«KAZAKH NATIONAL AGRARIAN RESEARCH UNIVERSITY» Non- commercial joint-stock society

DEVELOPMENT PLAN FOR THE EDUCATIONAL PROGRAM

HORTICULTURE

(6B08103, 7M08103, 8D08103)

For 2024-2028

Recommended by the Academic Committee of the Faculty of Agrobiology Protocol No. 10 dated 24.05.2024 Reviewed at the extended meeting of the Department of Horticulture, Plant Protection, and Quarantine

Protocol No. 10 dated 16.05.2024.

Almaty, 2024

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1	Basis for Developing the EP	The strategy and theme of the EP development plan align with the
	Development Plan	educational policy of the Republic of Kazakhstan.
		Strategic development plans of the Department of Horticulture,
		Plant Protection, and Quarantine for 2024–2028.
2	Key Developers of the EP	Head of Department, PhD in Agricultural Sciences, Associated
	Development Plan	Professor M.D. Yesenaliyeva
	_	Master of Agricultural Sciences, Senior Lecturer R.S. Mazhitova
		Employer: LLP "Kazakh Research Institute of Horticulture,"
		Chairman of the Board, Doctor of Agricultural Sciences T.E.
		Aitbayev
		Students: S. Ergaraev
		Graduate: Z. Murat.
3	Implementation Timeline for	2024 - 2028
	the EP Development Plan	
4	Funding Volume and	State Budget and Contractual Basis
	Sources	
5	Expected Outcomes of the	- Training of qualified specialists in horticulture and nut production
	EP Development Plan	in accordance with national and international standards.
	-	- Updating and improving the content of the EP, including course
		titles that define modern professional competencies.
		-Integrating innovative teaching technologies into the educational
		process.

1. Educational Program (EP) Development Plan Passport

2 Analytical Justification of the Program

2.1 Information on the Educational Program

The content of the educational program is defined by the following documents:

- License for conducting the educational program KZ89LAA00031870, valid indefinitely, issued on 05.08.2021.
- Certificate No. AB 3129 from NAAR, valid from 24.12.2020 to 23.12.2025.

State Compulsory Standard for Higher and Postgraduate Education. Issued by the Minister of Science and Higher Education of the Republic of Kazakhstan on July 20, 2022, Order No. 2. Registered with the Ministry of Justice of the Republic of Kazakhstan on July 27, 2022, No. 28916.

Educational programs are implemented through curricula and course programs.

- In the bachelor's program, the educational program 6B08103 "Horticulture" consists of 11 modules.
- In the master's program, the educational program 7M08103 "Horticulture" (scientific and pedagogical, 2 years) includes 5 modules.
- The doctoral program offers a scientific and pedagogical track under the educational program 8D08103 "Horticulture," comprising 2 modules.

In the 2024-2025 academic year, the bachelor's program enrolls a total of 54 students: 48 in the Kazakh language track, 6 in the Russian language track, and 2 on a fee-paying basis (1 funded by the "People of Kazakhstan" foundation, and 1 post-military student attending tuition-free).

The master's program comprises 4 students: 3 funded by government grants and 1 international student studying on a paid basis.

The doctoral program includes 3 students, all supported by government grants.

Academic	: EP 6B08103-					EP 7M08103-				EP 8D08103-				
year	Horticulture					Horticulture				Horticulture				
	In particular					In particular				In particular		•		
	Total	Kazakh	Russian	Grant	Contract	Total	Kazakh	Russian	Grant	Contract	Total	Kazakh	Russian	Grant
2022- 2023	76	71	5	72	4	13	13		13		6	6		6
2023- 2024	48	48		47	1	6	6							
2024- 2025	47	47	6	44	3	4	4		3	1	3	3		3
2025- 2026	65	49	16	60	5	6	6		5	1	6	6		6
2026- 2027	70	53	17	67	3	6	6		6		8	8		8
2027- 2028	80	57	23	75	5	8	8		8		7	7		7
TOTAL	386	325	57	365	21	43	43		35	2	30	30		30

The group of students is presented in Table 1. Table 1 – Group of Students by Educational Program

2.3 Internal Conditions for EP Development

The department is well-equipped with modern educational and laboratory facilities, technical training tools, and visual and demonstration materials to support the training of bachelor's, master's, and doctoral students.

