Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Agricultural Technologies and Environmental Management
Department of Agricultural Technologies and Soil Science

Work program (syllabus) of the educational component

MODERN ASPECTS OF AGRICULTURE

МК-9

Implemented within the framework of the educational and scientific program

Agronomy

in the specialty N1 "Agronomy"
(code, name)

at the third educational and scientific level of higher education

Sums - 2025

Developer: _____ **Yuriy MISHCHENKO**, Doctor of Agricultural Sciences, Professor of the Department of Agrotechnology and Soil Science

Reviewed, approved, and adopted at a meeting of the Department of Agricultural Technology and Soil Science	Minutes No. 24 dated 16.06.2025
	Head of the department _____ Volodymyr TROTSENKO

Approved by:

Guarantor of the educational program _____ Andriy MELNYK

Dean of the Faculty of Agrotechnology and Natural Resource Management _____ Serhii HORBAS

Review of the work program provided (attached) _____ Ihor Mgsgyk

Methodologist of the Department of Education Quality, Licensing and Accreditation _____ (N. Baranik)
(signature) (full name)

Registered in the electronic database: date: 21.08 2025

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

<table>
<tr><td>1.</td><td>Name of EC</td><td colspan="8">Modern aspects of agriculture</td></tr>
<tr><td>2.</td><td>Faculty/Department</td><td colspan="8">Agrotechnology and Environmental Management / Agrotechnology and Soil Science</td></tr>
<tr><td>3.</td><td>Status of EC</td><td colspan="8">Compulsory</td></tr>
<tr><td>4.</td><td>Program/Specialty (programs) that include OK</td><td colspan="8">Agronomy / 201 – Agronomy</td></tr>
<tr><td>5.</td><td>OK may be offered for (for selective OK)</td><td colspan="8">-</td></tr>
<tr><td>6.</td><td>NRK level</td><td colspan="8">Level 3</td></tr>
<tr><td>7.</td><td>Semester and duration of study</td><td colspan="8">2 semesters, 15 weeks
Postgraduate students</td></tr>
<tr><td>8.</td><td>Number of ECTS credits</td><td colspan="8">3</td></tr>
<tr><td rowspan="3">9.</td><td rowspan="3">Total number of hours and their distribution</td><td colspan="6">Contact work (classes)</td><td colspan="2" rowspan="2">Independent work</td></tr>
<tr><td colspan="2">Lectures</td><td colspan="2">Practical</td><td colspan="2">Laboratory</td></tr>
<tr><td>Day</td><td>Part-time</td><td>Full-time</td><td>Part-time</td><td>full-time</td><td>part-time</td><td>full-time</td><td>part-time</td></tr>
<tr><td></td><td>10</td><td></td><td>20</td><td></td><td>-</td><td>-</td><td>60</td><td></td></tr>
<tr><td>10.</td><td>Type of assessment</td><td colspan="8">Credit</td></tr>
<tr><td>11.</td><td>Language of instruction</td><td colspan="8">Ukrainian</td></tr>
<tr><td>12.</td><td>Lecturer/Coordinator of the educational component</td><td colspan="8">Yuriy Mishchenko</td></tr>
<tr><td>13.</td><td>Contact</td><td colspan="8">Professor of the Department of Agricultural Technology and Soil Science
Office 203a, Faculty of Agricultural Technology and Environmental Management
Email address: yrmis@ukr.net
Teacher profile - https://agro.snau.edu.ua/kafedri/kafedra-zemlerobstva-gruntoznavstva-ta-agroximi%d1%97/sklad-kafedri/mishhenko-yurij-grigorovich/
Consultations:
in person - every Tuesday from 3:00 p.m. to 4:00 p.m.;
online via Zoom, Viber - Wednesdays from 16.00 to 17.00</td></tr>
<tr><td>14.</td><td>General description of the educational component</td><td colspan="8">The discipline "Modern Aspects of Agriculture" highlights the peculiarities of growing crops with the most efficient use of climatic and soil resources. This goal can only be achieved by creating optimal growing conditions for crops, optimizing water, nutrient, air, and heat regimes, and successfully combining crop fertilization, soil cultivation, and crop protection systems.</td></tr>
<tr><td>15.</td><td>The purpose of the educational component</td><td colspan="8">The purpose of studying this discipline is to provide degree seekers with knowledge and skills in the general, environmental, and biological aspects of agriculture, modern environmentally safe and economically feasible agrotechnical measures for growing and protecting agricultural crops, designing rational crop rotations, resource-saving tillage systems and erosion control measures, and the specifics of adaptive systems of industrial, soil-protecting, ecological, and biological (organic) farming.
Objectives: to acquire theoretical and practical skills in growing crops under different farming systems for specific soil and climatic conditions.</td></tr>
</table>

