MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SUMY NATIONAL AGRARIAN UNIVERSITY

Department of Selection and Seeding named after Professor M.D. Goncharov

«APPROVED»
by Head of the Department
of Selection and Seeding named
after Professor M.D. Goncharov
April 22, 2019
_____Onychko V.I.

PROGRAM OF THE EDUCATIONAL DISCIPLINE

Organization and technique of selection selection process of crops

PROGRAM SUBJECT AREA ***201 "Agronomy"***
(code and specialty name)

Faculty of Agrotechnology and Natural Resource Management

2019-2020 academic year

Program on **Organization and technique of selection process of crops** for postgraduates of educational and scientific level “Doctor of Philosophy”

The program is developed by: Kozhushko N.S., Doctor of Agricultural Sciences, Full Professor of the Department of Selection and Seeding named after Professor M.D. Goncharov

The program was approved at a meeting of the Department of Selection and Seeding named after Professor M.D. Goncharov

Minutes No. 21 dated 22.04.2019

Head of the Department _____ **Onychko V.I.**

Agreed:

Dean of the Faculty _____ **Kovalenko I.M**.

1. Description of the course

<table>
<tr><td rowspan="2">Indicators</td><td rowspan="2">Field of study, subject area, educational level</td><td colspan="2">Characteristics of the discipline</td></tr>
<tr><td>full-time education</td><td>evening form of training</td></tr>
<tr><td>Quantity of credits – 4</td><td>Field of study:
20 Agrarian Sciences and Foodstuffs</td><td colspan="2">Normative</td></tr>
<tr><td rowspan="6">Quantity of modules – 2

Quantity of content modules – 2

Total – 120</td><td rowspan="6">Subject area:
201 "Agronomy"</td><td colspan="2">The year of training:</td></tr>
<tr><td>2019-2020</td><td>2019-2020</td></tr>
<tr><td colspan="2">Course</td></tr>
<tr><td>2</td><td>2</td></tr>
<tr><td colspan="2">Semester</td></tr>
<tr><td>3</td><td>3</td></tr>
<tr><td>Weekly hours for full-time study:
classroom –4
individual work – 2</td><td>Educational level:
Doctor of Philosophy</td><td colspan="2">Lectures</td></tr>
<tr><td></td><td></td><td>44 hours</td><td>44 hours</td></tr>
<tr><td></td><td></td><td colspan="2">Practical classes, seminars</td></tr>
<tr><td></td><td></td><td>44 hours</td><td>44 hours</td></tr>
<tr><td></td><td></td><td colspan="2">Laboratory work</td></tr>
<tr><td></td><td></td><td>-</td><td>-</td></tr>
<tr><td></td><td></td><td colspan="2">Individual work</td></tr>
<tr><td></td><td></td><td>16</td><td>16</td></tr>
<tr><td></td><td></td><td colspan="2">Individual tasks</td></tr>
<tr><td></td><td></td><td>-</td><td>-</td></tr>
<tr><td></td><td></td><td colspan="2">Type of control:</td></tr>
<tr><td></td><td></td><td>credit</td><td>credit</td></tr>
</table>

Note. The ratio of hours of practical classes to individual work is (%): 84,6 (15,4)

2. The purpose and objectives of the discipline

The purpose: formation of a system of special advanced theoretical knowledge about the modern organization and basic technique of selection process of self-pollinated, cross-pollinated and vegetatively propagating field crops.

Objectives: the study of the discipline provides the acquisition of knowledge of the modern results of selection research to create high-quality, valuable for quality varieties of crops, adapted to certain conditions of cultivation on the basis of the existing organization and technique of the selection process.

After studying the discipline, the postgraduate should

know: problems of theory and modern technology of adaptive selection and stages of their solution;

be able to: operate the acquired knowledge to search for perspective directions of breeding for creation of fundamentally new selection forms of crops with desirable traits and development under them of an improved organization and innovative technique of selection process.