The department operates two educational and research laboratories and lecture halls equipped with advanced technical equipment: a Snol 58/350 thermostat, MWP 150N laboratory scales, a display cabinet for showcasing achievements (room 420), an oxygen sensor, Inter Write DualBoard 1279 interactive whiteboard, infrared dryer, modular greenhouse, portable gas analyzer ANKAT-76B-11 (three-component), NOVA5000 portable data logger, pH and soil moisture measurement devices, BenQ MP 622 projector, Fourier NOVA Air wireless sensor system, Lamotte STH-14 soil laboratory (code 5010-01), and additional instruments. All labs are fitted with exhaust hoods to maintain proper ventilation.

The cleanliness and sanitation of the laboratories and classrooms meet required standards. Each classroom has a passport detailing seating, inventory, and area specifications.

Educational programs are fully supported by 100% course materials. New academic and research literature aligned with the specialty, such as *Propagation of Fruit Species*, *Training and Pruning of Fruit Trees*, *Organic Fruit Growing*, *Biological and Technological Foundations of Cultivating Orchard Crops*, and *Modern Vegetable Growing in Open and Closed Fields*, has been acquired.

Faculty members have personal computers and unrestricted internet access.

One of the department's objectives is to develop a joint educational program with leading universities, focusing on integrating into the global scientific community through academic

exchanges for both faculty and students. Academic mobility is established with institutions such as S. Seifullin Kazakh Agrotechnical University (Astana), Zhangir Khan West Kazakhstan Agrarian-Technical University (Oral), Saint Petersburg State Agrarian University (Russia), the Plant Protection Research Institute (Poland), and universities in Serbia, Hungary, Malaysia, the Czech Republic, Germany, and Turkey.

Foreign scholars have been invited to deliver lectures, including Dr. Ismail Demirtas, Deputy Director of the Egirdir Research Institute (Turkey), and Rina Kamenetsky (Israel). These international experts are also developing course materials in English.

Efforts have been made to involve industry professionals in the educational process, bridging theory and practice to help graduates adapt more quickly to the professional environment. Notable invited experts include:

• Dmitry A. Kostylev, PhD in Agricultural Sciences, Associate Professor, owner of the "Flower Garden of the Urals" nursery (Ufa, Russia), Chair of the Scientific Committee, and honorary member of the Central Asian Nursery Association.

• Roman B. Shneiderman, General Director of the landscape bureau "Envicon-A."

• T.E. Aitbayev, doctor of agricultural sciences, Professor, and Chair of the Board at LLP KazRIFVG.

• B.A. Duisembekov, candiadate of agricultural sciences, professor, and Chair of the Board at LLP KazRIPPG named after Zh. Zhiembaev.

• Alexander N. Dragan, Director of the "Semirechye Nursery" LLP.

2.4 Characteristics of the Surrounding Community

A priority in developing the educational program is student-centered learning, which aims to foster students' individual abilities and shape them into active and engaged participants in the educational process.

The educational environment's foundation is its social component, which, for this program, includes KazNARU's traditions and reputation, mutual accountability, a supportive moral and emotional climate, and social support for students. Additionally, extracurricular activities, such as creative groups, sports clubs, and academic societies, play a crucial role.

Another key component is the intellectually stimulating environment, which includes:

• Modern educational technologies, such as interactive teaching methods.

• A system of electives (business games, excursions).

• A selection of elective courses across various educational program areas for topic-specific knowledge.

• Intellectual competitions at different levels, including subject and interdisciplinary Olympiads, contests, tournaments, intellectual marathons, and games.

• A support system for gifted students.

All elements of this educational environment are accessible, providing opportunities for self-realization, which enhances motivation for academic activities and develops communication skills.

