How long do biennial plants grow?
4. What are the most important botanical families?
5. What family does wheat belong to?
6. What other cereals belong to the grass family?

7. Do forage crops also belong to the grass family?
 8. What roots have grasses (legumes)?
 9. Why are legumes so important?
 10. What large-seeded legumes do you know?
- 7. Read Text B without a dictionary. What examples of *winter* and *spring* crops, *biennial* and *perennial* crops are given by the author?**

Text B Life cycle

According to their life cycle plants are classified as annuals, biennials and perennials. The life cycle of a plant includes all the phases of plant growth starting with a seed. Many important crop plants complete their life cycle in one growing season. Such plants are known as annuals. Some annuals are spring annuals planted in spring and harvested in autumn. There are also winter annuals planted in autumn and harvested next summer. Winter wheat is an example of a winter annual and corn is a typical spring annual. Some plants complete their life cycle in two seasons. During the first season stems and roots are produced. Second-year plants produce flowers, fruit and seed and at the end of the second season they die. Beet is a good example of a biennial plant. People use roots of biennial plants and harvest root crops at the end of the first season. Many plants live for more than two seasons, such plants are known as perennials. They produce seed every year. After seeds have been produced, the plants do not die. They are not active during winter, but in spring they produce new growth. Many of our hay and pasture crops are perennials. The examples of perennial crops are alfalfa and clovers.

8. Read text B once again. Split it into four paragraphs and headline them in Russian or in English.



Listening and Speaking Focus

Classification of agricultural crops.

9. Watch the video and answer the following questions:

1. What classifications of crops are mentioned in the video?
2. What is agricultural classification?
3. Name the groups of crops classified according to their life span (cycle).

What examples of these are given in the video?

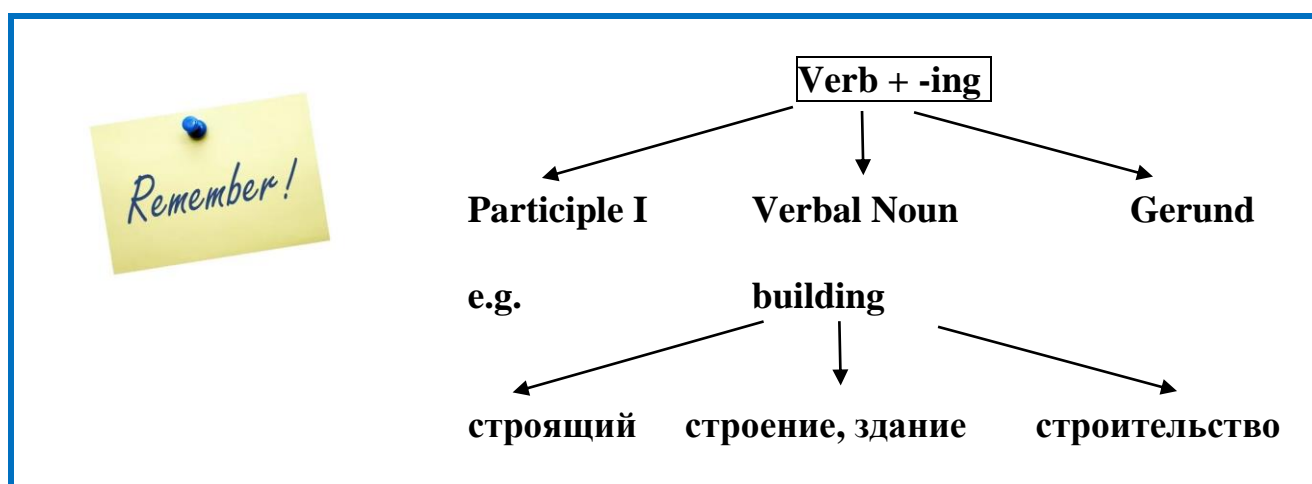
https://www.youtube.com/watch?v=75WGtk03Npo&ab_channel=EverydayFarmer

Discussion. What crops are of most importance – annuals, biennials or perennials? Why?

UNIT 4: CLASSIFICATION OF FOOD CROPS

In this unit you will learn:	Grammar focus: - Gerund. - Verbal Noun. - Word meaning: like, unlike. - Word meaning: for. - Transmutation /Functional shift (конверсия). Vocabulary focus Reading and comprehension focus: - Text A. Agronomic classification of field crops. - Text B. Legumes for protein and oil.
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Grammar Focus



В английском языке есть 3 формы глагола с суффиксом **-ing**:

1. Причастие I;
2. Отглагольное существительное;
3. Герундий.

Эти формы важно различать, чтобы найти их эквиваленты в русском языке.

Русский эквивалент причастия I зависит от того, какую функцию выполняет эта форма в предложении (см. Grammar unit 3).

Отглагольное существительное в этом смысле трудностей не вызывает, т.к. в русском языке ему всегда соответствует тоже существительное.

The growing of wheat

выращивание пшеницы

Герундий обозначает название процесса, т.е. «делание». Это сближает его с существительным. В отличие от причастия герундий может быть в предложении подлежащим и дополнением.

Applying fertilizers increased soil fertility.

Внесение удобрений повысило плодородие почвы.

В русском языке формы аналогичной герундию нет. Ему может соответствовать существительное, неопределенная форма глагола, деепричастие и глагол в личной форме, если перед ним имеется притяжательное местоимение или существительное с суффиксом 's. Выбор соответствующего эквивалента зависит от контекста.

Applying proper fertilizers is of great importance.

Yields may be increased by **applying** proper fertilizers.

Good results will largely depend on your **applying** proper fertilizers.

1. **Внесение** соответствующих удобрений очень важно.

2. **Вносить** соответствующие удобрения очень важно.

1. Урожаи могут быть повышены **внесением** соответствующих удобрений.

2. Урожаи можно повысить, **внося** соответствующие удобрения.

Хорошие результаты во многом будут зависеть от того, **применяете** ли вы соответствующие удобрения.

Grammar Practice

Highlight in colour and read aloud sentences containing the -ing word that corresponds to a noun in Russian.

1. The using of the new method produced good results.
2. The farmers grow wheat using the new method of cultivation.
3. Using fertilizers usually is effective on this type of soil.
4. We are using the method recommended by our agronomist.
5. We began using these fertilizers last month.

LESSON 4.1. AGRONOMIC CLASSIFICATION OF FIELD CROPS

Grammar and vocabulary activities

1. **Translate the following paying attention to the words ending in –ing.**
 1. Harvesting crops is done with special machines.
 2. Higher yields of crops can be obtained by using improved varieties.
 3. The planting of seed should be done into warm soil.
 4. We spoke about his using a new corn harvesting machine.



2. **Find and read aloud sentences containing the word *growing* that corresponds to a noun in Russian.**
 1. Growing legumes increases soil fertility.
 2. Growing legumes, we increase soil fertility.
 3. Farmers growing legumes increase soil fertility.
 4. Farmers increase soil fertility by growing legumes.
 5. The growing of this legume will increase the fertility of the soil.

3. Find the–ing words in text A and identify their function.

Vocabulary Focus



Handwrite the words and word combinations related to text A and provide their Russian equivalents. Check them in the agronomy and soil science dictionaries.

field beans, field peas, millets, rice, root crop, sorghum, tuber, vegetable, green manure crop, fibre, to adapt, to process, source, valuable, useful, purpose, throughout the world, like, unlike, for, main, mainly.



4. Read aloud and translate Text A.

Text A

Agronomic classification of field crops

Agronomically field crops are most often grouped according to the way in which they are used. Some of our crop plants have several uses; for example, corn is most often grown as a grain crop, but it is also known as one of the most productive forage crops. Another example is soybeans that are most often produced as an oil crop, but they are also grown as a hay or green manure crop¹.

The most common agronomic classification divides field crops into the following Main groups:

I. Cereals or Grain Crops. A cereal is a grass grown for its edible grain. The most important grain crops widely grown throughout the world are wheat, corn, barley, oats, rye, rice, sorghum, and millets. Grain crops are mainly used as bread crops and as concentrates in feeding livestock. They are well adapted to machine harvesting and processing. All of them are annuals, producing seed in the year of sowing.



II. Large-Seeded Legumes. The principal legumes grown for seeds are field peas, field beans and soybeans. The edible legumes are widely grown by man, for they are a very important source of protein. The growing of legumes is very useful for improving soil fertility.

III. Root Crops. Crops known as root crops are cultivated for their enlarged nutritious roots. The most widely grown root crops are vegetable crops used as human food. They are carrots, radishes, beets and others. Unlike cereals, they are

biennials. The food collected by them the first year is stored up in their roots and used for producing seeds the second year.

IV. Forage Crops. These are the crops used as feed for animals in a fresh or preserved form. Forage crops including grasses, legumes and some other crops are cultivated and used for hay, pasture and silage. Most forage crops are perennials, that is², they can live and produce seeds for many years in succession³.



V. Tuber Crops. The most important tuber crop cultivated throughout the world is potatoes. A tuber is not a root, it is a short thickened underground stem. Like root crops tubers are biennials, but people grow them as annuals.

VI. Fibre crops. As the name shows, these crops are grown for their fibre which is used in making clothes or for different purposes in industry. Almost all fibre crops produce seed containing valuable oil used either as human food or as industrial material. Of the fibre crops cotton, flax and hemp are of greatest importance for man.

Some other groups of field crops can be named, such as sugar crops, drug crops, oil crops, etc.

Notes to the text

1. green manure crop – культура на зеленое удобрение, сидеральная культура;
2. that is – то есть;
3. in succession – подряд.
- 4.

REMEMBER!

LIKE - подобно

UNLIKE — в отличие от

FOR	
предлог	союз
для; в течение	так как (часто после запятой)

Grammar and vocabulary activities

5. Identify the part of speech the following words belong to and give their Russian equivalents without a dictionary:

1. to form, a form, formal, formally, formation, forming, formed;
2. to select, selected, selection, selective, selecting, selectively;
3. to depend, dependence, dependent, independence, independent, depending, depended, independently.

6. Identify functions of the words ending in –ing in the following sentences.

Translate them.

1. The farmers are harvesting sugar beet now.
2. Using the improved cultural practices the farmers obtain more grain per hectare.
3. Different forage crops are grown for feeding farm animals.
4. Sowing spring wheat in our region should be done in May.
5. Sowing wheat, one should use high quality seed.
6. Preparing the soil for planting potatoes farmers of our farm used new tractors.
7. The soil and climatic conditions should be favourable for the developing of corn.
8. We know of their producing high yields of potatoes every year.
9. This type of soil is well adapted to potato growing.
10. Planting field crops should begin when the seedbed is warm.
11. There are two ways of raising crop production.
12. They will begin planting potatoes in 3 days.

7. Translate the sentences paying attention to the words in bold.

1. Corn **like** wheat has a fibrous root system.
2. **Unlike** cereals alfalfa and clover have tap roots.
3. **Unlike** animals plants can manufacture food by the process of photosynthesis.
4. Rice **like** cotton does best under warm conditions.
5. **Unlike** wheat buckwheat is not affected by the day length.
6. Air **like** temperature and light is an important environmental factor.

8. Translate the following sentences paying attention to different meanings of the the word "for".

1. Many factors are essential **for** good growth of soybeans.
2. We shall grow cereals in this field **for** three years.
3. Corn **for** grain should be grown in the South, **for** this crop requires the temperature of 25 to 30°C and short day **for** its best development.
4. Air is an essential factor, **for** it supplies carbon dioxide and oxygen necessary **for** plant growth.
5. Perennial crops are those that can grow and produce seeds **for** more than two years.
6. Root crops are grown **for** the food value of their roots.
7. The crop will not grow well, **for** the temperature of the soil is too low **for** it.



9. Name in English all the crops used by man for food.

10. Name in English fiber crops and say in Russian or in English how they are used by man.

Listening and Speaking Focus

Major Crops.

a) Watch the video and answer the following questions:

1. How can crops be classified?
 2. What are the most important food crops?
 3. Where are they grown?
- b) Give the summary of the video.

https://www.youtube.com/watch?v=oG6DQtRWmj8&ab_channel=Studentfacts

LESSON 4.2 LEGUMES FOR PROTEIN AND OIL

Grammar and vocabulary activities

12. Fill in the gaps with words from text A in the appropriate form.

Complete the task in written form.

1. The increase in grain production is the main problem of agriculture ...
... ..
2. Edible grain is the most important ... of human food.
3. Wheat is a valuable grain crop ... to different soil and climatic conditions.
4. There are some farm crops which may be grown for many different
5. Carrots, beets and radishes are nutritious... .. .
6. The growing of a large-seeded legume as a is useful for increasing soil fertility.
7. Sugar beet is a biennial crop ... food the first year and producing seed the second year.
8. Rice, sorghum and millets ... wheat belong to cereals.
9. ... are a very important human food crop as their tubers are high in protein and vitamins.
10. The seed of cotton, flax and other ... crops may be ... into oil widely used by man either as food or as industrial material.



13. Use the verb in brackets in the appropriate form (Participle I, Participle II, the Gerund). Complete the task in written form.

1. Grain is the product (to obtain) by man by (to grow) cereals.
1. These are the two crops (to differ) in the structure of the roots.
2. Some soils are rich in all kinds of food (to require) by plants.
3. The grain crops (to require) cool conditions for their best growth are wheat, barley, oats and rye.

4. Crop production can be raised by (to cultivate) new land or by (to increase) crop yields.

5. We know many environmental factors (to influence) the growth of farm crops.

6. Corn, sorghum, rice and millets are the crops (to adapt) to conditions of short day.

14. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Пшеница широко выращивается во всем мире.

2. Зерно может использоваться в кормлении скота.

3. Хлопок и лен – наиболее ценные прядильные культуры, используемые для многих целей.

4. Большинство корнеплодов используется в пищу человека.

5. Зерновые культуры убираются машинами.

6. В отличие от зерновых культур, картофель производит семена на второй год.

b)

1. Полевые культуры можно классифицировать или согласно их использованию, или согласно сходству их частей.

2. С точки зрения агрономии полевые культуры делятся на шесть основных групп.

3. Сельскохозяйственные машины широко используются для уборки зерновых.

4. Среди зерновых культур наиболее важными и наиболее широко выращиваемыми являются пшеница, кукуруза и рис.

5. Сахарная свекла – важнейшая корневая культура, возделываемая для получения сахара и на корм скоту.

6. Зерновые бобовые очень важны, так как, выращивая их, можно решить три главные задачи: увеличение производства зерна, увеличение растительного белка и улучшение почвенного плодородия.

7. Как листья, так и стебли люцерны используются на корм скоту.



15. Replace Russian words in brackets by their English equivalents:

1. The problem of the (борьба) of pests and diseases is a very important one in agriculture.

2. The (вегетационный период) of spring wheat is from 75 to 115 days.

3. Corn requires a long and (безморозный) period for its good growth and development.

4. The (содержание белка) in legumes is high.

5. Soil fertility may be increased by ploughing under (растительные остатки) of legumes grown.
6. Crops have either (мочковатый) or (стержневой) roots.
7. Our farm has a great (опыт) in growing soybeans.
8. This crop produces high yields only (в благоприятных условиях).
9. Legume crops are often grown as (культуры на зеленое удобрение).
10. Cereals are highly valued (во всем мире).

16. Identify the part of speech for the words in bold. Translate the sentences orally.

1. We **value** these crops for their fiber.
2. The **value** of cereals is known to all people.
3. People **use** the seeds of peas for food.
4. The agronomist spoke about this new **field** crop and its **use** in food industry.
5. We worked in the **field** yesterday.
6. Rye **yields** well under cool conditions.
7. Rye **yields** are usually high under cool conditions.
8. Yield **increases** can be obtained by growing improved varieties.
9. Our farm **increases** soil fertility by applying fertilizers and growing legumes.
10. Agronomists **group** field crops according to their **use**.
11. Corn has many **uses**.
12. Next summer our **group** will work on the farm "Zarya".



17. Answer the following questions to text A:

1. What is the principle of classifying field crops agronomically?
2. What crops have several uses?
3. How can corn be used?
4. Into what groups are field crops classified agronomically?
5. What is a cereal?
6. Why are large-seeded legumes so important for man?
7. Are root crops annuals or biennials?
8. When do biennial crops produce seed?
9. What is a forage crops?
10. How long can a forage crop grow?
11. What is the most important tuber crop?
12. How can fiber crops be used?

18. Scan text B and say what crops is mentioned in it.

Text B

Legumes for Protein and Oil

Cereals are the main source of energy in the human **diet**. But they do not contain much protein. Edible legumes are high in **plant protein** which is necessary both for man and farm animals.

The main edible legumes grown in the United States include soybeans, field beans and field peas. Soybeans are now one of the leading farm crops in this country. Soybeans area has increased and now this crop is **economically** as important as corn.

The soybean plant is adapted to different soil and climatic conditions. There are many varieties of this crop. Some of them are adapted to northern and some to southern conditions.

Soybeans are mainly grown for forage, grain or as a vegetable. They can also be grown as a green manure crop. As a forage crop soybeans are used for pasture, hay and **silage**. Soybean grain is highly **nutritious** and many human foods are produced from it. The protein content of soybean seed varies from 30 to 50 **percent** and the oil content from 15 to 25 percent. The grain can be processed into oil used either as human food or as industrial material.

The crop for grain should be harvested when seeds are low (низкий) in moisture, not more than 13 percent. In regions where soybeans are harvested with high moisture content air **ventilation** should be provided in the storage.

19. Read text B without a dictionary. Guess the meaning of the words in bold.
20. Name all the factors in soybeans importance (in Russian or in English).
21. Render the last paragraph (in Russian or in English).



UNIT 5. PLANT, ITS PARTS AND THEIR FUNCTION

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- Compound Forms of Participle I and Gerund.- Word meaning: due, due to, to be due to.- Word meaning: the former, the latter. Vocabulary focus Reading and comprehension focus: <ul style="list-style-type: none">- Text 5A. Plant, its parts and their function.- Text 5B. Photosynthesis. - Listening and speaking focus.
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Grammar Focus



Причастие I в функции обстоятельства может употребляться в следующих формах:

	Active	Passive
Present	planting сажая	being planted будучи посажены (когда сажают)
Perfect	having planted посадив	having been planted будучи посажены (после того как посадили)

Сравните:

Using farm machinery we can prepare the seedbed better.

Having introduced new machines we made the field work much easier.

Being applied in time fertilizers usually increase the yields.

Having been studied well, this method could be used in different regions.

Используя с-х. машины, мы можем лучше подготовить пашню.

Внедрив новые машины, мы намного облегчили полевые работы.

Будучи внесены (когда вносятся) вовремя, удобрения обычно повышают урожай.

После того как этот метод был хорошо изучен, он мог быть применен в различных районах.



Форы герундия полностью совпадают с формами причастия I

	Active	Passive
Simple	increasing	being increased
Perfect	having increased	having been increased

Простая форма (Simple) указывает на то, что действие, выраженное герундием, происходит одновременно с действием, выраженным сказуемым.

Перфектная форма (Perfect) показывает, что действие, выраженное герундием, предшествует действию, выраженному сказуемым; в русском языке этой форме соответствует глагол в прошедшем времени.

Increasing the yields of grain crops was of great importance.

Повысить урожаи зерновых культур было очень важно.

Повышение урожаев зерновых культур имело большое

We know of their **having** greatly **increased** the yields of grain crops. значение. Мы знаем, что они сильно **повысили** урожаи зерновых культур.

Grammar Practice

Укажите, какую форму причастия нужно употребить в следующих предложениях:

1. ... the new chemicals we can better control pests.
2. ... for pest control in our area, the new chemicals produced good results.
3. ... the new chemicals the farmers obtained better results in controlling pests.

1) having used, 2) being used, 3) using, 4) having been used.

LESSON 5.1. PLANT, ITS PARTS AND THEIR FUNCTION

1. Translate the following sentences containing compound Forms of Participle I and Gerund:

a)

1. Being adapted to the conditions of our region, sorghum produces high yields.
2. Having been grown for two years, legumes increased soil fertility.
3. Having completed its life cycle, the plant died;

b)

1. High yield of potatoes was obtained by their having been grown on a good soil.
2. We know of corn being produced both for grain and for silage.
3. The farmer could improve his soil by having provided it with the necessary mineral elements.

2. Find the meaning of the following word combinations in an electronic dictionary.

for instance, because of, in addition, in addition to, to take place, to some extent.

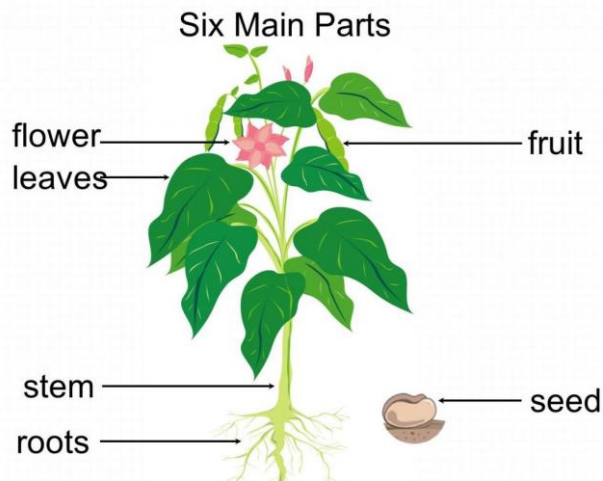
3. Find compound –ing forms in text A and identify their function

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science.

to germinate, seedling, to flower, to mature, leaf (leaves), to reproduce, to lodge, tops, nutrients, resistant, resistance, to control, water, rain, amount, size, storage, to store, underground, to reach, kind, number, to find (found), due, due to, to be due to, the former, the latter, to consist of. **dictionaries.**

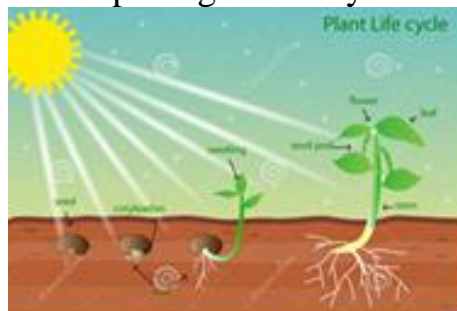


4. Read aloud and translate text A.

Text 5A

Plant, its parts and their functions

Most of the important crop plants are reproduced by seeds, and they are known as seed plants. In the life cycle of these plants the seed germinates and produces a seedling. The vegetative phase is characterized by increases in the number and size of roots, stems and leaves. Finally, having reached the reproductive phase, the plant flowers and produces seeds, thus completing its life cycle.



Sometimes as much¹ as one half, but in certain root crops more than one half of a crop plant is underground. Being in the soil the roots are as important as the tops because nearly all the water and all the mineral nutrients required are absorbed by roots. Having been absorbed from the soil, the nutrients and water are translocated from roots to other plant parts.

In addition to² the main function mentioned the root performs two more functions. It anchors the plant by branching throughout the soil and serves as a storage organ for nutrients in biennial and perennial plants. Due to their having stored up food during the previous year these plants are able to produce new spring growth.

Two general kinds of roots are found in crop plants: fibrous roots and tap roots. The roots of cereals and other grasses belong to the former and those of legumes and root crops – to the latter. Water and nutrients dissolved in it are absorbed through the root hairs found on roots and root branches of both fibrous rooted and tap rooted plants.

The above ground portion of a plant consists of leaves and stems. The leaf plays a highly important role due to its manufacturing carbohydrates through the process known as photosynthesis.



The main functions of the stem are: conducting water and plant nutrients from root to leaf, supporting leaves and storing food materials as in the case of sugarcane and sorghum.

Being young the grasses have solid stems, that is, the ones filled with the pith. Having matured the stems of most grasses become hollow. Some crops as corn, for instance, have stem pith throughout their lives.

A major crop production problem associated with the stem is lodging which is due to the adverse effects of rain and wind. Resistance to lodging, or the capacity of stems to withstand the adverse effect of weather, is an important quality in cereals. Growing lodging resistant varieties is the main controlling measure.

Notes to the text

1. as much as (перед цифрой) – до, целых;

the former – первый (из двух названных)

the latter – последний (из двух названных)

2. in addition to – кроме;
3. two more – еще две.



due – надлежащий, соответствующий;
due to – из-за; вследствие; благодаря;
to be due to – объясняться, обуславливаться.

Grammar and vocabulary activities

4. Provide Russian equivalents:

reproduction, normally, physiology, to combine, energy, reaction, genetics, progress, critical, organic, inorganic, to limit, material, method, individual, carbohydrates, botanist, protein.

5. Translate the sentences paying attention to the –ing-forms.

1. Having used improved cultural practices, the farmer obtained higher yield of wheat per hectare.
2. Most farms growing potatoes use potato harvesting machines.
3. Harvesting small grains with combines is widely used throughout the world.

4. Harvesting small grains with combines, man obtains more grain per hectare.
5. Cultivating the soil used for row crops one can control weeds and provide favourable conditions for plant growth.
6. Being raised under favourable environmental conditions the plants grow and flower well and produce much seed.
7. The yield of sugar beet was high due to the farmers' having controlled weeds during the growing season.
8. Having been applied at the due time, fertilizers increased the fertility of the soil.
9. The planting of warm-season crops should be done into warm soil.



6. Translate the sentences paying attention to the words in bold.

a)

1. **Due** conditions should be provided for good development of this crop.
2. A large amount of carbon dioxide in soil air **is due** to the respiration of roots and microorganisms.
3. Corn is widely used as feed for animals **due to** its high feeding value;

b)

1. Roots are grouped into fibrous roots and tap roots. **The former** are typical of grasses, **the latter** – of legumes and root crops.
2. There are crops which grow best under cool conditions and those requiring warmer conditions. Wheat belongs to **the former**, while corn can be an example of **the latter**.

7. Name all the parts of a plant and their functions.



Listening and Speaking Focus

How do crops grow ?

a) Watch the video and say what the main parts of plants are and what plants are displayed in the video.

b) What is the main idea of the video?

https://www.youtube.com/watch?v=hhZyaJrNh9o&ab_channel=AgricultureandNaturalResources

LESSON 5.2. PHOTOSYNTHESIS

Vocabulary Activities

1. Fill in the gaps with suitable words in the appropriate form. Complete the task in writing.

to conduct, resistant, to lodge, root, solid, leaf, tap roots, water, storage, above ground, plant nutrients, root hairs.

1. The examples of plants having are alfalfa and carrots.
2. The root does not only absorb ... and from the soil, it also anchors the plant.
3. The plant is divided into two parts – the root system and the portion.
4. Both roots and stems may serve as a ... organ.
5. Water and plant nutrients ... by the stem from ... to
6. The smallest roots through which water is absorbed are known as
7. Some crops have ... stems.
8. Small grains often ... due to unfavourable weather conditions.
9. Lodging can be controlled by growing ... varieties.

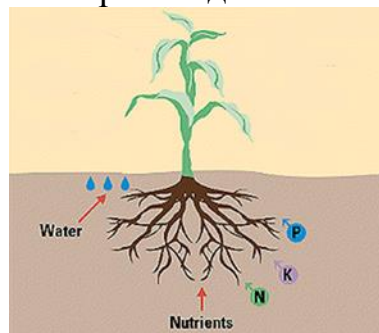
2. Determine which words from the right column can be combined with the word from the left column.

root	long, crop, fibrous, size, water, main, previous, general, tap, small, hairs; stem
stem	adverse, hollow, short, solid, similar, mineral, pith, due, lodging
to obtain	weather, yield, seed, seedlings, flowers, nutrients, food products, rain, measure

Put down your word combinations.

3. Translate the following sentences into English (in writing):

- a)
1. Семена производятся семенными растениями.
 2. Образовав семена, однолетние растения погибают.
 3. Растение состоит из корней и надземной части.
 4. Корни поглощают воду и питательные вещества из почвы.
 5. Углеводы производятся в листьях.
 6. Полегание обусловлено неблагоприятным воздействием погоды.
 7. Некоторые растения не производят семян.



- b)
1. Все растения, размножающиеся семенами, производят цветы.

2. Каждое растение состоит из двух основных частей, это корень и надземная часть. Первая обеспечивает растение водой и питательными веществами. Вторая, состоящая из листьев и стеблей, производит углеводы.

3. Все корнеплоды способны расти и производить семена на второй год благодаря питательным веществам, накопленным ими в первый вегетационный период.

4. Стебель не только проводит воду и питательные вещества от корня к листьям, но и поддерживает листья.

5. Стебли бывают двух видов: полые и выполненные.

6. Примером культуры, имеющей выполненный стебель, является кукуруза.

7. Некоторые сорта зерновых полегают, т.е. они не могут противостоять неблагоприятным погодным условиям.

Grammar and Vocabulary Activities

4. Give the Compound Participle forms of the following verbs and translate them.

to absorb, to increase, to produce, to store, to mention.

5. Match the dictionary definitions with the following words:

root, fibrous root, tap root, stem, fertilizer, green manure, plant nutrients.

1. Materials absorbed by plants and used by them for growth and development.

2. Any organic or inorganic material that is added to the soil to provide plant nutrients.

3. The kind of a root consisting of many roots of the same diameter and length.

4. The above ground portion of a plant that conducts water and plant nutrients from root to leaf.

5. The part of a plant that absorbs water and nutrients from the soil.

6. A crop grown for ploughing under when it is green.

7. The kind of root that consists of the main root and small branches throughout its length.

6. Answer the following questions to text A:

1. What is vegetative phase characterized by?

2. When does a plant complete its life cycle?

3. What are the functions of the roots?

4. What kinds of roots are there?

5. Why are leaves so important?

6. What functions does a stem perform?

7. What crops have hollow stems?

8. What is a very important quality of a cereal stem?

7. Read text B without using a dictionary and guess the meaning of the words in bold.

Text B

Photosynthesis

1. The most important difference between plants and animals is that plants can produce food from inorganic materials. The process by which carbohydrates are produced is known as "photosynthesis". It is also the only process by which oxygen is supplied into the air.

