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Кафедра германської та слов'янської філології

О. В. Піскунов

АНГЛІЙСЬКА МОВА ДЛЯ МАГІСТРІВ-БІОЛОГІВ

ПРАКТИКУМ

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Рецензенти:

Орел А. С – кандидат філологічних наук, доцент кафедри германської та слов'янської філології ДВНЗ «ДДПУ»

Радзієвська О. В. – кандидат філологічних наук, доцент кафедри іноземних мов ДВНЗ «ДДПУ»

Піскунов О. В.
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Навчально-методичний посібник призначений для розвитку навичок та умінь усного та письмового англійського мовлення у галузі освіти. Зміст посібника забезпечує засвоєння фонових знань та знайомство з найбільш вживаною термінологією. Система різноманітних вправ створює сприятливі умови для ефективного засвоєння змісту посібника під час аудиторних занять та самостійної роботи. Практикум вміщує в себе 6 розділів, до текстові та післятекстові вправи, тексти для різних видів читання, додатковий матеріал в вигляді текстів з біологічної тематики.

Для студентів-біологів вищих навчальних закладів педагогічного профілю.

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CONTENTS

ПЕРЕДМОВА

Однією з найважливіших проблем є забезпечення процесу навчання майбутніх освітян посібниками, зміст, структура та система вправ яких відповідали б сучасним вимогам.

Спроба вирішення означеної проблеми здійснюється у розробці, апробації та публікації матеріалів для навчання англійської мови у педагогічній галузі.

Мета посібника – удосконалення граматичних та лексичних навичок, якими повинні володіти студенти за стандартами «Загальноєвропейських рекомендацій з мовної освіти, вивчення, викладання, оцінювання», а також розвиток такого виду мовленнєвої діяльності, як письмо.

Завдання навчально-методичного посібнику з іноземної мови за професійним спрямуванням для студентів-біологів полягає у розвитку навичок розуміння й аналізу оригінальних текстів з основних тем освіти та науки, нагромадження словникового запасу, удосконалення навичок розмовної мови, уміння вести бесіду, брати участь у дискусіях англійською мовою, формувати соціально-комунікативну позицію.

Навчальний посібник складається з 6 розділів. Кожен розділ містить тексти за запропонованою темою та певний лексичний і граматичний матеріал. До кожного тексту пропонується низка завдань, більшість яких має творчий характер і спрямовані на розвиток навичок вживання граматичних явищ у розмовній мові. Студенти, працюючи над текстом, зважають не тільки на його зміст, але й на ті чи інші граматичні конструкції у ньому. Різноманітні граматичні вправи та тексти сприятимуть збагаченню лексики загалом і повторенню та закріпленню граматичного матеріалу зокрема, а це поліпшить опанування англійською мовою. В кожному розділі необхідно прочитати та вивчити нові слова і словосполучення; підібрати англійські еквіваленти до поданих слів і виразів; підставити пропущені слова у реченнях; прочитати та перекласти тематичний текст; відповісти на запитання; дати визначення словам; перекласти речення; виконати

граматичниі вправи. Післятекстові питання та вправи зорієнтовано на контроль розуміння прочитаного і сприяють розвитку навичок усного мовлення. Додаткові тексти, необхідні для формування комунікативних навичок, допоможуть інтенсифікувати навчальний процес. Тренувальні вправи допоможуть активізувати вживання термінологічної лексики, граматично правильно будувати свої висловлювання. Для закріплення тематичного матеріалу подаються запитання, які виступають планом для обговорення певної теми та спонукають студентів до участі у дискусії. Володіння навичками реферативного та анотаційного перекладу професійно-спрямованих текстів є одною з головних вимог в професійній підготовці студентів-педагогів. Знання лексико-граматичних і лексико-семантичних особливостей науково-технічної англійської літератури, оволодіння практичними навичками перекладу, анотування і реферування наукової літератури має важливе практичне значення, оскільки дозволяє уникнути помилок, які можуть бути викликані невмінням розпізнавати граматичні та лексичні явища, оптимізувати процес міжмовної професійної комунікації, вилучення корисної інформації, посилити роль інформаційного забезпечення, підвищити рівень проведених досліджень і розробок. У посібнику пропонується практичний матеріал, що містить обов’язкові вимоги до складання анотацій і рефератів з прочитаної оригінальної літератури за фахом. Текстові матеріали служать основою для формування словникового запасу спеціальної лексики.

У результаті вивчення даного курсу студент повинен вміти: використовувати знання і вміння у професійній діяльності, а також в іншомовній комунікації. По закінченню курсу студенти повинні:

- розуміти наукові терміни, різноманітні тексти і розкривати інформацію, що міститься в них;
- висловлюватись відповідно теми даної програми вільно і спонтанно, не відчуваючи браку мовних засобів для вираження думки;

- ефективно і гнучко використовувати англійську мову в різноманітних ситуаціях соціального, навчально-академічного та професійного спілкування

UNIT I

I. Read and translate the following sentences. Pay attention to the words from the vocabulary list.

1. **Soybean** plant is **very sensitive** to different **environments**.
2. Soybean plant **variety depends on** the location.
3. **Weeds, pests** and **diseases** are the main enemies of any cultivated crop.
4. The yield of the crop **was injured** by early frosts.
5. The **fertility** of the soil **influences** the **germination**, **growth** and **maturity** of the plant.
6. Cotyledons are used **to supply** food for seedling.
7. The seed **coat** is absolutely necessary **to protect** the embryo from different climatic **diversities.**
8. **Roots** may be of different types.
9. Wheat **stem** was very short because of drought.
10. The internodes begin **to elongate** during the process of growing.
11. The orchards were in full **bloom.**
12. It is not uncommon that the plant can produce **additional** flowers under good climatic conditions.

II. Choose the synonymous pairs from the following words:

environment	trouble
selection	sort
to vary	to start
injury	to take place
flowering	strength
to protect	to change
adversity	breeding
variety	surroundings
to begin	damage
to occur	bloom
vigor	to defend

III. Read and translate the following «chains» of nouns.

soybean growth, soybean development, variety selection, weed competition, pest injury, fertility levels, sensitivity level, growth stage, day-night temperatures, root/shoot axis, seed coat, pod wall, stem section, soil moisture, seed vigor

IV. Read and translate the following words:

total, location, date, selection, vegetative, photoperiod, temperature, embryo, to absorb, ideal

V. Read the text given below and answer the following questions:

1. What does the yield of the crop depend on?
2. What factors do influence the plant's growth and lifespan?
3. What are the main parts of soybean seed?
4. What are their functions?
5. What is the function of hilum?
6. How does the hilum color of mature seed vary and what does it depend upon?
7. When does the germination begin?
8. What happens during the process of germination?
9. What factors do influence the time of emergence?

TEXT A
SOYBEAN GROWTH AND DEVELOPMENT

The soybean plant is highly sensitive to its environment. The total growth and yield of the crop may vary widely depending upon location, soil, planting date, variety selection, weed competition, diseases, pest injury, fertility levels etc. This level of environmental sensitivity often varies according to the particular growth stage of the crop.

Development of the soybean plant begins at germination and ends when the mature seed is ready for harvest. The plant's total growth and lifespan, including length of vegetative growth, time of flowering, and maturity are greatly influenced by photoperiod and day-night temperatures.

SEED. The soybean seed has two main parts – the embryo, which consists of a root/shoot axis attached to and surrounded by the cotyledons, and the seed coat (hull). The cotyledons supply food for the germinating seedling and the seed coat protects the embryo from adversities before and during germination.

The hilum (seeds car or eye) on the seed coat originally served as the point of attachment of the seed to the pod wall. Hilum color of mature seed varies from yellow (clear, no color) to buff, to brown, to black, depending on the variety. The embryo also contains the epicotyls and hypocotyls- radical axis, which develop hypocotyls (the small stem section between the cotyledonary node and the primary root) begins to elongate upwards, pulling the cotyledons with it. Emergence of the cotyledons usually occurs within three to six days after planting under ideal environmental conditions. The time required for emergence depends on the soil moisture, temperature, seed vigor, variety, and planting depth. Lateral root development begins at emergence and becomes extensive by flowering.

FLOWERING. It is not uncommon for the soybean plant to abort up to 80% of its bloom and still attain a normal yield. In cases when flower abortion is extensive, plants will produce additional flowers. Depending on the variety, planting date and environmental conditions, the normal flowering period is three to five weeks.

VI. Read the following statements and define, if they are true or false. Fill the gaps with letters T or F.

1. _____The level of environmental sensitivity changes according to the growth stage.
2. _____ The day-night temperatures do not influence the plant growth and lifespan.
3. _____ Germination begins when the soybean absorbs more than 50% of its weight in moisture.
4. _____ Primary root begins to extend upward.
5. _____ Hypocotyl is the small stem section between the cotyledonary node and the primary root.
6. _____ Soybean plants can produce additional flowers.
7. _____ The time required for emergence does not depend upon seed vigor and planting depth.
8. _____ Hilum color of mature seed varies from yellow to dark green.
9. _____ The development cycle begins at germination and ends when the seed is ready for harvest.