2.5 Information on Faculty Implementing the EP

The department's teaching staff comprises 34 members, including permanent faculty: 2 Doctors of Science, 13 Candidates of Science, 2 PhDs, and 10 Masters. Part-time instructors include 2 Candidates of Science. The department's educational support staff consists of a senior laboratory assistant and 4 laboratory assistants, totaling 5 positions. The degree-holding rate in the department is 65%, with an annual trend toward growth.

Faculty members have opportunities to enhance their qualifications at leading research centers in Kazakhstan and abroad. In recent years, faculty members have completed internships at international universities. For example:

- Professor S.N. Oleichenko participated in the USAID Project on modeling and original techniques for pruning apple, cherry, and grape trees and preparing orchards for winter (Turkmenistan). Professor Oleichenko was also invited to lecture at Fergana State University in Uzbekistan and Multan University in Pakistan to promote inter-university collaboration.

- PhD D. Seydazimova attended a seminar on the development of agriculture in Kazakhstan, organized by the Xinjiang Uygur Autonomous Region (XUAR) Department of Commerce and the XUAR Center for Commercial Cooperation and Scientific and Technical Exchange, with support from the Ministry of Commerce of the People's Republic of China.

Most faculty members have completed a 72-hour professional development course on "IT Competencies and Online Teaching Methods in the Field of Agronomy."

The department's faculty members specializing in horticulture, plant protection, and quarantine engage in regular professional development. They also conduct seminars and round tables on pressing issues in fruit and vegetable production, viticulture, greenhouse vegetable production, and post-harvest processing and storage technologies.

Coursera

Today, distance learning is widely popular and provides opportunities for both primary and supplementary education from anywhere in the world. Distance learning enables students to choose their study times, create personalized schedules, and complete assignments in a comfortable setting, supporting individualized learning, learner autonomy, openness, and lifelong education.

The "Coursera" platform currently serves as an educational platform that connects numerous universities worldwide, offering a wide range of free courses on various topics. Upon meeting all course requirements, participants receive a Statement of Accomplishment or Statement of Accomplishment with Distinction. There is also the option of obtaining a Verified Certificate, which confirms that a specific participant has completed the course requirements, sometimes including the number of study hours. Most faculty members in the department hold these certificates and have access to the international Coursera platform.

Currently, the faculty implementing the bachelor's, master's, and doctoral "Horticulture" programs actively integrate new information technologies and multimedia tools into their teaching processes. Video presentations, educational films, and interactive teaching methods are used in classes, enhancing students' understanding and retention of the material.

The faculty publish scientific articles not only in local industry journals but also in impactfactor journals indexed in the Web of Science and Scopus databases.

2.6 Characteristics of educational program achievements

Key achievements of the educational program include the preparation of targeted specialists, scientific-pedagogical staff, and the conduct of research based on agreements with specialized research institutes and agricultural enterprises. Partner organizations include Kazakh Research Institute of Horticulture, Kazakh Research Institute of Agriculture and Plant growing, Kazakh Research Institute of Grain Farming named after A.I. Baraev, Kazakh Research Institute of Livestock and Feed Production, Kazakh Rice Research Institute, as well as the department's experimental fields at the "Agrouniversity" Educational and Experimental Station in Baibulak, and the Almaty branch of the State Scientific Production Center for Land Resources, among others.

Employer satisfaction is a key performance indicator. Collaborative work with employers on professional practice programs and dual education has enabled the program to meet its objectives. To assess employer satisfaction with the quality of graduate training and improve professional practice programs, round tables are regularly conducted at the university.

Agreements have been established with leading international institutions where students can undertake various types of internships, including:

- Russian State Agrarian University Moscow Timiryazev Agricultural Academy (Moscow)
- Belarusian State Agricultural Academy (Gorki)
- Stavropol State Agrarian University (Stavropol)

Research by the department's scientists aligns with priority areas of agricultural science, forming part of national programs and offering both theoretical and practical value. The department oversees several scientific projects, with active participation from students, master's

students, and doctoral candidates. The funded research topics are both fundamental and applied in nature.