General competencies that the postgraduate should master

Code	General competencies
GC 1	Ability to learn, master modern knowledge, self-improve and form systematic scientific outlook
GC 2	Ability to critically analyze and evaluate modern scientific achievements, synthesis of holistic knowledge, complex problem solving
GC 3	Ability to abstract creative thinking, identify, receive, systematize, synthesize and analyze information from various sources with the use of modern information technologies in scientific activity.
GC 5	Ability to generate new ideas and make informed decisions to achieve goals.
GC 8	Ability to demonstrate initiative, responsibility, to motivate people and move toward a common goal.
GC 11	Ability to prepare scholarly texts, present, discuss, debate scientific results in their scientific work in national and foreign languages, to an extent sufficient for full understanding, demonstrating a culture of scientific verbal and written language.

Expected learning outcomes of the discipline

Code	Program results
PR 1	Possess modern advanced conceptual and methodological knowledge when performing research and / or professional activities and at the border of subject areas of knowledge.
PR 2	Have a thorough knowledge of the subject area and understanding of the profession, knowledge of the works of leading domestic and foreign scientists, fundamental work in the field of research, to formulate the purpose of their own scientific research as a component of the civilization process.
PR 3	Possess the principles of financial support for research work, structure of estimates for its implementation, preparation of the request for funding, preparation of reporting documentation.
PR 5	To know the principles of organization, forms of realization of educational and scientific process in modern conditions, its scientific, educational-methodical and normative providing, working out of scientific and informational sources in preparation of lessons, application of active teaching methods.
PR 9	Analyze scientific works, identifying debatable and under-researched issues, monitor scientific sources of information regarding a problem that is being investigated to establish their informational value through comparative analysis with other sources
PR 14	To use modern information and communication technologies in communication, information exchange, collection, analysis, processing, interpretation of sources
PR 17	Have the ability to act socially consciously and responsibly on the basis of ethical motives, to make informed decisions, to develop and self-improve

The correlation of the discipline results with the program results

Competencies	PR **1**	PR **2**	PR **3**	PR **5**	PR **9**	PR **14**	PR **17**
GC 1	*		*	*	*		*
GC 2		*	*	*		*	*
GC 3	*	*	*	*			
GC 4		*	*	*	*		
GC 8	*		*	*	*	*	
GC 9	*		*		*	*	*

GC 1. Ability to formulate a scientific problem, develop working hypotheses, determine relevance, purpose, tasks that need to be accomplished to achieve the goal, evaluate the resources needed and time to implement, which involves a deep rethinking of existing and creating new holistic knowledge and / or professional practice.

GC 2. Ability to integrate research into agro-production and agronomy.

GC 3. Ability to have information on the current state and tendencies of development of world and domestic agro-technologies of cultivation of crops.

GC 4. Ability to formalize specialized applied problems in the field of agro-industrial testing, to algorithmize them.

GC 8. Ability to process the obtained experimental data, to establish analytical and statistical relationship between them and the studied parameters based on the use of standard mathematical packages of information processing.

GC 9. Ability to develop a system of experimental research to practically confirm theoretical assumptions and to implement it in the agro-technological process.

3. Program of the discipline

(Approved by the Scientific Council of SNAU, Minutes No. 10 dated 23.04.2018*)*

Content Module 1: **Theoretical foundations of organizational and methodological work in selection**

Theme 1. Selection as a means of agriculture production. Selection as a cheap, efficient and ecologically pure factor of crop production growth. The role of selection in increasing yields over the past 25 years in Ukraine and in the world. Realization of genetic potential of productivity of grain crops, cereals, industrial crops of the northeastern forest-steppe of Ukraine.

Theme 2. Achievements, tasks and directions of modern selection of crops. The modern state variety fund for spiked grain crops, cereals and legumes, industrial and forage crops. The main tasks of selection: the creation of plastic, high-

performance, valuable in quality varieties, resistant to harmful organisms. Areas of modern selection: increase in productivity and quality improvement; enhancement of adaptive properties; increasing resistance to biotic and abiotic environmental factors; increasing the payment of ground and air unit.