2. The process of photosynthesis is very **complex** consisting of many individual reactions. The conditions necessary for photosynthesis are light, carbon dioxide, water, some essential nutrients and due temperature.

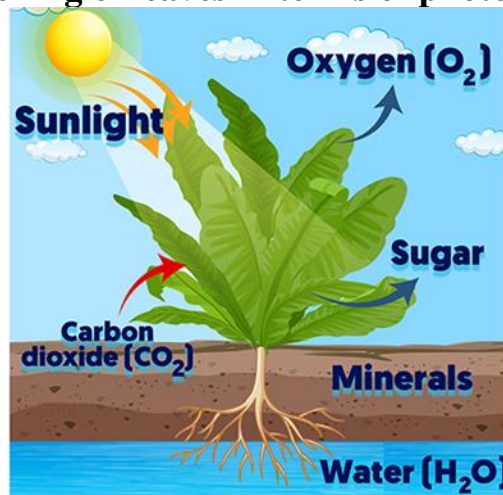
3. Light energy is necessary to **transform** carbon dioxide and water into **carbohydrates**. Water and nutrients required for manufacturing carbohydrates come from the soil through the roots. That is why leaves will function well if the plant has a highly developed root system. Carbohydrates produced by plants are the most important source of food for all plants and animals.

4. The main **limiting** factor for the daily amount of photosynthesis is the duration and **intensity** of sunlight. The process may also be limited by the amount of carbon dioxide, the supply of water and unfavourable temperature.

5. The word (слово) "photosynthesis" consists of two parts, "photo" which is "light" and "synthesis" which is "building". So, photosynthesis is "building with light".

9. Explain why photosynthesis process is so important for humans. Prove your answer using corresponding sentences from the text.

10. Indicate the paragraphs providing answers to the question: «What determines the good functioning of leaves in terms of photosynthesis?»



Listening and Speaking Focus

Photosynthesis.

Listen to the song and say

- What is the main idea of it?
- Give the summary of its content.

https://www.youtube.com/watch?v=TAuOy1BTCh0&ab_channel=KLT

UNIT 6. CROP BREEDING AND IMPROVEMENT

In this unit you will learn:	Grammar focus: - Absolute Participial Construction. - Word meaning: that. Vocabulary focus Reading and comprehension focus: - Text A. Crop breeding and improvement. - Text B. A new hybrid. Listening and speaking focus
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Grammar Focus



Absolute Participial Construction Независимый причастный оборот

During the first half of XX century chemistry made a great progress, **our scientists playing an important part in its development.**

Независимый причастный оборот – это причастный оборот со своим подлежащим. Он распознаётся по следующим признакам.

1. Наличие своего подлежащего, отличного от подлежащего основной части предложения.
2. Причастие находится после подлежащего, т.е. на том месте, на котором обычно стоит сказуемое.
3. От основной части предложения независимый причастный оборот отделяется запятой.

Предложение, содержащее независимый причастный оборот, строится следующим образом (Π_1 – подлежащее предложения, Π_2 – подлежащее независимого причастного оборота):

Π_1 + сказуемое, Π_2 + причастие ...

или

Π_2 + причастие, Π_1 + сказуемое ...

В русском языке аналогичного оборота нет, ему соответствует предложение. **При переводе** предложения, содержащего независимый причастный оборот, причастию соответствует сказуемое, при этом совершенным формам причастия соответствует глагол в прошедшем времени.

Если оборот следует после основной части предложения, при переводе перед ним могут употребляться слова «**причём**», «**при этом**», «**и**». Если оборот предшествует основной части предложения, он переводится с союзами «**так как**», «**когда**», «**если**», в зависимости от смысла всего предложения.

Farmers using complete fertilizers, the yield of wheat may be considerably increased. **Так как** землевладельцы **используют** комплексные удобрения, урожай пшеницы может быть значительно повышен.

Crops being grown under favourable environmental conditions, higher yields are usually obtained.

We increased yields of the main small grains, some could resistant varieties having been grown.

Когда культуры выращиваются при благоприятных условиях, обычно получают более высокие урожаи.

Мы повысили урожаи основных зерновых культур, при этом были выращены некоторые холодоустойчивые сорта.

Grammar Practice

Highlight the sentences containing the Absolute Participial Construction in the following sentences. Translate these sentences from English into Russian orally.

1. Farmers growing improved crop varieties usually obtain good results.
2. Being reproduced by seeds, these plants are known as seed plants.
3. Crop plants may have fibrous roots or tap roots, the roots of legumes belonging to the latter.
4. Potato being the most important tuber crop, all farmers throughout the world grow it widely

Значения слова "that" ("those")



Слово "that" ("those") может употребляться:

1. Как указательное местоимение в значении "тот (же)"

That soil is better for growing potatoes than this one. **Та** почва лучше для выращивания картофеля, чем эта.

2. Как заместитель упомянутого существительного. В этом случае часто употребляется с предлогом "of" и на русский язык переводится существительным, которое "that" заменяет

The yields of corn was higher than **that** of oats. Урожай кукурузы был выше, чем **урожай** овса.

1. Как союзное слово "который" (стоит после существительного)

The soil should provide the plant with nutrients **that** are necessary for its growth. Почва должна обеспечивать растению питательные вещества, **которые** необходимы для его роста.

2. Как союз "что" (стоит после глагола-сказуемого)

We know **that** plowing is the first step in the preparation of the soil. Мы знаем, **что** вспашка является первым шагом в подготовке почвы.

3. Как часть усиительной конструкции "It is... that...", которая переводится словом "именно"

It is the rotation of crops **that** helps to maintain the fertility of the soil. **Именно** севооборот культур помогает поддержать плодородие почвы.

4. Как союз "чтобы" в предложениях типа "It is necessary that..."

It is necessary **that** the soil for this crop be plowed in the fall.

Необходимо, **чтобы** почва под эту культуру была вспахана осенью.

5. **В ВЫРАЖЕНИЯХ:**

that is

то есть

that is why

вот почему, поэтому

so that

так что, так чтобы

LESSON 6.1. CROP BREEDING AND IMPROVEMENT.

Grammar and vocabulary activities

1. Provide Russian equivalents of the words containing suffixes –er (or).

higher, longer, larger, later, shorter, smaller;

grower, producer, cultivator, supplier, harvester, planter.

2. Highlight the Absolute Participial Construction in the following sentences. Translate the sentences.

I. 1. Corn being a good source of grain and roughage, farmers grow it widely.
2. Winter wheat having been sown in August, its roots can develop well before winter.
3. The soil containing much plant food, the crops will produce high yields.

II. 1. It is necessary to apply nitrogen into the soil, the amount varying with the crop.
2. Cereals are widely grown for obtaining grain, the latter being mainly used food for people and feed for livestock.
3. There are many root crops grown by man, the most important being sugar beets, carrots and radishes.

3. Highlight the Absolute Participial Construction in text A (4) and explain your choice.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

to breed, plant breeding, plant breeder, selection, hybridization, introduction, species, to cross, winter hardiness, maturity, disease, insect drought, science, desirable, successful, to precede, to follow, to differ (in), to compare, to vary with, available, to change, early, late, that.

4. Read aloud and translate text A.

Text A

Crop breeding and improvement

Plant breeding is the science of changing and improving the heredity of plants.

In the past the breeders had no scientific knowledge which is available now. The selection of superior types was the most important method of improving crop plants. Variations between plants of the same species were used as the basis for developing new improved varieties.

Now with increased knowledge of genetics and related plant sciences plant breeders are able to influence such plant characteristics as yield, early maturity, drought resistance, winter hardiness, disease resistance, insect resistance and quality.



Plant breeding depends on many sciences, genetics and cytogenetics being the two most important. Other sciences needed by the breeders are plant physiology, plant pathology, entomology, plant biochemistry, agronomy, botany, statistics and computer science. The most successful achievements in plant breeding are due to the combined work of many specialists.

Each crop variety possessing certain desirable and undesirable characteristics, the aim of the plant breeder is the development of a superior variety by eliminating the undesirable qualities and combining the desirable ones in the same variety.

The characteristics desired vary with¹ the crop and the conditions of growing. With wheat, for example, winter hardiness, protein content, milling quality and resistance to lodging are important. In some areas, early-maturing, cold-resistant varieties are needed, while in others later-maturing, drought-resistant varieties will do best, yield and resistance to major diseases and insects being important in all cases.

Three general methods of crop improvement are commonly used. These are introduction, selection and hybridization, the last one being the method of crossing two or more varieties that differ in some inherited characters. These methods are not wholly distinct because hybridization almost always must be preceded or followed or both preceded and followed by some scheme of selection.

Progress in crop breeding can be measured only by experimental tests except when breeding is done for disease resistance, better colour or some other character that can be readily seen. Even then the investigator must know how the new strain compares in yield with the variety replaced. That is why field-plot test² should be conducted.

Notes to the text

1. to vary with – различаться в зависимости от; зависеть от;
2. field-plot tests – испытания на полях в поле.

Grammar and Vocabulary Activities

5. Group the words according to the parts of speech (noun, pronoun, verb, participle I, participle II, proverb).

gradually, abundant, aggregated, lower, competition, properly additional, seeder, to decrease, poorer, directly, desirable, careful, limiting, suitable, requirement, removed, maintenance, wider, mixture, mechanical, physiologist, harrowed, favouring, fixer, to destroy, finest, follower.

6. Highlight the Absolute Participial Construction in the following sentences. Translate these sentences.

1. Plant breeding being the science of changing the heredity of plants, the scientists widely use it in improving crop plants.

2. Many plant sciences are used by plant breeders in developing new varieties of crops, genetics and cytogenetics being most important.

3. Many varieties of corn producing good yields of high quality forage and grain are cultivated throughout our country.

4. Each plant has two parts, the roots and the above-ground portion, the latter consisting of leaves and stems.

5. The stem of corn varies greatly in length in different varieties, the usual length being 5 to 10 feet.

6. Planting machines being used, a smaller amount of seed is required.

7. Highlight the sentences in which the word *that* is equivalent to the Russian word *который*.

1. The climate of Moscow is colder than that of Krasnodar.

2. We know that millets belong to the grass family.

3. That experiment was conducted two years ago.

4. The experiment that was conducted two years ago gave very good results.

5. The optimum temperature for cotton is higher than that for small grains.

6. It has been shown by experiments that the quality of grain depends on the soil used.

7. The variety of wheat that will be grown on our farm is highly productive.

8. We need a good soil for our experiment, that is, the one that is supplied with the necessary amount of water and nutrients.

9. Corn is a good source of grain and forage: that is why it is widely grown by farmers.

8. List the traits of plants that can be modified with the help of selection (in English, orally).

Listening and Speaking Focus

Watch the video, answer the following questions:



1. What idea did Gregor Mendel propose?

2. Were the initial attempts in plant breeding successful?

3. What two key steps does the selection process involve?

4. What is evaluation carried out for?

5. What are the existing best varieties called?

6. Why is distribution so important?

7. What does the success of any crop improvement programme depend on?

<https://youtu.be/GpDbKfTLLzs>

LESSON 6.2. A NEW HYBRID.

Grammar and Vocabulary activities

1. Fill in the gaps with the suitable words from text A in the appropriate form.

1. Improving ... of crop plants is the aim of the science known as plant breeding.

2. Early ... is a highly important plant characteristic in areas where the growing period is short.

3. Winter cereals should with-stand fall and spring frosts, that is, they should possess ...

4. The most... breeding work has been done in improving corn.

5. The aim of ... or the crossing of two or more varieties is obtaining a hybrid ... better inherited characteristics.

6. Very often high yields of good-quality grain can be produced due to ... of superior varieties from other regions or other countries.

7. Rye being a plant, any class of soil may be used in growing this crop.

8. Selection should ... and ... hybridization.

2. Translate the following sentences from Russian into English using the words and word combinations from the texts and Vocabulary Focus section of this Unit. Complete the task in writing.

a)

1. Наследственность растений можно изменить.

2. Селекционеры выводят новые сорта.

3. Знание генетики необходимо для выведения новых сортов.

4. При выведении нового сорта используются достижения многих наук.

5. В некоторых условиях желательными признаками пшеницы являются зимостойкость и устойчивость к полеганию.

6. Гибридизация – это метод получения нового сорта скрещиванием двух или более сортов.

b)

1. Наследственность растений можно изменить и улучшить селекцией.

2. Раньше улучшение растений и выведение новых сортов производилось путем отбора лучших типов.

3. Сейчас многие признаки растений, такие, как урожайность, зимостойкость, засухоустойчивость и другие, успешно улучшаются нашими селекционерами.

4. Для выведения новых сортов нужно использовать достижения многих наук.

5. Новый улучшенный сорт можно вывести скрещиванием двух или более сортов, соединяя желательные признаки в одном сорте.

6. Каждый сорт, выведенный для данных климатических условий, обладает определенными полезными признаками.



Listening and Speaking Focus

Watch the video and answer the questions.

1. Why do farmers produce uniform crops?
2. Who maintains uniform crops?
3. What is “hybrid vigor”?
4. What are the disadvantages of seeds produced by hybrid crops?

https://youtu.be/zI_lwy8KfHI

Comprehension Activities

3. Translate the following groups of words.

for instance, lodging resistant varieties, a major crop production problem, one of the main controlling measures, plant breeding, plant breeder, winter hardiness, to eliminate undesirable characteristics, high disease resistance, to develop a variety, a superior variety, drought-resistant variety, general crop improvement methods, the same variety.

4. Make up sentences using words from exercise 3.

5. Answer the following questions to text A.

1. Can the heredity of plants be changed?
2. What was the main method of improving crop plants in the past?
3. What plant characteristics can be improved by breeding?
4. How can a superior variety be developed?
5. What do desirable plant characteristics vary with?
6. What are the three general methods of crop improvement?
7. What is hybridization?

6. Read text B without using a dictionary. Guess the meaning of the words in bold.

Text 6B A new hybrid



A new hybrid has been developed by crossing wheat and rye. It is the first man-made cereal named triticale. Its name comes from a combination of the scientific names for wheat, *Triticum* and rye, *Secale*.

The aims of hybridization between the two crops are increasing protein content of wheat and combining high yields of wheat with drought-resistance of rye.

The first hybrids between wheat and rye were obtained in 1875. But those hybrids were highly sterile and did not reproduce. Triticale as a variety was first produced in Hungary (Венгрия) in 1968. In North America the first variety of triticale was developed in 1970. A few thousand hectares of triticale were grown in the Soviet Union in 1973.

At present there are triticales that can be produced **commercially**. The crop is classed now as a feed grain. As such it is equivalent to other cereals. But the grain quality is not very good for bread making.

Protein content of the hybrid can be 30 percent, compared to 8 or 10 percent in corn and 13 – 5 percent in rye and wheat. Triticale protein is high in essential **amino acids** which make the crop very good as feed for livestock.

Plant breeders are now working at developing triticales with shorter stems that will not lodge. Much breeding work should be done in improving the grain quality and increasing the yield.

7. Put the questions in the logical order so that they could serve as a plan to text B.

1. What triticale characteristics should be improved?
2. What is triticale?
3. What are the uses of the crop?
4. Are there any varieties of triticale?
5. What characteristic makes triticale superior to wheat and rye?
6. What are the aims of crossing wheat and rye?

8. Characterise triticale as compared to wheat and rye (in Russian and/or in English).

Listening and Speaking Focus

Watch the video and answer the following questions:

1.
 - a) Give an example of GMO in nature.
 - b) What can it be caused by?
2. What can be used to insert a gene into a plant?
3. Why are all sweet potatoes called “naturally organic GMOs?”


<https://youtu.be/42x7up6lqRU>

UNIT 7. SEEDS AND SEEDING

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- Revision: Participle I, Participle II.- Revision: -ing forms.- Conditional clauses (conjunctions “if”, “unless”, “provided”).- Word meaning: should.- Word meaning: because, because of.- Word meaning: before, after.
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	Vocabulary focus Reading and comprehension focus: - Text A. Seeds and seeding. - Text B. Germination. Listening and speaking focus
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Grammar Focus



Conditional clauses

Условные предложения

Условные предложения вводятся союзом **if** (если), **provided** (если), **unless** (если не).

Если в главном предложении имеется **should** или **would**, а в условном придаточном сказуемое употреблено **в прошедшем времени**, на русский язык главное и придаточное предложения переводятся с частицей “**бы**”.

If you apply more fertilizers, the yield will be higher.	Если вы внесете больше удобрений, урожай будет выше .
If you applied more fertilizers, the yield would be higher.	Если бы вы внесли больше удобрений, урожай был бы выше.

Условные предложения могут относиться к настоящему, прошедшему и будущему времени.

I тип	Возможное настоящее или будущее	
	If you apply more fertilizers, the yield will be higher.	Если вы внесете больше удобрений, урожай будет выше .
I I тип	Нереальное настоящее	
	If you applied more fertilizers, the yield would be higher.	Если бы вы внесли больше удобрений, урожай был бы выше. (в настоящем)
I II тип	Нереальное прошедшее	
	If you had applied more fertilizers, the yield would have been higher.	Если бы вы внесли больше удобрений, урожай был бы выше (в прошлом)

Grammar Practice

Highlight the sentences that are translated into Russian using the particle «бы»:

1. Provided you had used better adapted varieties, you would have obtained higher yield.
2. Two farmers will not obtain good yield unless they irrigate the area.
3. If the weather were not so rainy, we should begin planting today.
4. One should know characteristics of the varieties used.

5. You would get better results in plant improvements, if you used the latest achievements of genetics.

LESSON 7.1. SEEDS AND SEEDING.



Grammar activities

1. From these words, select adjectives and participles with negative prefixes and suffixes and give them Russian equivalents.

unimportant, improper, useless, unimproved, unpopular, hardness, uniform, impossible, internode, uninherited, careless, include, inactive, underground, undesirable, fruitless, unfavourable, undeveloped.

2. Translate the sentences containing Conditional clauses.

a)

1. If we grow legumes, the soil fertility will be higher.
2. Corn will grow better if there is much nitrogen in the soil.
3. If the seed is of high quality, we shall obtain a higher yield.

b)

1. If we grew legumes, the soil fertility would be higher.
2. Corn would grow better if there were more nitrogen in the soil.
3. If the seed had been of good quality, we should have obtained a higher yield.

3. Identify participles in the following sentences and determine their function. Translate the sentences.

a)

1. Using the new method of harvesting, they obtained higher yield of sugar beets.
2. The collective farms using the new method of harvesting obtain higher yield of sugar beets.
3. Our collective farm is harvesting sugar beets now.
4. The growing period of barley is shorter than that of other cereals, this crop producing good yield when it is sown in late May.
5. Rye being drought-resistant, any soil can be used for this crop.

b)

1. Most wheat varieties cultivated produce high yields of good quality grain.
2. Wheat varieties cultivated in our country have been developed by our plant breeders.
3. Two wheat varieties are cultivated on the farm "Zarya".

c)

1. Having stored up nutrients in the first season, root crops are able to grow and produce seed in the second season.
2. Being anchored by roots, plants can withstand the adverse effects of rain and wind.
3. Having been sown in a well-prepared soil, wheat developed well and produced high-quality seed.
4. All farm crops have certain desirable characteristics, the highest yields being obtained from those best adapted to the conditions of growing.
5. Soil fertility having been increased, the farmer could obtain a higher yield of potatoes.

4. Find the *-ing* forms in the following sentences, which correspond to Russian nouns. Translate these sentences.

1. Conducting water and plant nutrients is the main function of the stem.
2. Conducting water and plant nutrients, the stem performs a very important function for the life of a plant.
3. Improving crop plants was done in the past by selecting superior types.
4. Improving farm crops, plant breeders use three general methods.
5. The yield of potatoes was reduced due to our having planted tubers into too cold soil.
6. Corn requiring much nitrogen, the soil should be well supplied with this element.

5. Find the following in text A:

1. **participles** (explain their function);
2. the ***-ing*** forms, which correspond to Russian nouns;
3. conditional clauses that are translated into Russian using the particle «**бы**» (paragraphs 4 and 6).

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

fine (seed), coarse (seed), mature, immature, stand, uniform, vigorous, poor, germinating power, seedbed, firm, moist, warm, moisture, proper, rate, surface, frost, deep, depth, weed, to apply, to reduce, to clean, if, unless, provided, should, because, because of, before, after, germination.

6. Read aloud and translate text A.

Text A Seeds and seeding



Good seed is highly essential to successful crop production. Its purity and germinating power should be known before it is planted.

After threshing seeds usually contain foreign materials such as chaff, dirt, weed seeds and seeds of other plants. These can be removed to a large extent¹ but not entirely by cleaning machinery. The presence of weeds in the seed often increases the labour required for the production of the crop, reduces crop yields and contaminates the product available as well as the seed and soil in future seasons.

Mature seed is preferable to immature seed. Immature seed having a low reserve of food supply because of its small size usually produces poor plants when conditions are adverse at planting time. In addition², immature seeds, high in moisture, are injured by frost.

Most seeds show dormancy, that is, they do not germinate immediately after having become mature even though³ external conditions favour germination. They must pass through a rest or after-ripening period, the duration of the dormancy varying greatly with different species. One should know the length of the dormancy period of the seed that will be planted. It ranges from a few days to some months or even years. Dormant seeds can survive conditions which would kill them if they were active.

Good stands can be obtained by seeding high-quality seed. However, even the best seed will not produce optimum yields, provided other factors are not proper. A moist, firm and warm seedbed that provides favourable environment for germination is of greatest importance in establishing a vigorous and uniform stand. Unless there is enough moisture in the soil, poor germination will take place.



Two critical factors must be controlled during seeding: depth and rate. Planting at a proper and uniform depth favours quick and uniform germination. The depth of seeding is influenced by the type of the soil and the size of the seed. If fine seed were placed too deeply it would have some difficulty in reaching the surface of the soil. Coarse seeds should be planted much deeper than fine seeds.

The establishment of high-quality stand is also favoured by a proper seeding rate, both underseeding and overseeding reducing potential yield. The former does not allow full utilization of the available moisture, nutrients and light while the latter requires more nutrients than are present in the soil and reduces the yield.

Other agronomic recommendations that should be followed in obtaining a good stand are seeding at optimum time, covering seed properly, using proper weed-control equipment, and applying proper fertilizers.

Notes to the text

1. to... extent – в... степени;
2. in addition – кроме того;

3. even though – даже если.

Remember

If - 1. если, 2. если бы;

unless - если ... не (сказ.);

provided – 1) (причастие II) – обеспеченный;

2) (прош.вр.) – обеспечил (-ли);

3) (союз) – при условии если, в том случае если;

should – 1) должен;

2) бы (в условных предложениях);

because of (предлог) – из-за; вследствие;

because (союз) – потому что;

before – 1) (предлог) – до, перед;

2) (союз) – до того как, перед тем как;

after – 1) (предлог) – после;

2) (союз) – после того как.

Grammar and Vocabulary Activities

7. Determine the part of speech the following international words belong to, and give their Russian equivalents.

1. to produce, a product, production, produced, producing, producer, productive, unproductive;
2. the aim, to aim, aimless, aiming, aimed;
3. water, to water, watering, watered, waterless.

8. Specify the sentence numbers in which the Russian particle «бы» should be used when translated into Russian. Highlight the sentences in which the action refers to: a) the present; b) the past; c) the future.

1. If we did not grow legumes, the fertility of the soil would be low.
2. The yield of wheat would be much higher if we applied more fertilizers.
3. If we were botanists we should know the difference between the roots of cereals and those of legumes.
4. This crop will develop well if planting is done at the due temperature.
5. If the new variety is better than the one replaced, the farmers will grow it widely.
6. This variety would be grown on our farm, if it were more drought resistant.
7. If the soil contains too much moisture, corn will not do well on it.
8. If the soil had been better, we should have grown corn.

9. Specify the sentences in which the verb *should* is equivalent to the Russian particle «бы».

1. If you could come to our farm we should show you our experimental plots.
2. All cereal crops should be grown on well-prepared soils.
3. We had obtained a good yield, if we should have applied more nitrogen into the soil.
4. Every student should know the difference between the roots of alfalfa and those of wheat.

5. If this crop were resistant to lodging, we should grow it for grain.



10. Translate the following sentences paying attention to the conjunctions *if, unless, provided*.

1. Unless there is enough moisture in the soil the seed will not germinate.
2. Provided temperature conditions of the late summer are not favourable, grain will not ripen properly.
3. The seed would germinate earlier, if there were more moisture in the soil.
4. If the rate of seeding were too high, the plants would have not enough water and nutrients for their growth.
5. Poor results may be obtained with this crop unless it is sown in a warm and moist soil.
6. Good stands can be obtained, provided high-quality seeds are used.
7. Provided the soil is not moist enough at planting time, irrigation should be applied.
8. If a seed placed under favourable conditions does not germinate, it is in a dormant state.

11. Specify the sentence numbers containing the Absolute Participle Construction. Translate them

1. The plants developed well because of their having been planted into warm and moist soil.
2. There existing some high-yielding varieties of corn, farmers grow those that are best adapted to their soil and climatic conditions.
1. 3 The soil having been supplied with too little nitrogen, a low yield of corn was obtained.
3. Late planting of this crop is undesirable because the plants may be injured by early frosts in autumn.
4. Obtaining of high-quality stand is influenced by both rate and depth of seeding.
5. Having been sown in a warm and moist soil the seed began germinating quickly and uniformly.
6. Fertilizers having been applied at the due time, the yield of potatoes increased greatly.

12. Say it in English:

основные факторы получения хорошего травостоя; зрелые семена с хорошей всхожестью, без примесей; влажная, уплотненная, достаточно теплая пашня; быстрые и дружные всходы; соответствующая глубина и норма высева; оптимальные сроки сева, борьба с сорняками, внесение удобрений.



Listening and Speaking Focus

Watch the video and describe the manual process of planting seeds.

<https://youtu.be/3FGxEYWAPf8>

LESSON 7.2. GERMINATION.

Grammar and vocabulary Activities

1. Identify if the the highlighted words are used as conjunctions or prepositions. Translate the sentences.

1. The seed does not germinate **because of** low soil temperature.
2. The seed does not germinate **because** the soil temperature is too low.
3. The roots of winter crops should develop properly **before** winter.
4. The roots of winter crops should develop properly **before** winter begins.
5. The seed started to germinate **after** rain.
6. The seed starts to germinate **after** the soil has become warm.
7. Many factors are essential **for** the germination of the seed.
8. The seed will not germinate **for** a long time, **for** the soil temperature is too low **for** it.

2. Choose the appropriate word.

1. The functions of roots and leaves differ, ... manufacturing, carbohydrates by the process of photosynthesis (the former, the latter).
2. Soil air contains ... oxygen than the atmospheric air because both plant roots and microorganisms use oxygen for respiration (more, less).
3. The amount of nitrogen in the soil increased ... the beans had been grown ... two years (before, for, after).
4. The growth of carrots was ... by our having irrigated the crop during the growing season (followed, influenced).
5. When high quality seed is not... farmers sow poor seed producing low yields (valuable, available).
6. The quality of the stored seed was reduced ... bad storage conditions (due. to, due).
7. One cannot obtain a high yield... the conditions of growing are favourable (if, unless).
8. The structure of the soil is affected by ... time and method of cultivation (proper, properly).
9. wheat alfalfa has a tap root system (like, unlike).



3. Fill in the gaps with suitable words in the appropriate form. Complete the task in writing.

dormancy, to favour, immature, to establish, practice, underseeding, proper, germinating power, overseeding, favourable.

1. Quick and uniform germination can be provided by planting seed at a ... depth.
2. Both ... and ... reduce potential yield.
3. Applying proper fertilizers ... seed germination.
4. It is necessary to test before the seed is planted.
5. Dormant seed does not germinate even under... conditions.
6. Each species has its... period.
7. A vigorous and uniform stand can be obtained by proper rate and depth of seeding.
8. Using proper seeding machines is one of the agronomic ... recommended for obtaining good stand.
9. Poor plants may be produced by using... seed.

4. Match the words from both columns to make up as many meaningful word combinations as possible.

- | | |
|------------|--|
| seed | mature, high-quality, dormant, fibrous, hollow, moist, active, useful, immature, weed, successful |
| stand | desirable, improved, proper, available, poor, frost-free, cool, careful, scientific, vigorous, uniform |
| to produce | yield, seed, stand, dormancy, threshing, seeding machinery, environment, proper, conditions |

5. Translate from Russian into English using the words and word combinations from this Unit. Complete the task in writing.

- a)
1. Чистота и всхожесть – основные качества хороших семян.
 2. Незрелые семена не должны использоваться для посева.
 3. Семена обычно не прорастают сразу после созревания.
 4. Почва для высева семян должна быть достаточно влажной и теплой.
 5. Крупные семена заделываются (высеваются) глубже, чем мелкие.
 6. Глубина и норма посева очень важны для получения высококачественного травостоя.
- b)
1. Успешное выращивание культур в большой степени зависит от чистоты и всхожести семян.
 2. Семена можно очистить от примесей, используя специальные машины.

3. Не следует высевать незрелые семена, так как они не дадут сильных и дружных всходов.

4. Если почва недостаточно влажная и теплая, семена не прорастут быстро и дружно.

5. Высев семян сверх нормы нежелателен, так как растения не будут иметь достаточного количества питательных веществ и воды для хорошего роста.

6. Высевая высококачественные семена при благоприятных условиях, можно получить высокие урожаи сельскохозяйственных культур.

Grammar and Vocabulary Activities

6. Answer the following questions to text A.

1. What kind of seed is essential to successful crop production?
2. How can weed seed be removed?
3. Why is immature seed undesirable for planting?
4. What is dormancy?
5. Why shouldn't fine seed be planted too deeply?
6. What agronomic practices should be followed for obtaining high-quality stand?