Under the national budget programs of the Ministry of Education and Science of the Republic of Kazakhstan, the following scientific research projects have been grant-funded:

1. "Effectiveness of New Bioorganic Fertilizers and Plant Growth Stimulators on PotatoesandVegetableCropsinSoutheasternKazakhstan"Project Leader: Professor T.E. Aitbayev

2. "Improvement of Potato Planting Material from Viral Infections Using Innovative Methods and Adaptation for Introducing Higher-Yielding Varieties of Potatoes, Vegetables, and Melons of Foreign Selection for Soil and Climatic Conditions in Southeastern Kazakhstan" Project Leader: Professor T.E. Aitbayev

3. Under the guidance of Professors T.E. Aitbayev and G.N. Kairova, research is conducted on testing new plant protection products for potatoes, vegetables, fruits, and grapes. Collaborating companies include LLP "Astana-NAN" (Kazakhstan), Arysta LifeScience (Great Britain), and LLP "Bayer Kaz."

4. "Development of Competitive, Stress-Resistant Varieties of Fruit, Berry, and Grape Crops for Eco-Adaptive Intensive Horticulture; Improvement and Propagation Using Biotechnology and IT"

Project Leader: G.N. Kairova

5. "Study of Major Walnut Diseases and Molecular-Genetic Justification for the Resistance of Promising Varieties to Economically Important Pathogens" Project Leader: G.N. Kairova

6. "Identification of Resistance Sources to Wheat Root Rot Caused by *Bipolaris sorokiniana* and *Fusarium culmorum* Using Phytopathological and Molecular Approaches" Project Leader: E.B. Dutbayev

7. "High-Efficiency Production of the Valuable Orchard Crop Sea Buckthorn. Project Code RNTTD-22RK0093"

Project Leader: S.N. Oleichenko.

Professors from the department have conducted seminars, webinars, and consultations as part of the implementation of budget program 267, "Enhancing Knowledge Accessibility and Scientific Research":

1. "Fertilizer and Plant Protection Systems for Vegetable Crops; Efficient Irrigation Systems and New Technologies for Vegetable Cultivation" at KH "Rassvet," Almaty Region. Consultant: Prof. T.E. Aitbayev, Doctor of Agricultural Sciences.

2. "Key Pests and Diseases of Fruit Crops and Integrated Pest Management" at LLP "Saryagash Zher Syi," Turkestan Region. Consultant: Assoc. Prof. G.N. Kairova, Candidate of Agricultural Sciences.

3. "Original Technology for Creating Intensive, Trellis-Free Orchards on Medium-Sized Rootstocks" at LLP "Almaprodex," Almaty Region. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

4. "High-Efficiency Production of the Valuable Orchard Crop Sea Buckthorn" at LLP "Semirechye Nursery," Almaty Region, and "Fruit-Berry Nursery Merke," Zhambyl Region. Seminar by Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

5. "Walnut and Black Walnut: Prospects for Cultivation in Kazakhstan" webinar at KazNAIU. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

6. "Almonds, Pistachios, and Hazelnuts: Distribution and Technological Aspects of Cultivation" webinar at KazNARU. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

7. "Technological and Varietal Aspects of Adaptive Viticulture in Kazakhstan" webinar at KazNARU. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

8. "Promising Techniques for Reducing Tree Growth Vigour and Accelerating Fruiting" webinar at KazNARU. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

9. "Golden Currant and Blackberry: Prospective Diversification Crops for Kazakhstan's Horticulture" webinar at KazNARU. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

10. "Organic Technology for Creating Standard Vineyards in Southern Kazakhstan" at LLP "Saryagash Zher Syi," Turkestan Region. Consultant: Prof. S.N. Oleichenko, Doctor of Agricultural Sciences.

11. "Promising Methods for Producing Fruit Crop Planting Material" webinar at KazNARU. Consultant: Assoc. Prof. M.D. Yesenaliyeva, Candidate of Agricultural Sciences.