Theme 3. Theoretical foundations of basic selection technology. Stages of development of selection theory and practice. The problem of theory and modern technology of adaptive selection. Concepts of genetic control of quantitative traits. Modeling in selection. Methodological problems of selection by macro signs.

Theme 4. Immunological basis of field crop selection. The task of selection for immunity. Searching a combination with high productivity. Principles of crop selection for immunity. Components of selection methodology for crop resistance to diseases and pests. Features of implementation of signs of stability of crops. Traditional and advanced selection methods for creating stable genotypes.

Theme 5. Organization of selection work with self-pollinated crops. The purpose of selection of self-pollinated crops. Specificity of the scheme of selection work. Seedbeds: their main purpose, types of work.

Theme 6. Organization of selection work with cross-pollinated crops. Specificity of work with cross-pollination crops. Scheme and technique of the selection process. Volume of the material.

Theme 7. Organization of selection work with vegetatively propagating crops. Features of crop biology. Specificity of selection. Scheme of selection work. The volume of accumulated seed of new variety.

Theme 8. Methodology of evaluation of selection material in the scheme of selection process. Accounting for economic and biological traits and properties created lines, varieties and hybrids by the selectionist. Types of plant evaluation in the early and final stages of selection. Classification of assessment methods. Evaluation at different stages of the selection process. Assessment on individual grounds. Evaluation of selection material for product quality, suitability for mechanized production. Criteria for evaluating the economic value of a variety.

Content Module 2: **Scientific and methodological foundations of the technique of separate crops selection process.**

Theme 9. Technique of selection process and field and harvesting works.

The validity of the assessment of selection material in the field. Typicality of the experience. Placing repetitions on a site. Size and shape of sections. Placing plots in repetitions. Specificity of field and harvesting techniques in the selection process.

Theme 10. Normative and methodological foundations of the technique of the selection process of grain crops. *Wheat selection.* Scheme of selection process from 4 units of seedbeds: starting material, selection, control and sort testing of preliminary and competitive. Volumes of selection work with winter (spring) wheat. Selection of winter rye. The technique of isolation and hybridization of evaluation of selection material by direct and indirect indicators, field and laboratory methods. *Selection of barley* for productivity, height of stem and resistance to lodging, diseases and pests, duration of the growing season, drought resistance, fodder and brewing properties. Scheme of continuous selection process of barley. *Oat selection* for yield, shallowness, drought resistance to shedding and shattering, disease resistance. Methodology and technique of selection material for self-pollinators. *Selection of corn.* Directions and tasks. Methods and techniques of breeding. Links of the selection process.

Theme 11. Scientific and methodological foundations of techniques of cereals selection process. *Buckwheat selection:* achievements, tasks and directions. The source material. Methods of selection. Methodology and technique of selection process. Scheme, features, prospects for its improvement. *Selection of millet* for productivity, high adaptability of grain quality, high protein content. The source material. Methods of selection. Features of the scheme of the selection process.

Theme 12. Scientific and methodological foundations of the technique of grain legumes selection process. Achievements, tasks and directions of selection of peas, soybeans. Methods, methodology and technique of selection process. The main elements of harvesting and accounting for pea plants. Soybean selection methodology and techniques.

Theme 13. Scientific and methodological bases of technique of technical oilseeds selection process. The main stages of scientific selection of sunflower. Heterosis and inbreeding in the crop selection. Tests of sunflower hybrids. The task and direction of selection of winter (spring) rapeseed. Usage of heterosis. Methodology and technique of crossing. Methods for evaluating rapeseed production.

Theme 14. Scientific and methodological bases of technology of technical sugar-bearing crops selection process. Introduction to sugar beets. Achievements and directions of selection, methods. Creation and evaluation of hybrid components. Scheme, organization and technique of selection.

Theme 15. Scientific and methodological bases of technology of technical starch crops selection process. Achievements, tasks and directions of potato selection. Features of selection for resistance to potato nematodes, for suitability for mechanized production, long-term storage, suitability for deep processing. Scheme, organization and technique of selection.