		As a result of studying the discipline, students should: ***Know*:** -the theoretical foundations of farming systems; -the components of farming systems and ways to fully implement them; -agroclimatic and soil conditions for the implementation of adaptive farming systems; -agrobiological characteristics of agricultural crops, their requirements for growing conditions; -the impact of agricultural crops on soils in connection with the peculiarities of biology and agricultural technology; -principles of optimizing the placement of agricultural crops; -prospects for soil cultivation; -fertilizer application systems; -methods of regulating soil biogenicity; -methods of optimizing plant protection; -features of various farming systems in Polissya, the Forest-Steppe, and the Steppe; ***Be able to***: - scientifically evaluate modern agriculture; -develop information-logical models of ecological factors of plant life and determine measures and resources for their regulation; - develop dynamic economic and mathematical models for determining humus reserves in arable, root-containing, and meter-deep soil layers, as well as models for restoring these reserves in the specified layers; - determine the biological activity of the soil and develop measures for its optimization; -determine the phytosanitary condition of the soil and develop measures for its optimization; -develop measures to restore soil fertility; -determine the necessary conditions for the implementation of farming systems; -develop links and stages for the implementation of farming systems; -develop technological maps for growing agricultural crops for different farming systems.
16.	Prerequisites for studying OK, connection with other educational components of OP	**Prerequisites:** Basic disciplines in agronomy. **Post-requisites:** Modern global agricultural technologies, Stability and sustainability of agrocenoses, Regenerative agriculture, Features of nutrition and increasing its efficiency in organic farming.
17.	Academic integrity policy	**Academic integrity** at SNAU is regulated by a number of regulatory documents, which are posted on the official website of the higher education institution https://snau.edu.ua/viddil-zabezpechennya-yakosti-osviti/zabezpechennya-yakosti-osviti/akademichna-dobrochesnist/. These documents define academic integrity and contain guidelines on the procedure to be followed when a participant in the educational process violates academic integrity. Actions such as plagiarism, impersonation, fraud, fabrication, falsification, self-plagiarism, deception, and biased assessment are considered direct violations of academic integrity and will result in severe penalties: − retaking the assessment (test, exam, credit, etc.); − retaking the course; − warning; − reprimand; − expulsion from the university (Article 48 of the Law of Ukraine "On Education"). **Course policy**

		Postgraduate students are advised not to miss classes, to dress appropriately, to complete assignments diligently, and to actively participate in the learning process. In case of absence due to illness, a corresponding certificate must be provided. Missed classes must be made up at a time agreed in advance with the teacher. The use of other sources with alternative views on certain issues is encouraged in order to foster productive discussion on the problems of the academic discipline. Compliance with the norms of academic integrity is a mandatory requirement. Students pursuing a degree must systematically and consistently master the course material. They must actively participate in practical classes, take part in discussions and case studies, and fully engage in active forms of learning. To receive a high grade, the following conditions must be met: – do not miss classes or be late; – actively participate in the learning process; – complete assignments on time; – comprehend, analyze, and understand the course material; – not be distracted by extraneous matters during classes; – respect the opinions of other students; – refrain from using gadgets during classes without the teacher's permission; – pay sufficient attention to independent work; – to earn extra points and improve their grade in a subject, students can participate in scientific conferences, prepare scientific articles, etc. The criteria for assessing knowledge for current control are the success in mastering knowledge and acquired skills in lectures and practical classes, which includes the ability of a higher education student to master the categorical apparatus, skills of generalized thinking, the logic and completeness of teaching the educational material, active work in practical classes, level of knowledge based on the results of the survey, independent study of topics in general or specific issues. The total number of rating points for studying the educational component for the semester is calculated as the sum of the points received based on the results of current and final assessments. The maximum number of points for the semester is 100 points. Individual assignments and written work submitted late without a valid reason are graded lower (15% of the total points for a specific class). The educational process is inclusive for people with special needs, taking into account their abilities and needs (distance learning in the Moodle system, etc.).
18.	Keywords	Agriculture, weeds, crop rotation, soil cultivation, soil fertility, crop yield
19.	Link to the course in the Moodle system	https://cdn.snau.edu.ua/moodle/course/view.php?id=5926