VII. Match the terms given bellow with the parts of the plant.

terminal bud, main stem, petiole, auxiliary buds, cotyledons, node, hypocotyl, lateral roots, trifoliolate leaf, internode, taproot, nodules, unifoliate leaf, cotyledonary node

VIII. Read the sentences given below, find the predicate and define the tense forms. Translate the sentences.

1. The total growth and yield of the crop vary greatly.
2. The development of any plant begins at germination.
3. The cotyledons are supplying food for germination.
4. The seed coat protected the embryo during germination.
5. The hilum served as the point of attachment of the seed to the pod wall.
6. Germination has already begun.
7. Plants will produce additional flowers.
8. The time necessary for germination always depended on soil moisture, temperature and variety.
9. Varieties of southern latitudes will normally grow taller and mature later than normal.

IX. Read text B.

TEXT B
MUNGBEAN

Growth Habits. Mungbeans are in the Legume family of plants and are closely related to adzuki and cowpea. They are warm season annuals, highly branched and

having trifoliolate leaves like the other legumes. The pale yellow flowers are born in clusters of 12-15 near the top of the plant. Mature pods are variable in color (yellowish-brown to black), about five inches long, and contain 10 to 15 seeds. Self pollination occurs so insects and wind are not required. Mature seed colors can be yellow, brown black or green, depending upon variety. These round oblong seeds vary in size from 6,000 to over 12,000 per pound, depending upon variety.

Uses. Mungbean seeds are sprouted for fresh use or canned. Sprouts are high in protein (21%-28%), calcium, phosphorus and certain vitamins. The food industry likes to obtain about 9 or 10 grams of fresh sprouts for each gram of seed. If the mungbean seed does not meet sprouting standards it can be used as a livestock food with about 1.5 ton of mungbean being equivalent to 1.0 tons of soybean meal for protein content.

Climate. Mungbeans are a warm season crop requiring 90-120 days of frost free conditions from planting to maturity (depending on variety). Adequate rainfall is required from flowering to late pod fill in order to ensure good yield.

Late plantings which result in flowering during the high temperature-low moisture period in July and August will reduce yield. High humidity and excess rainfall late in season can result in disease problems and harvesting losses due to delayed maturity.

Mungbeans are adapted to the same climatic areas as soybean and cowpea. Mungbeans are responsive to length of daylight so short days hasten flowering and long days delay it. Varieties differ in their photoperiod response.

Seeding Date. Mungbean should be planted between May 15 and June 6 like the other legumes. Too late a planting date results bloom and pod fill during the hottest, driest period of the summer. In some areas mungbean is planted as a second crop after the small grain is harvested. If this is done planting should occur immediately after the grain harvest.

X. Choose the answers to the following statements.

1. Mungbeans are:

a) warm season annuals;
b) spring perennials;
c) fall annuals;
d) high-temperature perennials;

2. The yellow flowers are borne:

a) on the top of the plat;
b) in clusters;
c) on the lower branches;
d) on the lower part of stem;

3. Mungbean seeds are sprouted for:

a) canning;
b) fresh use;
c) livestock food;
d) all of the above;

4. Mature pods are of different colors:

a) from yellow-brown to black;
b) from yellow to brown;
c) from pale green to dark brown;
d) from green to black;

5. Adequate rainfall is required from:

a) flowering to late pod fill;
b) planting to flowering;
c) germination to pod fill;
d) maturing to harvesting;

6. Mungbeans are responsive to length of day light, so short days:

a) hasten flowering;
b) delay flowering;
c) inhibit flowering;
d) retard flowering;

7. Sometimes mungbean is planted as a second crop:

a) in the driest period of summer;
b) immediately after the small grain harvest;
c) in two months after the harvesting of the previous crop;
d) immediately after plowing;

XI. Read text B again. Fill in the following table.

Family	
Use	
Main characteristics	
Ways of pollination	
Climate requirements	
Seeding date	

XII. Choose the definitions to the following terms:

Cotyledon – early stages in the development of an organism;

Embryo – area of stem between two nodes;

Epicotyl – joint of a stem; site of attachment of leaf or leaves;

Hypocotyl – potion of an embryo axis above the attachment of the cotyledon;

Node – portion of a seedling below the node where the cotyledons are attached;

Internode – fleshy seed «leaf» formed within a soybean seed; there are two cotyledons in a soybean seed which surround the young embryonic plant;

XIII. Read and translate the following texts using a dictionary, if necessary.

TEXT A

Tillage has been an integral part of most crop production systems for centuries. It enables a grower to equalize soil conditions (surface moisture, residue, cloddiness, firmness) in different parts of a field and from field to field.

Before the advent of herbicides, tillage was the most cost effective means for controlling unwanted vegetation. Tillage has been used to bury crop residues for improved disease and insect management, to incorporate lime and fertilizer and, simply, to loosen the soil.

The significant disadvantage of tillage has been the cost and time involved in preparing a seedbed and the exposure of the soil surface to early season rainfall that is likely to cause serious soil erosion.

The development of effective pest management strategies and planting and fertilization equipment has made it possible to eliminate tillage for soybean production without a yield penalty. The cost and time savings of no-till soybean production are a practical reality for many soybean growers.

TEXT B

The essence of profitable soybean production is the interception, assimilation and storage of sunlight energy in grain. The date of planting, row width and a variety's maturity determine the maximum assimilation and therefore yield for the growing season. Planting date and a variety's relative maturity determine the beginning and end of the growing season, while the row spacing determines how early in the season the leaf canopy will intercept all available sunlight. Factors such as poor soil fertility, inadequate crop fertilization, weeds, insects, disease and the weather (cloud cover, temperature, rainfall) can all slow the energy assimilation process.

Many soybean growers are reducing or eliminating tillage from their soybean production system. Producing no-tillage soybean requires special attention to soil drainage, soil compaction, crop rotation, cover crops, variety selection, planting procedures, diseases, insects, weed management and crop fertilization. Proper management of these factors is important in both conventional tillage and no-till. However, the yield penalty for improper management of these production factors can be greater in no-till than in tillage-intensive production system.

UNIT 2

I. Read and translate the following sentences. Pay attention to the words from the vocabulary list.

1. This soil is very poor. It has **a deficiency** of minerals.
2. An **excess** of water can result in plant **root rot diseases.**
3. This soybean variety is **resistant** to many diseases.
4. **The maturity** of this plant is determined by the pod color.
5. **Lodging** is not a problem for varieties with good **standability.**
6. Soybean hybrids have a high **degree** of **tolerance** to root **rot.**
7. The environments of this region **fit** the variety grown by the farmers.
8. For better **tillage** this crop must be grown in wide **rows.**
9. Plant **tolerance allows** it to increase **competition** with weeds.
10. This year the crop yield is lower than the **average** one.

II. Read and translate the following «chains» of nouns.

variety selection	air pollution
soybean variety	sulfur dioxide
yield potential	ozone injury
production practice deficiencies	soil compaction
maturity information	crop growth
production area	taproot growth
growth habit	moisture stress
variety characteristics	root development
soybean production	tillage practices
seeding vigor	drought damage symptoms
root rot disease	season damage
water damage	herbicide injury
vegetative stage	reproductive stage

III. Choose the synonymous pairs from the following words:

to till	to cultivate
variety	to reduce
yield	damage

deficiency	to choose
to select	lack of
resistant	phase
to adopt	harvest
to hasten	tolerant
to decrease	to speed
to restrict	to limit
injury	to fit
stage	sort

IV. Read and translate the following words:

soybean, genetic, potential, production, practice, to select, system, problem, history, information, to adopt, characteristics, tendency, ozone, symptom, stress, reproductive, normal, period, to associate,

V. Read the first two paragraphs of text A and find the answers to the following questions:

1. Why do soybean varieties seldom produce genetic yield potential in excess of 100 bu(ac)?
2. What is it best to do under the conditions of environmental and production practice deficiencies?
3. What varieties are better when there are lodging problems?
4. When are varieties with resistance to the disease used?
5. What is superior: fitting a variety to the environment or hoping the environment fits the variety?
6. What variety characteristics are important for soybean production?

TEXT A
VARIETY SELECTION

Many soybean varieties have a genetic yield potential in excess of 100 bu (ac). They seldom produce to this potential because of environmental and production practice deficiencies. It is best to select varieties with characteristics that allow them to perform well in the cultural system and environment to be used.

For example, if excessive growth and lodging are problems, select medium to short varieties with good standability. If the field has a history of Phytophthora root rot, select varieties with resistance or a high degree of tolerance to the disease. Use maturity information to select varieties adapted to the production area. For best yield in wide rows, select full-season varieties with a bushy growth habit. Fitting a variety to an environment superior to selecting a variety and hoping the environment fits the variety.