Theme 16. Scientific and methodological foundations of technique of technical spinning crops selection process. Achievements, tasks and directions of selection of hemp and flax-liqueur. Methodology and technique of selection process. Methods of evaluation of selection material. Improvement of the selection process.

Theme 17. Scientific and methodological bases of technique of perennial legume forage grasses selection process. Achievements and tasks of selection. Features of selection alfalfa and clover. Scheme, organization and technique of the selection process. Prospects for selection other crops.

Theme 18. Scientific and methodological foundations of technique of perennial cereals forage grasses selection process. Achievements and main directions of selection. Scheme, organization and peculiarities of selection of timber and timothy. Methods of evaluation of selection material. Improving the scheme of the selection process. Prospects for selection other crops.

4. Structure of the discipline

Title of content modules and themes	Quantity of hours					
	Full-time and evening forms of training					
	Total	including				
		lectures	Practical classes	Laboratory work	Individual tasks	Individual work
Module 1. Organization of crop selection process						
***Content Module 1:* Theoretical foundations of organizational and methodological work in selection**						
Theme 1. Selection as effective means for agriculture production	**1**	**1**	**-**	**-**	**-**	**-**
Theme 2. Achievements, tasks and directions of modern selection of crops	**1**	**1**	**-**	**-**	**-**	**-**
Theme 3. Theoretical foundations of basic selection technology	**1**	**1**	**-**	**-**	**-**	**-**
Theme 4. Immunological basis of field crop selection	**1**	**1**	**-**	**-**	**-**	**-**
Theme 5. Organization of selection work with self-pollinated crops	**2**	**2**	**-**	**-**	**-**	**-**
Тема 6. Organization of selection work with cross-pollinated crops	**2**	**2**	**-**	**-**	**-**	**-**
Theme 7. Organization of selection work with vegetatively propagating crops	**2**	**2**	**-**	**-**	**-**	**-**
Theme 8. Methodology of evaluation of selection material in the scheme of selection process	**6**	**2**	**-**	**-**	**-**	**4**
Total for Content Module 1	**16**	**12**	**-**	**-**	**-**	**4**
Module 2. Technique of crop selection process						
***Content Module 2:* Scientific and methodological bases of technique of some crops selection process**						
Theme 9. Technique of selection process and field and harvesting work	**2**	**2**	**-**	**-**	**-**	**-**
Theme 10. Scientific and methodological bases of technique of grain crops selection process	**30**	**8**	**20**	**-**	**-**	**2**
Theme 11. Scientific and methodological bases of technique of cereals selection process	**10**	**4**	**4**	**-**	**-**	**2**

Title of content modules and themes	Quantity of hours					
	Full-time education					
	Total	including				
		lectures	Practical classes	Laboratory work	Individual tasks	Individual work
Theme 12. Scientific and methodological foundations of the technique of grain legumes selection process	**10**	**4**	**4**	**-**	**-**	**2**
Theme 13. Scientific and methodological bases of technique of technical oilseeds selection process	**12**	**4**	**6**	**-**	**-**	**2**
Theme 14. Scientific and methodological bases of technology of technical sugar-bearing crops selection process	**5**	**2**	**2**	**-**	**-**	**1**
Theme 15. Scientific and methodological bases of technology of technical starch crops selection process	**5**	**2**	**2**	**-**	**-**	**1**
Theme 16. Scientific and methodological foundations of technique of technical spinning crops selection process	**10**	**4**	**4**	**-**	**-**	**2**
Theme 17. Scientific and methodological bases of technique of perennial legume forage grasses selection process	**2**	**1**	**1**	**-**	**-**	**-**
Theme 18. Scientific and methodological foundations of technique of perennial cereals forage grasses selection process	**2**	**1**	**1**	**-**	**-**	**-**
Total for Content Module 2	**88**	**32**	**44**	**-**	**-**	**12**
Total	**104**	**44**	**44**	**-**	**-**	**16**
Total	**104**	**44**	**44**	**-**	**-**	**16**