12. "Innovative Technologies for Producing Planting Material of Fruit and Berry Crops" at Atyrau Agrarian and Technical College named after O. Kushekova, Atyrau Region. Consultant: Prof. G.A. Kampitova, Candidate of Agricultural Sciences.

13. "Advanced Technologies for Cultivating Fruit and Berry Crops" at KH "Koktal," Turkestan Region. Consultant: Prof. G.A. Kampitova, Candidate of Agricultural Sciences.

14. "Agrotechnical Foundations for Establishing an Intensive Orchard" at Atyrau Agrarian and Technical College named after O. Kushekova, Atyrau Region. Consultant: Prof. G.A. Kampitova, candidate of agricultural sciences.

15. "Virus-Free Planting Material Production for Fruit and Berry Crops Using Biotechnology" at KazNAU. Consultant: assoc. prof. L.S. Yerbolova, PhD.

Dual Education

Dual education (DE) provides students with both theoretical knowledge in the educational institution and practical skills in a real production environment.

For 3rd and 4th-year students, dual education is conducted as pre-graduation internships at the Kazakh Research Institute of Horticulture during the 6th and 8th semesters. The group includes 15 third-year students (9 from the Kazakh division, 6 from the Russian division) and 6 fourth-year students, totaling 21 students. The courses covered are *Viticulture with Basics of Ampelography*, *Fruit Growing*, and *Vegetable Growing*.

3. Challenges Addressed by the EP Development Plan

• Limited availability of educational materials in foreign languages

• Insufficiently equipped research laboratories with next-generation equipment and instruments

• Low motivation among the faculty to publish scientific articles in impact-factor journals.

4. Main Goals and Objectives of the EP Development Plan

The goal of the educational program 6B08103 - Horticulture is to train highly qualified horticulture specialists with professional skills in developing efficient methods for cultivating fruit and vegetable crops.

The goal of the educational program 7M08103 – *Horticulture* is to prepare competitive horticulture specialists for public, local, regional, and international institutions, as well as to develop scientific and pedagogical staff for higher education institutions and colleges.

The goal of the educational program 8D08103 – *Horticulture* is to train highly qualified experts in horticultural science with strong ethical and moral values, contributing to the nation's food security and addressing modern scientific, technical, social, and economic challenges. These specialists will have a high level of professional culture, civic responsibility, and the capability to identify and address interdisciplinary scientific and practical problems. They will be equipped to teach in universities and colleges and conduct research and management activities in the agro-industrial sector.

To achieve these goals, the following objectives are set:

• Create an innovative educational environment.

- Expand the educational scope.
- Align the educational program with research activities for students.
- Ensure the level of education meets current requirements and practical needs.
- Develop human resource potential.

• Enhance language training for faculty by requiring attendance at language courses offered both within and outside the university.

• Expand international cooperation with foreign universities through research projects and academic mobility for students and faculty.

5. Expected Outcomes of the EP Development Plan

• Improved efficiency of the education system and continuous professional growth of the department's faculty.

• Modernization of human resources, information resources, and material and technical capabilities.

• Enhanced quality of education.

• High demand for graduates of the *Horticulture* educational program in the job market.

6. Risk Mitigation Measures for the EP

Various risks may impact the successful implementation of the educational program, and preventive measures have been developed to reduce these risks:

• Attracting a student body on a fee-paying basis.

• Enhancing faculty efforts to develop electronic educational resources in the state language and integrate them into the curriculum.

• Establishing agreements with enterprises for internship placements and potential employment opportunities.

• Increasing faculty participation in international research institutes and universities to support academic mobility and professional development.

• Actively participating in competitions announced by Kazakhstani ministries and international organizations to secure grants for research projects.

• Timely and planned procurement of modern equipment and continual updating of the inventory of devices and tools.