Variety characteristics that are important for soybean production are:

1) Good emergence in cool, wet soil (good seedling vigor).

2) Resistance or excellent tolerance to existing root rot diseases.
3) Bushy growth habit to hasten canopy closure for rows more than 15 inches apart.
4) Tendency to grow taller or faster than average to increase competitions with weeds.

Read the rest of the text A and name the main environmental stresses.
Fill in the tables for each environmental stress.

Environmental Stress.

Air pollution.

Soybeans are sensitive to certain air pollutants, especially ozone and sulfur dioxide. The degree of sensitivity to these two pollutants depends on the variety and the specific environmental conditions.

Ozone injury is similar to sunburn injury to the leaf and may include a grayish cast to the leaf. The symptom for sulfur dioxide injury can be severe enough to cause a complete bleaching of interveinal tissue

Name of Stress	**Pollutants**	**Symptoms**

Soil Compaction.

Soil compaction can result in poor crop growth and reduced yields. Symptoms of damage include restricted or distorted (L-shaped) taproot growth which may result in moisture stress and/or nutrient deficiencies. Compacted zones may restrict root development to the extent that various deep tillage practices are recommended.

Name of Stress	**Results**	**Symptoms**

Crusting.

A hard crust may form when rain falls on excessively tilled soils. Seedlings may be completely depleted of carbohydrate reserves before emergence, and the hypocotyls arch may break trying to emerge through the crust. Crusting may cause the stems to thicken and the root system to be pushed deeper into the soil due to expansion of the hypocotyls. Bending and twisting of seedlings are symptoms of crusting damage. Avoid planting too deep on soils that tend to crust.

Name of Stress	Reasons	Results	Symptoms

Drought.
Drought damage symptoms appear early as leaf wilting and reduced growth. In the reproductive stage, flower and pod abortion are increased. Late season damage is exhibited as small pods with fewer and smaller seeds than normal.

Name of Stress	Early symptoms	Late symptoms

Water Damage.

Soybeans flooded for extended period of time generally appear nitrogen deficient. The taproot may be killed and extensive callus develop as the flood water subside, and plants may appear normal but stunted. Phytophthora root rot in susceptible varieties is frequently associated with flooding damage. Herbicide injury often is more severe in flooded spots. Extensive flooding during very early vegetative stages and the early reproductive stages is more likely to reduce yields than at the other growth stages.

Name of Stress	Reasons	Results	Early flooding

VI. Choose the answer to each statement according to the text above.

1. Soybeans are sensitive to:

a) nitrogen;
b) ozone;
c) ozone and sulfur oxide;
d) ozone and sulfur dioxide;

2. The degree of sensitivity depends on:

a) temperature and moisture;
b) variety and environmental conditions;
c) state of soil;
d) tolerance of the variety;

3. Ozone injury may include:

a) interveinal bleaching;
b) leaf wilting;
c) reduced growth;
d) grayish cast

4. Symptoms of soil compaction damage are:

a) moisture stress;
b) tillage practices;
c) L-shaped taproot;
d) nutrient deficiency;

5. A hard crust may form when:

a) rain falls for several days;
b) rain falls on a compacted soil;
c) rain falls on a very tilled soil;
d) rain falls on flooded soil;

6. Twisting of seedlings are symptoms of:

a) air pollution damage;
b) soil compaction damage;
c) crusting damage;
d) variety selection;

7. Crusting may cause the root system:

a) to get deeper into the soil;
b) to grow on the upper soil level;
c) to break;
d) to thicken;

8. Small pods and fewer seeds are the result of:

a) flooding;

b) drought;
c) ozone injury;
d) soil compaction;

9. Phytophthora root rot is associated with:

a) sunburn;
b) water damage;
c) drought;
d) flood water subside;

10. Extended flooding reduces yields during:

a) early vegetative stages;
b) late vegetative stages;
c) middle of the growth period;
d) early vegetative and reproductive stages;

VII. Read sentences given below, define the predicate and translate the sentences.

1. Spring seeding is preferred over late seeding in northern states of US.
2. Herbicides were not required for late-summer seeding.
3. When the field will be used for grazing, select grazing-tolerant varieties.
4. Weed management will be discussed in more detail in the Production section.
5. The mungbean has been grown in India since ancient times.
6. Feeding trials have been conducted at Oklahoma State University for swine and young calves with good results.
7. If mungbean is being planted in a field for the first time the proper nitrogen fixing bacteria must be provided.

VIII. Choose the definitions to the following terms:

Interveinal – organism or agent (e.g. virus, bacterium) that causes disease in another organism;

Lateral – death of plant cells, usually resulting in tissue turning dark;

Lesion – situated on or coming from the side;

Necrosis – situated between the veins on a leaf;

Pathogen – well-marked, but localized diseased area; a wound;

IX. Read and translate the following texts with the help of the dictionary.

TEXT A
Fertilization Salt Burn.

Fertilizer salt burn can occur when excess chloride salts come into contact with the developing root system of young plants. The problem is more likely to occur when banding fertilizer material containing nitrogen and/or potassium too close to the seed. Broadcasting the fertilizer is less likely to cause burn, but injury can still occur on soils that have a marginal salinity problem, especially coupled with dry weather near planting time. The characteristic symptoms are marginal necrosis of leaves, plants taking on bluish appearance and/or sudden wilting of the plant. Unless this salt concentration is reduced by rainfall or irrigation, seedling often die or remain extremely stunted.

TEXT B
Frost Damage.

Frost injury symptoms can include necrotic splotching to overall grayish-blackening of leaf tissue. Plants appear wilted and, if completely frozen, leaflets dry and drop off and plants cease growth. Because soybean vegetative tissue can tolerate temperatures down to 27-28° F for several hours without harm, examine damaged plants through dissection. When all above ground tissue, including terminal and axillary buds, are damaged, replanting is required.

Late in the season, a «killing frost» prior to plant maturity can reduce yields and quality through reduced seed size and / or immature (green) seed. Symptoms may include bronzing or blackening of leaves and smaller seed.

TEXT C
Heat Damage.

Heat damage can be manifested in many ways, from a reduction in emergence, to increased flower abortion and reduces seed vigor. Soil temperatures at or above 100° F cause soybean cotyledons to deteriorate rapidly. High soil temperatures at plant emergence are thought to be a primary reason for “heat canker” or “pinched stems at surface” (sunken necrotic lesions near the soil surface). Nodule formation, development and nitrogen fixation are reduced when soil temperatures rise above 90° F. Day temperatures in excess of 95° F, coupled with low humidity, have been shown to reduce seed set and potential seed vigor. In general, the soybean plant can tolerate short periods of high temperatures if supplied with adequate soil moisture.

UNIT 3

I. Read and translate the following sentences. Pay attention to the words from the vocabulary list.

1. **Legumes are sown** to reduce the deficiency of nitrogen.
2. If soils are very poor it is necessary **to adjust nutrient availability.**
3. The **range** of soil PH is very wide in different areas.
4. From the **point of view** of different agronomists **the herbicide** application is necessary for **maintenance** of various crops.
5. To decrease soil PH **the addition** of a definite **amount** of fertilizers is recommended.
6. **The uptake** of nitrogen at planting time **delays** nodulation.
7. The application of **lime removes** soil PH.
8. Phosphorus fertilization of soybean crop is not needed **except** soils with low phosphorus level.
9. This theory was not **accepted** by other agronomists.

II. Match the verbs with the corresponding nouns. Some variants are possible.

to sow to accept to adjust to add to delay to remove	nutrients soybean phosphorus sowing lime PH level device seeds ideas fertilizers moisture harvesting point of view planting time crops

III. Translate the following «chains» of nouns.

soil nutrient deficiency	plow layer	subsoil layer
soil PH	surface soil	surface PH values
subsoil PH values	herbicide injury	micronutrient deficiency
plant nutrition	nodule formation	plow layer PH values
nitrogen fertilization	crop needs	soil test levels

row phosphorus fertilization soybean yields

IV. Read and translate the following words:

deficiency, to produce, ideal, result, herbicide, formation, to fix, atmospheric, to recommend, plus, portion, test, system

V. Read and translate the names of the following chemical elements. Use the dictionary if necessary.

carbon	calcium	chlorine	fluorine	hydrogen	magnesium
nitrogen	manganese	oxygen	sulpher	copper	potassium

VI. Skim text A. Begin your answer with the words: «This text is about ...»

VII. Read text A and find the answers to the following questions:

1. What is necessary to do before sowing?
2. What soil PH is ideal for soybean production?
3. What PH may result in micronutrient deficiencies and herbicide injury?
4. What PH values do help nodule formation?

TEXT A
CROP FERTILIZATION

Before sowing it is advisable to correct soil nutrient deficiency. This is especially critical if both the plow layer and subsoil are low in pH or phosphorus and potassium.