7. **Read text B without using a dictionary. Specify the paragraph number where it says what the soil should be for good germination.**

Text 7B Germination

1. When environmental conditions are favourable a young dormant plant begins to grow. This change from a dormant condition (состояние) to that of activity is known as germination.



2. Seeds of various kinds of plants require specific conditions for germination. These conditions include adequate moisture, due temperature and proper amount of air. Seeds of a very few plants require light as well. Unless all these conditions are provided, the seeds will not germinate properly.

3. The most favourable temperature for germination varies with the crop. Some seeds require high temperature for good germination, others will germinate best at lower temperature. Oats, for example, germinate at a much lower temperature than corn.

4. When the seed is sown in a firm, moist seedbed, quick and uniform germination is obtained, provided other conditions are favourable. A firm seedbed is desired because under such conditions the seed and soil come into closer (тесный)

contact and moisture becomes available to the seed. Too much moisture is undesirable because it may reduce germination due to deficiency of air.

5. Air is needed for germination, for oxygen is necessary for certain chemical reactions that take place in the plant food stored in the seed.



8. Specify the statements which do not match the content of the text.

Explain your choice in Russian and/or in English.

1. Seeds do not require light for germination.
2. Any seed begins germinating when conditions are favourable.
3. Germinating seeds require more moisture than air.

9. Based on the content of text B say under what conditions seeds will not germinate (in Russian or in English).

Listening and Speaking Focus

- a) Watch the video and answer the following questions:
 1. What is the process of germination controlled by?
 2. What are the four factors of germination?
 3. What grows after the seed coat becomes soft and swells?
 4. What grows when the cotyledon falls off?
- b) Describe the process of photosynthesis.

<https://youtu.be/RIGjjwphZas>

UNIT 8. SOIL

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- The infinitive as a subject and an adverbial modifier of aim.- Coinstruction for + noun (pronoun) + infinitive.- Correlative pair “the... the...”. Vocabulary focus Reading and comprehension focus: <ul style="list-style-type: none">- Text A. Soil.- Text B. Soil water. Listening and speaking focus
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Grammar Focus

The infinitive			
	Simple	Contin uous	Perfect
Active	to make	to be making	to have made
Passive	to be made		to have been made



Инфинитив в функции подлежащего

Инфинитив, стоящий в начале предложения, перед глаголом-сказуемым, является **подлежащим**. Вместе с относящимися к нему словами такой инфинитив образует **группу подлежащего**. В русском языке инфинитиву в функции подлежащего соответствует глагол в неопределенной форме или существительное.

To increase food production is one **Увеличить** производство of the most important problems of our продуктов питания – одна из days. важнейших задач нашего времени.

Увеличение производства продуктов питания – одна из важнейших задач нашего времени.

Инфинитив в функции обстоятельства цели

Инфинитив (или инфинитивная группа) в функции обстоятельства цели может стоять в начале предложения (перед подлежащим) или в конце предложения (после дополнения или обстоятельства). Такой инфинитив может вводиться союзом “in order” (“чтобы”, “для того чтобы”), который, однако, часто опускается.

(In order) to grow well plants need **Чтобы расти** хорошо, растениям water and nutrients. нужна вода и питательные вещества.

Plants need water and nutrients **(in order) to grow** well. Растениям нужна вода и питательные вещества, **чтобы расти** хорошо.

Таким образом, при переводе инфинитиву в начале предложения может соответствовать либо неопределённая форма глагола (если это инфинитив в функции подлежащего), либо неопределенная форма глагола с союзом “чтобы” (если это инфинитив в функции обстоятельства цели).

To prepare a good seedbed is very **Подготовить** хорошую почву important. очень важно.

To prepare a good seedbed we **Чтобы подготовить** хорошую must plow the soil in spring. пашню, мы должны вспахать почву весной.

Инфинитиву после слов **too** (слишком), **enough**, **sufficiently** (достаточно) в русском языке соответствует неопределённая форма глагола с союзом “чтобы” (“для того чтобы”).

This soil is fertile **enough to produce** good crop. Эта почва **достаточно** плодородна, **чтобы дать** хороший

урожай.

Grammar Practice

Укажите, при переводе каких предложений перед инфинитивом нужно употребить союз “чтобы”.

1. This soil contains too much moisture to use it for potato growing.
2. It is necessary to increase the yields of most grain crops.
3. To obtain good crops it is necessary to prepare the seedbed properly.
4. Different chemicals are used in order to control pests.
5. To develop high yielding varieties is one of essential aims of our

agriculturists.

Оборот “for + существительное (местоимение) + инфинитив

В русском языке такому обороту соответствует придаточное предложение, при этом слову “for” соответствует союз “чтобы”, а инфинитиву – сказуемое.

For seeds to germinate well the **Чтобы семена** хорошо **проросли**,
seedbed should be thoroughly prepared. пашня должна быть тщательно
подготовлена.

Grammar Practice

Укажите, в каких предложениях при переводе нужно употребить союз “чтобы” (“для того чтобы”).

1. For plants to grow better mature seeds should be used.
2. We cannot begin planting, for the soil is not wet enough.
3. Proper seeding rate is essential for good stands to be obtained.
4. Agriculture should produce more food products for people.
5. This area has been under cultivation for many years.



LESSON 8.1. SOIL

Grammar Activities

1. Identify infinitives and their functions in the following sentences.

Translate the sentences.

1. Fertilizers are used to improve soil fertility.
2. For these crops to grow well fertilizers should be applied.
3. This soil is fertile enough to produce high yields.
4. To classify crops properly one should know their characteristics.
5. The soil of this area is too poor to produce high yields of grain crops.
6. Plants absorb nutrients from the soil in order to grow well.
7. To obtain nutrients and water from the soil is the main function of plant roots.
8. Botanists study the structure of plants in order to know how they grow.

2. Say the Russian equivalents of the following international words.

1. structure, structural, structurally, structureless;
2. proportion, disproportion;
3. aggregate, aggregated, aggregation;
4. erosion, erosive;
5. normal, normally, normalization;
6. adequate, adequately, inadequate;
7. chemical, chemically, chemist;
8. deficit, deficient;
9. absorption, to absorb, absorbing, absorbed;
10. aeration, aerator.



3. Identify the following in text A:

- a) **infinitive** functions (the last 2 paragraphs);
- b) **participle I** functions (the first 2 paragraphs).

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

heavy soil, light soil, clay loam, sand, sandy loam, acid soil, alkaline soil, fine (soil), soil structure, soil texture, soil particle, fertile, organic matter, oxygen, phosphorus, potassium, erosion, wind, deficient, sufficient, to determine, to need, necessary, supply, preparation, quantity, in order (to) the ... the...

4. Read aloud and translate text A.

Text 8A
Soil

Being less important than climate, soil properties are essential in determining which crops to grow.

Texture of a soil refers to the size of its particles. Soils range from pure sands to pure clays. The principal textural classes are sand, sandy loam, clay loam, and clay. A soil with a large proportion of clay particles is usually called a heavy soil, and the one with a large proportion of sand – a light soil, the two types differing greatly in the ease of cultivation. Soil structure refers to the manner in which the particles are arranged. An aggregated or compound structure favours good seedbed preparation, ease of cultivation, and protection from wind or water erosion. Aggregated structure normally is found in soils rich in¹ organic matter.



Among soil constituents, water is the most important one. The finer the soil particles, the more water the soil holds. Extremely coarse sandy soils are unable to store moisture in sufficient amounts for crops to grow well.

Air, which makes up from 20 to 25 per cent by volume of an ordinary moist soil, supplies oxygen necessary for root growth and for oxidation of organic matter and other soil constituents.

To grow well crop plants need an adequate supply of plant nutrients during the growing season. About 25 or 30 chemical elements are found in plants, carbon, oxygen and hydrogen being most abundant. The essential mineral elements that are present in plants and are most frequently deficient in soils are nitrogen, phosphorus, and potassium. But in order to grow normally crops also absorb considerable quantities of other minerals, such as calcium, magnesium, and sulfur.

Good soils contain adequate amounts of available nutrients to meet the needs² of a crop plant for normal growth. They are not too acid or too alkaline to produce good growth. In general, fertile soils with a good water-holding capacity are favourable for the growth of the most important crop plants. Some soils may have an especially wide range of crop adaptation. However, to apply additional fertilizers is usually a good practice even on the best soils, provided growing conditions are favourable.

Notes to the text

1. rich in – с высоким содержанием;
2. to meet the needs – удовлетворять потребности.

the + сравнительная степень прилагательного или наречия...

... the + сравнительная степень прилагательного или наречия —
чем ... тем.

The sooner the better – Чем скорее, тем лучше.

Grammar and Vocabulary Activities

5. Translate the following sentences paying attention to the infinitives and their functions.

1. To develop good tubers potatoes need sandy or sandy loam soils.
2. Fine soils can store enough moisture for crops to grow normally.
3. To produce high yields crop plants require an adequate supply of plant nutrients and water.
4. Crops also require minerals in order to grow well.

5. The climate of this area is too cold to cultivate corn.
6. To apply fertilizers is the most usual practice in cultivating most crops.
7. For soil to produce good crops, it should not be too acid or too alkaline.
9. In order to improve the structure of this soil we must supply it with organic matter.
10. To get good results the plant grower must know the properties of the soil cultivated.
11. To prepare the proper seedbed is very important for obtaining good results.
12. The soils in our region are too heavy to provide normal development of tubers.
13. Legumes can be grown to improve soil fertility.
14. For soil moisture to be high enough irrigation is often necessary.

6. Specify the sentence numbers which should be translated using the Russian particle «бы». (Grammar Focus Unit 6).

1. If nutrients and water were not absorbed by the roots, the plant would not grow.
2. We should not obtain high yields if the soil were not fertile enough.
3. Provided the soil contains nitrogen, phosphorus and potassium in proper amounts, we shall be able to obtain normal development of plants.
4. Poor results may be obtained with this crop unless it is sown in a well prepared seedbed.
5. If the temperature conditions of the summer were not favourable, the plants would not grow properly.
6. Good crop cannot be produced unless the soil is well supplied with organic matter.

Listening and speaking Focus

- a) Watch the video and answer the questions:
 1. What are the negative effects of using synthetic fertilizers?
 2. How does shallow cultivation work?
 3. What do fungi and bacteria supply the plant with?
 4. What happens when the plant gets nutrients from mycorrhizal fungi?
- b) Describe the symbiosis between the plant, fungi and bacteria in the soil.

<https://youtu.be/8ugaL6wsXME>

LESSON 8.2. SOIL WATER

Grammar and vocabulary activities

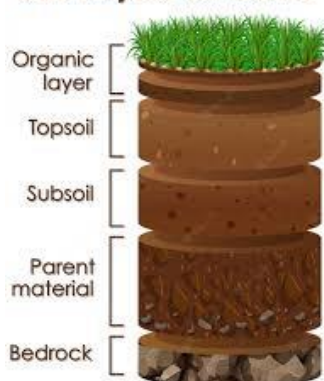
1. Translate the following sentences using *the ... the*.

2. The better the soil is, the higher the yield will be.
3. The more favourable the climatic conditions are, the better results you get.
4. The finer the soil particles are, the more moisture is stored in the soil.
5. The lighter the soil is, the more easily it is cultivated.

2. Look through text A, find and write down antonyms to the following:

heavy, coarse, rich, small, able, deficient, unfavourable, less.

Soil Layers on Earth



3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Есть тяжелые и легкие почвы.
2. Основные типы почв – песчаные, суглинистые и глинистые.
3. Почвы имеют различную структуру.
4. Вода является самым важным составным элементом почвы.
5. Воздух снабжает растения кислородом.
6. Чтобы хорошо расти, растениям требуются питательные вещества.

b)

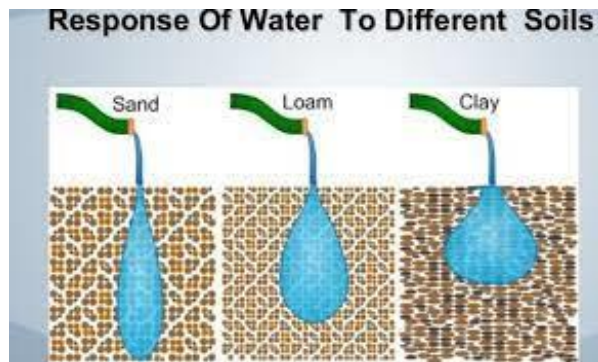
1. Текстура почвы определяется размером почвенных частиц.
2. По текстуре почвы классифицируются на тяжелые (с большим количеством глинистых частиц) и легкие (с большим количеством песка).
3. Почвенная структура зависит от расположения почвенных частиц.
4. Почвы с большим количеством органического вещества имеют сложную структуру.
5. Хорошие почвы способны удерживать влагу, которая необходима для того, чтобы растения могли нормально развиваться.
6. Чтобы хорошо расти, растениям необходим целый ряд химических и минеральных элементов.
7. Плодородные почвы содержат достаточное количество питательных веществ, которые поглощаются растениями через корни.
8. Полезно применять удобрения даже на плодородных почвах.

4. Answer the following questions to text A.

1. What textural classes of soil do you know?
2. What is soil structure?
3. What do plants absorb from the soil?
4. What do plants obtain from the air?
1. 5. What are the most important mineral elements required for plant growth?
5. Why can plants grow well on fertile soils?
6. Should fertilizers be applied to fertile soils?
- 5. Name in English all the types of soil you know.**
- 6. Read text B without using a dictionary.**

TEXT 8B

Soil water



Soil water is one of the most important factors affecting crop production. The success of a cropping system may sometimes depend on adequate irrigation and drainage programme.

Water must be available in the soil to compensate its losses through some natural processes during the growing season. Soil water is needed as it conducts nutrients for growing crops. It also has a great effect on aeration and temperature conditions in the soil. The soil must be able to provide water for maximum yield to be obtained.

However, the moisture content of a soil is not always optimum for the highest crop production. Usually there is either a deficiency or a too big amount of it, and crop production is reduced.

Some soils contain too much water at all times, and to be used for agriculture they require special drainage. There are soils which are always deficient in moisture because of inadequate rainfall, and will produce poor crops unless they are irrigated.

Most agricultural soils have enough water to meet plant requirements during a considerable part of the year.

Soil water is also a very essential factor in cultivation. It often determines the time and the depth of sowing. If there is too much water, the use of machine cultivation and harvesting machinery may be not possible. Insufficient amount of moisture makes the soil too hard and very difficult to cultivate.

7. Read aloud the passage from text B about the role of water in the supply of plant nutrients.

8. Give a talk on the role that soil moisture plays in growing crops.

Listening and Speaking Focus



- a) Watch the video and answer the following questions:
1. What is field capacity?
 2. What happens at wilting point?
 3. What does the term “available water” refer to?

b) Give a talk on how to determine soil moisture in the field.

<https://youtu.be/QXuXtwh4PbE>

UNIT 9. FARM MANURE

In this unit you will learn:	<p>Grammar focus:</p> <ul style="list-style-type: none"> - Verbs “to be” and “to have” before the infinitive. - Non-conjunctive relative clauses. - Word meaning: <i>to be</i>, <i>to have</i> (revision). - Verbs with the meaning of obligation (revision). - Correlative pair <i>neither... nor....</i> <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Farm Manure. - Text B. <p>Listening and speaking focus</p>
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Grammar Focus



Word meaning: *to be*, *to have*.
Значения *to be* и *to have*.

Значения *to be* и *to have*

Глаголы ***to be*** и ***to have*** могут иметь разные значения в зависимости от того, какая часть речи следует за ними в предложении. Соответственно различаются и их русские эквиваленты.

to be

1) be + существительное (иногда с предлогом) или прилагательное	Быть, являться, находиться, часто не переводится.
This is a farm. We are on the farm. The farm is large .	Это ферма . Мы (находимся) на ферме . Это хозяйство большое .
2) be + причастие I	Служит для образования форм продолженного времени
Different machines are working in the field.	Различные машины работают в поле.
3) be + причастие II	Служит для образования форм страдательного залога
Fields are often plowed in spring.	Поля часто пахут(ся) весной.
4) be + инфинитив	1) должен 2) состоит в том, чтобы ¹

We are to develop new corn varieties.	Мы должны вывести новые сорта кукурузы.
Our aim is to develop new corn varieties.	Наша цель состоит в том, чтобы вывести новые сорта кукурузы.

¹Если по смыслу предложения **to be** перед инфинитивом не может соответствовать «должен», следует употреблять «состоит в том, чтобы».

to have

1) have + существительное	Иметь
This soil has good structure.	Эта почва имеет хорошую структуру.
2) have + причастие II	Служит для образования перфектной формы
We have improved this soil by using fertilizers.	Мы улучшили эту почву, используя удобрения.
3) have to + инфинитив	должен
We have to apply organic matter to this soil.	Мы должны вносить органические удобрения в эту почву.

Grammar Practice

Укажите, в каких предложениях глаголы **to be** и **to have** не имеют значения долженствования.

1. We have grown these vegetable crops for many years.
2. Better varieties are to be selected.
3. Next year improved varieties should be used.
4. We have to apply this soil with proper amount of organic matter.
5. The farmers are preparing the seedbed for wheat.



Non-conjunctive relative clauses.

Бессоюзное присоединение определительных придаточных предложений.

В определительных придаточных предложениях слова **that, which, who** могут быть опущены. Если за двумя рядом стоящими существительными (не образуя «цепочку» существительных) или существительным и личным местоимением в именительном падеже следует глагол в личной форме, второе существительное (или местоимение) обычно является подлежащим придаточного предложения, которое присоединено к главному **без союза**.

The soil **^** the farmers use as a seedbed is rich in organic and mineral matter.

Такие придаточные на русский язык переводятся с добавлением союзного слова «который».

Почва, **которую** фермеры используют в качестве пашни, богата органическими и минеральными веществами.

Если в конце такого придаточного предложения имеется предлог, при переводе он ставится перед союзным словом.

The soil we speak **about** can be used for growing potatoes. Почва, **о которой** мы говорим, может быть использована для выращивания картофеля.

Grammar Practice

Укажите, в каких предложениях при переводе на русский язык нужно добавить союзное слово «который».

1. The classification of farm crops given in this book is based on their use.
2. The climate of this area is not favourable for growing rye.
3. All the area you have seen belongs to our farm.
4. The temperatures these seeds germinate at is rather low.
5. The fertilizers the farmers use to increase soil fertility contain nitrogen, phosphorus and potassium.



Verbs with the meaning of obligation Глаголы со значением долженствования.

Есть несколько глаголов, имеющих значение долженствования. За ними непосредственно следует инфинитив. После глаголов **must** и **should** инфинитив употребляется **без частицы to**.

We must We should	use fertilizers	Мы должны использовать удобрения.
We are to We have to We ought to	use fertilizers.	

Grammar Practice

Укажите, в каких предложениях имеется глагол со значением долженствования.

1. You should plow this soil in spring.
2. Crop production is to be increased.
3. Crop production has been increased greatly.
4. We should obtain higher yields if the soil there were more fertile.
5. You have to control weeds better.
6. We shall use combine harvester in these area.
7. Most farms of this area take measures for protection from erosion.

8. These fields must be irrigated.

LESSON 9.1. FARM MANURE

Grammar Activities

1. Translate the following sentences paying attention to the verbs *to be* and *to have* before the infinitive.

1. Many agricultural processes are to be mechanized.
2. Our aim is to mechanize more agricultural processes.
3. We have to apply nitrogen and phosphorus to this soil.
4. We are to introduce some new methods of selection on our farm.
5. The agronomist has to use chemicals to control weeds.

2. Translate the sentences adding the missing conjunction.

1. The fertilizers we have applied will increase crop yields.
2. The seedbed the farmers use for planting must be well prepared.
3. The principal parts a plant consists of are the roots, the stem, and the leaves.
4. The classification of grain crops we discussed last week is of great interest.

3. Identify in text A:

- a) The meaning of the verb *to be* before the infinitive in paragraph 5;
- b) the missing conjunction «*который*» in paragraph 2.

Vocabulary Focus

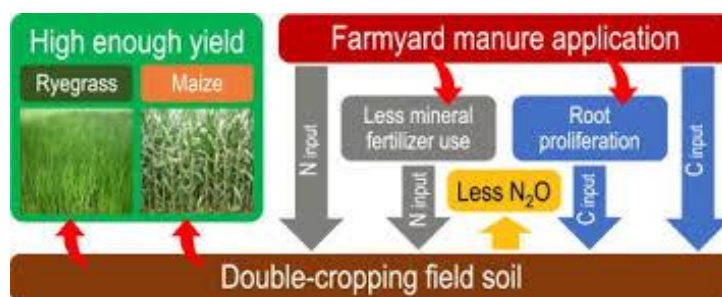


Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

cover crop, humus, manure, leguminous, decomposition, leaching, maintenance, substance, to lose (lost, lost), low in, property, to add, to turn under, possible, aim, during, too, since, neither... nor.

4. Read aloud and translate text A.

Text 9A Farm manure



Fertility is one of the most essential properties of the soil, as high crop production always greatly depends on it.

A lot of factors may help to produce soil fertility. A fertile soil is warm, moist and well structured; it is neither too acid nor too alkaline, and contains a great amount of soil nutrients. Since good structure and the supply of nutrients depend on organic

matter, one can say that fertility of a soil is greatly affected by the organic matter it contains.

However, plant nutrients are lost from the soil in different ways. To compensate the nutrients the growing crops remove, as well as those lost through erosion and leaching farmers have to use barnyard manure and green manure crops.

Farm or barnyard manure is highly important for growing crops, its value for maintenance of soil productivity having been recognized since early times. Manure can improve the soil that is cropped because it contains such substances as nitrogen, phosphorus and potash. It also adds humus which is the product of organic matter decomposition.

When the soil is low in organic matter, the growing of crops which are to be plowed under may be desirable. Such crops are referred to as¹ green manure crops. The aim of growing them is to increase organic matter and nitrogen content of the soil. Cover crops which are used to protect the soil surface should commonly be turned under for green manure, too.

Green manures are primarily used in order to increase the yield of subsequent crops as well as to improve the fertility of the soil, supplying organic matter and thus compensating for its losses through cultivation. The purpose of green manuring is also to prevent the leaching of plant nutrients from the soil during periods between regular crops, and to increase the supply of combined nitrogen when leguminous plants are turned under.

However, it is not always practically possible to increase the organic matter content of a given soil to any considerable extent. The beneficial results often obtained from incorporating a green manure crop are due to increased availability of soil nutrients rather than² to an increase in the organic matter content in the cultivated soil.

Notes to the text

1. to be referred to as – называться;
2. rather than – а не.



Grammar and Vocabulary Activities

5. Translate from English into Russian paying attention to the meanings of the *to be* and *to have*.

1. We have used these crops as green manure to increase the amount of organic matter in the soil.
2. Manure is to add humus to the soil.
3. If soil is low in nitrogen, legume crops are often plowed under.
4. The aim of using green manure crops was to prevent the leaching of plant nutrients from the soil.
5. Sometimes plant growers have to turn under leguminous plants in order to raise the supply of nitrogen in the soil.

6. In our country we have a lot of areas with highly fertile soil.
7. The soil of our farm is rich in phosphorus and potash.
8. Many important problems are to be solved in agriculture.
9. The value of soil fertility is well known to agriculturists.
10. To increase the yields we have to use barnyard manure and fertilizers.
11. Our plan is to obtain good stands by seeding high quality seed.
12. The value of humus has been recognized since early times.

6. Specify the sentences where the conjunction («который») is omitted.

1. The optimum temperature the seed will germinate at varies with different kinds of seeds.
2. The farm our agronomist spoke about is a good producer of forage crops.
3. Cereals that are widely grown in this region are used as food both for man and for livestock.
4. To obtain good stands plant growers should follow the recommendations which are given by the agronomist.
5. The crops farmers grow for plowing under are called green manure crops.
6. We use fertilizers and barnyard manure to supply nutrients the plants have removed.

7. Identify sentences containing verbs with the meaning of obligation.

1. Seed should be sown at a proper rate.
2. If we were asked we should recommend to start harvesting next week.
3. Our farm is to plant legumes on larger area next year.
4. We shall grow more fiber crops in order to obtain more oil.
5. To germinate uniformly seed must be planted at the same depth.
6. At present plant breeders can influence some characteristics of plants.
7. These improved potato varieties have been obtained through hybridization.
8. If the soil is not sufficiently moist, we shall have to irrigate it.
9. Green manures are to be used to increase the yields of crops that will follow.
10. Cover crops should be grown to protect the soil surface.
11. Most vegetable crops should be grown on the soil high in organic matter.

Listening and Speaking Focus



Watch the video and answer the following questions:

1. What is the usual limit of salt per acre?
2. What can farmers do with liquid manure?
3. Why should a farmer get manure in the ground as quickly as possible?
4. What are the advantages of using dry manure?

LESSON 9.2

8. Translate the sentences paying attention to the word meaning of *since*:

1. We have not discussed this problem since last year.
2. Since this crop requires a long growing season it should be planted in early spring.
3. Since there is not enough organic matter in this soil, green manure crops are to be grown on it.
4. This corn variety has been cultivated in our region since 1980.

9. Translate the following word combinations.

unlike cereals; like cereals; to be rich in nutrients; to be low in organic matter; to be high in organic matter; to depend on; one should know; neither nitrogen nor phosphorus; either nitrogen or phosphorus; both nitrogen and phosphorus; nitrogen as well as phosphorus; most soils; most favourable conditions; more favourable conditions; less favourable conditions; since 1970; since this soil is deficient in nitrogen...

10. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Урожай зависят от почвенного плодородия.
2. Плодородная почва содержит много питательных веществ и влаги.
3. Содержание органического вещества сильно влияет на плодородие почвы.
4. Навоз и минеральные удобрения должны компенсировать потери питательных веществ вследствие эрозии и выщелачивания.
5. Чтобы повысить плодородие почвы, можно использовать сидеральные культуры.
6. Эти культуры увеличивают количество органического вещества в почве и его доступность для растений.

b)

1. Плодородие почвы сильно влияет на урожай с.-х. культур.
2. Плодородная почва должна быть теплой, достаточно влажной и должна иметь хорошую структуру.
3. Запас питательных веществ для растений зависит от количества органического вещества, которое содержится в почве.
4. Питательные вещества выносятся растениями и теряются вследствие эрозии и выщелачивания.
5. Их можно компенсировать путем внесения в почву навоза и удобрений.
6. Навоз улучшает почву, так как содержит азот, фосфор и калий.
7. На почвах с низким содержанием органического вещества нужно выращивать культуры, идущие на зеленое удобрение.
8. Эти культуры увеличивают количество азота в почве.

9. Сидеральные культуры могут также повышать доступность питательных веществ для растений.



11. Specify sentences that do not correspond to text A. Correct them accordingly.

1. A fertile soil is either acid or alkaline.
2. Soil fertility depends on the amount of the organic matter contained.
3. Plant nutrients removed from the soil by the growing plants cannot be compensated.
4. Green manure crops are grown on the soil rich in organic matter.
5. Green manures always increase the organic matter content of the soil.

12. Read and translate text B without a dictionary, title it. Define the meaning of words in bold according to the context.

Text B



Organic matter made up of living material is an important component that may greatly influence physical, chemical and biological processes that take place in the soil.

Organic matter which includes crop and animal residues is of great value in its effect, as it improves soil structure. Due to organic matter contained the soil can better absorb and hold water thus reducing considerably the losses of valuable nutrients by leaching and erosion.

Having decomposed, organic matter forms humus which increases the availability of mineral matter for nutrition. It also can make a heavy soil lighter.

Organic matter favours the growth and development of beneficial types of bacteria in the soil. It can also store nitrogen needed by growing plants.

If organic matter is contained in a proper amount, it helps the soil to absorb heat from the sun and warm up more easily.

The amount of organic matter the soil accumulates is dependent upon soil and climatic conditions and upon the way in which the land is used. If the soil is cultivated too intensively, or if no crops are grown in the area for long periods, the supply of organic matter in the soil is reduced.

13. Find the definition to the word «гумус» in text B.

14. Basing on text B name in Russian (in English) the function of organic matter in soil.

Listening and Speaking Focus

Watch the video and answer the questions:

1. What are the negative factors with manure?
2. What's the role of bacteria in composting?
3. When do nutrients release faster: if you are composting or if you use manure?
4. How long does the normal process of composting typically take?

<https://youtu.be/AmjvmRX5jHI>

UNIT 10. SEEDBED PREPARATION

In this unit you will learn:	Grammar focus: - Attributive function of the infinitive. Vocabulary focus Reading and comprehension focus: - Text A. Seedbed preparation. - Text B. Tillage. Listening and speaking focus
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Grammar Focus



Attributive function of the infinitive Инфинитив в функции определения

Инфинитив или инфинитивная группа, следующие непосредственно после существительного, могут являться не только обстоятельством цели, но и **правым определением** к этому существительному (обычно инфинитив в функции определения имеет пассивную форму – to be used, to be applied). В русском языке такому инфинитиву соответствует определительное придаточное предложение с союзным словом «который». Сказуемое этого придаточного предложения обозначает действие, **которое должно произойти**.

Crops **to be grown** in this region should be adapted to the environmental conditions.

Культуры, **которые будут (должны) выращиваться** в этом районе, должны быть приспособлены к условиям окружающей среды.

The problem **to be solved** in the nearest future is to obtain more high-quality food products.

Проблема, **которую нужно решить** в ближайшем будущем, состоит в том, чтобы получить больше высококачественных продуктов питания.

Grammar Practice

Specify, when translating which sentences you need to use the word «which» in Russian («который»).

1. We use irrigation to increase the amount of moisture in the soil.
2. The seedbed to be prepared will be used for sowing wheat.
3. These crops are to be used as green manure.
4. Cover crops to be turned under as green manure are used to protect the soil.
5. Plant nutrients lost from the soil have to be compensated.