5. Themes and plan of lectures
(full-time and evening forms of education)

Order number	Theme title	Quantity of hours
1.	**Theme 1: Selection as means of agriculture production** 1. The role of selection in increasing yields in the world and in Ukraine 2. Realization of the genetic potential of productive varieties of the main groups of crops	1
2.	**Theme 2: Achievements, tasks and directions of modern selection of crops** 1. The modern state variety variety of crops 2. Tasks and directions of selection	1
3.	**Theme 3: Theoretical foundations of basic selection technology** 1. Problems of theory and modern technology of adaptive selection 2. Modeling in selection for increasing adaptive capacity	1
4.	**Theme 4: Immunological basis of field crop selection** 1. The task of selection for immunity 2. Traditional and advanced methods of selection for immunity	1
5.	**Theme 5: Organization of selection work with self-pollinated crops** 1. Features of biology of self-pollinated crops 2. The purpose of selection 3. Scheme of the selection process	2
6.	**Theme 6: Organization of selection work with cross-pollinated crops** 1. Features of biology of cross-pollinated crops 2. The purpose of selection. Specificity 3. Scheme of the selection process	2
7.	**Theme 7: Organization of selection work with vegetatively propagating crops** 1. Features of the biology of crop 2. The fundamental diversity of vegetatively propagating crops selection 3. Specificity of the scheme of selection process	2

Order number	Theme title	Quantity of hours
8.	**Theme 8: Methodology for evaluation of selection material in the scheme of selection process** 1. Classification of assessment methods 2. Evaluation at different stages of selection process 3. Assessment on individual grounds	2
9.	**Theme 9: Technology of selection process and field and harvesting works** 1. Reliability of evaluation of selection material in the field 2. Selection and preparation of the site for testing 3. Specificity of field and harvesting operations in selection process	2
10.	**Theme 10: Scientific and methodological foundations of the technique of grain crops selection process** 1. Achievements, tasks and directions of winter (spring) wheat selection 2. Methods, methodology and technique of selection process	2
11.	**Theme 10 (continuation)** 3. Values, origin, achievements, directions of winter rye selection 4. Methods, methodology and features of the technique of selection process	2
12.	**Theme 10 (continuation)** 5. The achievements, objectives and directions of barley and oats selection 6. Selection methods, methodology and techniques of selection process	2
13.	**Theme 10 (continuation)** 7. Origin and distribution of maize 8. Directions and tasks of selection 9. Specificity of methods and techniques of selection process	2
14.	**Theme 11: Scientific and methodological foundations of techniques of cereals selection process** 1. Achievements, tasks and directions of buckwheat selection 2. Methodology and technique of selection process 3. Prospects for improving the scheme of selection process	2

Order number	Theme title	Quantity of hours
15.	**Theme 11(continuation)** 4. Achievements, tasks and directions of millet selection 5. Methodology and technique of selection process 6. Features of the scheme of selection process	2
16.	**Theme 12: Scientific and methodological foundations of the technique of grain legumes selection process** 1. Achievements, tasks and directions of pea selection 2. Methods, methodology and technique of pea selection process 3. The main elements of accounting for the productivity of plants of peas	2
17.	**Theme 12 (continuation)** 4. Achievements, tasks and directions of soybean selection 5. Features of methods and techniques of soybean selection	2
18.	**Theme 13: Scientific and methodological bases of technique of technical oilseeds selection process** 1. The main stages of scientific selection of sunflower 2. Heterosis and its practical use 3. Inbreeding in sunflower selection 4. Tests of sunflower hybrids	2
19.	**Theme 13 (continuation)** 5. Tasks and directions of rapeseed selection 6. Creating heterosis hybrids 7. Methodology and technique of crossing	2
20.	**Theme 14: Scientific and methodological bases of technique of technical sugar-bearing crops selection process** 1. Introduction of sugar beet into crop 2. Achievements and directions of selection 3. Methods of selection of sugar beet 4. Creation and evaluation of hybrid components 5. Testing of hybrid combinations	2
21.	**Theme 15: Scientific and methodological bases of technology of technical starch crops selection process** 1. The achievements, objectives and directions of potato selection 2. Methods of potato selection 3. Scheme, organization and technique of selection	2