Soil pH: Generally, soybeans produce best when the soil pH is between 6.0 and 7.0. This range of soil pH is ideal for the availability of phosphorus, potassium, calcium, magnesium and all the micronutrients. If the subsoil has a high pH (>6.5) then the surface soil pH is not so critical. Where acid (<6.0) subsoils exist, the surface soil should be limed to pH 7.0. Soils with both surface and subsoil pH values above 7.0 may result in micronutrient deficiencies and herbicide injury.

From the plant nutrition point of view, high plow layer pH values are acceptable if the pH of the subsoil is below 6.5. Surface pH levels should be greater than 6.0 to allow for adequate nodule formation, and improved herbicide performance. Adjustments can be accomplished by adding small amounts (1-2 tons) of lime to the soil surface as needed every 2-4 years.

Nitrogen: Soybean is a legume and can fix up to 150 pounds of atmospheric nitrogen per acre. Usually about half of the nitrogen used by the crop comes from atmospheric fixation. Research has shown that nitrogen fertilization is usually unprofitable. Fertilizer nitrogen applied at planting time, even at small amounts, has been shown to delay and decrease nodulation. Applying nitrogen to a soybean

crop is recommended only in those situations where rhizobial fixation plus uptake from the soil is inadequate to meet crop needs.

Phosphorus: Each bushel of harvested soybean removes about 0.8 pound of P2O5 per acre. Because the soybean plant takes up only a small portion of the phosphorus applied in the year of planting, maintenance of adequate soil test levels is important. The soybean plant has very fibrous and extensive root system and row phosphorus fertilization is generally not needed except for soil testing low in phosphorus.

Potassium. Each bushel of harvested soybean removes about 1.4 pounds of K2O per acre. Only a small part of the fertilizer potassium is taken up by the crop during the year of application. Therefore, high soil test levels must be maintained if good soybean yields are to be obtained. In some parts of the Midwest, soybeans require higher soil test levels of potassium than either corn or wheat.

VIII. Read the last three paragraphs of the text and define the peculiarities of fertilizer application.
Fill in the table.

Fertilizer name	**Application peculiarities**
Nitrogen	
Phosphorus	
Potassium	

IX. Find in text A: What is necessary to do if PH values are the following:

1. **PH is < 6.0**
2. **PH is >7.0**
3. **PH is 6.5**
4. **PH is between 6.0 and 7.0**

X. Form Gerund from the following verbs.

toV	**V + ing**	**noun**

to sow to test
to correct to plant
to plow to improve

to harvest to add
to remove to adjust

XI. Read and translate the following sentences. Pay attention to the translation of Gerund.

1. Harvesting is the last stage in crop cultivation.
2. Farmers increase the productivity of soil by using mineral fertilizers.
3. Applying nitrogen is recommended when uptake from soil is inadequate.
4. Soil pH is adjusted by liming.
5. Fertilizer nitrogen applied at planting time leads to delaying and decreasing nodulation.
6. Adjustments of soil pH levels are accomplished by adding small amounts of lime every 2-4 years.
7. Soil testing is necessary for soils low in phosphorus.

XII. Read and translate the following text without a dictionary.

Mungbeans require phosphorus, potassium, and certain micronutrients at levels similar to other field beans. The amount of fertilizers should be based on soil test levels, organic matter content and projected yield level.
In the field with Rhizobium for nitrogen fixation, additional nitrogen is not required. However some growers provide 30-50 lbs of N to assist in early plant establishment, especially on sandier soils. Like the other legumes most of the nutrient uptake occurs later in the season so starter fertilizers have not been helpful.
Mungbean require slightly acid soil for best growth. If soil pH is below 6.3, lime should be added to raise pH to the desired level. For best results, lime should be applied one year prior to growing mungbeans.

XIII. Read and translate the following texts with the help of the dictionary, if necessary.

TEXT A
TEST SOIL BEFORE PLANTING

Proper fertility management, including an adequate liming program, is the key to optimum economic yield. Proper fertilization of alfalfa allows for good stand establishment and promotes early growth, increases yield and quality, and improves winter hardiness and stand persistence. Adequate fertility also improves alfalfa’s ability to compete with weeds and strengthens disease and insect resistance.

Fields differ in their fertilizer needs. Soil testing is the most convenient and economical method of evaluating the fertility levels of a soil and accurately assessing nutrient requirements.
Most soil testing programs make recommendations for pH and lime, phosphorus, potassium, and several of the secondary nutrients and micronutrients. Optimal soil test levels for alfalfa differ among states due to varying subsoil fertility, nutrient buffering capacities, soil yield potential, and different management assumptions.

TEXT B
APPLY LIME BEFORE SEEDING

Liming is the most important fertility concern for establishing and maintaining high yielding, high quality alfalfa stands. Benefits of liming alfalfa include:

- increased stand establishment and persistence,
- more activity of nitrogen-fixing Rhizobium bacteria,
- added calcium and magnesium,
- improved soil structure and tilth,
- increased availability of phosphorus and molybdenum, and
- decreased manganese, iron and aluminum toxicity.

For maximum returns, lime fields to at least pH 6.7 to 6.9. Field trials performed in southwestern Wisconsin shows that yields drop sharply when soil pH falls below 6.7.
Because lime reacts very slowly with soil acids, it should be applied 12 months- preferably longer- before seeding. For typical 4-to 6- year crop rotations, the best time to apply the recommended amount of lime is when coming out of alfalfa. This allows more time for reaction with the soil. The accompanying tillage for rotation crops may result in two or three remixings of the lime with the soil. This should raise the pH to the desired level by the time alfalfa is replanted.

UNIT 4

I. Read and translate the following sentences.

1. Stem **rot** is a widely spread disease throughout the American Corn Belt.
2. Stem rot can be **severe due to** wet weather.
3. The disease **occurs** in varieties that are more **susceptible** to it.
4. **Water-soaked lesions** are the first symptoms of the disease.
5. Wide rows **permit** air to move through the canopy.
6. Soybeans can be planted into corn **residue.**
7. **Foliar** fungicides are not used in this period.

II. Translate the following «chains» of nouns.

stem rot, corn belt, stem symptoms, seeding rates, plant leaves, soil surface, yield potential, infection rate, seven-inch rows, disease severity, crop residue, seed treatment, foliar fungicides

III. Read and translate the following words:

genetic, symptoms, to form, incidence, potential, practices, to adopt, percent, infection, spores, fungicide, effective

IV. Read text A and answer the following questions.

1. Under what conditions is Sclerotinia stem rot especially severe?
2. Some varieties are less susceptible than others due to genetic resistance, aren't they?
3. What are the symptoms of stem rot?
4. What is the dependence between:
    a) the width of rows and the severity of the disease?
    b) the width of rows and the yield?
5. When does the disease tend to be more serious in no-till?
6. What no-till planting does show less infection and what are the reasons?
7. What is not effective against this disease?

TEXT A
COMMON SOYBEAN DISEASES

Sclerotinia stem rot (white mold) is present throughout much of the Corn Belt and can be severe when wet weather occurs during flowering. Some varieties are less susceptible than others, but there is no known genetic resistance. Stem symptoms appear as water-soaked lesions followed by cottony growth and eventually large, black, irregular shaped sclerotia formed on and in the stem or pods. Wide rows (20-30 inches) and reduced seeding rates generally reduce incidence of the disease by permitting air to move through the canopy to dry plant leaves and the soil surface. However, overall yield potential is reduced when these practices are adopted. Wisconsin studies found a seven percent higher infection rate in seven-inch rows than 30- inch rows, but yields were still five bu/acre greater in the seven-inch rows.

There was no difference in disease severity or yield due to tillage. The disease tends to be more serious in no-till when soybean follow soybean due primarily to crop residue, increased soil moisture and disease inoculum at the soil surface.

Michigan researchers have observed less infestation when soybeans are planted no-till into heavy corn residue. Speculation is that heavy residue reduces the ability of spores to reach the flowers. Seed treatments and foliar fungicides are NOT effective against this disease.

V. Read the text below and fill in the table.

Brown stem rot fungus enters the plant through the roots and travels upward into the xylem where it interferes with the flow of water. Symptoms develop after flowering and are identified by an internal browning of the stem in August. Foliar

symptoms are rarely detected but the leaves of the infected plants may gradually dry 20-30 days before maturity. Though wilted, leaves remain attached to the plant. BSR is much more severe in no-till since the organism can survive for several years in soybean residue.

The name of the disease	Ways of infection	Symptoms	Ways of tillage

VI. Read text B

TEXT B
SOYBEAN CYST NEMATODE

Soybean cyst nematode, Heterodera glycines, is one of the major factors limiting soybean production throughout much of the north central region.