2. LEARNING OUTCOMES FOR THE EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP TO THE PROGRAMME LEARNING OUTCOMES

Learning outcomes for the OC:	Program learning outcomes that the EC is aimed at achieving (indicate the number according to the numbering given in the OP)				How RND is assessed
	PRN1	**PRN3**	**PRN5**	**PRN7**	
DRN 1. Demonstrate knowledge and understanding of applied problems in agronomy. Apply advanced knowledge of agronomy and related fields, as well as research skills in planning and conducting scientific research.		+			Multiple-choice test and individual assignment. Presentation, report. Written exam. Short tests (up to 5 minutes). Careful checking and analysis of completed tasks. Discussion of selected ways to solve the problem. Oral presentations, self-assessment, and peer assessment. Mastering observation skills and abilities. Observation of applicants in the process of completing tasks
DRN 2. Plan and carry out theoretical and experimental research in agronomy using modern methods, technologies, and tools, critically analyze research results.	+				Multiple-choice test and individual assignment. Presentation, report. Written exam. Short tests (up to 5 minutes). Cooperation of applicants in a group and ability to work with focus. Careful checking and analysis of completed tasks. Individual discussions about the results of completed tasks. Discussion of selected ways to solve the problem. Oral presentations, self-assessment, and peer assessment. Mastering observation skills and abilities. Observing applicants in the process of completing tasks
DRN 3. Freely present and discuss research results research, scientific and applied problems of agronomy, reflect research results in scientific publications.			+		Multiple-choice test and individual assignment. Presentation, report. Written exam. Short tests (up to 5 minutes). Collaboration among applicants in a group and ability to work with focus. Careful checking and analysis of completed tasks Individual discussions about the results of completed tasks. Discussion of selected ways to solve the problem, self-assessment, and peer assessment. Mastering observation skills and abilities. Observation of applicants in the process of completing tasks
DRN 4. Understand the general principles and methods of agricultural sciences, as well as the methodology of scientific research, apply them in your own research in the field of agronomy and teaching practice.				+	

3. CONTENT OF THE EDUCATIONAL COMPONENT
(ACADEMIC DISCIPLINE PROGRAM)

Topic. List of issues to be covered within the topic	Distribution within the overall time budget								Recommended reading
	Classroom work						Independent work		
	Lk		Pz		Lab				
	den.	correspondence	day	part-time	day	correspondence	day.	correspondence	
Module 1. Strategic directions of modern agriculture.									
Topic 1. Modern directions of agriculture development.	1		2				7		1-6, electronic resources
Topic 2. The importance of climatic and soil conditions in different farming systems	1		2				7		1-6, electronic resources
Topic 3. Methods of weed control in different farming systems	1		2				8		1-6, electronic resources
Topic 4. The role of main and intermediate crops in crop rotations in different farming systems	2		4				8		1-6, electronic resources
Module 2. Features of crop cultivation in modern agriculture									
Topic 5. Crop nutrition under different farming systems	1		2				7		1-6, electronic resources
Topic 6. Prospects for soil cultivation in agriculture	2		2				7		1-6, electronic resources
Topic 7. Crop protection in different farming systems	1		2				8		1-6, electronic resources
Topic 8. Development of crop cultivation technologies for different farming systems	1		4				8		1-6, electronic resources
Total	**10**		**20**				**60**		