Order number	Theme title	Quantity of hours
22.	**Theme 16: Scientific and methodological bases of technology of technical spinning crops selection process** 1. Achievements, tasks and directions of selection of hemp 2. Methodology and technique of selection process 3. Methods of evaluation of selection material	2
23.	**Theme 16 (continuation)** 1. Achievements, tasks and directions of flax-liqueur selection 2. Methodology and technique of selection process 3. Methods of evaluation of selection material	2
22.	**Theme 17: Scientific and methodological bases of technique of perennial legume forage grasses selection process** 1. Achievements, tasks and directions of selection 2. Selection of alfalfa 3. Selection of clover	1
23.	**Theme 18: Scientific and methodological bases of technique of perennial cereal forage grasses selection process** 1. Achievements, tasks and directions of selection 2. Selection of bromus 3. Selection of timothy	1
Total:		**44**

8. Themes of practical seminars (full-time and evening form of study)

Order number	Theme title	Quantity of hours
1.	Scheme, organization and technique of winter soft wheat selection, prospects for improvement	2
2.	Scheme, organization and technique of spring wheat selection and prospects for their improvement.	2
3.	Scheme, organization and technique of winter durum wheat selection, prospects for improvement	2
4.	Scheme, organization and technique of spring wheat selection, prospects for improvement	2
5.	Links and techniques of winter rye selection process, prospects for their improvement	2

6.	The scheme, organization and technique of winter triticale selection, prospects for their improvement.	2
7.	Scheme, organization and technique of spring triticale selection, prospects for their improvement.	2
8.	Links, organization and technique of spring barley selection process, prospects for improvement.	2
9.	Scheme, organization and technique of oat selection, prospects for improvement.	2
10.	Links, organization and technique of the selection process, field and harvesting operations in maize, their prospects.	2
11.	Modern scheme, organization and technique of buckwheat selection and their improvement.	2
12.	Scheme, organization, technique of millet selection process, their prospects.	2
13.	Links and techniques of selection, field and harvesting in pea sowing, improvement.	2
14.	Scheme, organization and technique of selection process, field and harvesting works in soybeans, their prospects.	2
15.	Links of the selection process with sunflower, features of technology and improvement of creation of various seedbeds and harvesting their crops.	2
16.	Modern and perspective schemes, organization and technique of selection, field and harvesting operations in winter rapeseed.	2
17.	Modern and perspective schemes, organization and technique of selection, field and harvesting works in spring rapeseed.	2
18.	Stages of sugar beet selection process and peculiarities of their technique, prospects.	2
19.	Scheme, organization and technique of selection, field and harvesting operations in potatoes, improvement.	2
20.	Main stages and technique of selection process, field and harvesting work in hemp, their perfection.	2
21.	Modern and perspective schemes, organization and technique of selection, field and harvesting works in linen.	2
22.	Specificity of methodology and technique of modern selection process of perennial herbs and their improvement.	2
Total		**44**

9. Individual work

Order number	Theme title	Quantity of hours
1.	Methodology of evaluation of selection material in the scheme of selection process of separate crops	4
2.	Prospects for the organization of technology for grain crops process	2
3.	Improvement of the technique of cereals and legumes selection process	4
4.	Improvement of organization and technique of technical oilseeds selection	2
5	Improvement of scheme, organization and technique of selection, field and harvesting works of technical sugar and starch crops	2
6.	Improvement of organization and technique of technical spinning crops selection process	2
	Total:	**16**

11. Methods of teaching

1. Methods of teaching by source of knowledge:

1.1. ***Verbal***: lecture, methodical instructions.

1.3. ***Practical***: laboratory method, practical work.