Above-ground symptoms of soybean cyst nematode damage do not appear consistently and may be absent for several years following introduction of the nematode into a field. When above-ground symptoms appear, they can be mistaken for damage due to compaction, iron deficiency chlorosis, other nutrient deficiencies, drought stress, herbicide injury, or plant diseases. Often, soybean injury and yield loss go undetected for several years because of absence of above-ground symptoms.

The only unique sign of cyst nematode infection is the presence of adult female nematodes and cyst (dead female) in the soybean roots. Cysts appear as tiny, lemon-shaped objects which are initially white but turn yellow, then tan to brown as they mature. The cysts are about the size of a pinhead and are much smaller than nitrogen-fixing nodules. Roots must be carefully removed from the soil to observe the cysts on the roots, otherwise the cysts may become dislodged. In most years, such diagnoses can be performed beginning four to six weeks after planting and continuing through September in the north central region.

Soybean cyst nematode can move through the soil only a few inches per year on its own power. However, it can be spread great distances in a variety of ways. Spread can occur by farm machinery, vehicles and tools, winds, water, animals, and farm workers.

One obvious impact of no-till management on soybean cyst nematode is the reduction in within-field spread of the nematode by farm machinery due to less mechanical disturbance of the soil.

VII. Translate the following word-combinations.

above-ground symptoms;
lemon-shaped objects:

nitrogen-fixing nodules;
no-till management;
within-field spread;

VIII. Enumerate the conditions due to which the above-ground symptoms can be mistaken.

1._____
2._____
3._____
4._____
5._____
6._____

IX. Find in the text information how soybean cysts look like. Write it down.

_____
_____
_____
_____

X. Read the following statements and define if they are true or false.
Fill in the gaps with letters T or F.

1._____ Soybean cyst nematode limits soybean production throughout the north central region.
2._____ Above-ground symptoms appear during several years.
3._____ Soybean injury and yield loss go undetected for several years.
4._____ Adult female nematodes and cysts are not the only signs of infection.
5._____ Roots must not be removed from the soil to observe the cysts.
6._____ Soybean cyst nematode can move through the soil only some centimeters per year.
7._____ Nematode spreading can occur by farm machinery, winds, water, and farm workers.
8._____ The diagnoses of soybean nematode are done beginning four to ten weeks after planting.
9._____Cysts are tiny, lemon-shaped objects that are initially white.

XI. Form Participle I from the following verbs.

V + ing

to limit
to detect
to remove
to spread

to begin
to appear
to observe

XII. Translate the following sentences, paying attention to the function of Participle I.

1. Nematode spreading throughout the field does not show the symptoms for several years.
2. Travelling upward into the xylem fungus mixes with the flow of water.
3. Stem symptoms appearing as water-soaked lesions were detected during the experiment.
4. Cysts having the size of a pinhead are much smaller than nitrogen-fixing nodules.
5. Limiting the use of herbicides we can improve the quality of crop.
6. Removing the roots from the soil we can observe the cysts.
7. Turning brown the nematode becomes mature.

XIII. Read and translate the following text without a dictionary.

The soybean cyst nematode injures soybean roots, which can cause stunting of the plant. Plants may be chlorotic due to a reduction of root nodulation.
Cysts of this nematode are lemon-shaped and vary from white to brown as the cyst matures. The cyst is filled with eggs, which penetrate the roots and develop into adults in 14-21 days. As they develop, the cysts rupture the roots, but remain root attachment for some time, and then die and fall off in the soil. The soybean cyst has 16 races, but only race1,3 and 4 are known to be controlled with varietal resistance. Rotation to such crops as corn, cotton, sorghum, and wheat is helpful in reducing nematode population.

XIV. Read the following texts with the help of a dictionary, if necessary.

TEXT A

Phormopsis seed rot can be severe when rainfall occurs intermittently during grain dry-down and harvest. The longer soybean are in the field after maturity, the greater the incidence of seed rot. Harvesting soon after leaf drop (17-23% moisture) decreases the amount of seed damage. Using varieties with a range of maturities allows for more timely harvest and higher quality grains.
Crop rotation also aids in control. No-till culture permits field re-entry sooner after rainfall and therefore may permit more timely harvest and decreased losses due to seed decay.

TEXT B

Sudden death syndrome (SDS) is a mid-to late-season soilborn disease. Low temperature and high moisture in no-till favor greater severity of SDS in no-till than conventional tillage. Disease risk is higher for early planting than delayed planting. Disease risk can be reduced by planting infested fields last with cultivars of late maturity or by using tolerant cultivars. Cultural practices that reduce plant stress and improve drainage help plants tolerate the disease. Chemicals and seed treatments are not effective in controlling this disease. The disease spreads by soil movement, so to control soil movement by wind and water prevent the disease from spreading to other fields.

UNIT 5

I. Read and translate the following sentences. Pay attention to the words from the vocabulary list.

1. The toxic levels of soil surface **inhibit** the plant growth.
2. Aluminum **availability** leads to the plant **stunting.**
3. The symptoms of the disease are **dry** and **necrotic** leaf **margins.**
4. In some cases the plant stem becomes **crinkle** and **distorted.**
5. **To alleviate** the problems of soil toxicity it is advisable **to apply limestone.**
6. Symptoms of nitrogen deficiency sometimes occur as a result of ineffective **strains** of rhizobia.
7. The disease is usually **confined** to the upper leaves.

II. Read and translate the following «chains» of nouns.

aluminum availability	leaf size
aluminum toxicity	foliar treatment
leaf margins	crop emergence
soil surface	soil acidity problem
iron deficiency	soil test
manganese- deficient plant	sulfur fertilization
foliar fertilizer spray	plant analysis
plant height	plant symptoms

III. Read and translate the following words:

aluminum, toxicity, symptoms, horizontal, effective, problem, deficiency, to limit, veins, result, calcium, analysis, to identify, to neutralize, organic, test, to associate, normally

IV. Read and translate the names of chemicals used in the text below.

Iron, manganese, molybdenum, nitrogen, calcium, sodium, ammonium, sulfur, potassium, magnesium, sulfate

V. Choose the synonymous pairs from the following words:

to apply	to take place
stunt	appearance
to alleviate	ground
to confine	alike
necrotic	to use
extensive	stop
emergence	to ease
similar	to show
soil	to limit
to occur	decrease
to indicate	wide
reduction	dead

VI. Skim text A. Begin your answer with the words: «This text is about…»

VII. Read text A and find the answers to the following questions:

1. What are the symptoms of aluminum toxicity?
2. What is the role of aluminum toxicity in nodulation and root development?
3. What is the best way to correct the problem?
4. Compare the iron chlorosis and manganese toxicity symptoms. Fill in the table.

Name of the problem	**Reasons**	**Plant size**	**Leaves appearance**	**Ways to correct the problem**

5. The result of what are the symptoms of molybdenum-nitrogen deficiency?
   - _____
   - _____
   - _____
   - _____
   - _____
6. What are the conditions under which sulfur deficiency occur?

7. What are the ways to correct sulfur deficiency problem?

TEXT A
FERTILITY PROBLEMS

ALUMINUM TOXICITY (LOW pH). On soils with low pH, aluminum availability may increase to toxic levels. Symptoms of aluminum toxicity include plant stunting and interveinal yellowing on most leaves. In severe cases, leaf margins become crinkled and necrotic

Nodulation is often inhibited and roots may show extensive horizontal spreading just below the soil surface. Application of agricultural limestone is the most effective way to correct the problem.

IRON CHLOROSIS. Iron deficiency, like manganese deficiency is limited to high pH (7 or above) soils. The deficiency is accentuated by very dry soil. Plants are stunted with pale green or yellow to nearly white leaves with green veins similar to manganese-deficient plants. Symptoms are usually confined to the upper part of the plant. Iron deficiency is more commonly reported west of the upper Mississippi River, while manganese deficiency is reported east of the Mississippi.

Consider using tolerant varieties and correcting with foliar fertilizer sprays.

MOLYBDENUM-NITROGEN DEFICIENCY. Deficiencies appear as pale green or yellow leaves and reduced leaf size. Symptoms occur as a result of poor nodulation, low calcium, low pH, ineffective strains of rhizobia or deficiencies of molybdenum in the soil. Either sodium or ammonium molybdate may be used as a foliar treatment to correct the problem after crop emergence. Seed treatments of molybdenum are also beneficial, and the addition of lime to neutralize a soil acidity problem increases soil molybdenum availability.

SULFUR DEFICIENCY. Sulfur deficiency symptoms are similar to nitrogen but tend to appear on upper leaves. Problems are most likely to occur during cool, wet weather on sandy and/or low organic matter soils. There is no reliable soil test to indicate if sulfur fertilization would be profitable. However the use of plant analysis to identify deficiencies, and the soil application of calcium sulfate (gypsum), potassium sulfate, or potassium magnesium sulfate will correct the situation.