3.1 Topics and lecture plan

No No	Topic title and plan	Number hours
1.	**Topic 1. Directions for the development of agriculture.** 1. Directions for the development of agriculture systems. 2. Advantages and disadvantages of modern agriculture.	1
2.	**Topic 2 The impact of soil and climatic conditions on modern agriculture** 1. Climate change and crop cultivation 2. The impact of soil conditions on the state of the anthropic biocenosis	1
3.	**Topic 3. Modern strategies for weed control** 1. Controlling the spread of weeds 2. Alternatives to traditional weed control measures	1
4.	**Topic 4.1 Crop rotation in modern agriculture** 1. Modern components of crop rotation. 2. The importance of rational crop rotation in crop rotation.	1
5.	**Topic 4.2 The role of catch crops**	1
	1. Use of intermediate crops 2. Cover ***crops***	
6.	**Topic 5. Modern views on crop nutrition** 1. Optimization of plant nutrition. 2. Features of fertilizer application	1
7.	**Topic 6.1 Modern views on soil cultivation in agriculture** 1. Adaptation of the soil cultivation system 2. Vertical soil cultivation	1
8.	**Topic 6.2 Soil protection in modern agriculture** 1. Problems of soil degradation 2. Methods of soil improvement	1
9.	**Topic 7. Optimizing crop protection in modern agriculture** 1. Protection against diseases and pests 2. Biological products and growth stimulants	1
10.	**Topic 8 Developing crop cultivation technologies** 1 Growing winter wheat 2. Soybean cultivation	1
Total:		**10**

3.2. Topics for practical classes

No No	Topic	Number hours
1.	Topic 1. Features of the emergence and development of farming systems.	2
2.	Topic 2. The role of climatic and soil conditions in crop cultivation	2
3.	Topic 3. Features of weed control	2
4.	Topic 4.1. Placement and compaction of crops in crop rotations	2
5.	Topic 4.2. Use of green manure	2
6.	Topic 5. Features of plant nutrition in different farming systems	2
7.	Topic 6 Justification of soil cultivation under different farming systems	2
8.	Topic 7. Features of the use of plant protection products and growth stimulants in different farming systems	2
9.	Topic 8.1. Development of wheat cultivation technology	2
10.	Topic 8.2. Development of soybean cultivation technology	2
Total:		**20**

3.3 Independent work

No No	Topic title and plan	Number hours
1	**Topic 1. Current trends in agriculture.**	7
2	**Topic 2 The importance of climatic and soil conditions in different farming systems**	7
3	**Topic 3. Methods of weed control in different farming systems**	8
4	**Topic 4** The role of main and intermediate crops in crop rotations in different farming systems	8
5	**Topic 5. Crop nutrition in different farming systems**	7
6	**Topic 6. Prospects for soil cultivation in agriculture**	7
7	**Topic 7. Crop protection in different farming systems**	8
8	**Topic 8 Development of crop cultivation technologies for different farming systems**	8
Total:		**60**

4. TEACHING AND TRAINING METHODS

DRN	**Teaching methods** (work to be done by the teacher during classroom sessions, consultations)	**Number of hours**	**Learning methods** (what types of learning activities should be performed by the student independently)	**Number of hours**
DRN 1. Demonstrate knowledge and understanding of applied problems in agronomy. Apply advanced knowledge of agronomy and related fields, as well as research skills in planning and conducting scientific research.	− **verbal** (lecture, conversation, story, explanation, educational discussion); − **visual** (demonstration, illustration, presentation); − **practical** (exercise, experiment, practical work); − by logic of presentation (induction, deduction); − **by level of cognitive activity** (explanatory-illustrative, reproductive, problem-based presentation, partial-search, research); − **interactive teaching methods** (interactive technologies for collective-group and cooperative learning: general circle, microphone, unfinished ideas, brainstorming, case method, work in small groups, dialogue, synthesis of opinions, joint project, information search, circle of ideas); − **non-traditional teaching methods** (teacher as moderator, game design)	6	Careful reading of lecture notes and consideration of problematic questions, solving problems; - visiting the library, working with various literature, taking notes, making notes; - discussing the learning material with other students without the teacher's participation; - preparing reports, announcements, abstracts, presentations; - completing individual assignments; using a computer	14
DRN 2. Plan and carry out theoretical and experimental research in agronomy using modern methods, technologies, and tools, critically analyze research results.		8		16
DRN 3. Freely present and discuss research results research results, scientific and applied problems of agronomy, reflect research results in scientific publications.		6		14
DRN 4. Understand the general principles and methods of agricultural sciences, as well as the methodology of scientific research, apply them in your own research in the field of agronomy and teaching practice.		8		16
Total		**30**		**60**

5. ASSESSMENT BY EDUCATIONAL COMPONENT

Continuous assessment is used for the educational component – this is a combination of summative and formative assessment. Continuous assessment is used to establish feedback with students and summative assessment to record grades. It is essential that the assessment method allows for verification of whether the established learning outcomes have been achieved. To this end, several methods are used simultaneously.