LESSON 10.1. SEEDBED PREPARATION

Grammar Activities

1. Highlight the attributive function of the infinitive in the following sentences. Translate these sentences.

1. The seedbed to be used for sowing grain crops should be rich in organic matter.
2. The variety of corn to be sown this year has been developed by our agronomists.
3. The best method to be recommend for improving soil fertility in this region is to plow under green manure crops.
4. The methods of crop improvement to be applied vary with the conditions of cultivation and some other factors.
5. The application of manure should increase the organic matter content in the soil to be cultivated.

2. Find in text A:

1. инфинитив в функции определения;
2. глагол to be в различных значениях (предпоследний абзац).

3. Name the vocabulary form of the following:

1. прилагательных – more favourable, best, deeper, greatest;
2. причастий – produced, grown, planting;
3. существительных – qualities, growers, losses.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

fall, absorption, evaporation, harrow, mellow, residue, to roll, tillage, temperature, wet, loss, to maintain, to kill, to destroy, to insure (ensure), to allow, to occur, common, quite, rapid, while.

4. Read and translate text A.

Text A

Seedbed preparation

Good stands start with good seed. However, even the best seed will not produce optimum yields unless other factors are favourable. A good seedbed that supplies the proper environment for germination is of the greatest importance in

ensuring an optimum stand of the crops to be grown. Such seedbed is to insure adequate moisture for germination at the due seeding depth. The soil particles must be in contact with the seed they surround to allow a maximum water absorption for rapid germination.



Before planting, a grower has to perform cultivation practices that insure the proper environment for germination and at the same time preserve soil structure and minimize water loss due to evaporation from the soil surface. If the soil were too finely pulverized, crusting would occur. To maintain good structure the soil should not be cultivated when it is wet.

The first tillage operation following the preceding harvest is to destroy crop residues and to incorporate them into the soil to be used for seeding. In some regions this is done in the fall, while in areas with short growing season this operation is delayed until early spring. Early cultivation allows more time for organic matter to decompose.

Final seedbed preparation is completed in spring or late summer for crops to be sown in the fall. The first step is to cultivate with discs or harrows, or both. The surface soil is to be worked finely enough to minimize evaporation and to insure fine and mellow seedbed. It has to be cultivated deeply enough to kill early growing weeds. After cultivation, fields are sometimes rolled to insure a firm seedbed. This is quite common in preparing the seedbed for most forage grasses. For crops that require irrigation, beds should be formed before rolling. To conserve moisture, final seedbed preparation should be followed by immediate planting.

However, even the best seedbed will not insure a good stand unless there is enough oxygen and proper temperature for seed germination.



Comprehension Focus

5. Translate the following sentences. Mind the difference when translating attributes expressed by participle constructions and the infinitives.

1. The soil to be used as a seedbed should be warm, moist and mellow.
2. The soil cultivated when it is too wet will not provide conditions for normal plant growth.
3. Seed planted deep enough will have a sufficient supply of moisture and nutrients.

4. Developing a new variety to be cultivated in a given area one should know its soil and climatic requirements.
5. We were given the seed to be used for sowing.
6. The seedbed prepared in spring is to provide the proper environment for seed germination.
7. Fertilizers to be applied must be of highest quality.
8. The yield of root crops produced last year was rather low.
9. The yields to be obtained on our farm greatly depend on soil condition.
10. The increase in corn yield to be produced greatly depends on the amount and quality of fertilizers and manure added to the soil.

6. Highlight words and groups of words that function as attributes to nouns (participle constructions, infinitives, clauses). Translate the sentences.

1. The seedbed we prepare for sowing this crop must provide optimum conditions for plant development.
2. Before planting the farmer has to prepare a seedbed insuring optimum conditions for seed germination.
3. The soil to be used as a seedbed should not be too finely pulverized.
4. The soil that is too wet will not provide proper germination.
5. The seedbed used for growing forage grasses must be firm enough.
6. The amount of seed to be sown per hectare should be well known.
7. The fertilizers applied produced good effect on the growth of the plants.
8. The period of the potato tubers form and develop should be cool enough.

7. Identify the part of speech for the highlighted words. Translate the sentences.

1. One must **water** the flowers regularly.
2. **Water** is required by all plants.
3. There exist some **water** plants which grow in water.
4. The practice of minimum tillage often produces good **results**.
5. Such practice **results** in much higher yields.
6. Every farmer knows that he must **plant** seeds in a well prepared seedbed.
7. This **plant** requires a long frost-free period.
8. We **use** this method for increasing food production.
9. The **use** of legumes for food is well known.
10. Our aim is to increase **yields** of the main crops.
11. This crop **yields** better when fertilizers are applied.

Listening and Speaking Focus

Watch the video and answer the questions:

1. Why is making seedbeds of the same size a good idea? Give 2-3 reasons.
2. How can you use wooden stakes and woolen string?
3. Describe the stale seed bed technique.

<https://youtu.be/-8TgRilpXh4>

LESSON 10.2. TILLAGE

1. Translate the sentences. Mind the meanings of *due*, *due to*, *to be due to*.

1. This soil has been improved due to the growing of legumes.
2. The seedbed should be prepared at the due time.
3. The increase in yield was due to the proper management of the soil.
4. Seed should be sown at the due depth.
5. Losses of nutrients from the soil may be due to different factors.
6. Due to mechanization the work on the farm has become much more effective.

2. Find nouns in the text that correspond to the following verbs and adjectives:

to yield, to plant, enviromental, to grow, to absorb, to harrow, to prepare, important, moist, to germinate, to loss.



3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Хорошая пашня так же важна для получения высоких урожаев, как и хорошие семена.
2. Семена нужно сажать на соответствующую глубину.
3. Культивация почвы сохраняет ее структуру и уменьшает потери влаги вследствие испарения.
4. Первые операции по обработке почвы производятся либо осенью, либо ранней весной.
5. Для сохранения почвенной влаги посадка должна следовать сразу за подготовкой пашни.
6. Если климатические условия неблагоприятные, хорошая пашня не обеспечит высоких урожаев.

b)

1. Хорошо приготовленная пашня имеет очень большое значение для получения хороших всходов.
2. Хорошая пашня обеспечивает влагу, которая необходима для быстрого прорастания.
3. Обработка почвы перед посевом позволяет сохранить почвенную структуру и уменьшить потери воды вследствие испарения.
4. Первая операция по подготовке пашни – это заделка в почву растительных остатков.
5. Иногда культивация должна быть достаточно глубокой, чтобы уничтожить сорняки.
6. При выращивании кормовых трав почва обычно прикатывается для получения плотной пашни.

7. Чтобы сохранить влагу, сразу за подготовкой пашни должна следовать посадка.

8. Если мало кислорода и температура воздуха слишком низкая, семена не будут нормально прорасти даже на хорошей пашне.

Grammar and Vocabulary Activities

4. Find equivalents to the following English words and word combinations in the Russian sentences below.

due, due to, to be due to, to vary with, until, unless, to provide, provided, both, both ... and.

1. Мы обеспечили все необходимые условия для нормального развития сеянцев.

2. Если растения не получают достаточного количества необходимых питательных веществ, они не могут хорошо развиваться.

3. Способ улучшения сортов картофеля, который мы выберем, зависит от конкретных условий.

4. Нельзя начинать посев до тех пор, пока почва не прогреется.

5. Оба наши комбайна нуждаются в ремонте.

6. Все операции были проведены в должной последовательности.

7. Если такая сухая погода продержится долго, урожай может пострадать.

8. Большие потери зерна объясняются сильным полеганием.

9. Структура почвы несколько улучшилась благодаря правильной обработке.

10. Для получения хороших всходов необходима как хорошо подготовленная пашня, так и высококачественный посевной материал.

5. Answer the questions to text A.

1. Why is good seedbed necessary?

2. Is moisture required by germinating seeds?

3. What is cultivation done for?

4. Why is it recommended to cultivate the soil early in the season?

5. What should be done to conserve moisture?

6. Is a good seedbed the only factor providing proper germination of seed?

6. Name all the seedbed preparation operations that you know in English.

7. Read and translate text B without a dictionary. Identify the meaning of highlighted words according to their Russian equivalents and to the context.

Text B Tillage



After seedbed preparation and the planting of the crop, the young plants start to grow in a few days. When row crops such as corn, soybeans, and cotton are grown, farmers have to cultivate to control weeds. Cultivation includes some tillage operations. One of the purposes of tillage is to maintain good soil tilth, that is the physical condition of the soil providing normal plant growth. A soil with a good tilth will be mellow, friable and easily worked.

These conditions are necessary for the roots to absorb nutrients, water and air needed for plant development.

Tillage at the due time and with the proper machines will produce desirable soil tilth. However, too much tillage in preparing the seedbed or cultivating crops may be undesirable.

Nowadays the traditional tillage practice is increasingly replaced by minimum tillage, its main **advantages** being better soil protection from erosion and lower soil **compaction**. Under minimum tillage the crop yield is usually as good as under traditional cultivation, while the number of operations is reduced. Farm equipment used now can prepare the soil, apply fertilizers, and plant the seed in one operation.

Vegetable and small fruits can sometimes be grown with no tillage after planting the crop, weeds being controlled with **herbicides**. Yields of potatoes, carrots and some other crops grown under such system are sometimes even higher than yields when cultivation is practised.

8. Look through text B and:

- a) find and define «*soil tilth*»;
- b) name in Russian the main advantages of minimum tillage.

9. Complete the following sentences.

1. When no tillage is practised, weeds are...
2. Under traditional cultivation yields may be as high as under....
3. Minimum tillage better protects the soil from



Listening and Speaking Focus

Watch the video and answer the questions:

1. Why do some farmers have angled tillage in a square field?
2. What does a farmer do if there is a hill in the field?
3. What can a farmer do to reduce erosion?

<https://youtu.be/HxMXE6q7PGo>

UNIT 11. AGRICULTURAL PRACTICES

<p>In this unit you will learn:</p>	<p>Grammar focus:</p> <ul style="list-style-type: none"> - Functions of Infinitive (revision). - <i>No</i> as a modifier. - Conjunction “whether”. <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Agricultural practices. - Text B. Drainage and irrigation. <p>Listening and speaking focus</p>
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LESSON 11.1. AGRICULTURAL PRACTICES

Grammar Activities

1. **Revise the Grammar Focus sections of Units 8 and 10.**
2. **Identify the functions of the infinitive in the following sentences.**

Translate them.

1. The aim of our work is to prepare a sufficiently fine seedbed.
2. We spoke about new winterhardy crop varieties to be developed for northern regions.
3. To prepare a good seedbed we must use both disc and harrow on this soil.
4. To have sufficient amount of hay and silage we must grow forage crops on rather big areas.
5. Crops grown in this region should be frost-resistant in order to be able to withstand adverse effects of cold and windy weather.
6. As the weather was very hot and dry, the farmers had to irrigate the crop area.
7. For grasses to germinate more rapidly farmers have to add some manure to the soil.
8. This soil being low in organic matter, a lot of barnyard manure is to be applied.
9. The soils of our region are too acid to produce good stands of alfalfa.
10. Fertilizers to be applied should contain required amounts of nitrogen, phosphorus and potassium.
11. We do not grow enough forage crops on our farm to feed our livestock properly.



3. Determine by suffix the part of speech the following words belong to:

fulfilment, clearly, wider, harvester, sandy, principal, realize, reproductive, bulky, famous, supplier, helpless, manager, unavailable, cultivator, usefulness, picture, association, darkness, difference, probability, originate, remarkable, physicist, composition, insufficient.

4. Find in text A:

- a) все глаголы, имеющие значение долженствования (4-й абз.);
- b) инфинитив в функции подлежащего (5-й абз.);
- c) инфинитив в функции определения (5-й абз.);
- d) независимый причастный оборот (предпоследний абз.).

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

to drill, dry, equipment, to cut (cut, cut), management, to ripen, silage, to shatter, hot, thick sowing, thin sowing, to cause, to compete, close, to get (got, got), to prevent, suitable, no, weather, whether.

5. Translate text A.

Text A

Agricultural practices

There are many ways in which the yield can be affected by management of a crop.

No crop will grow¹ well unless it gets a good start in a suitable seedbed. The seedbed must be either fine or coarse, it must have fine soil at the depth where the seed is to be sown, and it should be moist. Different crops require different seedbed.



Sowing a crop must be done properly. The seed is to be drilled in at the right depth, depending on the size of the seed and the season. Generally the smaller the see closer it has to be sown to the surface. The time of sowing the crop depends on the length of the growing season and of the variety chosen, as well as on the moisture conditions. The sowing rate must be lower in dry areas with no rain for long periods.

In such areas plants compete strongly for soil water, and irrigation should be done to obtain higher yields. The soil being rich nutrients, the rate of sowing may be increased. This factor is of great importance, for too thick or too thin sowing will lower grain production.

Proper cultivation of a crop is often essential if the highest yield is to be obtained, and the main reason of cultivation is to kill weeds when they are To harvest a crop at a proper time is also one of the conditions greatly affecting the crop production. However, before fixing the time for harvesting we should know, whether the crop is to be used for hay or for silage. Crops to be harvested for silage must be cut when they are bulky and still succulent. Crops used for hay are usually cut before they set seed. As to grain crops, they should not be harvested until the grain is mature, and hot dry weather is usually the best for grain harvests.

Mechanical harvesting helps the farmers to harvest field crops while they are in peak condition, more timely harvest reducing the risk of bad weather causing a loss in quantity and quality. For modern harvesting equipment to be of greater effect, crop varieties better adapted to mechanical harvesting have been developed. They are more uniform in height and ripen more evenly. Also crops with shorter growing season are being developed. Some grain varieties do not shatter easily as they are cut with modern harvesters.

The problem of choosing proper soil management practices is highly essential-as it not only affects the yield, but also maintains high fertility level, prevents soil erosion, and improves soil structure.

Notes to the text

1. no crop will grow – никакая культура не будет расти.

Grammar and Vocabulary Activities

6. Specify and highlight in different colours the sentence in which the following is to be used before the infinitive:

a) чтобы,

b) который.

1. Small seeds are to be sown close to the soil surface.
2. To increase yields in dry areas with long rainless periods irrigation is to be used.
3. Crops to be harvested mechanically should be uniform in height.
4. Proper soil management practices should be applied to maintain soil .fertility and prevent erosion.
5. To get a good start in a proper seedbed is of great importance for the plant to develop normaly.
6. The sowing rate to be followed varies with soil and climatic conditions of the area.
7. Our aim is to develop new varieties better adapted to dry conditions.
8. The weather is too bad to begin harvesting.
9. We have to delay harvesting these crops because of the grain being still immature.
10. Crops to be used for hay are to be cut before they set seed.
11. The main reason of some tillage operations is to kill weeds.

12. In order to harvest all the field crops at the due time we must use modern harvesting equipment.



7. Translate the following.

1. the crop is to be harvested...;
2. the crop to be harvested...;
3. the crop is harvested...;
4. the crop harvested last week...;
5. the crop has been harvested...;
6. the crop has to be harvested.

8. Translate the sentences. Mind the conjunction *whether*.

1. Before using harvesters we must find out whether the crops to be cut are adapted to mechanical harvesting.
2. Choosing the time for harvesting, one should know whether the crop is grown for silage or for hay.
3. It cannot be said now whether the weather tomorrow will be suitable for working in the field.
4. We should ask the agronomist whether the new method is as effective as the old one.

9. Translate the following word combinations.

Weather conditions; soil management practices; grain crop varieties; high soil fertility; higher soil fertility; the highest soil fertility; more fertilizers; much more fertilizers; less fertilizers; more useful practice; the most useful practice.

10. Find the passage in text A where the advantages of mechanized harvesting are discussed.



Listening and Speaking Focus

Watch the video and give a talk on sustainable farming practices.

<https://youtu.be/Xxzyj2f7mkU>

LESSON 11.2. DRAINAGE AND IRRIGATION

1. Translate the sentences. Mind the different meanings of the word *for*.

1. Students worked on this farm for a month.
2. Seed must have enough moisture for germination.

3. This seed does not germinate well, for the soil is not moist enough.
4. We could work in the field for some days, for the weather was too rainy for harvesting.

2. Translate the sentences containing the pronoun *no*:

1. No plant can grow without water.
2. There will be no germination if the soil is not warm enough.
3. Seed requires no light for its germination.
4. There has been no rain for 2 months.

3. Find the synonyms to the highlighted words in Text A.

The **proper** depth, to **influence** the yield, to **need**, to be **high** in nutrients, at a **due** time, crops should be **cut**, in **best** condition, highly **important**.

4. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Ни одна культура не будет расти, если она посеяна в плохую пашню.
2. Семена должны заделываться на соответствующую глубину.
3. Время и норма посева семян зависят от многих факторов.
4. Культуры должны быть убраны вовремя.
5. Время уборки различно в зависимости от вида культуры.
6. Уборка машинами позволяет быстрее собрать урожай.
7. Не все сорта приспособлены для уборки машинами.
8. Применение правильных приемов обработки почвы помогает получить более высокие урожаи.

b)

1. Правильные приемы возделывания культур имеют большое значение.
2. Чем крупнее семена, тем глубже они должны заделываться.
3. Время посева зависит от состояния почвы и от длительности вегетационного периода культуры, которая должна быть посеяна.
5. Если почва содержит много питательных веществ, норма высева увеличивается.
6. Уборка должна производиться вовремя, при этом время уборки зависит от вида культуры.
7. Уборка машинами производится быстрее и позволяет сократить потери вследствие плохой погоды.
8. Чтобы получить хороший урожай, нужно применять соответствующие приемы обработки почвы.

Grammar and Vocabulary Activities

5. Arrange the questions so that they serve as a plan to text A, then answer them.

1. Why are proper soil management practices important?
2. What does the proper time of sowing depend on?
3. Do different crops require the same kind of seedbed?
4. Is crop production affected by the time of harvesting?

5. Why is mechanical harvesting used?
6. What does the sowing rate vary with?
6. **Read text B without a dictionary. Identify the meaning of the words in bold according to the context.**

Text 11B
Drainage and irrigation



One way of **drainage** is the natural property of the soil to allow water to pass deeply into the ground. The ease with which water can pass through a soil is influenced by soil texture. The coarser the particles, the more rapidly the water passes through the soil. So, light sandy soils are more water permeable than heavy clays.

Another way is artificial (искусственное) drainage, that is the removal of water which is not needed in order to maintain correct balance of air and water in the soil. Good drainage makes a soil easier to cultivate and increases the feeding area for plant roots. A well drained soil will also have enough air for aerobic bacteria to decompose organic matter into humus and so to provide food for the plant.

Where and when the supply of water is insufficient, **irrigation** is needed. There are two main sources of irrigation water: surface water and ground water. The former may be obtained from different rivers and other water reservoirs, while the latter is provided by the underground water stores.

The amount of water required for irrigation depends on a number of factors. These are the type of soil, the water deficit in the soil, the type of crop and its phase of growth. The irrigation requirement of a crop is not the same throughout its growing period, most plants requiring larger quantities of water during the later periods of growth.

7. **In text B, find the sentences saying about the main ways of drainage (the first two paragraphs).**



8. **Answer the following questions to text B in English.**
 1. When is drainage necessary?
 2. When is irrigation necessary?
 3. Do plants need the same amount of water during the growing?

Listening and Speaking Focus

Watch the video and answer the following questions:


1. What problems does poor drainage lead to?
2. How does drain tile work?
3. What system is recommended as economically efficient?

<https://youtu.be/Ug96yQUp7nc>

UNIT 12. FERTILIZERS

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- Complex Subject.- -ing-forms (revision).- Uses of Passive Voice. Special cases (revision).- Any in affirmative sentences. Vocabulary focus Reading and comprehension focus: <ul style="list-style-type: none">- Text A. Fertilizers and their application.- Text B. Essential minerals. Listening and speaking focus
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Grammar Focus

	ПОДЛЕЖАЩЕЕ Существительное или местоимение в именительном падеже	СКАЗУЕМОЕ Личная форма глагола в страдательном залоге + Инфинитив
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В качестве сказуемого при таком подлежащем используются глаголы: **to know** – знать, **to say** – говорить, **to think** – думать, **to believe** – полагать, **to consider** – считать, полагать, **to suppose** – предлагать, **to find** – находить. Все эти глаголы формально являются сказуемыми, а по сути, передают лишь отношение к содержанию высказывания.

This cultural practice is known to be of great use on farms.

1. Этот прием возделывания, как известно, широко используется в хозяйствах.
2. Известно, что этот прием возделывания широко используется в хозяйстве.

This soil was believed to be deficient in nitrogen.

1. Эта почва, как полагали, содержит недостаточно азота.
2. Полагали, что эта почва содержит недостаточно азота.

The new variety has been found to grow well under such climatic conditions.

1. Новый сорт, как установлено, хорошо растет в таких климатических условиях.
2. Установлено, что новый сорт хорошо растет в таких климатических условиях.

Следовательно, при переводе предложения, содержащего конструкцию "сложное подлежащее", инфинитиву соответствует сказуемое, а "формальному" сказуемому – либо вводные слова (как известно, как полагают и т.д.), либо неопределенно-личное предложение с последующим союзом "что" (известно, что полагают, что ... и т.д.).

Grammar Practice

Укажите, в каких предложениях имеется конструкция "сложное подлежащее".

1. Weather conditions are known as one of the most important factors in crop production.
2. Weather conditions are known as one of the most important factors in crop production.
3. Weather conditions of these area are known to all
4. It is supposed that this farm will obtain high yields of grain crops this year.
5. This farm is supposed to obtain higher yields of grain crops this year
6. Weather conditions of these area are known to all

LESSON 12.1. FERTILIZERS AND THEIR APPLICATION

Grammar Activities

1. **Study the Grammar Focus Section of this Unit.**
2. **Translate the sentences. Mind the Complex Subject.**
 1. Legumes are known to improve soil fertility.
 2. This soil has been found to be deficient in some plant nutrients.
 3. This *seedbed* is believed to contain too much moisture.
 4. The farm «Rassvet» was said to produce high quality cotton.
 5. Alfalfa *and* clover are known to belong to forage crops.
 6. This area was considered to be suitable for growing cereals.
 7. Our farm is expected to produce high yield of rye this year.
 8. He is thought to become an experienced agronomist in some years.
3. **Find the following in text A:**
 1. сложное подлежащее (3-й абзац);
 2. инфинитив в функции обстоятельства цели (3-й абзац);
 3. инфинитив в функции подлежащего (3-й абзац);
 4. независимый причастный оборот (4-й абзац).
4. **Identify by suffixes the parts of speech the following words belong to:**
 1. application, applicable, applied, applying;
 2. nitrogen, nitrogenous;
 3. phosphorus, phosphatic;
 4. effect, effective, effectively, effectiveness;
 5. soluble, solubility;
 6. mixture, mixed, mixing.
5. **Give the Russian equivalents to the following words.**
unnecessary, insufficient, immature, irregular, ineffective, irrational, unplowed.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

commercial fertilizers, broadcast application, top dressing, side dressing, lime, mixture, to place, to distribute, injury, to spread (spread, spread), stage, susceptibility, to become (became, become), certain, to consider, to receive, to mean, several, to tend, any, and so on, so that.

6. Translate text A using the Vocabulary Focus.

Text A

Fertilizers and their application



As crops are known to remove nutrients from the soil, the latter may become deficient in some elements. Application of commercial fertilizers is to improve soil fertility and to ensure better quality of the crops to be grown.

Fertilizers are usually classified according to the food element which forms their main constituent. So, they may be grouped as nitrogenous fertilizers, phosphoric fertilizers, potassic fertilizers and so on.

To be effective, fertilizers should be applied where and when the plant needs them. Single yearly applications were found to be insufficient for some crops, being unnecessary for others. Young growing plants should not be given concentrated, highly soluble fertilizers because of salt injury. To make repeated applications throughout the season is of great use in case of perennials or long-season annuals.

There are various methods of fertilization. Broadcast application means spreading the material uniformly over the soil surface, usually before the crop is planted. Sometimes the fertilizer is placed directly over the growing crop, which is known as top dressing. When plants are subject to injury fertilizers can be put alongside the plants as a side-dressing, the latter being often made along with cultivation.

Sometimes a mixed fertilizer containing two or more fertilizer elements is to be applied, the time of placement being highly essential. Mixtures with low amount of nitrogen are usually applied to the soil before or during planting, followed by a top dressing or side-dressing with a liquid or granulated nitrogen fertilizer. Winter cereals usually receive a top dressing in spring. Row crops, such as corn, receive a side dressing after the plants made some growth. With many crops nitrogen is applied several times during the growing season because it is known to be subject to leaching and conversion to unavailable forms. But one should not forget that too much nitrogen tends to cause lodging, late maturity, poor seed development in some crops, and greater susceptibility to certain diseases. Phosphatic fertilizers are considered to

be most effective when they are applied before the crop is sown, so that they can be worked into the soil and be evenly distributed by plowing. Lime used to correct soil acidity can be applied at any time of the year and to a crop at any stage of growth.

Notes to the text

1. **and so on** – и так далее;
2. **which ... что** (обычно *which* после запятой соответствует в русском языке слову «что»);
3. **to work into** – заделывать (удобрения).



Any – любой (в утвердительных предложениях)

Grammar and vocabulary activities

7. Identify the Complex Subject in the following sentences. Translate them.

1. Application of fertilizers several times throughout the season has been found to be useful with perennial crops.
2. Too much nitrogen in the soil is known to cause lodging of the crop.
3. Top dressing is considered to be the best way of applying fertilizers to this crop.
4. Such fertilizer mixture is believed to be of great use on this soil.
5. This variety was supposed to be more frost-resistant than the one we were growing before.
6. Phosphatic fertilizers are expected to produce rather high increase in yield in this soil.
7. Lime is known to be applied to correct soil acidity.
8. Soils of this area are said to be highly deficient in organic matter.
9. Legumes are known to be grown both for human food and for soil improvement.
10. Broadcast application of fertilizers is supposed to spread the material more evenly over the soil surface.

8. Translate the sentences paying attention to the predicate in the Passive Voice.

1. Winter cereals are usually given top dressing in spring.
2. Application of fertilizer mixtures with low amount of nitrogen should be followed by top dressing with liquid nitrogen.
3. The organic matter content of the soil is greatly influenced by the amount of manure applied.
4. The condition of the soil is always affected by soil management practices.
5. The development of this disease was favored by high humidity.

9. Identify the function of the –ing-words in the following sentences. Translate the sentences.

a)

1. Applying fertilizers, we may essentially increase the yield.
2. Applying fertilizers to this crop usually produces a good effect.
3. Farmers applying fertilizers to this crop usually obtain good results.
4. Farmers applying proper fertilizers, the yields are usually much higher.

b)

1. Having supplied the soil with organic matter, the collective farm obtained a good yield of small grains.

2. Being adapted to potato growing, these sandy loams will produce tubers of the highest quality.

3. Among the factors influencing crop production climate is the most important one.

4. Preparing the seedbed is one of important operations **in** crop growing.

6. The method of harvesting used depends on many factors, proper maturity being one of the most important.

7. Planting the seed, we use farm machines in Order to make the work easier.

10. Specify the sentences in which:

a) **which** corresponds to the Russian **что**.

1. Nitrogen was applied several times during the growing season, which is considered to compensate its losses through leaching.

2. Show me the plants which are to be side-dressed.

3. The method of harvesting corn depends upon the use for which the crop is grown.

4. The soil was plowed in the fall, which means that the planting may begin early in spring.

b) **any** corresponds to the Russian **любой**.

1. Did your agronomist give any new recommendations on fertilization practices?

2. You may apply lime at any stage of the growing period.

3. We shall not grow any root crops this year.

Listening and Speaking Focus

a. Watch the video, answer the following questions:

b. <https://youtu.be/n7nG-gHcv4I>

How to figure out the nutrient concentration in a bag of fertilizer?

2. What the numbers on the front of a bag mean and how they will influence plant growth?



LESSON 12.2. ESSENTIAL MINERALS

Grammar and vocabulary activities

1. Use the following correlative conjunctions in the sentences below: *the ... the, either...or, neither...nor, both ... and, as... as, not so ... as.*

1. ... vegetable ... fruit crops are rich in vitamins.
2. ... soils too high in nitrogen ... those too low in this element are good for cropping.
3. Fertilizers may be applied ... as top dressing... as side dressing.
4. Heavy clays are suitable for potato growing ... light sandy soils.
5. ... higher is the moisture content of the soil ... more intensive will be the growth of this plant.
6. This field is said to receive ... much nitrogen ... it requires.

2. Fill in the gaps with words from text A in the appropriate form.

1. ... fertilizers are of great use for plants, but they should not be applied at a very high rate.
2. The method of spreading fertilizers uniformly over the soil surface is called ...
3. Sometimes nitrogen is applied several times during the growing season leaching.
4. Broadcasting, top-dressing, and side-dressing are known as different methods of ...
5. As growing crops remove plant nutrients from the soil requires fertilization.
6. Fertilizers are classified their main food element.
7. Corn usually receives after the plant has made some growth.
8. Lime may be applied at ... time of the year.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Внесение удобрений, как известно, улучшает плодородие почвы.
2. Удобрения нужно вносить тогда, когда растения в них нуждаются.
3. Иногда удобрения приходится вносить несколько раз в течение вегетационного периода.
4. Существуют различные методы внесения удобрений, главные из них внесение вразброс, поверхностная подкормка и междурядная подкормка.
5. Часто нужно вносить смесь удобрений, содержащую несколько питательных элементов.
6. Слишком большое количество удобрений может оказать вредное воздействие на почву.

b)

1. Удобрения вносятся, как известно, чтобы повысить плодородие почвы.
2. Нужно вносить удобрения, содержащие те питательные элементы, которых недостает в почве.

3. Основные удобрения, которые нужно вносить, азотные, фосфорные и калийные.
4. Время внесения удобрений различно для различных культур.
5. Основные методы внесения удобрений – внесение вразброс, поверхностная подкормка и междурядная подкормка.
6. Часто используют смеси, состоящие из нескольких удобрений.
7. Некоторые удобрения, как было обнаружено, более эффективны, если их вносят до или после посадки.
8. Иногда внесение удобрений следует за посадкой.
9. Известь можно вносить на любой стадии развития культуры.