2. Methods of teaching by the nature of logic of knowledge:

2.1. ***Analytical***

3. Learning methods for the nature and level of individual mental activity:

3.1. Reproductive (possibility of application of the learned material into practice)

4. Active teaching methods – use of technical means of study, excursions, self-assessment of knowledge, use of basic lecture notes.

5. Interactive learning technologies – use of multimedia technologies.

In case of small groups the following teaching methods are used:

Personalized Learning

Differentiated Instruction

Inquiry-based Learning

12. Control methods

1. Rating control over a 100-point ECTS rating scale.

2. Conducting intermediate control during the semester (intermediate attestation).

3. Multicriteria assessment of postgraduate' current work:

- the level of knowledge demonstrated in practical classes;
- results of implementation and protection of practical works;
- written tasks in the course of control work;

Assessment of the postgraduate is carried out by the commission (the committee includes members of the department)

13. Distribution of points

Current testing and individual work																		**Total for Modules and individual work**	**Attestation**	**Total**
Content Module 1 – 30 points								**Content Module 2 – 40 points**										**I W**			
T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8	T 9	T 10	T 11	T 12	T 13	T 14	T 15	T 16	T 17	T 18	15	85	15	100
3	3	3	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4				

Rating scale: national and ECTS

Total points for all activities	**ECTS grade**	**Rating on a national scale**
		For exam
90 – 100	**A**	**excellent**
82-89	**B**	**good**
75-81	**C**	
64-73	**D**	**satisfactorily**
60-63	**E**	
35-59	**FX**	**satisfactorily**
0-34	**F**	**unsatisfactory with the possibility of reassembly unsatisfactory with the compulsory re-study of the discipline**

14. Methodological support

1. Конспект лекцій з дисципліни Селекція окремих культур і сортознавство, Ч. 1, Зернові культури / Н.С. Кожушко. – Суми: СНАУ, 2017. – 72 с.

2. Методичні вказівки щодо проведення лабораторно-практичних занять з дисципліниСелекція окремих культур і сортознавство / Н.С. Кожушко. – Суми: СНАУ, 2018. – 40 с.

3. Методичні вказівки щодо виконання самостійної роботи з дисципліниСелекція окремих культур і сортознавства/Н.С.Кожушко. – Суми:СНАУ, 2018. – 25 с.

4. Методика проведення експертизи сортів рослин картоплі та груп овочевих, баштанних, пряно-смакових на придатність до поширення в Україні (ПСП) / За ред. Ткачик С. О. – К. : ТОВ «Нілан-ЛТД», 2014. – 96 с.

15. Recommended references

1. Спеціальна селекція польових культур: [навч. посіб.] / В.Д. Бугайов, А.В. Власенко, С.П. Васильківський та ін.; за ред. М.Я. Молоцького. – Біла Церква, 2010. – 368 с.

2. Селекція і насінництво с.-г. культур: [підручник] / М.Я.Молоцький, С.П. Васильківський, В.І. Князюк, В.А. Власенко. – К.: Вища школа, 2006. – 463 с.

3. Селекція та насінництво польових культур: [практикум] / М.Я. Молоцький, С.П. Васильківський, В.І. Князюк. – Біла Церква, 2008. – 192 с.

4. Селекція та генетика окремих культур: [навч. посіб.] / М.М. Чекалін, В.М. Тищенко, М.Е. Баташова. – Полтава: ФОП Говоров С.В., 2008. – 368 с.

Accessory References

1. Василюк П.М. Етапи формування національних сортових рослинних ресурсів в системі державного законодавчого регулювання України / П.М. Василюк // Сортовивчення та охорона прав на сорти рослин. – К. : ІЕСР, 2013. – № 4(21). – С.75-80.

2. Василюк П.М. Оцінка стабільності та пластичності показників продуктивності та якості нових сортів пшениці м’якої озимої в умовах Лісостепу України / П.М. Василюк // Сортовивчення та охорона прав на сорти рослин. – № 1(222). – 2014. – С. 15-19.

16. Information resources

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