5.1. Summative assessment

Summative assessment summarizes the student's learning activities at a certain point in time, usually at the end of modules (module 1, module 2, module 3, module 4), SRC, attestation, and exam. Summative assessment can be described as an assessment at the end of a course that allows you to determine the level of student achievement, summarizing a certain stage of learning.

5.1.1. To assess the expected learning outcomes, the following are provided

No.	Methods of summative assessment	Points / Share in the overall assessment	Date of completion
1.	Multiple choice test and individual assignment. (**Module 1. Strategic directions of modern agriculture;** Topics 1-4).	40 points / 40%	1 semester, Week 6
2.	Multiple choice test and individual assignment (**Module 2. Features of crop cultivation in modern agriculture;** Topics 5-8)	60 points / 60%	1 semester, Week 15

Forms of examination: written, oral (variety – test and response to individual assignment). The choice of examination form is proposed by the teacher of the academic discipline, approved by the department, and supported by the methodological and coordination council of the higher education institution, faculty, which is indicated in the program of the academic discipline.

5.1.2. Assessment criteria

Component	Unsatisfactory	Satisfactory	Good	Excellent
Multiple choice test and individual assignment. (**Module 1. Strategic directions of modern agriculture;** Topics 1-4).	*< 9 points*	*10-19 points*	*20-29 points*	*30-40 points*
	Assignment requirements not met	Most requirements have been met, but some questions have not been fully answered, and there is no analysis of the material studied	All requirements of the task have been fulfilled	All requirements of the task have been fulfilled, the results obtained have been clearly interpreted, suggestions for improving and refining specific issues have been made, an opinion and vision of a particular problem have been formed, the ability to critically evaluate various sources of information and thoughtfulness have been demonstrated, and conclusions have been made regarding the use of the knowledge gained in professional activities

Multiple-choice test and individual assignment (**Module 2. Features of crop cultivation in modern agriculture;** Topics 5-8)	*< 15 points*	*15-30 points*	*37-42 points*	*43-60 points*
	Task requirements not met	Most requirements have been met, but some questions have not been fully answered, and there is no analysis of the material studied	All requirements of the task have been fulfilled	All requirements of the task have been fulfilled, the results obtained have been clearly interpreted, suggestions for improving and refining specific issues have been made, and an opinion and vision of a particular problem have been formed.
	Requirements for the task not met	Most requirements have been met, but some issues have not been fully addressed, and the student does not have a complete grasp of the material	All requirements of the task have been fulfilled, and a free command of the material has been demonstrated.	All requirements of the assignment have been fulfilled, demonstrating a high level of knowledge in the applicant's assigned topic, the ability to critically evaluate various sources of information, thoughtfulness, and conclusions regarding the use of the acquired knowledge in professional activities.

5.2. Formative assessment

Formative assessment is a source of information about the success of learning outcomes for both teachers and applicants themselves. Formative assessment is usually conducted during the study of the OK. The results of the applicants' assessment tasks help the teacher make decisions about the nature of further training.