4. Determine which sentences do not match the content of text A.

Correct them accordingly.

1. Only nitrogenous, phosphoric, and potassic fertilizers should be applied for soil fertility improvement.
2. Too much nitrogen in the soil may increase plant susceptibility to certain diseases.
3. Too little phosphorus in the soil may cause lodging of the crop.
4. Mixed fertilizers should contain not more than two fertilizer elements.
5. Perennial crops often receive fertilizers several times during the season.
6. Corn is usually given top dressing in early spring.
7. Soil acidity can be corrected by lime used at any time of the year.

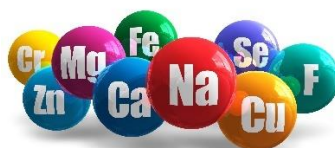
5. Make up sentences matching the right parts.

1.	This fertilizer mixture is believed		unless a mixed fertilizer containing too high dose of nitrogen were applied.
2.	There exist		are usually given top dressing.
3.	This crop would develop normally		the former being usually used with winter cereals.
4.	Young plants		to contain not enough nitrogen.
5.	Winter cereals		different ways of fertilization.
6.	Both top dressing and side dressing are methods of fertilization		may be injured by highly concentrated fertilizers.

6. Name in English all the methods you know to apply fertilizers.

7. Read text B without a dictionary. Identify the meaning of the underlined words according to their Russian equivalents and to the context.

TEXT B
Essential Minerals



To grow well, plants, like animals and people, need a balanced diet of several specific minerals.

The minerals required by plants may be divided into two groups: macronutrients needed in relatively large amounts, and micronutrients needed in much smaller amounts.

Among macronutrients, nitrogen, potassium, and phosphorus are known to be primary plant feeds. They are most often applied as commercial fertilizers. But to be absorbed and used by plants each of them must be combined with some other elements. For example, nitrogen is believed to be more available to plants when it is combined with oxygen as a nitrate or with hydrogen, making ammonia.

Among the other macronutrients, calcium is an important plant food, being the main constituent of lime. If a soil is very acid, with a PH value less than 5.0, lime can be added to correct acidity. All plants are affected by the degree of acidity or alkalinity of the soil, high acidity making some elements unavailable to plants. The presence of lime is found to make essential plant food elements more easily available.

Nitrogen, phosphorus and potassium are more easily available in a well limed soil than in an acid soil.

There are seven micronutrients – iron (железо), manganese, zinc, molybdenum, copper, and chlorine. They are not often applied as fertilizers. But they are also essential for plant growth and may play some role in respiration or photosynthesis.

8. Express the main content of text B in Russian as short as possible.

Listening and Speaking Focus

Watch the video, answer the following questions:

1. Where do plants get their food from?
2. Why plant can have stunted growth?
3. Why plants can have yellow leaves?
4. What nutrients does the plant need?



https://youtu.be/w_x-WDdQdxI

UNIT 13. CROP ROTATION

<p>In this unit you will learn:</p>	<p>Grammar focus:</p> <ul style="list-style-type: none"> - Compound subject and predicate . - Functions of the Infinitive (revision). - Word meaning: <i>to result</i>. <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Crop rotation. - Text B. Beneficial effects of proper rotations. <p>Listening and speaking focus</p>
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Grammar Focus



Несколько глаголов, использующихся в качестве сказуемого при сложном подлежащем, употребляются в действительном залоге. В русском языке им соответствуют "оценочные" слова (т.е. слова, выражающие уверенность или неуверенность говорящего): **to seem, to appear, to be likely** – "вероятно", "по-видимому", **to be unlikely** – "вряд ли", **to be sure, to be certain** – "безусловно", "наверняка".

Top-dressing **is likely** to be the best way of applying fertilizers to this crop.

Поверхностная подкормка, **по-видимому**, является лучшим способом внесения удобрений под эту культуру.

Potatoes **are sure** to grow well on light soils.

Картофель наверняка будет хорошо расти на легких почвах.



Инфинитив (или инфинитивная группа) в функции обстоятельства цели может стоять в начале предложения (перед подлежащим) или в конце предложения (после дополнения или обстоятельства). Такой инфинитив может вводиться союзом *in order* ("чтобы", "для того чтобы"), который, однако, часто опускается.

(In order) to grow well plants need water and nutrients.

Чтобы расти хорошо, растениям нужна вода и питательные вещества.

Plants need water and nutrients **(in order) to grow** well.

Растениям нужна вода и питательные вещества, **чтобы** расти хорошо.

Grammar Practice

Укажите, в каких предложениях имеется сложное подлежащее.

1. A mixed fertilizer is sure to improve this soil. We know the agronomist to grow legumes for increasing the nitrogen content of the soil.
2. The students of our group want to work on the vegetable growing farm this summer.
3. Increased yields seemed to result from using the proper system of crop rotation/
4. Farmers have found the continuous growing of the same crop to result in the loss of nutrients from the soil.
5. The agronomist wanted the practice of minimum tillage to be applied on the farm.



При переводе инфинитиву в начале предложения может соответствовать либо неопределенная форма глагола (если это инфинитив в функции подлежащего), либо неопределенная форма глагола с союзом "чтобы" (если это инфинитив в функции обстоятельства цели).

To **prepare** a good seedbed is very important.

Подготовить хорошую пашню очень важно.

To prepare a good seedbed we must plow the soil in spring.

Чтобы подготовить хорошую пашню, мы должны вспахать почву весной.



Инфинитиву после слов 'too' (слишком), 'enough', 'sufficiently' (достаточно) в русском языке также соответствует неопределенная форма глагола с союзом "чтобы" ("для того чтобы").

This soil is fertile **enough to produce** good crop.

Эта почва **достаточно** плодородна, **чтобы дать** хороший урожай.

Grammar practice

Укажите, при переводе каких предложений перед инфинитивом нужно употребить союз "чтобы".

1. This soil contains too much moisture to use it for potato growing.
2. It is necessary to increase the yields of most grain crops.
3. To obtain good crops it is necessary to prepare the seedbed properly.
4. Different chemicals are used in order to control pests.
5. To develop high yielding varieties is one of essential aims of our agriculturists.

LESSON 13.1. CROP ROTATION

1. Study the Grammar Focus section of this unit.

2. Translate the following sentences with the complex subjects and predicates expressed by *seem, is likely, is sure*.

1. This method of maintaining soil fertility seems to be rather effective.
2. Top dressing is likely to be the most desirable method of applying fertilizers to winter cereals.
3. This wheat variety is unlikely to grow well under such climatic and soil conditions.
4. Soil low in organic matter is sure to produce poor potato crop.
5. This crop does not seem to require much potash.
6. Good stands of wheat are likely to be obtained on our farm this year.
7. Soils of this area appear to be well supplied with nitrogen.

3. Find the following in text A:

1. все предложения, в которых имеется сложное подлежащее (2-й абзац);
2. инфинитив в функции определения (последний абзац).

4. Provide Russian equivalents of the following international words.

Pay attention to the suffixes and prefixes.

selective, periodic, periodically, limit, unlimited, result, fixation, fixer, limited, vitamin, resource, economic, situation, effective, balance, unbalanced, organic, inorganic.

Vocabulary Focus

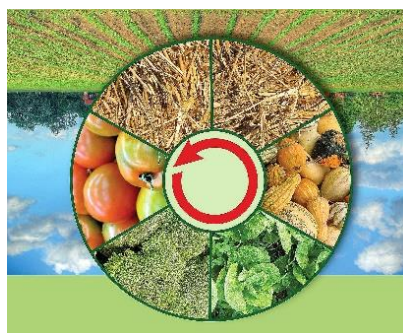


Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

crop rotation, tilth, continuous, efficient, penetration, previous, to leave (left, left), as to, besides, to result, to result in, to result from, as a result, to seem, to be likely, to be sure, though, thus.

5. Translate text A.

Text A Crop rotation



Crop rotation is known to be a system of growing different kinds of crops one after another on the same land. A rotation may be considered good or bad depending on its effect on soil productivity. It should also be measured by its economic returns.

Continuous growth of the same crop has been found to result in the loss of organic matter from the soil, which is sure to have a bad effect on its tilth. The growth of grass pasture and deep-rooted legume crops in rotation is likely to correct this situation through maintenance of organic matter. Besides, the alternation of deep-rooted and shallow-rooted crops prevents continuous absorption of plant nutrients from the same root zone year after year. As to nitrogen for non-leguminous crops, it may be provided by legumes included in the rotation. However, it should be mentioned that rotations are unlikely to supply other plant nutrients in which the soil may be deficient.

Legumes are more efficient in fixation of nitrogen on soils with low rather than high nitrogen content. For this reason, a legume is considered to be a better nitrogen fixer when two or more crops come between applications of barnyard manure. Naturally, legume crops are usually grown previous to crops that require large amounts of nitrogen. Thus, increased yields of crops that follow alfalfa seem to result from the addition of nitrogen to the soil contributed by alfalfa crop.

The preceding crop has an important influence on crop yields. So, in case deep-rooted legumes are followed by corn, the latter may yield more as a result of better root penetration as well as due to nitrogen residues.

Crop sequences are very important under dryland conditions because of the difference in residual soil moisture left by various preceding crops. Thus, small grains yield more after corn than after small grains or sorghum, because corn leaves more moisture in the soil.

Though the proper rotation is of great importance in farming, this practice alone is unlikely to produce maximum yields. For the highest yields to be obtained both crop rotation and fertilization are to be used.

REMEMBER!

to result - происходить
в результате

to result in – приводить к
to result from – происходить от

as a result – в

Grammar and vocabulary activities

6. Translate the following sentences containing the complex subject.

1. Proper crop rotation is sure to help in maintaining soil fertility and producing higher yields.
2. Crop rotation alone is unlikely to increase fertility of this soil.
3. Such rotation does not seem to be suitable for the temperate zone.
4. The alternation of grasses and legumes is likely to increase the organic matter content of the soil.
5. Continuous growth of the same crop is certain to cause the loss of organic matter from the soil.
6. Good development of this crop seems to be the result of growing it after a legume crop.

7. Translate the sentences paying attention to the function of the infinitive.

1. To find the optimum system of crop rotation will be of the greatest importance for increasing crop production.
2. The system of crop rotation to be used depends on different agronomic factors.
3. To find the optimum system of crop rotation one should know the agronomic and economic situation on the farm.
4. The system of crop rotation we have chosen is likely to produce good results.
5. This system of crop rotation is considered to be suitable for soil and climate conditions of the area.
6. In order to obtain good results with this system of crop rotation we must also apply proper fertilizers.
7. The system of crop rotation chosen has been found to be the best for our region.
8. This system of crop rotation combined with the proper fertilization system is sure to produce good results.

8. Translate the following word combinations:

proper crop rotation system; green manure crops; small grains; deep-rooted legume crop; plant nutrient deficiency; nitrogen-fixing crop; under improper

conditions; barnyard manure application; proper soil fertility maintenance; plant nutrient balance; much higher soil productivity.

9. Find the passage in text A about the influence of legumes on the following crop.

Listening and Speaking Focus

https://youtu.be/mJwOr-pe_I8

Watch the video, answer the following questions:

1. What is crop rotation?
2. Why crop rotation is an important thing?
3. What types of crop rotation have you learned?



LESSON 13.2. BENEFICIAL EFFECTS OF PROPER ROTATIONS

Grammar and vocabulary activities

1. Translate the sentences. Mind the meaning of the verb *to result*.

1. If there is too much nitrogen in the soil lodging of the crop may **result**.
2. Soil improvement **has resulted** from using the proper system of crop rotation.
3. Growing the same crop on the same area for many years usually **results** in lower productivity of the soil.
4. We have improved the fertility of this poor soil as **a result** of continuous growing different legume crops.
5. Having used the minimum tillage practice on our farm, we obtained good **results**.

2. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Севооборот – это поочередное выращивание различных культур на одной и той же земле.
2. Цель севооборота состоит в том, чтобы повысить почвенное плодородие.
3. Бобовые часто включаются в севооборот, так как они, как известно, могут повысить содержание азота в почве.
4. Правильная система севооборота безусловно улучшает плодородие почвы.
5. Однако одно только чередование культур вряд ли сильно повысит урожай.
6. Для получения максимальных урожаев нужно сочетать чередование культур и правильную систему применения удобрений.

b)

1. Чередование культур, как известно, важный способ повышения плодородия почвы.
2. Длительное выращивание одной и той же культуры на одной и той же земле приводит к понижению плодородия.

3. Вид применяемого севооборота зависит от ряда агрономических и экономических факторов.

4. Бобовые часто включаются в севооборот благодаря их способности фиксировать азот из воздуха.

5. На урожай оказывает сильное влияние предшествующая культура.

6. Так, урожай кукурузы, которая следует за бобовыми в севообороте, обычно бывает выше.

7. Однако для получения максимальных урожаев чередование культур должно сочетаться с правильной системой применения удобрений.

3. Find equivalents to the following English words and word combinations in the Russian sentences below: *to result in, to result from, as a result, due to, to be due to, the latter, under conditions.*

1. В севообороте злаковые выращиваются после бобовых, так как последние увеличивают содержание азота в почве.

2. В результате правильной системы чередования культур плодородие почвы повысилось.

3. Эта культура не может развиваться в условиях повышенной влажности.

4. Использование механизации привело к повышению урожаев основных культур.

5. Плохой рост этой культуры объясняется недостатком минеральных веществ в почве.

6. Структура почвы была улучшена благодаря использованию сидеральных культур.

7. Заболоченность почвы возникла в результате большого количества осадков.

4. Answer the questions to text A.

1. What is crop rotation?

2. What is crop rotation used for?

3. Why are legumes included in the rotation?

4. What examples of crop rotations can you give?

5. Can the proper rotation alone provide the highest yield?

5. Read and translate text B without a dictionary. Identify the meaning of the words in bold according to the context.



Text B

Beneficial effects of proper rotations

Proper crop rotation is one of the essential factors of good farm management.

Continuous growing of a crop is likely to produce good effect for a few years, but well-planned rotations are best over a long period of time because they conserve and improve the soil.

The physical condition of the soil is known to be unfavourably affected by growing cultivated crops for many years. However, if sod-forming grasses and legumes are included in the rotation, the tilth is considerably improved. Legumes are

also valuable because they add organic matter to the soil. Besides, they are able to fix nitrogen from the air and **convert** it into a form that can be used by all growing crops.

Various crops differ in the kind and amount of nutrients they take from the soil, that is why crop rotation helps to maintain the proper nutritional balance in the soil.

Most weeds and pests are believed to be controlled by crop rotation. Diseases and insects usually attack certain crops, and they cannot develop during the periods when resistant crops are grown.

With crop rotation labour is distributed more uniformly, as peak work periods on farms growing different crops come not at the same time.

Finally, the risk of poor production is usually greater with one crop than when several crops are grown.

6. Comment on the role of legumes in crop rotation.


7. Speak about the advantages of crop rotation in crop production.

Name them in Russian.

UNIT 14. CEREALS

In this unit you will learn:	<p>Grammar focus:</p> <ul style="list-style-type: none"> - Complex object. - Word meaning <i>number</i>. <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Cereal or grain crops. - Text B. Break crops. <p>Listening and speaking focus</p>
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Grammar Focus

	I	II	III
	Подлежащее	Сказуемое в действительном залоге	Сложное дополнение (существ, или местоим. в объектном падеже + инфинитив)

"Complex object (сложное дополнение)" употребляется после следующих глаголов: **to want** – хотеть, **to know**, **to think**, **to believe**, **to consider**, **to expect**, **to find**, **to suppose** и некоторых других. Эти глаголы используются в функции сказуемого предложения, но, в отличие от конструкции "сложное подлежащее", употребляются в **действительном залоге**.

При переводе предложения на русский язык "сложному дополнению" соответствует придаточное предложение с союзами "что", "чтобы", при этом инфинитив передается сказуемым русского предложения.

We expect the new system of crop rotation to result in higher soil fertility.

Мы **надеемся, что новая система севооборота** в результате **повысит** плодородие почвы.

The farmers **wanted the agronomist to give** them recommendations on using legumes in crop rotation.

Колхозники **хотели, чтобы агроном дал** им рекомендации по использованию бобовых в севообороте.

LESSON 14.1. CEREAL OR GRAIN CROPS

Grammar activities

1. Highlight the words with the suffix –er according to its function.

1. суффикс существительного,
2. суффикс сравнительной степени прилагательного,
3. часть основы слова:

warmer, summer, grower, earlier, proper, later, flower, producer, feeder, another, breeder, drier, roller, finer, helper, mixer, rather, fiber.

2. Translate the sentences containing the Complex Object.

1. We know organic matter to affect soil fertility greatly.
2. Any student knows different crops to require different kinds of seedbed.
3. The agronomist says this soil to be rich in all nutrients.
4. The farmer believes the application of commercial fertilizers to improve soil fertility.
5. All farmers know proper preparation of the seedbed to insure a good stand.
6. We know the time of sowing to depend on the variety chosen as well as on the moisture conditions of the soil.

3. Find the complex object in text A (para. 1, 3, 4).

Vocabulary Focus

Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.



cool-season crop, warm-season crop, to crop, temperate, moderate, ground, straw, tall, shallow, weak, excessive, similar, case, to remain, reason, rather, although, per, total, a number of, relatively.

4. Translate text A.

Text A

Cereal or grain crops



Cereals are those members of the grass family which have edible starchy seeds. Everybody knows wheat, barley, rye, oats, maize (known as corn in America), rice, sorghum and millets to be most common cereals. They are all spring or winter annuals, that is, they complete their life cycle in a single growing season. The

temperate zone cereals or cool-season species known as small grains (wheat, barley, oats, and rye) are to be planted in the fall or spring and harvested in mid-to-late summer. The rest¹ of the cereals belong to warm-season species sown in late spring or early summer and harvested in the fall. The main aim in growing cereals is to produce grain to be used either as human food or as feed for livestock.

Of the cereals raised wheat, rice and corn are the world's three major grain crops, all being about equally important in terms of world production. Although rice seems to constitute the main food of more people, wheat is the first in importance on a world scale of all the cereals as to both the total area sown and the annual production. It is the principle source of carbohydrates for human nutrition.

There is a number of reasons why cereals are the man's leading food source. We know cereals to be annuals, that is why they produce food in a relatively short period of time. In addition, they are adapted well to a variety of⁴ soils, climates and cropping systems. Because cereals require relatively little labour, large areas of land can be cropped, **and** the return in terms of food per unit of labour is high. They are known to be rather resistant to diseases and insects. But above all⁵ the grain the cereals produce is easily harvested, cleaned and stored, all these operations, including sowing, being highly mechanized.

General cultural practices required in growing grain crops are quite similar. It is known that they do best on moderately fine but not pulverized seedbeds containing a proper amount of moisture near the soil surface. The seeding depth has been found to vary from 1 to 3 inches. The farmer cannot expect cereals to grow well if they have been sown too shallow because in this case the plants will be poorly supplied with water due to its evaporation from the soil surface.

A problem common to all cereals is lodging resulting from excessively high rates of nitrogen and heavy seeding rates which may produce tall, weak-stemmed plants⁶ that fall to the ground. The aim of plant breeders is to develop dwarf stiff-strawed⁷ varieties that will not lodge.

Though cereals do not supply enough protein and vitamins necessary for a balanced diet, they are sure to remain a major source of food for people throughout the world.

Notes to the text

1. **the rest** – остальные;
2. **in terms of** – с точки зрения: в переводе на;
3. **a number of** – ряд;
4. **a variety of** - ряд, разнообразие, множество;
5. **above all** – прежде всего;
6. **weak-stemmed plant** – растение со слабой соломиной;
7. **stiff-strawed plant** - растение с крепкой соломиной.

Grammar and vocabulary activities

5. Specify the sentences containing the Complex Object.

1. This crop is likely to belong to the grass family.
2. All students of agriculture know both spring and winter wheats to be annuals.

3. The farmer expects the green manure he has plowed under to improve the soil structure

4. Much nitrogen is sure to cause lodging in.

5. Agriculturists know continuous cereal growing to result in the loss of organic matter from the soil.

6. Plants are to absorb most of their nutrients from the soil

7. Winter hardiness is considered to be of great importance in winter varieties.

8. Oats are believed to be not so cold resistant as wheat and barley.

7. Give the Russian equivalents of the following words and word combinations.

to do well, available nutrients, too acid, continuous cereal growing, proper crop sequence, commercial fort application, high organic matter content, early spring dressing, a number of cultural practices, temperate zone crops, both the total area and annual production, a variety of reasons, per unit of area, to a considerable extent, unless, until, in order to, to result in, to result from, one should, is of high quality, most, that is, that is why, the former, the latter, whether.

8. Translate the sentences using the grammar and vocabulary material you have studied so far.

1. It is well known that the rate of seeding is affected to a considerable extent by the environmental conditions.

2. Early sown spring wheat is usually more productive than that sown later and the grain is of better quality.

3. For germination to occur three conditions are necessary: proper temperature, sufficient moisture and enough air.

4. Legume crops are spoken of as soil improvers.

5. Corn, like all other farm crops, cannot produce maximum yields unless sufficient nutrients are available.

6. In most cases the application of commercial fertilizers may be expected to increase yields and to favour earlier maturity, the latter factor being of great practical value in areas where early frost is possible.

7. Since barnyard manure has been found to be relatively low in phosphorus, a commercial fertilizer containing this nutrient is to be added in order to increase the effectiveness of manure.

8. Whether corn is grown for grain or for silage, cultivation is necessary during the growing season, for it provides good conditions for plant development.

9. One should know that the rate of planting corn is determined by a number of factors, the variety to be grown being one of the most important.

10. The first beets analyzed contained as little as 6 percent sugar but due to the work of the plant breeders the crop yields contain now more than 20 percent.

11. The temperate zone is most suitable for successful sugar-beet growing.

12. Provided a deep and mellow seedbed has been prepared, root crops will develop properly.

13. Too deep cultivation is likely to injure the roots and reduce the yield.

14. The later the crop is sown the less time it will have for its development.

15. If there were not enough air in the soil, the plant growth would be considerably decreased.

16. Being a cultivated crop, corn is a good preceding crop for cereals.

9. Name the world's three major grain crops and explain the reasons for their importance (in English).

10. Зачитайте предложение, в котором говорится о причине плохого развития растений вследствие неправильной глубины заделки семян.

Listening and Speaking Focus

<https://youtu.be/2CluFZKclto>

Watch the video, answer the following questions:

1. What are grains and the types of grains?
2. Which subcategories of cereals are described in the video?
3. Structure of whole grains and refined grains?



LESSON 14.2. BREAK CROPS

Vocabulary activities

1. Define the word *number* in the following sentences. Translate these sentences.

1. The **number** of crops grown in a crop rotation different.
2. There is a **number** of methods of apply in fertilizers.
3. A **number** of factors may help increase fertility.
4. There is a great **number** of reasons why cereals are so widely cultivated by man.
5. This is text **number** II.

2. Group the words and word combinations in synonymic chains. Complete the task in writing.

to sow, to grow well, amount, many, if, since, to seed quantity, as, much, aim, to plant, to do well, for, to grow provided, a lot of, purpose, to raise, to ripen, to affect, to occur, also, to plow under, to mature, due to, too, substantial, to take place, to cultivate, as well, to produce, to turn over, to influence, because of, matter.

3. Group the words in pairs of opposites.

thick, like, to be low in, to increase, early, thin, too moist, deep, to be high in, overseeding, dry, late, favorable, shallow, unlike, warm, to decrease, underseeding, cold.

4. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Зерновые культуры широко выращиваются во всём мире.
2. Яровые зерновые должны высеваться весной.
3. Пшеница, кукуруза и рис являются основными культурами, широко выращиваемыми во всем мире.
4. Пшеница хорошо приспособлена к ранним почвам.

5. Все операции выращивания зерновых культур высоко механизированы.

6. Зерновые не следует сеять слишком мелко.

7. Полегание происходит от очень больших доз азота.

b)

1. По требовательности к свету и теплу зерновые делятся на холодостойкие и теплолюбивые виды.

2. Известно, что из всех выращиваемых зерновых озимая пшеница является наиболее ценной культурой.

3. Зерновые содержат много углеводов, но они бедны белком и витаминами.

4. Чтобы успешно выращивать зерновые, нужно придерживаться определенных агротехнических приемов.

5. Выращивая зерновые на достаточно влажной, мелкокомковатой почве, фермеры могут получать высокие урожаи зерна.

6. На полегание влияют высокие дозы и высокие нормы высева семян.

7. В некоторых условиях нужно выращивать низкорослые сорта зерновых культур, которые будут устойчивы к полеганию.

Comprehension activities

5. Answer the following questions to text A.

1. What cereals belong to cool-season species (to warm season species)?

2. What is the aim of growing cereals?

3. Why is wheat the most valuable of the cereals raised by man?

4. Why are cereals the leading food source for people?

5. What soils are best for cereals?

6. Why shouldn't cereals be seeded too shallow?

7. What are the reasons of lodging grain crops?

8. Are cereals high in protein?

6. Read text B without a dictionary and say what «a break crop» is.

Text B

Break crops

The acreage of cereals may sometimes be increased considerably by growing these crops one after another on the same area. It is not uncommon to find four, five or even more successive or following one after another cereal crops in a rotation. If cereal crops are grown on the same land for many years in succession, such practice is known as continuous cereal growing. In the past this practice often resulted in low



yields due to weeds and diseases. Today there is better control of these by chemicals such as fungicides and herbicides and thus farmers have the possibility of growing cereal crops for longer periods of time.

In practice, it is common to grow wheat for two or three years, barley for longer period and then to break (нарушить) the sequence with a crop which is called a break crop. The aim of a break crop is to prevent diseases from increasing.

The farmers usually grow those break crops which are as profitable (выгодный) to grow as cereal crops.

The break crop to be grown varies with the soil and climate, farming and rotation systems and other factors.

There are two main types of break crops:

1. Combinable break crops. They are peas, beans, oil seed crops, corn, etc.
2. Other break crops, such as root crops and forage crops.

7. Based on text B, negate the following statements.

1. Continuous cereal growing is less practiced at present than in the past.
2. The only possible way of controlling diseases in growing cereals is the application of chemicals.
3. Environmental and other factors do not affect the choice (выбор) of a break crop to be grown

Listening and Speaking Focus

Watch the video, answer the following questions:

https://youtu.be/NxNOYkNaQ_k

1. What is crop rotation?
2. Who discovered the principle of rotation of cultures?
3. Which plants replace wheat?



UNIT 15. WHEAT AND RYE

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- Forms of the Infinitive.- Complex subject. Complex object. (revision).- Word meaning: <i>one</i> (revision).- There-insertion existential clauses (revision). Vocabulary focus Reading and comprehension focus: <ul style="list-style-type: none">- Text A. Wheat (Part I).- Text B. Rye. Listening and speaking focus
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Grammar Focus



В английском языке существует несколько форм инфинитива

	Active Passive	
Indefinite	to grow	to be grown
Continuous	to be growing	–
Perfect	to have grown	to have been grown

Формы инфинитива, в составе которых имеется глагол "to have", называются перфектными. В инфинитивных конструкциях перфектные формы обозначают действие, **предшествующее** действию, выраженному сказуемым. В русском языке им соответствует сказуемое в **прошедшем времени**.

Сравните:

1. The agronomist was sure that mixed fertilizers should be applied.
2. Fertilizers are known to be applied in different ways.
3. Too much nitrogen is likely to cause lodging of the crop.
4. It is unlikely that phosphoric fertilizers will be of some use on this soil.



Слово «**one**» может быть:

1) числительным "один".

Wheat is **one** of the most important grain crops.

Пшеница – **одна** из важнейших зерновых культур;

2) заместителем ранее названного существительного.

В этом случае "one" либо не переводится, либо переводится тем существительным, которое оно замещает.

This method did not give good results, let's use another **one**.

Этот метод не дал хороших результатов, давайте используем другой (**метод**);

3) формальным подлежащим, если употребляется перед глаголом в личной форме. При переводе такому предложению соответствует безличное предложение (т.е. без подлежащего).

One should know different classifications of farm crops.

Следует знать различные классификации с.-х. культур.



В сочетаниях с глаголами **there** самостоятельного значения не имеет, на русский язык переводится только глагол.

There are many different ways of applying fertilizers.

Имеется (есть) много различных способов внесения удобрений.

There exist many systems of crop rotation.

Существует много систем севооборота.

There may be not enough nutrients in some soils.

В некоторых почвах **может быть** недостаточно питательных веществ.

Если в предложении с вводящим *there* имеется наречие *there* ("там"), оно употребляется в конце.

There are many different farm machines **there**.

Там имеется много различных с.-х. машин.

Grammar practice

Укажите, в каком предложении слову *there* соответствует русское «там».

1. There exist different systems of soil management.
2. Some new irrigation practices are used there.
3. There may often be nitrogen deficiency in the soil.
4. There are different methods of applying the required nutrients to the soil.

LESSON 15.1. WHEAT

1. Study the Grammar Focus section of this unit.

2. Translate the sentences. Pay attention to different forms of the Infinitive.

1. We know cereals to have been used as human food and as feed for livestock.
2. Wheat is believed to have been grown in Asia 5,000 years ago.
3. They are likely to have already prepared the proper seedbed for wheat.
4. This variety does not seem to have produced a high yield in a cool climate.
5. The agronomist thinks the application of manure to have improved the structure of the soil.
6. The farmers seem to have already applied potash to this soil.
7. This scientist is said to have developed a new variety of rye.

3. Provide Russian equivalents of the following words with negative prefixes.

Inorganic, non-available, unknown, unlikely, to decompose, uncommon, inefficient, infertile, unquestionably, unexpected, unfavorable, uncertain.

