

**Project name:** AP14870270 "Molecular genetic substantiation of domestic and foreign potato varieties and hybrids resistant to main viral, nematode and late blight pathogens".

**Relevance:** Success in creating new varieties depends on the choice of pairs for crossing, as well as on the accuracy of subsequent selections in the hybrid population of genotypes with traits of interest to the breeder. For many years, breeders had to select material by phenotype, while the assessment of future varieties for resistance to phytopathogens depended directly on the conditions of a particular growing season. With regard to fungal diseases, this approach can justify itself in epiphytotic years, however, total infection of the source material, due to the cumulative effect of viral degeneration, can significantly undermine the potential for competitiveness of varieties, greatly complicating seed production. Therefore, the use of marker-associated selection significantly increases the accuracy of selection and reduces the time for its implementation.

**Purpose:** to study the resistance of highly productive domestic and foreign varieties and promising potato breeding lines to PVY, PVX, nematodes, late blight on the platform of molecular genetic marking, as well as using artificial infection with phytopathogens.

**Expected and achieved results:** In the conditions of a slightly humid moderately warm zone of the Akmola region, in the subzone of dark chestnut soils, economically useful traits of potato breeding and genetic material will be determined: yield, ripeness group, starch and dry matter content, table and culinary qualities, an experiment will be carried out to determine the storability.

A search will be carried out for molecular markers of resistance genes to PVY, PVX and nematodes in highly productive domestic and foreign varieties and promising potato lines. The studied potato samples will be inoculated with local isolates of phytopathogens.

Abstracts of reports will be prepared within the framework of the scientific-practical conference.

Based on the results of the first year, the economic and useful features of the breeding and genetic material of potato grown in the KATU named after S. Seifullin collection were identified: productivity, group of ripeness, starch, dry substance, table and culinary qualities; an experiment was laid to determine the storability of the tuber mass during storage. The selected highly productive potato hybrids were analyzed for the presence of DNA markers of resistance to PVY, PVX, golden nematodes. The inoculation of the studied varieties of potato with PVY, PVX isolates was carried out. 3 scientific articles were published, the materials of which are reported at the International Scientific and Practical Conference "Seifullin readings 18 (2):" SCIENCE OF THE XXI CENTURY - THE ERA OF TRANSFORMATION. "

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*Names of research team members (project position) with their identifiers (Scopus Author ID, Researcher ID, ORCID, if any) and links to relevant profiles*

**List of publications and patents published within the framework of this project: (with links to them):**

1. Khairullaeva N.Kh., Khassanov V.T. The content of pigments in the breeding material of potato // Sat. material. International Scientific and Practical Conference "Seifullin readings - 18 (2):" THE SCIENCE OF THE XXI CENTURY IS THE ERA OF TRANSFORMATION. " Volume 2, Part 1. - Astana, 2022. - S. 6-10.

[https://kazatu.edu.kz/webroot/js/kcfinder/upload/files/%D0%BD%D0%B0%D1%83%D0%BA%D0%B0/%D0%A1%D0%A7-18\(2\)/%D0%A5%D0%B0%D0%B9%D1%80%D1%83%D0%BB%D0%BB%D0%B0%D0%B5%D0%B2%D0%B0%20%D0%9D.%D0%A5.%2C%20.pdf](https://kazatu.edu.kz/webroot/js/kcfinder/upload/files/%D0%BD%D0%B0%D1%83%D0%BA%D0%B0/%D0%A1%D0%A7-18(2)/%D0%A5%D0%B0%D0%B9%D1%80%D1%83%D0%BB%D0%BB%D0%B0%D0%B5%D0%B2%D0%B0%20%D0%9D.%D0%A5.%2C%20.pdf)

2. Beisembina B., Kuzminova O.A., Azhimakhan M.A., Khassanov V.T., Vologin S.G. International experience in the study by scientists of Kazakhstan and Tatarstan (Russian Federation) of markers of resistance genes to potato viruses // Sat. material. International scientific - practical..conf. "Seifullin Readings - 18 (2): "SCIENCE OF THE XXI CENTURY - THE AGE OF TRANSFORMATION". Volume 1, part 1. - Astana, 2022. - S. 131-135.

[https://kazatu.edu.kz/webroot/js/kcfinder/upload/files/%D0%BD%D0%B0%D1%83%D0%BA%D0%B0/%D0%A1%D0%A7-18\(2\)/%D0%91.%201%D0%91%D0%B5%D0%B9%D1%81%D0%B5%D0%BC%D0%B1%D0%B8%D0%BD%D0%B0%2C%20.pdf](https://kazatu.edu.kz/webroot/js/kcfinder/upload/files/%D0%BD%D0%B0%D1%83%D0%BA%D0%B0/%D0%A1%D0%A7-18(2)/%D0%91.%201%D0%91%D0%B5%D0%B9%D1%81%D0%B5%D0%BC%D0%B1%D0%B8%D0%BD%D0%B0%2C%20.pdf)

3. Suleiman M.A., Beisembina B., Khassanov V.T. Biotechnological science on guard of plant protection and quarantine // Sat. material. International scientific - practical..conf. "Seifullin Readings - 18 (2): "SCIENCE OF THE XXI CENTURY - THE AGE OF TRANSFORMATION". Volume 1, part 1. - Astana, 2022. - S. 88-90.

[https://kazatu.edu.kz/webroot/js/kcfinder/upload/files/%D0%BD%D0%B0%D1%83%D0%BA%D0%B0/%D0%A1%D0%A7-18\(2\)/%D0%A1%D2%AF%D0%BB%D0%B5%D0%B9%D0%BC%D0%B0%D0%BD%20%D0%9C.%20%D0%90.pdf](https://kazatu.edu.kz/webroot/js/kcfinder/upload/files/%D0%BD%D0%B0%D1%83%D0%BA%D0%B0/%D0%A1%D0%A7-18(2)/%D0%A1%D2%AF%D0%BB%D0%B5%D0%B9%D0%BC%D0%B0%D0%BD%20%D0%9C.%20%D0%90.pdf)

**Information for potential users:**

**Additional Information:**