N⁰	Events	Implementation		
		dates		
1	Enhancement of Bachelor's, Master's, and Doctoral Educational	2024-2028		
	Programs with Input from Potential Employers			
2	Development of a plan for publishing textbooks, educational	2024-2028		
	materials, and methodological guidelines for educational programs.			
3	Active implementation of academic mobility for students and	2024-2028		
	faculty.			
4	Expansion of scientific collaboration and partnership ties with	2024-2028		
	leading international universities and research centers; attracting			
	prominent foreign scientists to conduct research and deliver lectures			
	for students.			
5	Equipping classrooms with modern equipment.	2024-2028		
5 6	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of	2024-2028 2024-2028		
5 6	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of	2024-2028 2024-2028		
56	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of Kazakhstan, as well as projects commissioned by regional specialized	2024-2028 2024-2028		
5 6	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of Kazakhstan, as well as projects commissioned by regional specialized public councils and economic entities.	2024-2028 2024-2028		
5 6 7	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of Kazakhstan, as well as projects commissioned by regional specialized public councils and economic entities. Publication of scientific articles in journals indexed in Web of Science and	2024-2028 2024-2028 2024-2028		
5 6 7	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of Kazakhstan, as well as projects commissioned by regional specialized public councils and economic entities. Publication of scientific articles in journals indexed in Web of Science and Scopus, and in scientific journals with impact factors.	2024-2028 2024-2028 2024-2028		
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5 6 7 8 9	Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of Kazakhstan, as well as projects commissioned by regional specialized public councils and economic entities. Publication of scientific articles in journals indexed in Web of Science and Scopus, and in scientific journals with impact factors. Undergoing independent national specialized accreditation for the educational program "6B08103, 7M08103, 8D08103 Horticulture." Participation in the national ranking of educational programs among universities in the Republic of Kazakhstan.	2024-2028 2024-2028 2024-2028 2028 Each year		
5 6 7 8 9 10	 Equipping classrooms with modern equipment. Submission of applications for scientific projects through the Ministry of Agriculture, the Ministry of Education and Science of the Republic of Kazakhstan, as well as projects commissioned by regional specialized public councils and economic entities. Publication of scientific articles in journals indexed in Web of Science and Scopus, and in scientific journals with impact factors. Undergoing independent national specialized accreditation for the educational program "6B08103, 7M08103, 8D08103 Horticulture." Participation in the national ranking of educational programs among universities in the Republic of Kazakhstan. Preparing students for and participating in Republican Olympiads for the 	2024-2028 2024-2028 2024-2028 2028 Each year 2024-2028		

7. List of Activities for the EP Implementation Plan

11	Establishing agreements with relevant enterprises for students to undergo	2024-2028	
	industrial and research internships.		

8. Mechanism for Implementing the Educational Program Development Plan

- 1. Legislative and Regulatory Acts: Law of the Republic of Kazakhstan "On Education" dated July 27, 2007, No. 319-III.
- 2. Development Strategy of Kazakh National Agrarian University: Development Program 2024-2028.

9. Assessment of the Socio-Economic Efficiency of the Educational Program Development Plan

The implementation of the educational program development plan is expected to achieve the following socio-economic effects:

- Improvement in the quality of professional education and, consequently, the competitiveness of specialists in the fields of soil science and agrochemistry.
- Preparation of graduates who meet the needs of potential employers.
- Increased involvement of employers in the professional training of personnel.
- Increased demand for qualified personnel and optimization of their age structure.
- Expansion of opportunities for the professional self-realization of young people.
- Prevention of the outflow of promising teaching staff to other sectors.
- Modernization of educational and material resources (updating educational, laboratory, computer, and technological facilities to meet current standards and requirements).