No.	**Elements of formative assessment**	**Date**
1	Short tests (up to 5 minutes)	Weekly, at the end of practical classes
2	Cooperation among students in the group and ability to work with focus	Weekly, throughout the semester
3	Careful review and analysis of completed tasks	Weekly, throughout the semester
4	Individual discussions about the results of completed assignments	Weekly, throughout the semester
5	Defense of practical work	Weekly, throughout the semester
6	Analysis of professional texts or data	Weekly, throughout the semester
7	Discussion of selected ways to solve the problem	Weekly, throughout the semester
8	Oral presentations, self-assessment, and peer assessment	Weeks 2-14
9	Mastering observation skills and abilities	Weekly, throughout the semester
10	Observing applicants while they perform tasks	Weekly, throughout the semester

5.3. Distribution of points awarded to students during the study of EC

Current testing and independent work								Total for modules and independent work	Sum
Module 1 0-40 points				Module 2 0-60 points					
T1	T2	T3	T4	T5	T6	T7	T8	100	100
10	10	10	10	15	15	15	15		

Distribution of ECTS points based on learning outcomes and semester (final) assessment in the form of an exam:

up to 100 points – based on the results of modular control during the semester;

Grading scale: national and ECTS

Total points for all types of educational activities	**ECTS grade**	**National scale grade**	
		for exam, course project (work), internship	**for credit**
90	**A**	excellent	pass
82	**B**	good	
75-81	**C**		
69-74	**D**	Satisfactory	
60-68	**E**		
35-59	**FX**	unsatisfactory with the possibility of retaking	not counted with the possibility of retaking
1-34	**F**	unsatisfactory with mandatory retake of the course	not credited with mandatory retaking of the course

6. LEARNING RESOURCES (LITERATURE)

6.1. Main sources

6.1.1. Textbooks, manuals

6.1.1. Textbooks, manuals

1. Agriculture: Textbook / Ed. I.D. Primak. K., 2020. 578 p.
2. Scientific foundations of modern systems of domestic agriculture: teaching aids for the preparation of higher education applicants in specialty 201 "Agronomy" / Ed. Dr. of Agricultural Sciences, Prof. I. D. Primak. Vinnytsia: Works, 2022. 319 p.
3. Ecological problems of agriculture: practical course: teaching aids for higher education applicants in specialty 201 "Agronomy" in higher education. agricultural. educational institutions / Ed. Dr. of Agricultural Sciences, Prof. I. D. Primak. Vinnytsia: Nilan-LTD, 2025. 167 p.
4. Development of intensive farming systems on irrigated lands of Ukraine: scientific and technological support / edited by R. A. Vozhegova. Kherson: OLDI-PLUS, 2020. 254 p.
5. Vozhegova R. A., Malyarchuk M. P., Granovska L. M. et al. No-till farming system in Ukraine: science and practice: monograph. Kherson: OLDI-PLUS, 2021. 218 p. ISBN 978-966-289-529-2
6. Siderates in modern farming: scientific and production publication (monograph) / Shuvar I. A. et al.. Ivano-Frankivsk: Symphony forte, 2018. 156 p.
7. Ecological problems of farming: Textbook / edited by V. L. Gudzia. Zhytomyr: Publishing house "Zhytomyr National Agroecological University". 2016. 708 p.
8. Manko Yu.P. Model of the ecological farming system in the Forest-Steppe of Ukraine. / Yu.P. Manko, O.L. Tsyuk // Methodological recommendations for implementation in production. - Kyiv: Agrarian Education, 2018. 36 p.

6.1.2. Methodological support

1. Mishchenko Yu.G. Modern aspects of agriculture. Course of lectures. For applicants of the third educational and scientific level of higher education. OS Doctor of Philosophy in Agronomy, specialty H1 - "Agronomy". Sumy: Sumy National Agrarian University, 2025. 110 p.
2. Mishchenko Yu. G. Modern aspects of agriculture. Methodological instructions for conducting laboratory and practical classes and independent work for applicants of the third educational and scientific level of higher education. OS Doctor of Philosophy in Agronomy, specialty H1 - "Agronomy". Sumy: Sumy National Agrarian University, 2025. 76 p.