4. Find in text A:

1. инфинитив, которому в русском языке соответствует сказуемое в прошедшем времени (абзацы 1,2,4)
2. инфинитив в функции определения (4 абзац)
3. слово "one" как заместитель существительного

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

acreage, principal, to exist, to prefer, habit, characteristic, to choose, cool, to favor, precipitation, inch, to accompany, threshing, bread, frost-free, quick-maturing, to hasten.

5. Translate text A

TEXT A Wheat (part I)



Wheat is considered to have been the most important world cereal crop. The countries that lead in wheat production are the Soviet Union, the United States, China, Canada, India, France and Italy. Wheat ranks second¹ as a cereal crop in the United States, being exceeded only by corn in acreage and in production.

Everybody knows wheat to have played an important role in the development of civilization from the earliest time. It is one of the principal sources of food for man and animals. Wheat is believed to have originated in south-western Asia.

There exist different classifications of wheat varieties. The most common classifications of wheat are those based on the time of sowing, as spring and winter wheat; on the colour of the grain, as red and white wheat, on the density of the grain, as hard and soft wheat; on the products for which they are grown, as bread and macaroni wheat; on the presence or absence of beards. As to winter wheat, it is usually preferred to spring wheat in regions where it will overwinter successfully.

We know many new varieties of wheat to have been developed, and among them lodge-resistant and shatter-resistant ones. Different cultivated varieties of wheat vary greatly in their habit, form and structure, but all are annual grasses, that is², they require one season from sowing to producing seeds. Some important characteristics to consider in selecting a wheat variety are; (a) time of maturity, (b) winter hardiness, (c) disease and insect resistance, (d) shattering and lodging, (e) quality and yield. Yield is usually the main characteristic to be considered in choosing the variety to be grown.

Wheat is poorly adapted to warm or moist climates unless there is a comparatively cool dry season which favors plant growth and reduces the danger of diseases. The world wheat crop is grown in the temperate regions where the annual rainfall averages between 10 to 70 inches, being mostly grown in regions having precipitation of 15 to 45 inches. High rainfall, especially when accompanied by high temperatures, is unfavorable for wheat. It results in lodging, affects harvesting, threshing, storing, sowing and soil preparation. The best quality bread wheats are produced in areas where winters are cold, summer comparatively hot and precipitation moderate. In general, there should be a frost-free period of about 100 days or more for safe wheat production. Quick-maturing varieties may be grown where the frost-free period is 90 days or less and where long days hasten flowering.

Notes to the text

1. **... ranks second** - ... занимает второе место;
2. **that is** - то есть;
3. **in general** - в общем.

Grammar and vocabulary activities

6. Translate the following sentences with introductory *there*.

1. There must be mentioned two methods of sowing cereals: broadcasting and drilling, the latter being more widely used.
2. There seems to be no need of applying nitrogenous fertilizers for wheat, when it follows legumes in crop rotation.
3. There should be careful cultivation of corn soon after planting to kill the weeds at the beginning of their growth.
4. There exist many varieties of winter hardy wheat, each of them being adapted to a certain region.
5. There may be some difference in preparing a seedbed for wheat, depending on the crop, that wheat follows.

7. Translate the following sentences. Pay attention to different forms of the Infinitive.

1. They believe him to have obtained this information from our agronomist.
2. Oats are reported to do well under climatic conditions too cool for the best results with wheat, barley, and corn.
3. The method of cultivation you speak about is said to have been used by our Experimental Station several years ago.
4. While rye is very hardy and naturally a plant of cold climate, it does not seem to be affected by hot weather.
5. We think a high wheat yield to have been obtained on our farm last year due to the new system of applying fertilizing materials.
6. Wheat is known to have a longer growing period as well as higher heat requirements than the other small grains.
7. Our agronomist considers heavy manuring to have favored the development of this disease.
8. The seed treatment applied is unlikely to have affected the development of winter wheat.
9. We know the root growth of barley to be less abundant than that of wheat, oats, or rye.
10. A number of quick-maturing varieties of corn are reported to have been developed recently for the production in northern areas.

8. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Пшеница - одна из самых важных зерновых культур, так как она является главным источником пищи для человека.
2. Существует много сортов пшеницы.
3. Они отличаются по времени созревания, зимостойкости, осыпанию, полеганию, качеству и урожаю.

4. Большое количество осадков неблагоприятно для пшеницы, так как это приводит к полеганию.

5. Пшеница требует безморозного периода в сто дней и более.

6. Имеются сорта, стойкие к полеганию и осыпанию.

b)

1. Пшеница, как известно, является самой важной злаковой культурой.

2. Ученые полагают, что пшеница произошла из Юго-Восточной Азии.

3. Очень важно вывести сорта, устойчивые к полеганию и осыпанию, а для некоторых районов - раносозревающие.

4. Существует много сортов пшеницы, отличающихся по ряду свойств: зимостойкости, качеству зерна, структуре, урожаю и т.д.

5. Мы знаем, что пшеница плохо приспособлена к теплему и влажному климату. Она будет хорошо развиваться в умеренных зонах со средним количеством осадков.

6. Большое количество осадков как считают, приводит к полеганию растений и потерям зерна при уборке.

7. Какая главная особенность должна учитываться при выборе сорта пшеницы?

LESSON 15.2. RYE

Vocabulary activities

1. Highlight the sentences that contradict the contents of text A. Explain your answer.

1. Quick maturing varieties may be grown in areas with more than 90 days of frost-free period and short days.

2. The annual rainfall for safe wheat production must be between 10 to 70 inches.

3. Disease and insect resistance is the main characteristic to be considered in selecting the variety.

4. The origin of wheat is unknown.

5. Winter wheat is more widely grown than spring wheat in regions where it can over-winter successfully.

6. Warm or moist climates generally reduce the danger of diseases.

7. Different cultivated varieties do not differ from one another, as they are all annual grasses.

2. Read text B without a dictionary. Найдите и прочтите предложения, в которых говорится о том, как и где началось возделывание ржи.

Text B

Rye



Rye seems to be rather a new crop as compared with wheat and barley. Specialists consider rye to have been found first as a weed in wheat in central Europe. Then it was separated from the wheat and used as a new crop. It seems to have been cultivated first in western Asia and southern Russia.

Soil requirements of rye are not as exacting (взыскательный) as those of other small grains. It is more productive on infertile, sandy, or acid soils than wheat, oats, or barley. Rye often is the only small-grain crop that can be grown successfully on sandy soils, but it grows best being sown in a well-prepared, firm seedbed.

There exist both winter and spring varieties of rye. However, the latter are less productive than the former and are grown to only a limited extent. Spring rye should be sown at the time spring wheat is seeded, when the ground can be worked. The time of seeding winter rye will depend on the use to be made of the crop.

The usual depth of seeding is from 1/2 to 2 inches. The depth will vary with the type of soil and season. On sandy soils and in dry seasons the seed should be placed deeper. Better results are usually obtained from seeding with the drill than from broadcasting the seed. The former method is almost universally practiced.

Rye is harvested in the same manner as other small grains.

3. Arrange the questions so that they serve as a plan to the text.

1. What does the depth of seeding rye depend on?
2. On what soils can rye be successfully grown?
3. What rye varieties are more productive?

Listening and Speaking Focus

<https://youtu.be/8FZR-TRZCvA>

Watch the video, answer the following questions:

1. What is the height of the rye?
2. What is the structure of the rye stem?
3. Where rye is found?



UNIT 16 WHEAT (PART II)

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- The Infinitive Constructions (revision).- Transmutation /Functional shift (конверсия) (revision).- Word meaning <i>to mean, means</i>. Vocabulary focus
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Reading and comprehension focus:

- Text A. Wheat (part II).
- Text B.

Listening and speaking focus

Grammar Focus



Конверсия – это способ словообразования без добавления суффиксов и префиксов и без изменения основной формы слова.

to use – использовать

farm – хозяйство

use – использование

to increase – увеличивать

to farm – вести хозяйство

increase – увеличение

Grammar Practice

Укажите, в каких предложениях подчеркнутое слово является глаголом.

1. As they **use** proper fertilizers, soil fertility will be improved.
2. Effective **use** of fertilizers resulted in higher yields
3. You must **water** the plants regularly.
4. Plants cannot grow without **water**.

LESSON 16.1. WHEAT

Grammat activities

I. Identify the part of speech of the underlined words. Translate the sentences.

1. They must change the rate of application of commercial fertilizer to this soil.
1. Any change in the rate of seeding will influence the yield.
2. These varieties of rye yield more under the climatic conditions of our region.
3. The amount of farm produce should be increased.
4. The farm we have just visited produces mostly cereals, while the produce of the neighbouring farm is vegetables.
5. Biennial plants produce seeds only the second year.
6. The root branches of this plant may penetrate to the depth of 30 feet or more, depending on the soil.
7. The root of this plant branches in all directions.
8. Water these plants abundantly and you will get the same results as we did.
9. In our country irrigation requires lots of water.

2. Translate the following sentences paying attention to Infinitive constructions.

1. We expect this method to give the best results in growing sugar beets.
2. Many factors are important for this crop to give the highest yield.
3. Wheat seems to yield more when it is preceded by a soil improving crop.
4. The agronomist considers this soil to have been plowed deep enough.

5. For this soil to be more fertile one should apply manure.
6. Large farms are known to have greater advantage in the use of machinery.

3. Find in text A:

1. Complex Subject (para. 2,4,5);
2. Complex Object (para. 3);
3. Construction corresponding to the Russian expression "чем тем" (para. 4);
4. the Infinitive as Attribute (para. 4).

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

to drain, free of weeds, prompt, to prevail, to secure, to conserve, to take into consideration, a drill, advantage, row, means, by means of, direct combining.

4. Read aloud and translate text A.

TEXT A Wheat (part II)



Wheat is best adapted to fertile medium or heavy textured soils¹ that are well drained. Silt and clay loams generally produce the highest wheat yields, but it does not mean, that wheat cannot be grown successfully on either clay soils or fine sandy loams.

Wheat grows best when it is sown in a well-prepared, firm, mellow seedbed that is relatively free of weeds². Sufficient moisture should be present to insure prompt germination and a good growth of the young plants. The time and method of seedbed preparation is determined largely by the prevailing moisture conditions, the crop that wheat follows in the rotation and whether wheat is to be sown in spring or fall. Early plowing is an essential factor in securing more grain per hectare. An early prepared soil is known to conserve moisture much better than the one prepared late.

We know a relatively, shallow seeding of 1 to 1.5 inches to produce good stands in areas and in years when sufficient moisture is available at seeding time. Seed sown in dry soil should be drilled from 2 to 3 inches deep.

The rate of seeding wheat is considered to be a very complicated problem. One must take into consideration¹ climate and soil conditions, the time of seeding wheat, the quality and germinating power of seed to be sown, the method of sowing to be applied, etc. The seeding rate both for winter and spring varieties ranges from 3 to 10 pecks per acre, depending on the factors mentioned above. In general, the lower the rainfall, the lower will be the optimum rate of seeding.

Most of the wheat grown is sown with a drill. Broad-cast seeding, the oldest and simplest method, is used in regions where modern practices have not been introduced. Sowing with a drill is believed to have important advantages over the broadcast method. The rate and depth of sowing and the distribution of the seed are more accurate and uniform, and less seed is required. Better stands, more uniform maturity and higher yields are thus obtained. The modern drill sows seeds in rows at the required rate and depth and also covers them.

Practically all wheat grown is harvested by means of combining. In general, wheat is probably better adapted to direct combining than any of the other small grains. It is highly important to harvest wheat at the time that will insure the greatest yield of high quality. Wheat is considered to be ready for combine harvesting when the moisture content of the grain is 14 per cent or less.

Notes to the text

1. **heavy-textured soil** - почва с тяжелым механическим составом;
2. **free of weeds** - без сорняков;
3. **to take into consideration** - принимать во внимание.

REMEMBER

means - средство

to mean – значить, означать

by means of - посредством,
при помощи

Listening and Speaking Focus

Watch the video, answer the following questions:

1. <https://youtu.be/OoIy2TUS2oo>
2. What variations of wheat have you learned?
3. What is the difference of variations?



Vocabulary activities

5. Translate the following sentences paying attention to different meanings of the word *mean* as a noun and a verb.

1. Winter oats are not so hardy as winter wheat. It means that they require a longer period to become well-rooted before coming of cold weather.
2. One can increase oat yields by means of applying manure to the preceding crop.
3. What chemical means of controlling weeds do you know?
4. The development of high-yielding varieties means more food from the same area of land.
5. Growing cover crops is a good means for conserving moisture in the soil.

6. Translate the sentences containing the Infinitive constructions.

1. This soil was found to have been exhausted by the continued growing of the same crop.
2. We consider this practice to be useful on sandy loams.
3. For prompt germination to occur sufficient moisture should be present.

4. Early preparation of the soil is essential for moisture to be conserved.
5. This method of seeding seems to result in better stands and uniform maturity.
6. Many days are known to be required for this crop to become well-rooted.
7. Do you suppose direct combining to be the best means for harvesting wheat?
8. Heavy textured soils should be well drained for wheat to be grown successfully.
9. This variety is sure to overwinter successfully in areas, where the average winter temperature is not less than - 10C.
10. Our agronomist is likely to have examined the seeds before sowing.

7. Make up sentences matching their parts.

- | | |
|--|--|
| a) to secure uniform and prompt | 1. The rate of seeding germination |
| b) are supposed to cause lodging of plants | 2. Sufficient moisture must be provided |
| c) should be from 2 to 3 inches | 3. When wheat is sown by broadcasting |
| d) more seed is required. | 4. Great amounts of nitrogen in the soil |
| e) depends on climate and soil conditions as well as on the quality of seeds | 5. The depth of seeding in a dry soil |

8. Find in text A and read aloud the paragraph which can be rendered into Russian as «о глубине посева пшеницы».

LESSON 16.2. WHEAT GROWING

Vocabulary activities

1. Find in the text and put down the following:

- a) words with the same meaning as below:
autumn, to hold, complex, precipitation, method, highest;
- b) words with the opposite meaning as below:
deep, deficient, slow, moist, disadvantage, infertile, fine textured, irrigated.

2. Translate the following sentences paying attention to the word meanings of the word *means*.

1. Manure is considered to be a good means of improving soil structure.
2. What does "complete fertilizer" mean?
3. One may reduce the danger of diseases by means of proper treatment of the seeding material.
4. There exist a lot of means of increasing the yield.
5. The preparation of seedbed in time and in the proper way means obtaining higher yield.
6. All cereals are thought to yield better when they are sown by means of a grain drill.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

- a)
 1. Пшеница требует хорошо подготовленную, мягкую пашню без сорняков.
 2. Время и метод подготовки пашни зависят от многих условий.
 3. Рано подготовленная почва сохраняет влагу лучше.

4. Большая часть пшеницы высевается рядовой сеялкой.
5. Пшеница обычно убирается при помощи комбайна.
6. Важно убирать пшеницу в соответствующее время.
7. Пшеница готова для уборки, когда содержание влаги в зерне не более 14%;

b)

1. Известно, что посев рядовой сеялкой имеет существенные преимущества перед посевом вразброс.
2. Мы сможем значительно улучшить структуру почвы посредством этого метода обработки.
3. Ранняя вспашка помогает сохранять влагу в почве.
4. Что нужно принимать во внимание, когда устанавливается норма посева?
5. Преобладающие условия влажности также определяют время подготовки пашни.
6. Наибольший урожай зерна высокого качества, как полагают, зависит от выбора правильного времени уборки.
7. Хотя большая часть пшеница убирается при помощи комбайна, это не значит, что ее нельзя убирать другим способом.
8. Посев рядовой сеялкой обеспечивает более однородное распределение и глубину заделки семян.

Vocabulary and comprehension activities

4. Answer the following questions to text A.

1. What soil does wheat require?
2. Can wheat be grown successfully on clay soil?
3. What seedbed is essential for wheat?
4. What do the time and method of seedbed preparation depend on?
5. What soil conserves moisture better?
6. Why is the rate of seeding wheat a very complicated, problem?
7. What is the relationship between the amount of rain-fall and the rate of seeding?
8. What are the advantages of drilling?
9. How is wheat harvested?
10. When is wheat ready for combine harvesting?

5. Read text B without a dictionary and paragraph it. Title each paragraph.

TEXT B

Man cannot influence climatic conditions. However, with new progress in science, crop production can be controlled by applying improved farming practices. So, the farmer cannot regulate the amount of rainfall, but he can prevent loss of moisture by proper cultivation and by incorporating into the soil large amounts of organic matter which helps conserve moisture. In some areas irregularities in rainfall and lack of moisture are compensated by irrigation. Proper temperature is also essential for successful plant growth. In addition it helps conserve water in the soil.

So, some plants grow best in cool climates not only because of direct effect of temperature, but due to higher supply of water under such conditions. Wind is another climatic factor influencing crop production. The farmer cannot control the wind, but he can farm his land in such a way as to lose as little soil as possible due to wind erosion. He can plant winter crops in areas where they will mature before dry, hot windy weather becomes a problem the next summer. Sunlight is highly important for many processes taking place in the growing plant. There exists a relationship between length of day and the flowering and fruiting of plants. Some plants produce flowers only when days are long and nights are short. They are called long-day plants. Some plants produce flowers and fruit in autumn when days are short and nights are long. They are called short-day plants. Some plants are not likely to be affected by the length of the day. Crops vary in their climatic requirements. Corn can be grown under a variety of climatic conditions, the most favourable environment being the one where the average summer temperature is between 70° and 80° F. Wheat sown in the fall does best in regions where the climate is cool and moist during the fall, winter and early spring months followed by warm and dry harvest period. Low yields may often result from too low temperatures and abnormally dry weather. Like potatoes, oats and barley do best in cool, moist climate. Both quality and yield of potatoes are better in cool regions. Vegetables, because of their high adaptability, are grown under different soil and climatic conditions, soils of good physical properties being especially important. To obtain high yield of a good quality crop it is necessary to select a proper variety best adapted to the conditions of the region it is to be grown in.

UNIT 17. CORN

In this unit you will learn:	Grammar focus: - Неполные придаточные предложения Vocabulary focus Reading and comprehension focus: - Text A. Corn. - Text B. Listening and speaking focus
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Grammar Focus

Неполные придаточные предложения



when (когда), while (в то время как), if (если), until (пока не), unless (если не), though (хотя) + причастие или прилагательное
 e.g. **When accompanied** by high temperatures, heavy rainfall is unfavourable for wheat.

Группы слов, состоящие из союзов when (когда), while (в то время как), if (если), until (пока не), unless (если не), though (хотя) и причастия или прилагательного, рассматриваются как неполные придаточные предложения.

Такую группу слов можно превратить в полное предложение, введя в нее недостающее подлежащее (то же, что и в главном предложении) и глагол to be в соответствующем времени, лице и числе.

e.g. When heavy rainfall is accompanied by high temperatures, it is unfavourable for wheat. Когда обильные осадки сопровождаются высокой температурой, они неблагоприятны для пшеницы.

LESSON 17.1. CORN

1. Study the Grammar Focus section of the unit: «Неполные придаточные предложения».

2. Translate the following sentences containing clauses:

1. When grown continuously on the same field, corn can exhaust the soil in a short time.

1. If included in the rotation, perennial grasses should precede cereals.

2. Though prepared properly, the seedbed didn't contain enough moisture for prompt germination of this crop.

3. When left rough, the soil is in better condition to hold moisture.

4. Unless applied at proper rate, this type of fertilizer may injure the crop.

5. While young, cotton plants are easily damaged by cool weather.

3. Identify by suffixes the parts of speech the following words belong to, provide their Russian equivalents.

1. require, requiring, required, requirement;

2. adept, adapted, adapting, adaptation, adaptability;

3. germinate, germinated, germinating, germination;

4. exist, existing, existence;

5. vary, varying, various, variously, variety, variability, variation.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

extremely, variable, shape, pound, transpiration, to be high in, water-holding capacity, adequate, sunshine, vegetative growth, to manufacture, apart, advisable, livestock feed.



4. Read aloud and translate text A.

Text A

Corn

Corn is believed to have been a highly developed cultivated crop in the new world¹ long before its discovery. The origin of corn is unknown since the plant has been found only under cultivation. How corn is more widely distributed over the world than any other cereal crop.

Corn is a member of the grass family. It's an extremely variable plant and there are a large number of varieties, varying greatly in size and shape.

Corn is warm-weather plant that requires high temperatures day and night during the growing season. It has been found to be highly susceptible to frost injury at any time of growth.

Actually corn requires a relatively small amount of water for each pound of dry matter produced, its high water requirement being due to the potential high acre production. When growing rapidly in July and August, corn needs much water because of the high rate of evaporation from the soil and transpiration from the leaves. Corn makes its best growth if planted in a fertile, well-drained, loam soil. Besides, soils high in organic matter are ideal for this crop for they have a high water-holding capacity.

In addition to fertile soil and adequate moisture an abundance of sunshine is necessary for the plants to manufacture large quantities of food to be stored in the grain. Cool, cloudy weather results in heavy vegetative growth and low yields of grain.

The object is to plant corn at the depth that will provide optimum soil temperature and water and result in rapid germination. Corn planting depth varies widely with the soil conditions and climate. As corn should be planted deep enough to place the seed in contact with warm moist soil, the usual depth is 2 to 3 inches in rows from 30 to 40 inches apart. The soil being rather cold, the depth of 1 to 1 1/2 inches may be advisable.

Corn is cultivated primarily to control weeds and to a less extent to conserve moisture and aerate the soil.

Corn is grown principally for grain, fodder, silage and posturing. Nearly 90% of the corn grain harvested is used directly as livestock feed. When cut for silage or harvested for fodder, corn does not usually leave the farms on which it is produced. Corn has numerous industrial uses. Its stems or leaves seem to have been used for making paper from ancient times².

Notes to the text

1. the New World – Новый Свет;
2. from ancient times – с давних времен.

Comprehension activities

5. Find in text A:

1. неполные предложения (4-й и последний абзацы);
2. инфинитив в функции определения;
3. инфинитив, который переводится сказуемым в прошедшем времени (1-й и последний абзацы).

6. Fill in the gaps with the following words in the appropriate form: to vary, to vary in, to vary with, to vary from ... to, variety, various, variable, variation.

1. The method of applying fertilizer the crop grown and the type of fertilizer to be used.

2. The depth of corn seedling 1... 3 inches, depending on soil temperature.

3. The stem of corn plant is found to be more ... in size and height than that of any other cereal.

4. The external factors influencing plant growth are moisture, suitable temperature, oxygen, ..., nutrients, and light.

5. Water-holding capacity of different soils ... greatly, being the highest in soils rich in organic matter.

6. The first step in the improvement of any crop is the selection of the best ... for given conditions.

7. Fertilizing materials for this crop nature and rate of application, being determined to a great extent by the character of the soil on which the crop is grown.

8. Great ... in the size of corn plant and in the time of its maturity is mainly due to the environment in which the crop is grown.

7. Translate the sentences containing clauses.

1. If planted too deeply, the seedlings of this crop will have some difficulty in reaching the surface of the soil.

2. When present in great amounts in the soil, nitrogen is known to cause lodging of most cereals.

3. Though of the same variety, the seeds may differ greatly in size and quality.

4. When young, weeds are easily controlled by proper cultivation.

5. This plant is said to be affected by cold weather, until well-rooted.

6. Though not sufficiently fertile for growing wheat, this soil can be used successfully for growing rye.

7. Unless planted deep enough, the corn seed will not have sufficient moisture for rapid germination.

8. Though not as important as climate conditions, soil properties must be also taken into consideration when choosing the crop to be grown.

9. When young, the corn plant is about 90% water and 10% dry matter.

8. Find in text A and read aloud the sentence about the purpose of corn production.



Listening and Speaking Focus.

Watch the video, answer the following questions:

1. How to determine growth stages of vegetative corn?
1. What are corn growing conditions?

<https://www.youtube.com/watch?v=KHGAsMooL7I>

LESSON 17.2

Vocabulary activities

1. Find in text A and put down in your notebooks all the verbs corresponding to the following nouns:

aeration, manufacture, existence, conservation, harvest, distribution, difference, need, storage, provision, result.

2. Find in text A and put down in your notebooks all the adjectives corresponding to the following nouns:

height, depth, moisture, warmth, variety, fertility, advice, industry, rapidity, cloud, vegetation.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Сорта кукурузы сильно различаются по форме, размеру и урожайности.
2. Кукуруза требует высокой температуры, обилия солнечного света и много влаги.
3. Кукуруза растёт лучше всего на плодородных суглинках.
4. Прохладная погода приводит к низким урожаям этой культуры.
5. Кукуруза выращивается для многих целей.
6. Большое количество кукурузы широко используется на корм скоту?



b)

1. Благодаря высокой влагоёмкости эти почвы очень подходят для выращивания кукурузы.
2. Известно, что кукуруза является теплолюбивым растением и очень подвержена повреждению заморозками.
3. Почвенные и климатические условия определяют глубину посадки. Обычная рекомендуемая глубина - 2-3 дюйма.
4. Считается, что обработка кукурузы производится главным образом для борьбы с сорняками.
5. Как влияют на кукурузу обилие солнечного света и прохладная облачная погода?
6. Когда кукуруза выращивается на силос, норма посева увеличивается.
7. Каковы главные цели выращивания кукурузы?

8. Кукуруза высевается слишком рано, она может быть повреждена заморозками.

4. Answer the following questions and prove your point.

Can wheat and corn be grown on the same farm?



5. Specify the sentences contradicting the contents of text A. Explain your answer.

1. Corn is grown primarily for the production of grain.
2. There is a great number of corn varieties differing in certain characteristics.
3. The main aim of cultivating corn is to conserve moisture in the soil and to aerate it.
4. Cool water accompanied by high precipitation is known to be favorable for the production of corn grain.
5. Corn is usually planted to the depth of 1 to 1 1/2 inches, if the soil is rather cold.
6. Corn doesn't need much moisture, as a relatively small amount of water is required to produce one pound of dry matter of this plant.
7. Soils having high water-holding capacity are believed to be best for corn.
8. When fed to livestock, corn is usually produced on the same farm.
9. The depth of planting corn is uniform for all soils.
10. At the beginning of the growing season water requirements of corn are of the highest.

6. Read text B without a dictionary and title it.

Text 17B

As with most cultivated crops plowing is usually the first step in seedbed preparation for corn. Corn having a more extensive and deeper rooting system than the other cereals, deeper plowing and cultivation are required, both fall and spring plowing practiced in growing corn. The final preparation of the plowed land usually consists in pulverization of the top 4 inches of the soil. This should be done immediately before the crop is planted in order to control weeds. Soil fertility is more important in growing corn than in growing any of the other cereals. Soils very rich in available nitrogen will cause lodging of the small grains, but they are desirable for corn. For these reasons, such practices as applying barnyard manure and using commercial fertilizers and the time of planting and later as a side dressing are all used to provide the fertility needed for good growth of corn. But one should remember that germination is much retarded (замедлять) by fertilizers coming in contact with the seed. In order to maintain high yields corn is usually grown in rotation with other crops. Corn rotations usually include a small grain, and a legume or a legume-grass mixture. As a rule, corn follows a legume-grass mixture.

7. Paragraph the text and render the main idea of each paragraph in Russian or in English.

8. Make a summary of text B in English.



Listening and speaking Focus

Watch the video then

a) answer the questions below:

1. How corn conquered the world

1. How did this single variety of this single plant become the biggest success story in agricultural history of USA?

1. What is another name for corn?

2. What was the corn first domesticated from?

3. What fact has made the corn production a global phenomenon?

b) make a summary of the video.

[https://www.ted.com/talks/chris a kniesly how corn conquered the world](https://www.ted.com/talks/chris_a_kniesly_how_corn_conquered_the_world)

9 Discussion. What are the disadvantages of corn production?

UNIT 18. POTATOES

In this unit you will learn:

Grammar focus:

- Усилительная конструкция It is ... that (who).

- Предложения типа It is necessary that

- Word meaning *it* (revision).

- Word meaning *that* (revision).

Vocabulary focus

Reading and comprehension focus:

- Text A. Potatoes.

- Text B. Growing Potatoes.

Listening and speaking focus

Grammar Focus



Схема использования конструкции:

It + is/was + главное действующее лицо + who/that + другие члены предложения

Усилительная конструкция It is ... that (who)

Когда мы хотим что-то выделить в своей речи, мы делаем акцент на этом: «Именно я предложил это. Я хочу учить именно английский язык. Именно ту песню я хочу послушать». В английском языке для этого используется усилительная конструкция **It is that**.

Данная конструкция служит для смыслового выделения члена предложения (подлежащего, дополнения или обстоятельства).

It is high temperature during tuber formation **that** results in lower yields. **Именно** высокая температура во время образования клубней приводит к более низким урожаям.

3. После глагола to wish в придаточных дополнительных предложениях для выражения желания, надежды, сожаления о невозможности желаемого, а также в выражениях типа I wish I knew (в значении I don't know):

a) если желание осуществимо, употребляется аналитическая форма would + инфинитив без to.

I wish they would pass their exams. Мне хочется, чтобы они сдали экзамены.

He wishes I would come to Minsk. Ему хочется, чтобы я приехал(а) в Минск.

b) если желание нереально и неосуществимо, то в придаточном предложении имеет место сдвиг времен (Past Subjunctive от to be – were. Past Indefinite или Past Perfect – от всех других глаголов соответственно правилам согласования времен: если в главном предложении глагол стоит в Present Indefinite, то в придаточном – в Past Indefinite; если в главном предложении глагол стоит в Past Indefinite или в другом прошедшем времени, то в придаточном – в Past Perfect, т. е. Perfect Subjunctive).

I wish they were there! Я хотел(а) бы, чтобы они были там!

I wish we had more films for children. Я хотел(а) бы, чтобы у нас было больше фильмов для детей (но их мало).

He wished we had gone. Он хотел, чтобы мы ушли.