S (strangth) - Strongths	W(waaknass) - Waaknassas
Ovality of students with foundational	Uigh taashing workload for faculty
-Quanty of students with foundational	- High teaching workload for faculty.
competencies in biology and chemistry.	- Low competitiveness and limited demand for
- Student participation in community	scientific research results in the industry.
activities.	- Insufficient motivation of young scientists for
- High-quality faculty composition.	research work.
- Faculty involvement in scientific research	- Low proficiency in foreign languages among
projects funded by budget programs and	faculty.
student, master's, and doctoral student	- Low rate of article publications in journals.
engagement in research work.	
- Availability of training farms "Saimasai" and	
"Baibulak" for academic and industrial	
internships, as well as for conducting research.	
- Organization and implementation of	
fundamental, applied, and experimental design	
projects in collaboration with research	
institutes and industry, providing opportunities	
for academic, industrial internships, and dual	
training for students, master's, and doctoral	
students at these facilities.	
O (opportunity) – opportunities	T (threat) – threats
- Access to international educational and	- Competition in attracting faculty and
research resources.	students.
- Additional course training on the	- Outflow of youth and high school graduates
international platform "Coursera".	abroad.
- Opportunity to invite "Guest Lecturers".	- Prevalence of distance learning, reducing the
- Organization of international and national	demand for in-person education.
scientific conferences, seminars, and training	
sessions.	

10. SWOT - Analysis

11. Graduate Model

	6B08103	7M08103	8D08103
Be able to:	 6B08103 carry out pre-sowing preparation of vegetable and fruit crop seeds depending on the shelf life of the seed material, biological characteristics of the crop; grow high-quality seedlings of vegetable crops and high-quality planting material of fruit and berry crops; calculate the optimal feeding area of vegetable, berry, fruit crops depending on the variety, breed, morphological characteristics of the grown plants; care for vegetable crops and fruit plantations; form the crown of trees depending on the type of rootstock; analyze the results of laboratory studies of the chemical composition of vegetables and fruit and berry crops 	 7M08103 plan and organize scientific research; use knowledge of fundamental sciences to solve specific research, information retrieval, and methodological problems; perform organizational and technical work on the production of horticultural crops; carry out work on the latest varieties of horticultural and fruit crops; develop technologies for improving and increasing the yield of horticultural and fruit crops; work with modern means of computing, office equipment, communications. determine the modes and periods of storage of products and planting material; 	 BD08103 test and implement progressive technological methods that allow obtaining high yields of fruit, berry, vegetable, melon crops and high-quality grapes, organize storage, processing and marketing of products for farms and other fruit and vegetable growing enterprises taking into account their land and soil-climatic resources; draw up technological maps for the cultivation of fruit and vegetable crops and grapes with the introduction of elements of innovative technology; calculate the need of farms for seeds, fertilizers, pesticides, fuel and lubricants, agricultural machinery and tools; regulate agricultural machinery, equipment; establish the norm and timing of sowing seeds and planting material of vegetable crops, fertilizers, pesticides, irrigation rates, etc.; test and implement progressive technological methods that allow obtaining high yields of fruit, berry, vegetable, melon crops and high-quality grapes, organize storage, processing and marketing of products for farms and other fruit and vegetable growing enterprises taking into account their land and soil-climatic resources; draw up technological maps for the cultivation of fruit and vegetable growing enterprises taking into account their land and soil-climatic resources; draw up technological maps for the cultivation of fruit and vegetable growing enterprises taking into account their land and soil-climatic resources; draw up technological maps for the cultivation of fruit and vegetable crops and grapes with the introduction of elements of innovative technology; calculate the need of farms for seeds, fertilizers, pesticides, fuel and lubricants, agricultural machinery, equipment; establish the norm and timing of sowing seeds and planting material of vegetable crops, fertilizers, pesticides, irrigation rates, etc.; organize correct and timely postharvest commercial processing

		-assessment of the phytosanitary
		condition of fields and forecasting.
		-knowledge of corporate ethics,
	· · · · · · · · · · · · · · · · · · ·	negotiation techniques, and basics of
		business communication.
		-familiarity with international and
		domestic standards, regulations,
		industry development plans,
		directives, orders from higher
		authorities, as well as the
		methodological and normative
		requirements of the Constitution of
1		the Republic of Kazakhstan and
× .		legislation related to horticulture.
		-addressing issues related to the
	·	organization of fruit, vegetable, and
		grape production, as well as
		understanding the qualitative and
		quantitative characteristics of
		domestic and foreign product
		samples

Dean of the Faculty of "Agrobiology"

Head of the Department of "Horticulture, Plant Protection, and Quarantine"

E. Abildaev Mary M. Yesenaliyeva