

The title of the Project:

IPH AP19676894 "Development of a soil-cultivating - sowing machine for grain crops in the precision farming system"

Relevance:

The idea of this project is to create an improved and affordable tillage - seeding machine for grain crops with inexpensive and easy-to-use machine control software in the system of precision agriculture, compatible with the ISOBUS terminal of the tractor, which provides high quality and allows simultaneously combining several work operations in one pass:

- 1) tillage, sowing and differentiated introduction of mineral fertilizers, leveling and rolling of the soil;
- 2) tillage of the soil, differentiated application of mineral fertilizers with a continuous tape, leveling and rolling of the soil;
- 3) processing, leveling and compaction of soil.

Purpose:

Development of a soil-cultivating - sowing machine for grain crops in the precision farming system provides high quality tillage, sowing and differentiated continuous application of mineral fertilizers, with reduced operating costs compared to foreign counterparts, in conditions of high prices for agricultural machinery.

Expected and achieved results:

As a result of the project implementation, the following will be published:

- at least 2 (two) articles and (or) reviews in peer-reviewed scientific publications indexed in the Science Citation Index Expanded database of the Web of Science and (or) having a percentile of Cite Score in the Scopus database of at least 35 (thirty-five) ;
- at least 1 (one) patent included in the Derwent Innovations Index database (Web of Science, Clarivate Analytics);
- as well as at least 1 (one) article or review in a peer-reviewed foreign or domestic publication recommended by the Committee for Control in the Sphere of Higher Education and Science.

Within the framework of the project, 1 PhD doctoral student will be trained, 2 master's theses and 3 theses of students will be defended.

A soil-cultivating - sowing machine for grain crops will be developed in the precision farming system for medium-sized farms, simultaneously performing several technological operations: tillage, sowing and differentiated application of mineral fertilizers, leveling and rolling the soil; tillage, differentiated application of mineral fertilizers with a continuous tape, leveling and rolling of the soil; tillage, leveling and rolling of the soil by one machine. A set of scientific and technical documentation for the machine being developed will be prepared for its mass production and commercialization.

Members of the research group:

1. Project manager Aduov M. A., Doctor of Technical Sciences, Professor, <https://www.scopus.com/authid/detail.uri?authorId=56127310000>
2. Chief Researcher-Saule Abaydildinovna Nukusheva, Candidate of Technical Sciences. <https://www.scopus.com/authid/detail.uri?origin=AuthorProfile&authorId=56127577900&zone=>
3. Leading researcher-Yesenaly Zhaksalykovich Kaspakov, Candidate of Technical Sciences, <https://www.scopus.com/authid/detail.uri?authorId=57194450434&eid=2-s2.0-85020206205>
4. Senior Researcher-Kazbek Galymtaevich Isenov, PhD,

[https://www.scopus.com/authid/detail.uri?origin=AuthorProfile&authorId=57194449183
&zone=](https://www.scopus.com/authid/detail.uri?origin=AuthorProfile&authorId=57194449183&zone=)

5. Senior Researcher-Volodya Kadirbek, Master of Agricultural Sciences.

[https://www.scopus.com/authid/detail.uri?origin=AuthorProfile&authorId=57194443640
&zone=](https://www.scopus.com/authid/detail.uri?origin=AuthorProfile&authorId=57194443640&zone=) 6. Senior researcher-Tulegenov Talgat Konysbaevich, Master of Agricultural Sciences.

[https://www.scopus.com/authid/detail.uri?authorId=57216861903&eid=2-s2.0-
85085028445](https://www.scopus.com/authid/detail.uri?authorId=57216861903&eid=2-s2.0-85085028445)

Information for potential users:

The introduction of the developed machine will allow to reduce fuel costs by up to 15% and the consumption of mineral fertilizers by 20% due to differentiated application according to the agrochemical map of field fertility, ensure the use of soil protection technologies in crop production.

Additional information:

The results of scientific and technical activities will be registered for further commercialization of the project.