Если действие относится к настоящему времени, то оно выражается через Simple Past/Past Indefinite.

I wish it were summer now. (= It's a pity it is not summer now.) Как бы мне хотелось, чтобы сейчас было лето. (= Жаль, что сейчас не лето.)

I wish you had time. (= I am sorry you haven't time.) Как бы мне хотелось, чтобы у тебя было время. (= Жаль, что у тебя нет времени.)

I wish I knew it. (= I am sorry I don't know it.) Как бы мне хотелось знать это. (= Жаль, но я, к сожалению, не знаю этого.)

Глагол to wish может стоять и в прошедшем времени, форма Subjunctive не изменяется при этом.

He wished he knew it. (= He was sorry he didn't know it.) Жаль, что он не знал этого.

Если действие относится к прошедшему времени, то оно выражается через Past Perfect.

I wish he hadn't gone. (= I am sorry he went.) Как бы мне хотелось, чтобы он не уезжал. (= Жаль, что он уехал.)

I wish you hadn't told him. (= I am sorry you told him.) Как бы мне хотелось, чтобы ты ему не говорил. (= Жаль, что ты сказал ему.)

He wished he had taken her advice. Как он жалел, что не послушал

(= He was sorry he hadn't taken her advice.) её совета. (= Жаль, что он не послушал её совета.)

в) если выражается сожаление в отношении невыполнимости действия в будущем, используется глагол could.

I wish he could come to see me tomorrow (but he couldn't). Жаль, что он не сможет прийти ко мне завтра.

I wish he could get a good salary. Жаль, что он не получает хорошую зарплату.

4. В придаточных предложениях обстоятельства цели в конструкции с that, so that, in order that – чтобы, для того чтобы; lest – чтобы не употребляется II форма Indefinite Subjunctive (should + инфинитив). Present Subjunctive (go, write...) или сочетание глагола may (might) + инфинитив или can (could) + инфинитив.

He brought me the book so that I should read it. Он принёс мне книгу (для того), чтобы я прочёл её.

Go to the station now that you may catch the train. Иди на вокзал сейчас, чтобы ты успел на поезд.

Put your money into the pocket lest you should forget it. Положи деньги в карман, чтобы не забыть их.

5. В придаточных предложениях условия, сравнения после союзов if/if only – если бы, если бы только. as if/as though – как будто, как если бы употребляется Past Subjunctive (were, went, brought и т. п.) или Past Perfect (had brought, had rained и т. п.):

а) для выражения невозможности совершения действия или нереального условия по отношению к настоящему времени употребляется Past Subjunctive (Simple Past).

If we all went to Paris! Если бы мы все поехали в Париж!

If only we had money! Если бы только у нас были деньги!

He behaves as if he owned the flat. Он ведёт себя так, как будто он хозяин квартиры.

She talks as though she knew where I was. Она говорит так, как если бы она знала, где я был.

б) для выражения невыполнимого действия, относящегося к прошлому, употребляется Past Perfect.

If it had rained yesterday! Если бы вчера был дождь!

He talks (talked) about Rome as though he had been there himself. Он говорит (говорил) о Риме, как если бы он сам там был (как будто он сам там был).

6. В придаточных уступительных предложениях, которые вводятся союзами или союзными словами though, although - хотя, whoever – кто бы ни, however – как бы ни, whatever - что бы ни, wherever – где бы ни, куда бы ни, употребляется II форма Indefinite Subjunctive (should write и т. п.) или Present

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

extensive, profitable, peat, muck, tolerant, acidity, to blossom, to set, piece, whole, to be subject to, to dig, digger, to sprout, to eliminate.



6. Read and translate text A.

Text 18A

Potatoes

Potato, *Solanum tuberosum* (lat.), known both as the Irish potato and as the white potato, is related to such plants as tomato, eggplant, and tobacco. Potato is believed to have been cultivated first in Peru. It was carried to Spain, Italy, and Germany about the middle of the 16th century.

It is the importance of potato as food that is generally recognized. In addition to its extensive use as food, potato is used both in agriculture as livestock feed and in industry. Now it is grown in most countries of the world.

Profitable yields appear to be possible where the average growing season temperature is between 60° and 70° F, and where the rainfall reaches 12-18 inches, being well distributed over a period from three to four months. That is why commercial production is largely limited to the areas where the climate is fairly cool and moist.

Soils preferred are drained sandy loams well supplied with organic matter and available plant food. If well-drained, peat or muck soils are particularly good for potato production. Potato is known to be tolerant of soil acidity. It makes a satisfactory growth and yield on a soil with a pH range of 4.8 to 5.4.

The best planting date should provide cool, moist conditions when the plants are blossoming and setting tubers, and relatively short days in the growing season for maximum tuber development.

It is because of the economy of the seeding material that most seed tubers are cut into pieces. However, the cut seed is not better than whole tubers from the standpoint of yield, and cutting adds labour cost. Moreover, when cut, the seed is more subject to drying out and diseases.

The depth of planting varies with the soil type and the equipment used, 3 to 4 inches generally being the best depth. The fertility of the soil and its moisture-holding capacity, the climate, the variety, and the amount of fertilizer applied affect spacing within and between rows.

At present almost all potatoes grown on a commercial scale are harvested by mechanical two-row diggers, that dig, pick up and load the crop.

When ready to store, the tubers should be clean, mature and free from injury. It is necessary that the temperature be between 36° and 40° F to prevent sprouting. There should be enough ventilation to provide oxygen and eliminate carbon dioxide and heat of respiration.

Notes to the text

1. from the standpoint of ... – с точки зрения;
2. on a commercial scale – в промышленном масштабе.

Remember:

(в смысле очень, весьма, чрезвычайно, сильно)

greatly – в большой степени

highly – в высшей степени

largely – в значительной степени



Grammar and vocabulary activities

7. Translate the following sentences containing *that* (*those*) in the different meanings:

1. The system of crop rotation that is used on our farm has raised soil fertility and improved soil structure.

2. The roots of alfalfa penetrate into the soil much deeper than those of other cereals.

3. It is undesirable that cutting of seed tubers be done, for cut seeds are more subject to diseases.

4. It is the organic matter content of the soil that can be increased with difficulty.

5. Forage crops grown on our farm are better than those grown on the neighboring farm.

6. The seedbed for potatoes should be plowed to a considerable depth, so that best conditions for tuber development be ensured.

7. The variety of corn developed by our Experimental Station does better in our region than that one.

8. It is well-known that fine pulverization of the soil minimises moisture losses.

9. This selection of a proper variety, that is, the variety that is best adapted to any given soil and climatic conditions is essential for obtaining high yields.

8. Highlight the sentences in which the word *it* is not translated into Russian.

1. Corn is a warm-weather plant. It means it requires rather high temperature and a lot of Sunshine during its growth.

2. It is high temperature that is especially unfavourable for wheat, as it results in losses due to lodging.

3. As cotton is subject to frost injury, it is necessary to plant it when the danger of cold weather is over.

4. Profitable to grow potatoes in regions where cool and moist conditions prevail.

5. It should be remembered that crop rotation alone cannot maintain soil fertility for a long time.

6. Rice serves as the principal food for many people. It is usually eaten whole.

7. It is a leading forage crop as its food value is high and adaptability is wide.

9. Translate the following word combinations containing comparative or superlative degrees of adjectives:

more profitable, the worst conditions, higher precipitation, less moisture, the most tolerant, larger pieces, much more subject to, to the greatest extent, better distribution, the best practice.

Listening and Speaking Focus

Watch the videos, answer the following questions:

1. What is the history of Irish potato?

<https://www.youtube.com/watch?v=M8Rbj7H0eX4>

2. What is the Irish method of growing potatoes?

3. Can potatoes be planted in autumn and why?

<https://www.youtube.com/watch?v=knCFAWDC6FM>

LESSON 18.2

Grammar and vocabulary activities

1. Identify which adjectives the following adverbs are formed from. Provide their Russian equivalents.

Fairly, daily, relatively, actually, wholly, generally, freely, annually, heavily, normally, commonly.

2. Make up sentences matching their parts.

1. The temperature in potato storage should be low enough	a. they are primarily utilized as human food.
2. There is a number of disadvantages in using out seed tubers	b. to prevent sprouting.
3. Well-drained friable soil high in organic matter	c. high labour cost of cutting being one of them.
4. Though potatoes are known to be used extensively as livestock feed and in industry	d. high temperatures accompanied by abundant rainfall.
5. Heavy vegetative growth and small	b) E) usually produces the least yields

tubers result from

of tubers.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

1. Картофель широко выращивается в большинстве стран мира.
2. Картофель, являясь ценной пищей для человека, используется также на корм скоту.
3. Промышленное производство картофеля ограничивается районами с довольно прохладным и влажным климатом.
4. Картофель выращивается на различных почвах: суглинках, ступесях торфянистых и других.
5. Картофель убирают механическими копалками.
6. Картофель должен храниться при температуре не выше 40° F.
7. Картофель, как полагают, был привезён в Европу в середине XVI века.
8. Будучи очень важным источником питания для человека, картофель широко возделывается по всему миру.
9. Довольно прохладный и влажный климат больше всего подходит для выращивания картофеля.
10. Соответствующая температура особенно важна в то время, когда картофель образует клубни.
11. Для посева картофель иногда режут на куски, но разрезанные клубни более подвержены болезням.
12. Глубина посева, как известно, зависит от типа почвы.
13. Расстояние внутри и между рядами изменяется в зависимости от плодородия почвы, её влагоёмкости, сорта картофеля и климата.
14. Картофель выкапывается, подбирается и загружается механическими копалками.
15. Чтобы предотвратить прорастание, картофель хранят в хорошо вентилируемом помещении при температуре 36°-40° F.



Comprehension activities

4. Answer the following questions to text A.

1. How are potatoes used?
2. In what climatic conditions do potatoes grow best?
3. What soils do potatoes require?
4. What are the disadvantages of cutting seed tubers?
5. What affects spacing within and between the rows?
6. How are potatoes harvested?
7. What conditions are necessary for safe potato storage?

5. Read text B without a dictionary. Identify the meaning of the underlined words according to their Russian equivalents and to the context.

Text 18B
Growing potatoes

Potatoes should be grown in a planned crop rotation to keep the soil fertile, maintain its friable and organic matter content, and reduce crop loss from insects and diseases. The rotations for potatoes depends on the crops grown in the area. It has been found that the highest potato yield and the best quality are obtained when the potato crop follows alfalfa and is planted on the same land only once in six or seven years.

Fertilization of the potato crop varies greatly on different soil types. A green manure crop proceeding potatoes is considered desirable, and animal manure is excellent as a fertilizer. The potato plant responds (реагировать) well to available nitrogen. Complete fertilizer is generally used in commercial potato-producing regions, although sometimes nitrogen may not be necessary on muck soils. Where manure is used, the only additional material needed may be superphosphate.

For many years the most commonly followed method of applying fertilizers has been side dressing. But experiments have shown that the use of one half of the fertilizer applied broadcast before plowing, with the latter half applied in the usual manner gives better results than when all is applied as side dressing.

Weed control is also very import. A number of early-season annual weeds can be controlled by herbicides applied immediately after planting, before the potatoes come up. Where late-season annual weeds are a problem, herbicides may be applied after the last cultivation.

6. Summarize the main idea of text B briefly. Make a summary listing the fertilizers used for potatoes and ways of applying them. What crop should potato follow to produce the highest yield? Why? Complete the task in Russian and in English.

UNIT 19. ROOT CROPS

In this unit you will learn:	<p>Grammar focus:</p> <ul style="list-style-type: none"> - Complex sentences (revision). - Correlative conjunctions (revision). - Conjunctions and their homonyms (words easily confused). <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Root crops. - Text B. Beets. <p>Listening and speaking focus</p>
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Grammar Focus

Сложноподчиненные предложения (Complex sentences)



Как и в любом языке, в английском существуют сложносочиненные и сложноподчиненные предложения. В сложносочиненном предложении все части равноправны и выражают законченный смысл, даже если их разделить.

В сложноподчиненном предложении главное предложение выражает законченную мысль, а придаточное не может существовать без главного.

Например:

The yield of corn is much higher and the soil contains more organic matter.

Урожайность кукурузы намного выше, а почва содержит больше органических веществ.

В этом примере оба простых предложения в составе сложного выражают законченные мысли, о чем и сигнализирует сочинительный союз *and*.

Например:

The soil contains more organic matter because the yield of corn is much higher. В почве содержится больше органического вещества, потому что урожайность кукурузы намного выше.

Попробуем разделить это предложение на части. *The soil contains more organic matter* – вполне себе законченная мысль. А вот *Because the yield of corn is much higher* звучит странно, незавершенно. Все потому, что перед нами сложноподчиненное предложение, в котором подчинительный союз *because* маркирует придаточную часть.

Примечание! Если придаточное предложение стоит перед главным, то их нужно отделить друг от друга запятой. Если главное предложение на первом месте, то запятая не нужна.

Конструкция «наречие + подчинительный союз» Для усиления значения некоторые подчинительные союзы могут использоваться в связке с наречиями (*adverbs*).

Например:

The soil contains more organic matter simply because the yield of corn is much higher. В почве содержится больше органического вещества просто потому, что урожайность кукурузы намного выше.

Парные союзы (*correlative conjunctions*)



Это обыкновенные союзы, состоящие из двух слов.
as ... as – так (же) ..., как (и) / такой (же) ..., как (и)
both ... and – как ..., так и, но *both* – оба
either ... or – или ..., или / либо ..., либо
neither ... nor – ни ..., ни
not only ... but also – не только ..., но и
not so ... as – не так(ой) ..., как
whether ... or – ли ... или
the + ср. степень ... the + ср. степень – чем ..., тем

Данные выражения служат противопоставлением в предложении и, как следствие, разделяют английское предложение на две части.

Например:

He either sits at the window thinking about his life or plays the piano in his free time – Он либо сидит у окна, думая о своей жизни, либо играет на фортепиано в свободное время.

Neither you nor your sister knows the exact meaning of this word – Ни ты, ни твоя сестра не знает точное значение этого слова.

Союзы, союзные слова и их омонимы (conjunctions and their homonyms)



as – так как, когда, по мере того как, как

as to – что касается

as well as – так же, как и

as well – также

as soon as – как только

as long as – до тех пор, пока

so as – так чтобы

after (союз) – после того как

after (предлог) – после

before (союз) – до того как

before (предлог) – до

because – потому что, так, как

because of – из-за, вследствие

for (союз) – так как

for (предлог) – для, в течение

since (союз) – так как, с тех пор как

since (предлог) – с, (наречие) – с тех пор

if – если, ли

provided – если, при условии если (не путать с 2-й и 3-й формой глагола *to provide*)

though, although – хотя

unless – если не

until – до тех пор, пока не

whether – ли

while – в то время как

who – кто, который

what – что

whose – чей, чьё

when – когда

which – каковой, (тот) который, что

that – что, который, то, кто

where – где, который

how – как

why – почему

Слова, выполняющие союзную роль, называются союзными словами (*Connecting Words*). Место союзных слов – перед предложениями, которые они вводят.

Происходя из самостоятельных частей речи, определенные союзные слова одновременно выполняют функцию членов предложения в связке подчиненного предложения. Подобными союзными словами, осуществляющими подчинительную связь, являются относительные и соединительные местоимения и наречия.

Кроме того, для осуществления сочинительной связи привлекаются слова – по происхождению наречия, отколовшиеся от них в большей или меньшей степени: *hence, therefore, however, consequently* и др. Эту группу слов можно обозначить термином союзные наречия (*Conjunctive Adverbs*).

Омонимы – слова, которые похожи по звучанию или написанию, но при этом имеют разную смысловую нагрузку. Омонимов в английском очень много. По некоторым данным, их доля составляет порядка 19.5% от всех существующих слов в английском языке.

Это связано прежде всего с этимологией. Например, слова *night* и *knight*. В старом английском языке эти слова не были омонимами потому, что изначально буква «k» в слове *knight* отчетливо произносилась. Но сегодня вследствие изменений, буква «k» не произносится, хотя пишется.

В отличие от английских союзов, союзные слова не только связывают части сложного предложения, но и являются членами придаточного предложения:

I know the farmer who has grown potatoes. Я знаю фермера, который вырастил картофель. (Союзное слово *who* здесь является подлежащим)

We were not even explained what to do. Нам даже не объяснили, что нужно делать. (Союзное слово *what* здесь является дополнением)

I am sure the soil will contain more organic matter when the yield of corn is much higher. Я уверен, что почва будет содержать больше органического вещества, когда урожайность кукурузы будет намного выше. (Союзное слово *when* здесь является обстоятельством времени)

LESSON 19.1. ROOT CROPS

1. Study carefully the Grammar Focus section of this unit.

2. Highlight subordinate clauses in the following sentences. Translate into Russian.

1. If the soil contained more organic matter the yield of corn would be much higher.

2. The rate of sowing may be increased, provided the soil is rich in nutrients.

3. The seeds will not germinate unless the soil temperature is proper.

4. If grown for grain on fertile soil rye is usually less profitable than other cereals.

3. Translate the following complex sentences.

1. The yield the new potato variety produces on our poor soil is rather high.

2. Soils potatoes prefer are well-drained sandy loams supplied with enough nutrients and water.

3. Tubers we use for planting are usually cut into pieces.

4. The depth the tubers are planted at varies with the soil type and the equipment used.

6. It is well known that the soil the root crops require should be fertile and deep.

4. Identify the meaning of the word *as* and translate the sentences.

1. As root crops are high in sugar and low in protein they do not supply a balanced diet.

2. As plants grow they require more nutrients and water.

3. In order to grow normally crops should absorb such minerals as calcium, magnesium and sulfur.

4. We have to apply much manure as this soil is too low in organic matter.

5. The nature of the soil changes as the proportion of clay particles increases.

5. Highlight correlative conjunctions and translate the sentences.

1. Potatoes are mostly grown in areas where the climate is neither too hot nor too dry.

2. Both cut tubers and whole ones can be used for planting.

6. The yield of corn grain is not so high in our region as it is in the South.

7. Spring wheat removes nitrogen in greater amounts than either potassium or phosphorus.

8. The coarser is the seed the deeper it should be sown.

9. Microelements are as important as primary elements.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries



Abundant, fresh, carrots, radishes, onions, by-product, herbicide, weedkiller, to consume, to value, type, comparatively, as a rule, level, recent, effective, to emerge, pre-emergence application, post-emergence application, mechanization, to facilitate.

6. Read and translate text A. Highlight complex sentences in the last paragraph and specify conjunctions introducing them.

Text 19A

Root Crops

The common feature of root crops is their fleshy underground storage organ. It is the root that these crops are widely grown for throughout the world both in home gardens and commercially. Compared to cereal and legume seeds, food stored in fleshy roots is watery and less concentrated. That is why root crops are not generally easily stored and transported. Most are abundant in carbohydrates and low in protein and oil and hence are useful “energy foods” but do not by themselves supply a balanced diet.

Some root crops consumed as fresh vegetables such as carrots, radishes, onions, etc. are valued both for their flavour and as sources of energy. Sugar beets have been developed for the extraction of sugar while their by-products are a valuable food for livestock.

Main factors affecting the growth and best development of roots a growing-season temperatures, type of soil with a particular reference to its water content, drainage, acidity and the available nitrogen supply. As far as the temperature is concerned it should be different at different stages of growth. Since the size and quality of the root depend on the development of the foliage, comparatively high temperatures during the seedling stage permit the development of large top. Somewhat lower temperatures after the tops are fully grown will result in the development of large high-quality roots.

As a rule, the best yield of roots are obtained on sandy loams which are not acid and in which the moisture content can be maintained at a reasonable level. With the roots growing underground, a deep seedbed is necessary. When practicable, the land should be plowed in the fall so that it may be worked early in spring. In general the soil recommended is the one that is fertile, deep and of a texture which is easy to work.

In recent years root crop growing has been changed by several new developments. One of them is mechanization which facilitates growing and harvesting roots. Special root drills and mechanical thinners make it possible to eliminate most of hand labour formerly required for root crop production. Weedkillers or herbicides are known to have been developed for controlling weeds in most of the root crops.

They can be applied either before plants emerge or after they appear. The former method is known as pre-emergence while the later as post-emergence application. If used with care, the weedkillers are highly effective in maintaining the soil free of weeds and hence in increasing root crop yields.

Notes to the text

1. compared to – по сравнению с;
2. by themselves – сами по себе;
3. as far as ... is concerned – что касается.

Comprehension activities

7. Highlight the sentences with conjunctions introducing subordinate clauses. Translate these sentences into Russian.

1. When the soil is known to be low in organic matter, the growing of green manure crops may be desirable.
2. Until the plant food becomes available plants cannot use it.
3. Whether corn is grown for grain or for silage, the soil should be fertile enough for plants to develop well.
4. Rye belongs to drought-resistant plants, which is due to its well-developed root system.
5. Winter grains grow well and withstand winterkilling, provided they are sown at optimum time.
6. Air which constitutes from 20 to 25 percent of a normally moist soil supplies the necessary amount of oxygen.
7. Though beets will withstand light frosts, it is usually best to delay seeding until the last killing frost date is past.
8. In our region corn is grown principally for grain while its tops are used as livestock feed.
9. Since corn is a warm-weather plant it is planted as soon as soil temperature becomes high enough.

8. Translate the following sentences paying attention to the words in bold.

1. It is not recommended to apply barnyard manure for oats **for** they lodge due to the presence of nitrogen in the manure.
2. Some perennials are able to live **for** more than 10 years or even longer.
4. **For** plants to manufacture much food they need an abundance of sunshine.
5. Soil **provided** with a good amount of organic matter will produce high **yields** of farm crops.
6. Last year our Experimental Station **provided** the farms of our region with the seed of this new winter wheat variety.
7. Oats are known to **yield** much better, **provided** they are grown after sugar beets than after small grains.
8. The crop did not **yield** well because the soil contained a small amount of nitrogen.
9. A poor potato crop was produced because of too low moisture content in the soil at the time of tuber formation.
10. They have grown this new corn variety **since** 1980.
11. They have not grown any other cone variety **since**.
12. We have not applied either organic or commercial fertilizers to the soil **since** we began the experiment.
13. Sandy and sandy loam soils are best adapted to potato growing **since** they produce tubers of high quality.
14. The fertility of the soil was rather low before growing legumes.
15. The grain may be injured before good storage conditions are **provided**.
16. Lodging **resulted** after abundant application of manure.
17. After the seedlings are transplanted to the field they should be **watered**.



9. Highlight sentences in each paragraph of text A expressing the main idea of the paragraph.

Listening and speaking Focus

Watch the video: How to Plant Root Crops. - URL: <https://www.youtube.com/watch?v=SU6xZtOZgdM> (accessed 01.11.2022), answer the following questions:

1. How to Plant Root Crops in the video?
2. What is the part of the plant that lives underground?
3. What is the part of the plant that we eat?

LESSON 19.2 BEETS

1. Fill in the gaps with the appropriate word.

1. One cannot secure a high yield ... the condition of the soil does not favour free circulation of air (provided, unless).
2. Onions had produced rather low yields ... farmers began applying lime (until, unless).
3. It is known that plant growth may be a retarded ... lacking primary elements in the soil (because, because of).
5. Early planting will allow any crop to establish ... the period of high temperatures begins (after, before).
6. Deep seedbed is necessary for roots to grow and develop well ... the latter grow under ground (since, science).
7. ... crops do well depends on the environmental conditions as well as on cultural practices performed (when, whether).
8. Much hand labour had been required ... special root drills and mechanical thinners were developed (after, before).

2. Fill in the gaps with the appropriate conjunction.

1. ... roots are grown on acid soil, the latter should be limed.
2. ... the soil was rather heavy the farmers applied much organic matter and obtained a high yield of carrots.
3. Root crops will grow and develop well ... the soil is deep and fertile enough.
4. All root crops are high ... in starch ... in sugar.
5. Food in fleshy roots and tubers is ... concentrated ... that in cereal or legumes seeds.
6. The by-products ... the sugar beets produce are a valuable food for livestock.
7. It is known that the root crops are ... easily stored ... transported.
9. Corn yields better ... it follows deep-rooted legumes in the rotation.

10. There are table beets and sugar beets, the former are grown as human food, ... the latter as a raw material for sugar industry.

11. All root crops are biennials ... man grows them as annuals ... it is the fleshy underground root developing during the first season that is nutritious and valued by people.

3. Find the equivalents of the following words in text A and put them down in your notebooks.

All over the world, unlike, to be high in, to vary with, some, achievements, to need, to destroy weeds, carefully.

4. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

a)

1. Корнеплоды трудно хранить.

2. Морковь, редис и свёкла богаты углеводами.

3. Некоторые корнеплоды можно употреблять свежими.

5. Чтобы производить высокий урожай корней, растения должны иметь хорошо развитую надземную часть.

6. Лёгкие почвы, используемые для выращивания корнеплодов, не должны быть кислыми.

7. Сорняки уничтожаются с помощью гербицидов.

b)

1. Так как корни моркови, свёклы, редиса и других корнеплодов водянистые, их трудно хранить.

2. Во время развития корней температура должна быть несколько выше, чем при развитии ботвы.

3. Корнеплоды лучше всего растут на супесчаных почвах при условии, если последние не кислые.

4. Чем плодороднее и глубже почва, тем выше урожай корней.

5. На выращивание корнеплодов большое влияние оказала механизация выращивания и уборки корней.

6. Гербициды, применяемые до или после появления всходов, способствуют хорошему росту корнеплодов.



Comprehension activities

5. Make up sentences matching their parts.

1. Carrots and parsnips differ in that the former is grown for roots

2. A high yield of radishes may be obtained

3. Radishes cannot be transported for long

a) since they are high in water.

b) provided the soil is limed and manured.

c) unless the temperature is high enough.

distance

4. The farms of our region which produced a lot of carrots last year
5. The foliage will not develop properly
6. Now commercial growing of root crops can be done on a larger scale

- d) because the machines and herbicides facilitate their production.
- e) provided all the towns of the region with this vegetable.
- f) while the latter for both roots and tops.

6. Answer the following questions to text A:

1. What are the roots of vegetable crops high in?
2. How can sugar beets and their by-products be used?
3. What are the main factors affecting the growth of roots?
4. Do root crops need high temperature during the whole growing season?
5. On what kind of soil do root crops grow best?
6. What are the new developments that have changed root crop drawing?

7. Read text B without a dictionary. Identify the meaning of the words in bold according to their Russian equivalents and to the context.



Text B
Beets

Beet crop is one of the most widely grown root crops. There are two **major** groups of beets, sugar beets and table beets. Both of them are best **adapted** to growing in the **temperate** climate.

Table beets are generally consumed when young, a few weeks after planting. They are about 8% **carbohydrates** and 2% **protein**. **Cultivated** beets are believed to have been **originated** from the wild beet of northern Europe, *Beta maritima* (lat.). Table beets are likely to have been developed as a garden crop only in the 16th century.

Sugar beets have much more **commercial** value than table beets. Through **selection** and breeding sugar content has been increased from 2 to 4% that is **normal** in table beets to as much as 20%. Most of the crop is grown in Europe including the Russian Federation.

A good percentage of soil organic matter supplied naturally, by manuring or by legume residues favours best yields. Loam or sandy loam soils **predominate** in most of the sugar beets areas, but heavy soils are also used to some extent, though the latter are less favourable for high yields. The sugar **content** of beets is highest on soils that also produce best yields.

Irrigation water is necessary for successful commercial sugar beet production where **rainfall** is less than about 18 inches.

The crop has the highest sugar content in areas where summer temperature averages about 67 to 72°F. The plant is not injured by cool nights. Cool autumn weather favours sugar **accumulation** in the roots.

Sugar beets are usually grown in **rotations** including a legume crop, a small grain crop, and frequently potatoes, corn, or beans. The growing of sugar beets in the continuous culture results in reduced yields due to different diseases.

Sugar beets should be left in the field until they reach a **maximum** sugar content. Maturity is **indicated** by browning the lower leaves and yellowing the upper ones.

8. Report which type of beet is given more attention in text B and why. Speak about the relationship between the yield and sugar content of the beet. Explain why it is not advisable to grow beets on the same soil every year. Summarise the main idea of text B. Make the summary of text B (in Russian and in English).



Listening and Speaking Focus

Watch the video: **Growing Beets from Sowing to Harvest**
<https://www.youtube.com/watch?v=1D1LLkLi8oM>

- a) answer the questions below:
1. Should beets be a staple of every vegetable garden?
 2. Are they really easy to grow from seed?
 3. Do they need special aftercare to avoid overcrowding?
 4. What are some simple guidelines to help you harvest a bumper crop of beets?
- b) make a summary of the video.

9. Discussion. What factors are of the greatest importance in increasing yields of beet crops?

UNIT 20. ALFALFA

<p>In this unit you will learn:</p>	<p>Grammar focus:</p> <ul style="list-style-type: none"> - <i>-ing</i>-forms (revision). - Word meaning <i>should</i> (revision). - Nouns in Common Case Used as Attribute to Noun. <p>Vocabulary focus</p> <p>Reading and comprehension focus:</p> <ul style="list-style-type: none"> - Text A. Alfalfa. - Text B. <p>Listening and speaking focus</p>
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Grammar Focus

-ing-forms



Различить причастие, герундий и отглагольное существительное можно только в предложении, потому что вне контекста они выглядят абсолютно одинаково: слово «living» может означать и «живущий» (причастие), и «жизнь» (существительное), и «жить» или «проживание» (герундий).

Окончание **-ing** в английском языке можно добавить ко всем глаголам, даже к тем, что не употребляются во временах группы Continuous. Словоформы, которые получаются в итоге такого «сложения», могут быть причастием, герундием или отглагольным существительным. Умение различать эти формы в тексте помогает лучше понимать смысл и, как следствие, правильно переводить их на русский.

В таблице перечислены основные отличия между причастием, герундием и отглагольным существительным.