MANGANESE TOXICITY. Manganese toxicity problems are normally associated with acidic soils. Plant symptoms are characterized by a dark green appearance and a reduction of plant height and leaf size. In severe cases, leaves are distorted or crinkled, and the term “crinkle leaf” is commonly used when referring to severe manganese toxicity. The addition of agricultural limestone to neutralize soil acidity normally alleviates the problem.

VIII. Read the following statements and define if they are true or false. Fill the gaps with letters T or F.

1. _____ Nodulation is often inhibited when aluminum toxicity takes place.
2. _____ Lime application is not effective when aluminum toxicity occurs.

3. _____ To correct the problem of molybdenum-nitrogen deficiency sodium is used for foliar treatment.
4. _____ Molybdenum seed treatment is not effective and beneficial.
5. _____ The addition of agricultural limestone is used to neutralize soil acidity.
6. _____ Soil tests are not reliable to decide if sulfur fertilization would be profitable.
7. _____ The term "crinkled leaf" is used to define severe manganese toxicity.
8. _____ Iron chlorosis symptoms are confined to the upper part of the plant.
9. _____ When there is aluminum toxicity roots may show horizontal spreading.

IX. Form the «chains» of nouns, according to the model. For example: level of toxicity – toxicity level

symptoms of aluminum toxicity
margins of leaves
spreading of roots
deficiency of iron
size of leaf
treatment of foliar
emergence of plants
seed treatment of molybdenum
problem of soil acidity
test of soil
problems of manganese toxicity
height of plant

X. Read the following text. Find all cases of Participle I and define the functions.

Rhizobia-Induced Chlorosis.

Certain strains of rhizobia interacting with certain soybean varieties can cause symptoms often confused with potassium and similar nutrient deficiencies. Leaves on affected plants show yellowing and necrosis of leaf margins, with the base of the leaf remaining dark green.
Symptoms occur on certain trifoliolate leaves, with later leaves appearing normal. Randomly occurring spots in the field normally do not make this an economic problems.

XI. Remember the formation of Participle II. Translate the following word combinations.

Vст	V+ed

crinkled leaves
continued browning
affected leaves
dwarfed stem
limited supply
detected problem
given problem

XII. Read and translate the following sentences. Pay attention to the function of Participle II.

1. The crinkled leaves and brown leaf margins are the symptoms of boron toxicity.
2. The affected leaves tend to be erected.
3. When limited the supply of phosphorus reduces the number of modulating bacteria.
4. When boron is placed near the seed toxicity can occur.
5. The detected problem may be overcome by side-dressing.
6. Continued browning and plant stunting are the symptoms of boron toxicity.
7. Phosphorus deficiency is detected through soil testing.

XIII Read and translate the following texts. Try not to use a dictionary.

Boron Toxicity. Toxicity can occur if boron is placed near the seed, particularly on low pH soils. Symptoms include yellowing to browning of leaf margins, crinkled leaves, and leaf edges that cup up or down. Continued browning of leaves and plant stunting occur in sever cases.

Chlorine Toxicity. Plants suffering from chlorine toxicity will initially show necrosis or burn along leaf margins, with affected leaves shedding prematurely. Symptoms occur most often in reproductive stage, and at times the addition of potassium chloride (potash) fertilizer can accentuate the injury.

Phosphorus Deficiency. Phosphorus deficiency generally appear as thin and dwarfed stems, blue-green upward-pointing leaves, and general early defoliation. Leaves tend to be more erect and form an acute angle with the stem. A limited supply of phosphorus reduces the number, as well as the efficiency of nodulating bacteria. Phosphorus deficiency is easily diagnosed through soil testing, but difficult to correct within the crop year.

Potassium (Potash) Deficiency. The soybean requires large amounts of potassium, which is essential for vigorous growth. Deficiency symptoms appear primarily on the lower leaves as pale green to lemon-yellow leaf margins.

Yellowing, then browning and necrosis of leaf margins, denotes an increase in the severity of the deficiency. Potash deficiency may be overcome by side-dressing immediately after the problem is detected.

Zinc Deficiency. Deficient plants are stunted with light green to yellow older leaves which may later bronze. Flowers are scarce and remaining pods are abnormal and slow to mature. Deficiency is most likely to occur on high pH, sandy, high phosphorus or low organic matter soils. Follow recommendations for foliar applications of zinc on deficient soybeans.

UNIT 6

I. Read and translate the following sentences. Pay attention to the words from your vocabulary list.

1. **Perennial** weeds are much more difficult to eliminate than the **annual** ones.
2. The increased soybean **stalk** reduces its **lodging** potential.
3. New varieties make soybean more **competitive** with **weeds.**
4. Postemergence herbicides **are applied** about three weeks after planting.
5. Climatic conditions of the region give good **opportunities** for the development of soybeans
6. Preplant herbicides **burndown** such weeds as **foxtail.**
7. These climatic conditions **fit** well to soybean growing.
8. Don't **rely on** preemergence herbicides.

II. Choose the synonymous pairs from the following words:

tall	manufacture
to reduce	to monitor
variety	to use
spacing	important
strength	high
production	distance
conventional	sort
to control	to decrease
to apply	to demand
to require	usual
essential	vigor

III. Translate the following «chains» of nouns.

row spacing	spring weed populations
stalk strength	winter annuals
lodging potential	preplant herbicide treatment
seeding rates	summer annuals burndown herbicide
canopy formation	burndown herbicide

no-till production systems	postemergence herbicide
weed control	weed control program
preplant herbicide application	season rainfall
crop residue	postemergence weed control program
weed management program	

IV. Read and translate the following words:

formation, result, potential, system, herbicide, populations, to control, effective, program, typically, season, giant, problem

V. Skim text A. Begin your answer with the words:"This text is about…"

VI. Read text A and answer the following questions:

1. What factors do soybeans make competitive with weeds?
2. What production systems are mentioned in the text?
3. What weeds can spring weed populations consist of?
4. What herbicides are used where weeds are more than few inches long?
5. What gives greater opportunity for herbicides to be moved into the soil?
6. Is it possible to rely on postemergence herbicides to control weeds that have already emerged at planting?
7. How can the giant foxtail be effectively controlled?

TEXT A
WEED MANAGEMENT

Use of taller growing varieties and reduced row spacing in no-till speed canopy formation makes soybeans more competitive with weeds. This is important since the slow, early growth of no-till soybean results in shorter plants. The increased stalk strength of no-till soybeans greatly reduces their lodging potential and allows the use of increased seeding rates to make soybeans more competitive with weeds.

No-till production systems are more dependent on herbicides for weed control than conventional or reduced-tillage systems where soil is tilled in spring prior to planting. Spring weed populations in no-till fields can consist of perennials, winter annuals, and early-emerging summer annuals. These emerged weeds must be controlled ahead of planting with an effective early preplant herbicide treatment or with burndown herbicides. If not killed at planting, emerged weeds often become too large to be controlled by postemergence herbicides that are typically applied about three weeks after planting. But where weeds are more than a few inches tall, the burndown herbicide program should include paraquat and glyphosate.

Applying early preplant herbicide treatments before weeds have emerged or when they are very small seedlings often eliminates the need to include glyphosate or paraquat in the weed control program. Early preplant herbicide application allows greater opportunity for herbicides to be moved into the soil by early season rainfall. However, early herbicide application can also result in less late-season

control of some weeds, especially giant foxtail and fall panicum, during growing seasons with above average rainfall. Applying residual herbicide closer to planting reduces the problem. Preemergence herbicides can provide acceptable control in no-till. However, they may require more rainfall to move them through crop residue and into the soil.

Postemergence herbicide programs seem to fit well into no-till production systems, especially where the population of annual broadleaf weeds has been reduced over time by an effective weed management program. But do not rely on postemergence herbicides to control weeds that have already emerged at planting. A burndown herbicide program at planting is essential for the success of any postemergence weed control program in no-till soybeans. Giant foxtail often increases during the first several years of no-till, but can be effectively controlled with either preplant or postemergence herbicide treatments.

VII. Read text A again and write out all herbicide names that are mentioned in the text.

- _____
- _____
- _____
- _____
- _____

VIII. What is the role of preplant herbicide treatments in weed control program?

- _____
- _____
- _____

IX. Read Text B. These words may be useful for you. Find the translation of them in the dictionary.

bindweed
milkweed
to suppress
to cease
undisturbed
to facilitate
dandelion

TEXT B

Perennial weeds like bindweed, milkweed, dandelion and others become more prevalent and difficult to control as tillage is reduced. Most of them haven't sufficiently emerged before soybean planting to be killed by a burndown application of glyphosate. Most postemergence soybean herbicides only suppress these perennials. The key to managing these perennials is effective control in the year prior to planting soybeans. Apply glyphosate, Banvel, and/or 2,4-D when these weeds are in the bud to bloom stage, or as late in the fall as possible; but before weeds mature or their growth ceases due to frost. At this growth stage, the herbicide will move throughout the plant, resulting in maximum kill. The best opportunity for making this type of application is in the fall after wheat harvest when plants have grown undisturbed for several months. Many growers in Ohio, Michigan, and Indiana plant wheat ahead of soybeans to facilitate this perennial weed management tactic.