6.1.3. Electronic resources

1. Legumes - fuel for organic farming: opportunities, problems, and crop rotation/ [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/ExperiencesTrefflerStriegel_LudwigAsam.pdf
2. Minimum tillage. FiBL, Switzerland, 2016 [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/Booklets/Zemlja_A4.pdf
3. Minimum tillage FiBL. 2015. [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/Hansueli_Dieraue_Mini_tillage_190302015.pdf
4. Spring harrow Striegel. [Electronic resource]. Access mode: https://www.youtube.com/watch?v=4sjcURjVNE8
5. Experience with mixed cropping in Switzerland (2009 to 2014). FiBL, Switzerland, 2016 [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-

ukraine/Hansueli_Dierauer_Mixed_crops_in_Switzerland_19032015.pdf
6. Mechanical weed control in vegetable production. Video. [Electronic resource]. Access mode: https://www.youtube.com/watch?v=TJWQwfzmAlY
7. Schmotzer cultivator with video control. Video. [Electronic resource]. Access mode: https://www.youtube.com/watch?v=wjjSxy_g90g
8. Preparing the soil for sowing with a Treffler cultivator. Video. [Electronic resource]. Access mode: https://www.youtube.com/watch?v=ZGtmB_ez1R0
9. Electronic encyclopedia of agriculture. Access mode: http: www2.agroscience.com.ua
10. System for protecting plants from weeds, pests, and diseases. Access mode: http://lib.chdu.edu.ua/pdf/posibnuku/246/16.pdf
11. Biological method. Access mode: http://www.referatcentral.org.ua/geography_economic_load.php?id=405
12. Predatory entomophages of false scale insects in southern Ukraine. Available at: http://web.znu.edu.ua/herald/issues/2009/biologia-2009-1/048-57.pdf
13. GrowHow. Is organic farming better than traditional farming? Access mode: https://www.growhow.in.ua/organichne-zemlerobstvo-krashhe-tradytsijnogo/
14. Library and information resources of the SNAU (book collection, periodicals, electronic media collections, etc.). Access mode: https://library.snau.edu.ua/.
15. SNAU Institutional Repository (scientific articles, dissertation abstracts and dissertations, teaching materials, student works, conference materials, teaching objects, scientific reports, etc.). Access mode: http://repo.snau.edu.ua/.
16. V. I. Vernadsky National Library of Ukraine. Access mode: http://www.nbuv.gov.ua/ (Kyiv, 3 Holosiivskyi Ave., +380 (44) 525-81-04) and other libraries.
17. System for protecting plants from weeds, pests, and diseases. Access mode: http://lib.chdu.edu.ua/pdf/posibnuku/246/16.pdf.
18. Agricultural sector of Ukraine. Access mode: http://agroua.net/
19. Growing organic sunflowers. Publisher: Research Institute of Organic Agriculture (FiBL) as part of the Swiss-Ukrainian project "Development of the organic market in Ukraine" (2012-2016), FiBL project office in Ukraine: [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/Booklets/Sonyashnuk_a4.pdf
20. FiBL Organic Rapeseed 2017 [Electronic resource]. Access mode: https://orgprints.org/33038/1/Organic_Rape_UA.pdf
21. Organic soybeans. Publisher: Research Institute of Organic Agriculture (FiBL) as part of the Swiss-Ukrainian project "Development of the organic market in Ukraine" (2012-2016), FiBL project office in Ukraine: [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/organic_soy_for_web.pdf
22. Organic corn. Publisher: Research Institute of Organic Agriculture (FiBL) as part of the Swiss-Ukrainian project "Development of the Organic Market in Ukraine" (2012-2016), FiBL project office in Ukraine: [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/ORGANIC_CORN_for_web.pdf
23. Organic wheat. Publisher: Research Institute of Organic Agriculture (FiBL) as part of the Swiss-Ukrainian project "Development of the Organic Market in Ukraine" (2012-2016), FiBL project office in Ukraine: [Electronic resource]. Access mode: https://ukraine.fibl.org/fileadmin/documents-ukraine/publications_presentations/%D0%9E%D1%80%D0%B3%D0%B0%D0%BD%D1%96%D1%87%D0%BD%D0%B0_%D0%BF%D1%88%D0%B5%D0%BD%D0%B8%D1%86%D1%8F_Organic_wheat.pdf

6.2. Additional sources

1. Crop rotations: Textbook / Ed. I.D. Primak. K., 2019. 365 p.
2. Mechanical tillage: history, theory, practice / Ed. I.D. Primak. K., 2019. 428 p.
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6.3. Software

1. Excel.
2. Word text editor.
3. Microsoft Office PowerPoint.
4. Electronic database with the Agrobase program. Web version: https://agrobaseapp.com/
5. Greenval program. Web version: https://greenval.org/about