	Причастие (Participle I)	Герундий (Gerund)	Отглагольное существительное (Verbal Noun)
Определение	Форма глагола, сочетающая в себе признаки глагола и прилагательного	Форма глагола, сочетающая в себе признаки глагола и существительного	Существительное , образованное от глагола
Какие функции выполняет	Определение Часть сказуемого (образует времена группы Continuous) Обстоятельство	Подлежащее Часть составного именного сказуемого Определение Обстоятельство Дополнение	Подлежащее Часть составного именного сказуемого Дополнение
Может ли быть во множественном числе (иметь окончание -s)?	Нет	Нет	Да
Может ли употребляться с артиклями (a/the) и указательными местоимениями (this/that, these/those)?	Только если стоит перед существительным, которое определяет: the singing girl – поющая девочка; those barking dogs – лающие собаки	Только если употребляется в роли определения и стоит перед существительным, которое определяет: a writing table – письменный стол	Может: The <i>screaming</i> of the brakes terrified me. – Визг тормозов напугал меня.
Может ли употребляться с притяжательными местоимениями (my, his, your) и существительными в	Только если стоит перед существительным, которое определяет: her reading son – её читающий сын	Может, если употребляется в составе герундиальной конструкции: Do you mind my smoking? –	Может: teachers' <i>meeting</i> – собрание учителей my <i>doings</i> – мои поступки

	Причастие (Participle I)	Герундий (Gerund)	Отглагольное существительное (Verbal Noun)
притяжательном падеже (David's, teachers')?		Вы не возражаете, если я закурю?	
Может ли употребляться сразу после предлога?	Только если стоит перед существительным, которое определяет: The doctors puts an ointment on aching bod у parts. – Врач наносит мазь на больные части тела.	Может: Water expands on heating. – Вода расширяется при нагревании. Instead of watching TV, I decided to read a book. – Вместо того чтобы смотреть телевизор, я решил почитать книгу.	В некоторых случаях, например, если употребляется во мн.ч. Но чаще между предлогом и отглагольным сущ. употребляется артикль
Имеет ли глагольные формы (Perfect, Active/Passive)?	Да	Да	Нет

Значения глагола *should*



«Should» может переводиться как «должен», но это долженствование гораздо мягче, чем в «must».

«Should» является самостоятельным модальным глаголом и не нуждается во вспомогательных глаголах при образовании отрицательных и вопросительных предложений.

Этот глагол используется, как правило при даче советов. При помощи него можно выразить свое мнение относительно правильности и целесообразности происходящего. Так как «should» выражает долженствование, то с его помощью можно выразить и приказ, но в виде настойчивого пожелания. Глагол обычно переводиться как «следует».

Этот глагол не склоняется по лицам и числам и имеет значения настоящего, будущего и прошедшего времени.

Например, если перед ним идет смысловой глагол в прошедшем времени, то «should» автоматически соотносится с действием в прошлом.

«Should» – один из самых часто употребляемых глаголов в английском, поэтому у него множество функций в языке. Давайте познакомимся с ними: совет (advice), возможность и ожидание (probability & expectation), долженствование и обязанность (obligation & duty), критика и упрек (criticism & reproach), в условных предложениях (conditional sentences).

Существительные в функции определения

Существительное в притяжательном падеже служит определением к другому, следующему за ним существительному:

the farmer's crop – урожай фермера.

Однако существительное может служить определением к другому существительному, когда оно стоит перед ним в общем падеже, то есть без всякого изменения своей формы. Такое существительное переводится на русский язык прилагательным или существительным в одном из косвенных падежей:

cane sugar – тростниковый сахар;

sugar cane – сахарный тростник.

Во многих случаях существительному предшествует не одно, а два или более существительных в роли определения. При переводе на русский язык одни определения могут переводиться прилагательными, а другие – существительными в одном из косвенных падежей:

crop price decrease – уменьшение цены на урожай.

LESSON 20.1. ALFALFA

Grammar activities

1. Study carefully the Grammar Focus section of this unit.

II. Provide Russian equivalents to the following:

Extensive tap root system, rapid plant growth, four-year crop rotation, early spring sowing, high quality alfalfa seeds, usual plant height, well-planned drainage system, modern crop farming, soil moisture deficiency.

3. Translate the following sentences. Mind the word meanings of *should*.

1. If we cultivated the land properly in the fall, we should conserve more moisture.

2. Though wheat grows under a wide range of climatic conditions, it is advisable that it should be grown in areas with moderate climate.

3. One should apply manure in the fall preceding spring wheat planting, so that it may have enough time to decompose.

4. If we grew this new rye variety for a number of years, we should find that it lodges less than the old one.

5. The usual rate of sowing oats should be increased by 20-40% when they are broadcasted.

6. It is necessary that moisture content of the grain should not be more than 14% for safe storage.

4. Translate the following sentences. Mind the forms and functions of the participles.

1. Including green manure crops into the rotation we help to maintain the organic matter content of the soil.

2. Having applied a commercial fertilizer at the time of planting and later as side dressing, the farmers increased corn yields considerably.

3. Applications of manure are beneficial for cotton, this fertilizing material being usually applied to the crop that cotton follows in the rotation.

4. Being used as top dressing manure decreases evaporation losses of water and improves the tilth of heavy soils.

5. The temperature being below 40°F, few plants will continue to grow.

6. The most important soil constituent determining its properties and fertility is humus.

7. The prevailing climatic conditions of our region are especially unfavourable for grain corn production.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

Nearly, leafy, permanent, to thrive (throve, thriven), semiarid, mostly, particularly, drainage, except, lumpy, to respond (to), liming, to lime, companion crop.

5. Read and translate text A. Find the word *most* in the meaning of «большинство» (para. 1, 5), different participle constructions (para. 3, 4).

Text 20A

Alfalfa

The Alfalfa plant is a perennial. It's known to vary in height from 18 inches to 3 feet. The roots of alfalfa are very long and penetrate to a great depth as compared with most other field crops. At the age of 5 months the tap root penetrates to a depth of 6,5 feet, and some of the side roots are nearly as deep.

Alfalfa is used in many different ways, and no other forage crop produced is likely to have so many varied uses. About 80% of the crop is made into hay. The most important considerations is determining the proper stage for cutting alfalfa for hay are: yield, quality of hay, effect on maintenance of the stand. Early cutting provides hay that is leafier, and higher in protein content than later cutting, but yields of dry matter appear to be lower. Furthermore, if cut too early, the plants are weakened and the productive life of the stand is shortened. Alfalfa is also used for pasturage, silage, and making meal. Besides, it is the good permanent cover crop and frequently increases the yield of the crop that follows it.

Alfalfa is known to be grown successfully under a wide range of climatic conditions, varying from extremely low winter temperatures to very high summer temperatures. But it is a dry hot climate that is most suitable, and alfalfa will not thrive in hot humid regions. Thus, alfalfa has been found to be mostly grown in the semiarid regions, especially where irrigation is used. A combination of high humidity, high precipitation and high temperatures is particularly unfavourable.

We know soil requirements of this crop to have always been next in importance to the climatic conditions. It is essential that alfalfa should be grown on deep soil due to the great root development, good drainage being also necessary. Under semiarid conditions alfalfa seems to thrive on nearly all soils except those, containing much alkaline salts.

The seedbed alfalfa requires should be firm, moderately lumpy, and relatively free of weeds. As alfalfa is very sensitive to acid soil conditions, it responds to liming better than most other legumes. Applications of lime to acid soils not only increase the yield, but hasten the activity of the nitrogen fixing bacteria as well.

The time of seeding depends upon several factors, and it therefore varies in different regions. Where rainfall is plentiful and soil conditions are favourable alfalfa is frequently seeded in early spring with a companion crop. When seeded alone, late spring and early summer seeding is preferred.

Notes to the text

1. as compared with ... – по сравнению с ...;
2. ... is made into hay ... – ... заготавливается на сено ...;
3. a wide range – большое разнообразие;
4. next in importance to ... - второй по важности после ...

Comprehension activities

6. Specify which of the following adjectives match with the word *soil*:

Excessive, fertile, friable, advisable, lumpy, principal, humid, acid, sufficient, dry, alkaline, wet, hot, firm, mellow.

7. Translate the following sentences. Mind the –ing-words.

1. There is a great number of experiments showing that manure is effective in reducing both soil and water losses.

2. Growing this crop in a rotation supplying the soil with organic matter does not eliminate the need of commercial fertilizers.

3. Several factors must be considered in determining the rate of planting soybeans, the purpose for which they're grown being one of them.

4. We know of corn being grown both for grain and livestock feed.

5. Liming of acid soil is considered to be a fundamental and essential practice in improving soil conditions.

7. Being more frost-resistant than corn, soybeans are not easily injured by light frosts either when young or mature.

8. The seedbed for cotton having been prepared properly, large amounts of soil water at planting time may be secured.

9. The yields of early potatoes in dry regions increased after the farmer's having used irrigation.

10. Growing this crop the farmers will not only reduce erosion losses but will also improve soil tilth.

11. Having fertilized the soil in the fall preceding wheat sowing the farmer created conditions very favourable for this crop.

8. Highlight the sentence in each paragraph that expresses its main message.



Listening and Speaking Focus

Watch the video about three ways to use alfalfa in your permaculture systems and your gardens. - URL: https://www.youtube.com/watch?v=DQ3ufK_M3ro (accessed 01.11.2022).

- a) answer the questions below:
 1. Should alfalfa be a staple of every vegetable garden?
 2. What are three ways to use alfalfa?
 3. Is it grown only for animal feed?
 4. What are nutrients of alfalfa?
 5. Is it used for mulch? Why and how?
- b) make a plan and a summary of the video.
- c) discussion: What factors are of the greatest importance in increasing yields of alfalfa crops? What crop should alfalfa precede in the rotation?

LESSON 20.2

Vocabulary activities

1. Work with a dictionary and the Internet resources (e.g. <https://learn.eartheasy.com/articles/know-your-garden-soil-how-to-make-the-most-of-your-soil-type/> etc.) to make up a mind map of the soil types in English (what they are called in English and their Russian equivalents, properties, what crops they are used for, etc.). It can be drawn by hand or using digital means (e.g. <https://www.mindmup.com/> or <https://miro.com/mind-map/> and others).

2. Fill in the gaps with the words from the Vocabulary Focus section of this unit in the appropriate form.

1. A well-planned ... system is ... important in growing cotton, as excessive moisture usually results in rotting of seeds.

2. Sorghum has been found ... well to deep plowing, applications of manure, and phosphatic fertilizers.

3. Sowing alfalfa with a ... sometimes reduces the stand because of competition of the two for moisture, light and soil nutrients.

4. Timothy tolerates soil acidity better than red clover, but ... is essential on soils with pH 4,5-5.

5. The acreage under sorghum in the Russian Federation is not very large, but it is believed to be expanded in arid and ... regions.

7. If cutting grass for hay is delayed 21, it is likely to be coarse in Dallas.

8. Soils being well supplied with calcium, phosphorus and potassium, alfalfa better and yields more.

3. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

1. Люцерна имеет стержневую корневую систему, которая проникает на большую глубину.

2. Люцерна должна скашиваться в правильное время.

3. Люцерну используют для различных целей.

4. Люцерна – это многолетнее растение и оно хорошо развивается при большом разнообразии климатических условий.

5. Известкование необходимо, если почва кислая.

6. Почти все почвы подходят для выращивания люцерны, за исключением слишком кислых.

7. Время посева зависит от района.

9. Люцерна часто высевается с сопутствующей культурой.
10. Большое количество люцерны идёт на сено.
11. Определяя время скашивания люцерны на сено, необходимо принимать во внимание: урожай, качество сена и влияние скашивания на травостой.
12. Скошив сено рано, мы получим облиственное сено с высоким содержанием протеина.
13. Будучи хорошей покровной культурой, люцерна часто увеличивает урожайность последующей культуры.
14. Люцерна хорошо растёт при широком разнообразии климатических условий, но сухой жаркий климат особенно благоприятен.
15. Люцерна очень чувствительна к кислым почвам и она лучше реагирует на известкование, чем другие бобовые.
16. Никакие другие фуражные культуры не используются так разнообразно, как люцерна.
17. Люцерна является засухоустойчивым растением благодаря тому, что её стержневой корень и даже боковые корни проникают на большую глубину.



Comprehension activities

4. Answer the following questions to text A.

1. What does liming result in?
2. Does alfalfa have a fibrous root system?
4. How is alfalfa used?
5. When should alfalfa be cut for hay?
6. Under what conditions is alfalfa seeded in early spring?
7. Why shouldn't alfalfa be cut too early?
8. What climatic conditions are best for alfalfa growth?
9. Why are deep soils so important for alfalfa?
10. What seedbed does alfalfa need?
11. Can alfalfa be 50 inches high?

5. Read text B without a dictionary. Identify the meaning of the words in bold according to their Russian equivalents and to the context. Title the text.

Text B

Red clover is the most widely grown and the most important of the true clovers. Its **widespread** use is **due to** the following: it produces a high yield of good quality hay; it is an excellent source of **pasturage**; it **fits** (подходит) into most **rotations** well; it is valuable for soil improvement.



This legume is best **adapted** to fertile, well-drained silt and clay loam types of soil that are relatively high in the content of organic matter. It does best when moisture is **abundant**, and rather poorly on soils with a low water-holding capacity. In some years it may be injured but **winterkilling** when grown on poorly drained soils.

Although red clover does best in a cool, moist climate, it is not injured to any considerable extent by hot weather, provided sufficient moisture is available. It **tolerates** soil acidity better than alfalfa, but grows better on properly limed soils. In addition to lime, this soil should contain sufficient amounts of available phosphorus and potassium to support a good growth of red clover. Generally, red clover is easier to grow than alfalfa.

Because of its **biennial** habit, red clover is mainly used in short rotations. An example of a common 3-year rotation is the one that includes corn or some other cultivated crop, small grain and red clover or red clover plus **timothy**. Red clover is **beneficial** to corn in such a rotation, as it adds considerable organic matter and **nitrogen** to the soil.

6. Specify the sentences corresponding to text B.

1. Corn grows better when it follows red clover.
2. Red clover is as sensitive to soil acidity as alfalfa.
3. Available potassium and phosphorus are necessary for profitable yields of red clover.
4. Red clover is mainly used for soil improvement.
5. If poorly drained, soils must not be used for growing red clover.

Listening and Speaking Focus

Watch the video: **Red Clover Seed Production**

<https://www.youtube.com/watch?v=TnZhHeSuWZI>

- a) answer the questions below:
 - a. What are challenges about doing seed production on medium red clover?
 - b. What are the main pollinators of red clover?
 - c. How can we see that it is completely pollinated and the seed is starting to develop?
 - d. When do we know that it's ready to harvest?
 - e. What do people use red clover for?
- b) make a summary of the video.
- c) discussion: What factors are of the greatest importance in increasing yields of red clover crops?



UNIT 21. GRASSLAND MANAGEMENT

In this unit you will learn:	Grammar focus: <ul style="list-style-type: none">- Functions of the Infinitive (revision).- Infinitive Constructions. Vocabulary focus Reading and comprehension focus: <ul style="list-style-type: none">- Text A. Grassland management.- Text B. Sweetclover for soil improvement.- Text C. Listening and speaking focus
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Grammar Focus

Функции инфинитива



Инфинитив – неличная форма глагола, которая обозначает действие, это неопределенная форма глагола (по-русски), которая выражает действие, но без уточнения лица или числа.

Инфинитив отвечает на вопросы «что делать?», «что сделать?» – в словаре слова представлены в этой форме, например: to establish – устанавливать, to protect – защищать.

Формальный признак инфинитива – частица to, которая в некоторых случаях опускается.

Инфинитив в предложении может быть на месте любого члена предложения. Он может выполнять различные роли:

Подлежащее (subject):

To establish a pasture is very important. – Создание пастбища очень важно.

Дополнение (object):

Many farmers decide to renovate a pasture. – Многие фермеры решают обновить пастбище.

Часть составного сказуемого (predicate):

My decision is to renovate a pasture. – Я решил обновить пастбище.

Определение (attribute):

He was the best to solve this problem. – Он лучше всех решил эту проблему.

Обстоятельство (adverbial modifier):

It was made to bring biological changes in the soil. – Он был создан для того, чтобы вызвать биологические изменения в почве.

В качестве вводных слов или фраз (в разговорной речи):

To tell the truth, I don't really like this pasture. – Честно говоря, я очень не люблю это пастбище.

Well, to cut a long story short, the work was awful. – Короче говоря, работа была ужасная.

Инфинитивные конструкции



	Active	Passive
Indefinite	to grow	to be grown
Continuous	to be growing	-
Perfect	to have grown	to have been grown

В английском языке встречается оборот, состоящий из существительного в общем падеже и инфинитива. В таком обороте существительное обозначает лицо или предмет, совершающий действие, выраженное инфинитивом, или подвергающийся этому действию. Оборот называют самостоятельным инфинитивным оборотом (Absolute Infinitive Construction). Он стоит в конце предложения и отделен запятой, на русский язык переводится предложением с союзом "причем", в котором глагол выражает долженствование.

LESSON 21.1. GRASSLAND MANAGEMENT

1. Study carefully the Grammar Focus section of this unit.
2. Look through the following words. Write out those that make up 2 groups: a) verbs matching with the word *soil*, b) adjectives characterizing climatic conditions.

To improve, to remain, temperate, certain, to influence, to supply, necessary, wet, to maintain, to contain, moderate, most, warm, to prevent, moist, to cultivate, warmth, favourable, to affect, to prevail, cold, principal, to use, to hasten, to harrow, humid, fresh, to roll, moisture, to irrigate, different, deficient, to choose, dry, profitable, mild, to provide, to drain, variable, to respond, hot, rapid, to dig, to conserve, cool, to consume, to plow, proper, suitable, to fertilize.

3. Work with a dictionary and the Internet resources (e.g. <https://education.nationalgeographic.org/resource/crop> etc.) to make up a mind map of crops in English (what they are called in English and their Russian equivalents, properties, usage, etc.). It can be draw by hand or using digital means (e.g. <https://www.mindmup.com/> or <https://miro.com/mind-map/> and others.)

4. Highlight the sentences that should be translated into Russian using the words “**который**”, “**чтобы**” or “**для того чтобы**” before an infinitive. Translate the sentences.

1. Planting of corn should always and be delayed until the ground is sufficiently dry to be worked and warm enough to favour germination.
2. Soils to be used for growing sweetclover may be less fertile and more alkaline than those for alfalfa.
3. To get maximum yields of high-quality hay one must choose the proper stage at which pasture plants are to be cut.
4. The two most important factors to be considered in selecting a crop variety to be grown are adaptation and the use which is to be made of it.
5. For obtaining profitable yields of a crop it is necessary to consider both environmental conditions and heredity.
6. Menures to be applied to corn land not only provide the necessary plant food, but also increase the water-holding capacity of the soil.

Vocabulary Focus



Handwrite the words and word combinations related to text A and give their Russian equivalents. Check them in the agronomy and soil science dictionaries.

Grazing, to establish, to occupy, self-seeding, mutually, to protect, to benefit, coverage, furrow, composition.

5. Read and translate text A. Specify the sentences containing the following: (a) «Complex Subject» (para. 3, 4, 5, 7); (b) sentences in which the verb-form *is* before an infinitive is translated as «состоит в том, чтобы» (para. 1, 2); pattern «for + сущ. + инф.» (para. 6); absolute participle construction (para. 2). Read aloud the paragraph about the advantages of growing legumes and grasses together.



Text A Grassland management

The chief object of good pasture maintenance is to provide green succulent feed for livestock during the entire grazing season. The dry matter of immature grasses is higher in protein and vitamins and is more digestible than the dry matter of mature grasses harvested for hay.

There exist several kinds of pastures, the two main groups being natural pastures and cultivated ones. Natural pastures are uncultivated lands occupied wholly or mainly by native types of forage plants. The main aim of establishing cultivated pastures is to grow those grasses and legumes which are able to provide more feed of better quality than the plants found in native pastures.

Two types of cultivated pastures appear to be most common: permanent and annual pastures. The former are made up of perennial grasses and legumes or of self-seeding annuals, or of both. They remain unplowed for long periods (five years or more). The latter are seeded each year **to take the place of** permanent pastures wholly or **in part**. One knows such pastures usually to include crops like rye, oats, barley, Sudan grass, rye-grass, soybeans and rape.

Mixtures of grasses and legumes have been found to be more productive than seedings of grasses and legumes grown alone. If grown together, grasses and legumes are mutually beneficial. Grasses tend to protect legumes during winter, while legumes benefit grasses by providing them with nitrogen.

When choosing the seeding mixture to be grown, the farmer should consider the purpose for which it is to be used as well as the soil and climatic conditions prevailing in the locality. Thus, for some regions mixture of red clover and timothy has been found to be more popular than that of alfalfa and brome grass.

Since most of the plant species used for permanent pastures have small seeds, it's necessary to prepare a firm seedbed for the closer contact between the seed and soil particles to be established. It is the use of good seeds of small-seeded grasses and legumes that is important in providing good pasture coverage relatively free of weeds. The seed should be drilled rather than broadcasted on a new seedbed. Special drills for seeding grasses and legumes have attachments which open furrows, apply fertilizer, and cover the fertilizer with a soil.

The type and quantity of fertilizer applied has a marked effect on the composition of a pasture. Superphosphate is known to have a stimulating effect on the growth of all species, especially legumes, while nitrogenous fertilizers stimulate the growth of grasses.

Pasture maintenance or improvement may **be brought about** by reseeding, fertilization, and good grazing programme.

Notes to the text

1. to take the place of ... – заменить;
2. in part – частично;
3. to bring about – осуществлять.



Grammar and vocabulary activities

6. Translate the sentences. Mind the functions of the Infinitive.

1. Hot, dry winds increase water losses and in some areas are reported to reduce the yields of corn considerably.
2. It is advisable to sow cool-weather grasses in early fall, but early spring seeding is preferable on extremely heavy soils.
3. Soil moisture deficiency at the time of tuber formation of early potatoes has been found to seriously retard this process.
4. Liming materials are used to bring about chemical, physical and biological changes in the soil that are so beneficial to plant growth.
5. Nitrogen application in autumn does not seem to be required for winter wheat, provided sufficient application of this element was made in spring as a top dressing.
6. We know the physical properties of the soil, which is either too heavy or too light, to be improved by an increase of the humus content.
7. One of the aims of pasture maintenance is to keep a good balance between grasses and clovers.
8. There are many rotations to be followed in corn production, the best rotation being the one, that provides the abundance of organic matter.
10. Special drills are likely to have been used in establishing this new pasture.

11. For a pasture mixture to give the highest yields, its components must be well adapted to soil and climatic conditions of a given region.

12. Seedbed for pasture plants should be sufficiently firm to obtain a uniform, shallow covering of the seed.



Listening and Speaking Focus

Watch the video: Grassland management. - URL: <https://www.youtube.com/watch?v=LuMHF5CQ0sk> (accessed 01.11.2022).

a) answer the questions below:

1. What are two basic grazing systems in grassland management?
2. What are plants that livestock do not like?
3. What is a rotational system?
4. What are reasons of managing grasslands through rotational grazing?
5. Why and how is hill farming used?

b) make a plan and a summary of the video.

c) discussion:

1. What factors are of the greatest importance in grassland management?
2. Why shouldn't legumes be grown in mixtures with grasses when they're to be used for soil improvement?
3. Can the mixture of clover, alfalfa and timothy be grown in your region?

LESSON 21.2. SWEETCLOVER FOR SOIL IMPROVEMENT

1. Fill in the gaps with the following words in the appropriate form: due, due to, to be due to, means, by means of, to mean, result, to result, to result in, to result from.

1. A relatively low productivity of most pasture lands ... the following: lack of soil fertility, improper grazing programme, and insufficient moisture.

2. Manure applied as a top dressing to pastures usually ... increasing yields of forage.

3. Lime gives best ... if it can be applied in the fall of the year preceding seeding and worked into the soil at that time.

4. ... tillage operation is a good ... of improving soil condition.

5. Since seedlings of sugar beets are very small and weak, poor stands usually ... seeding on a lumpy, improperly prepared seedbed.

6. Applications of stable manure are not recommended with oats, as the nitrogen of manure causes heavy vegetative growth and lodging often

7. One may improve soil structure ... proper tillage practices, applications of manure and growing of plants with different root systems.

8. ... lodging of high-yielding rye varieties this crop is not so extensively grown as it should be.

9. Oats are believed to be not adapted to heavy fertilization, but it does not ... that medium or light applications of fertilizers should not be used.

2. Translate from Russian into English. Use the Vocabulary Focus and text A of this Unit. Complete the task in written form.

1. Существуют две основные группы пастбищ: естественные и окультуривание.

2. На окультуренных пастбищах можно выращивать те травы и бобовые, которые обеспечивают больше корма лучшего качества.

3. Выбирая смеси для посева, мы должны учитывать почвенные и климатические условия данного региона.

4. Семена высеваются при помощи специальных сеялок.

5. Хорошее пастбище должно обеспечивать зелёный, сочный корм в течение всего сезона.

6. Окультуренные пастбища создаются для того, чтобы обеспечить зелёный сочный корм лучшего качества в течение всего сезона выпаса.

7. Существуют многолетние и однолетние окультуренные пастбища. Первые состоят из многолетних трав и бобовых и не вспахиваются в течение нескольких лет.

8. Рекомендуется высевать смеси трав и бобовых, так как они взаимно полезны.

9. Выбирая смеси для посева, нужно учитывать цель их использования, а также почвенные и климатические условия района. В одних районах преобладает смесь красного клевера и тимофеевки, в других – люцерны и разных видов клеверов.

10. Желательно высевать семенные смеси специальной рядовой сеялкой с приспособлением для внесения удобрений.

11. Пастбище может поддерживаться внесением удобрений, подсевом и правильной системой выпаса.



Comprehension Focus

3. Specify the sentences that do not correspond to text A. Explain your choice.

1. We know two main groups of pastures: natural and cultivated ones.

2. Nitrogenous fertilizers are believed to be beneficial for all pasture plant species.

3. Good grazing programme is the only way of pasture improvement.

4. Green succulent feed provided by pastures is of higher quality than hay, as it is richer in protein and vitamins.

5. Drills used for seeding pasture grasses are similar to the ones used for seeding cereals.

6. Pasture grasses and legumes having small seeds, the seedbed they require should be rather compact.

7. Farmers prefer to grow mixtures of grasses and legumes they are more productive and mutually beneficial.

8. Permanent pastures are known to be seeded with such crops as barley, oats, ryegrass, and some others.

10. The main thing to be considered while choosing the seeding mixture is the purpose for which it will be used.

11. Grasses and legumes grown on cultivated pastures are to provide more feed of better quality than the plants of native pastures.

4. Read text B without a dictionary. Identify the meaning of the words in bold according to their Russian equivalents and to the context.

Text B

Sweet clover for soil improvement



Sweet clover is considered to be one of the best legumes for soil improvement. The heavy, deeply **penetrating** and widely branching tap root tends to open up the **subsoil** (подпочва). Subsoil **minerals** not available to plants with shallow root systems are brought to the surface, and when the sweet clover plants decay, the **nutrients** contained in these minerals are made available for other crops. The decay of plowed under sweet clover results in a marked improvement of **aeration**, **drainage** and the general physical condition of the soil.

Best results are usually obtained when sweet clover is not plowed under until the plants are 6 to 12 inches tall in spring of the second year. At this time the plants already contain most of the **accumulated** nitrogen and it is still sufficiently early to plant corn or some other **cultivated** crop.

The **fertilizer** value of sweet clover plowed under in the fall of the first year is nearly the same as that plowed in spring of the second year. But fall plowing seldom kills the sweet clover plants and they are likely to come up the following spring as weeds in the succeeding crop. It is primarily for this reason that late fall plowing is not **recommended**.

5. Arrange the questions so that they serve as a plan to the text, then answer them.

1. Why is it recommended to plow sweet clover under in the fall?
2. How does the tap root of sweet clover influence the soil?
3. What are the advantages of plowing sweet clover under in spring?
4. What is the result of sweet clover decay?

6. Read text C without a dictionary and title it. Render the main idea of the text briefly. Summarise text C in Russian or in English.

Text C

There are several ways of establishing a pasture. The radical method is to plow an old pasture, to cultivate it until free of weeds, and to sow the seed into a clean seedbed. Complete cultivation allows the farmer to conserve water in the soil, and it has the effect of reducing competition between the pasture seedlings and other plants such as weeds and native grasses. Cultivation also makes some nutrients which benefit young plants more available.

Sub-surface sowing is a method of drilling seeds into an existing pasture with the aim of obtaining the pasture of a needed composition. From 10 to 20% of the seeds may be expected to germinate and grow when this method is used. In general, grass seeds sown in this way cannot compete with the native plants, but the method is more successful with legumes.

Whichever (какой бы ... ни) method of establishment is used, it is usually found that the species with large seeds are established more easily. The larger seeds carry more food and the seedlings grow more rapidly.

With all methods of pasture establishment best results follow the use of fertilizers. If pastures are not fertilized at all weeds may become a problem. It is due to the fact that weeds tolerate low soil fertility and will grow quite well in the soil which is too poor for the growth of pasture plants.

Listening and Speaking Focus

Watch the video: **Tips from our Team - Guidelines for Successful Perennial Pasture Establishment**

<https://www.youtube.com/watch?v=v2ybGu3nPFU> (accessed 01.11.2022).

a) answer the questions below:

1. What steps should be taken to renovate or establish a new perennial pasture to avoid wasting time and money?
 2. How do you understand if a pasture needs to be established or renovated?
 3. What is a critical part of the process when determining whether to renovate a pasture and why?
 4. How to understand what species to plant suitable for your climate and or soil type and if they are suitable for your pet? Who can help you figure this out?
- b) make a summary of the video.
- c) discussion: What is a key to long-term productivity of perennial pastures?



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Training manual

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