X. Read these statements and define if they are true or false. Fill the gaps with letters T or F.

1._____It is more difficult to control perennial weeds as tillage is reduced.
2._____Most postemergence soybean herbicides only suppress perennial weeds.
3._____Glyphosate and 2,4-D are applied when weeds are in growing stage.
4._____Glyphosate and Banvel are not used late in the fall.
5._____When weeds are in the bud to bloom stage the herbicide will move throughout the plant, resulting in maximum kill.
6._____The best opportunity for this type of application is in the fall after corn harvest.
7._____Many growers plant wheat ahead of soybeans.

XI. Read the following text and fill in the table given below.

BENZOIC ACID
(Banvel, Amiben)

Benzoic acid herbicides act as a growth regulator on soybeans. Banvel injury causes soybean leaflets to cup, stems to twist and the terminal bud to stop development. Branching may occur if the terminal bud is severely damaged. Banvel injury can result from the direct drift of spray or from the volatilization of the herbicide after application. Injury from the direct drift is usually more severe, while injury from volatilization can be widespread throughout the field. Yield reduction can occur if soybeans are injured during the reproductive stage.

Amiben injury rarely occurs and is difficult to detect since most of the soybean stand is usually affected. However, plant stunting can be significant and root proliferation can occur, but this injury is not normally detrimental to yield.

Herbicide name	**Injury Symptoms**	**Reasons**

XII. Read and translate the following texts. Use dictionary if necessary.

TEXT A
TRIAZINE (atrazine, Bladex, metribuzin)

Triazine injury symptoms are usually seen on the oldest leaves first, with initial injury developing at the leaflet tips. The leaves will turn yellow, and eventually the tissue may turn brown and die. Some defoliation may occur, but as long as the terminal bud is alive, the soybean may recover. The action and weed spectrum of metribuzin is similar to that of the S-triazines (atrazine simazine). However, its crop tolerance and fate in soils is much different. Research data indicates that early metribuzin injury is generally cosmetic and will not affect final yield.
Several soybean varieties are sensitive to metribuzin; refer to herbicide label for a list of these varieties. Shallow planting, environmental conditions, soil pH, soil type and soil organic matter will affect the relative severity of triazine injury.

TEXT B
CHLORIMURON (Classic, Canopy, Preview, Lorox Plus, Gemini)

Classic applied postemergence to soybeans may result in the temporary yellowing of leaves and some crop stunting. Leaf internodes may appear shortened. Newly-expanded leaves may exhibit crinkling and leaflet veins may be a darker green color. Adverse growing conditions which place the soybeans under stress, or use of excessive rates, will enhance injury.
Stress conditions include heavy rains shortly after application, drought, high temperatures, root pathogens and nematodes. Soils with high pH may increase the likelihood of injury. Prolonged injury may result in yield reduction. Similar injury symptoms may occur from soil applications of preemergence herbicides that contain chlorimuron.

TEXT C
DIPHENYL ETHER (Blazer, Cobra, Reflex, Tackle)

Soybean injury symptoms from diphenyl ether herbicides appear as leaf crinkling, spotting or speckling and temporary suppression of soybean growth. At higher rates the treated leaves have a reddish-orange color. Injury may be more pronounced when diphenyl ether are tank-mixed with other herbicides or specific additives. Applications made during periods of high temperature and humidity with intense sunlight may result in potentially severe injury. The plant often returns to normal growth usually within 3 to 4 weeks. If stress conditions persist, such as

high temperature and drought, activity from diphenyl ether herbicdes may affect yield.

SUPPLEMENTARY READING

TEXT A

NO-TILL CROP MANAGEMENT CONSIDERATIONS

Producing no-tillage soybeans requires special attention to soil drainage, soil compaction, crop rotation, cover crops, variety selection planting procedures, disease, insects, weed management and crop fertilization. Proper management of these factors is important in both conventional tillage and no-till. However, the yield penalty for improper management of these production factors can be greater in no-till than in tillage-intensive system.

Soil Drainage

Adequate soil drainage is essential to no-till soybean production. Plant residue on the soil surface reduces soil erosion. But it also reduces water evaporation and slows the rate at which the soil dries and may therefore delay soybean planting. Always plant the most well-drained fields first, thereby allowing less well-drained fields greater time to dry before planting. Where excessive soil wetness repeatedly delays soybean planting beyond reason, some fall tillage may be the best alternative to avoid the yield penalty due to delayed planting.

Soil Compaction

The use of no-tillage systems should be avoided in fields with zones of significant soil compaction. While it is true repeated use of no-tillage in a grain rotation will probably alleviate a compaction problem, it may take several years. Compaction should be minimized before initiating no-till. Following a controlled traffic pattern in no-till will tend alleviate future compaction problems, if planting is delayed until the soil has dried to the appropriate level.

Crop Rotation

The effect of crop rotation on crop yield is one of the most thoroughly studied cultural practices in the Midwest. In general, research data suggest an average soybean yield penalty of 5% to 15% when grown continually with tillage. Yield losses are usually greater in no-till systems that lack crop rotation. Soybeans should not be no-tilled into the prior year's soybean stubble due to the increased potential for disease infection and because the soybean cannot take full advantage of carry-over nitrogen produced by previous crop.

Planting no-till soybeans into perennial sod is a challenge because of the difficulty in controlling vegetation. Also, soybeans cannot take full advantage of the nitrogen produced by legumes in the sod.

One of the most difficult environments for establishing no-till soybeans can be wheat stubble where the previous year's straw has not been removed.

These fields usually have 100% of the soil covered finely chopped straw that reflects much of the sunlight energy and almost completely prevents evaporation of water from the soil. This soil environment is usually the coldest and wettest that a no-till producer will face. The solution is to remove the straw or partly incorporate it into the soil in the preceding fall. In more arid regions or in dry seasons, wheat straw does not present a problem and moisture conservation can result in higher yields.

Cover Crops

The purpose of a cover crop is to provide extra residue in situations where little crop residue is present after harvest. Cover crop residue reduces soil erosion and is sometimes also necessary to minimize soil crusting.

Always plant a cover crop after corn silage harvest on soils prone to erosion and crusting if you anticipate no-till planting the next year and if there is time to accumulate adequate growth in the fall. Cover crops can also be beneficial after soybean harvest where crop residue levels are insufficient to minimize soil erosion and crusting. A cover crop usually isn't necessary where no-till soybean planting follows corn grown for grain. The need for a cover crop for crusting control should decline after several cycles of a no-till corn-soybean rotation due to a build up of organic matter at the soil surface.

Rye can be used as a cover crop to prevent soil erosion or where soils tend to crust.

TEXT B
PHYTOPHTHORA ROOT ROT

Phytophthora root rot is a serious soybean disease throughout much of the Midwest. The occurrence and severity is greater in the high rainfall regions. It often more severe in no-till because of wetter soil conditions when soybeans are in the most susceptible seedling stage. Saturated soil conditions with temperatures above 60 F are ideal for infection. Planting early and before soil temperatures reach 60 F will often allow tolerant varieties to escape infection. Only highly tolerant or resistant soybean varieties should be grown on poorly drained soils or on soils known to have a history of the disease. And because tolerance and/or resistance doesn't develop until after soybean emergence, even these varieties should be treated with Apron or Anchor to inhibit the development of Phytophthora infection. Or the soil may be treated with Ridomil for season-long control of Phytophthora root rot. However, do not use a Phytophthora specific seed treatment and a Ridomil soil treatment at the same time because of the potential for seeding damage.

TEXT C

SEEDING RATES – ADJUSTMENTS FOR NO-TILL SOYBEANS

Soybeans typically show little response to changes in seeding rate. The optimum seeding rate (plant population) varies with variety growth pattern, growing season and latitude. As vegetative growth (plant size) increases, the optimum population decreases. Optimum populations increase as one moves from south to north. The optimum seeding rate is higher for a location in Wisconsin than for a location in Ohio, 200 miles to the south. Adjustments should be based more on the size of mature plants rather than the tillage system used. Remember that sunlight interception is the objective. A soybean leaf canopy made up of 75,000 evenly placed plants will produce as much yield as a canopy with 175,000 plants if the two canopies form at the same time and the plants mature at the same time.

Seeding rates should be high enough to get the lowest pods well above the soil for harvest but keep the plants short enough to prevent lodging. No-till soybeans are less susceptible to lodging because the lower internodes are shorter and stronger due to slower early growth.

TEXT D
LONG-TERM EFFECTS OF NO-TILL

Over time, physical and chemical properties of soil change drastically with the removal of tillage from a crop production system. Residue left on the soil surface decomposes and increases the organic matter content of the soil surface. Soil ph at the surface decreases when nitrogen for corn is surface applied, which can affect the activity of soil applied herbicides and the availability of plant nutrients at or near the soil surface. All crops pump nutrients from the subsoil and plow layer into above ground vegetation. This translocation plus the annual surface application of fertilizer and manure rapidly increases surface fertility. Some soils swell when wet then shrink in dry weather, producing large cracks allowing surface soil and nutrients to be washed into cracks thus redistributing some surface nutrients. Surface nutrient accumulation is greater for soils that do not shrink and swell extensively. Occasional (every 15-25 years) reincorporation of nutrients may be desirable for these soils.

TEXT E
SOIL TESTING

Nutrients and acidity tend to accumulate in the surface soil in no-till fields: therefore, the methods used to sample soil are quite important. Adequate soil sampling for an accurate measure of its nutrient content is quite important.

Separate samples at different soil depth are suggested. The first sample should be comprised of soil cores from a 0 to 8 inch soil depth as when sampling soil under conventional tillage. Be sure to take cores to a full 8 inch depth and avoid any remnants of a fertilizer band. This sample should be analyzed for both nutrients and pH. The second sample should be comprised of soil cores from a 0 to 2 inch depth and should be analyzed to determine soil pH and lime requirement only.

TEXT F
ENVIRONMENTAL STRESS

Heat Damage. Heat damage can be manifested in many ways, from a reduction in emergence, to increased flower abortion and reduced seed vigor. Soil temperatures at or above 100 F cause soybean cotyledons to deteriorate rapidly. High soil temperatures at plant emergence is thought to be a primary reason for "heat canker" or "pinched stems at surface" (sunken necrotic lesions near the soil surface). Nodule formation, development and nitrogen fixation are reduced when soil temperatures rise above 90 F. Day temperatures in excess of 95 F, coupled with low humidity, have been shown to reduce seed set and potential seed vigor. In general, the soybean plant can tolerate short periods of high temperatures if supplied with adequate soil moisture.

Lightning Damage. Lightning kills 90% or more of soybeans and all other plants present in circular spots up to 40 feet or more in diameter. The affected spot generally has a clearly defined margin. Plants at the edge of the spot that are not killed have brown to black surface discoloration on the stems that could be mistaken for disease. Pith of such plants appears blanched. Lightning affected areas do not expand with time.

Planting Depth. Deep planting of soybeans results in more time needed for emergence, thus longer exposure to soil insects and disease pathogens. Ideal planting depths range from 10 to 15 inches. While some varieties will emerge from up to 4 inches, most will not emerge well from depths greater than 2.5 inches even with high quality seed. Larger seeds will not necessarily emerge from greater depths because the large cotyledons experience more resistance to emergence than cotyledons of small seed. Small seeds may not have sufficient reserves to permit emergence from deep planting.

TEXT G
FERTILITY PROBLEMS

Rhizobia-induced Chlorosis. Certain strains of rhizobia interacting with certain soybean varieties can cause symptoms often confused with potassium and similar nutrient deficiencies. Leaves on affected plants show yellowing and necrosis of leaf margins, with the base of the leaf remaining dark green.

Symptoms occur on certain trifoliolate leaves, with later leaves appearing normal. Randomly occurring spots in the field normally do not make this an economic problem.

Potassium (potash) Deficiency. The soybean requires large amounts of potassium, which is essential for vigorous growth. Deficiency symptoms appear primarily on lower leaves as pale green to lemon-yellow leaf margins. Yellowing, then browning and necrosis of leaf margins, denotes an increase in the severity of the deficiency. Potash deficiency may be overcome by side-dressing immediately after the problem is detected.

Magnesium Deficiency. Although rarely a problem, magnesium deficiency may occur on sandy, low pH or high potash soils.

Deficiency symptoms are pale green lower leaves, with yellow mottled interveinal tissue, which later show rusty speckling or bronzing. Both soil and plant analyses are good diagnostic tools. Correct with applications of limestone.

REFERENCES

1. Bell J., Gower R. Advanced Expert Coursebook. Longman (Pearson Education). 2018. 208 p.
2. Butler L. Fundamentals of Academic Writing. London : Pearson Longman, 2018. 236 p.
3. Cotton D., Falvey D., Kent S. New Language Leader Advanced Course-book. Longman (Pearson Education). 2019. 184 p.
4. Cotton D., Falvey D., Kent S. New Language Leader Upper Intermediate Course-book. Longman (Pearson Education). 2018. 184 p.
5. Dressler W. Introduction to Text Linguistics. Routledge & CRC Press Series : Longman Linguistics Library, 2017. 235 p.
6. Harmer Jeremy. The Practice of English Language Teaching (Longman Handbooks for Language Teaching). Pearson Longman; 5 th evised edition, 2016. 446 p.
7. Hewings M. Advanced Grammar in Use Book with Answers and Interactive eBook: A Self-study Reference and Practice Book for Advanced Learners of English (Cambridge Advanced Grammar in Use). Cambridge University Press; 3 rd edition, 2016. 304 p.
8. Latham-Koenig C., Oxenden C., Lambert J., Chomacki K. English File (4 th edition) Advanced. Teacher's Guide. Oxford University Press, 2020. 231 p.
9. Latham-Koenig C., Oxenden C., Lambert J., Chomacki K. English File (4 th edition) Advanced. Student's book. Oxford University Press, 2020. 177 p.
10. Murphy R. English Grammar in Use. 5 th ed. UK : Cambridge University Press, 2019. 396 p.
11. Murphy R. English Vocabulary in Use. 4 th ed. UK : Cambridge University Press, 2018. 396 p.
12. Pople I. An Introduction to Text & Discourse Analysis: Investigating English Language. Nelson Thornes : Oxford University Press, 2018. 112 p.
13. Titscher S., Meyer M. Methods of Text and Discourse Analysis: In Search of Meaning. SAGE Publications Ltd, 2019. 283 p.
14. Wallwork A. English for Academic Research: Writing Exercises. 3 rd ed. US : Springer Publishing, 2019. 190 p.
15. Алексеєнко Н. М., Бутко Л. В., Сізова К. Л., Шабуніна В. В. Лінгвістичний аналіз тексту : практикум : навчальний посібник. Кременчук, 2018. 243 с.
16. Бахов І. С. English for Post-Graduate Students. Англійська мова для аспірантів та здобувачів : навч. посіб. для студ. вищ. навч закл. К. : ДП «Видавничий дім «Персонал», 2016. 276 с.
17. Возна М. О. Англійська мова для старших курсів. Вінниця: Нова Книга, 2017. 256 с.
18. Єрмоленко С. І., Юрченко О. В. Методичні рекомендації до курсу «Лінгвістичний аналіз тексту». Мелітополь, 2019. 40 с.
19. Капінус О. Л., Гроза І. М. Основи академічного письма англійською мовою : навчальний посібник. Одеса, Видавничий дім «Гельветика», 2018. 212 с.
20. Разом до успіху : Інноваційні навчально-методичні матеріали з дисципліни «Англійська мова» для студентів і викладачів вищих навчальних

закладів / за ред. : Ольги Кульчицької, Якова Бистрова. Вінниця : Нова Книга, 2016. 176 с.
21. Сидоренко Т. М., Стороженко Л. Г. Структуризація тексту: навч. посіб. Київ: ДУТ, 2018. 132 с.
22. Яблонська Т. М. Лінгвістичний аналіз художнього тексту : навч. посіб. для студ. Одеса : видавець Букаєв Вадим Вікторович, 2019. 325 с.

Інформаційні ресурси

1. Електронний ресурс] – Режим доступу http://bio.1september.ru/urok/
2. Електронний ресурс] – Режим доступ ***http://www.school.edu.ru/catalog.asp?cat_ob_no=25&oll.ob_no_to=***
3. Електронний ресурс] – Режим доступу www.educationusaintaiwan.blogspot.com/2007_04_01_archive.html
4. Електронний ресурс] – Режим доступу www.projectv.fin/audio.htm
5. Електронний ресурс] – Режим доступу www.visitdublin.com/multimedia/dublinpodcasts/iwalk.aspx?id=275
6. Електронний ресурс] – Режим доступу Inside the Ivy League - https://www.youtube.com/watch?v=FKIH7RINNI8
7. Електронний ресурс] – Режим доступу History of Ivy League Schools: Sports and Education - https://www.youtube.com/watch?v=LUuTn3rVaQw
8. Analyzing Novels & Short Stories. URL: https://writingcenter.tamu.edu/
9. A Short Guide to Close Reading for Literary Analysis. URL: https://writing.wisc.edu/handbook/assignments/closereading/
10. Figures of Speech Tables. URL: https://faculty.nipissingu.ca/williams/figofspe.htm
11. Glossary of Literary Terms - Georgia Southern University. URL: http://personal.georgiasouthern.edu/~dougt/terms.htm
12. How to Analyze a Fiction Text. URL: http://www.menrath-online.de/documents/methfic.pdf