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INTEGRATED SYSTEM OF PROTECTION OF SOYBEANS FROM PESTS AND THE INNOVATIVE TECHNOLOGY OF CULTIVATION

Abstract. The article presents data on research on crops, LLP "Bayserke agro", LLC "Agropark Ontustik" in Almaty region.

Developed an innovative scheme of soybean cultivation is introduced in the crops of LLP "bayserke agro" on an area of 650 hectares, 2013-2016 and since 2018 all work is carried out in LLP "Ontustik Agropark".

The question of the best ways of sowing soybeans in different soil and climatic zones, remained unresolved. This is a consequence of various natural and agrotechnical conditions, as well as varietal composition.

Keywords: soybean, innovative technology, integrated protection system, processing, method.

Introduction. In line with the strategic course of development of the Republic of Kazakhstan Strategy "Kazakhstan-2050", President's address, "the Third modernization of Kazakhstan: global competitiveness" (2017), the President's address "New opportunities of development in the context of the fourth industrial revolution" (2018), the State program of development of agriculture of the Republic of Kazakhstan for the years 2017-2021, a priority and an important direction of development of plant breeding is to increase productivity, production of competitive products to meet the domestic needs of the population and the development of the export potential of the country on the basis of increasing the knowledge intensity of agricultural technologies.It is emphasized that the agricultural sector of the country should become a new driver of the economy, the task of increasing the efficiency of land use, increasing the area of irrigated land by 40 %, thereby bringing them to 2 million hectares [1-4].

Methods of research. When implementing innovative technologies of soybean cultivation, an innovative patent was used [5, 6], which provides soil enrichment with trace elements in a natural way, that is, an increase in fertility due to the green mass of siderate crops of the upper soil layer.After the harvest of agricultural crops is carried out sealing of crop residues in the upper layer of the soil followed by sowing of beds sigaretnyj cultures and fueling intense irrigation for irrigation grooves.Once sprouted siderate culture and the weeds, give the green weight of them crushed and buried in the upper layers to a depth of 12-15 cm with subsequent cutting of seed beds and irrigation furrows for the harvest of the following crops in the crop rotation [7], after the snow melts, spend a harrowing two tracks, followed by formation of raised beds with a width of 60-140 cm, depending on soil type and planting materials, and irrigation after cutting grooves with a depth of 12-15 cm early spring sowing is carried out with intensive nourishing irrigation, providing effective control of the surface crust as well as pests before leaving. Sowing and fertilization is carried out simultaneously.

This method increases the moisture storage and moisture-saving ability of the soil, effectively destroys weeds, increases the yield of soybeans, reduces the consumption of herbicides, contributes to the full germination of seeds.This ensures effective control of weeds and root rot [8], seeds and mineral

fertilizers are evenly distributed in the seed beds, and seed sowing and fertilization is carried out in one horizon while continuous processing also destroys sprouted weeds.Device for seeding and fertilizing comprises hoses made of metal pipes, and the tines United on the frame rigid bracket. The method contributes to an increase in yield due to the uniform distribution of seeds and fertilizers both on the field area and on the depth of incorporation, which leads to improved nutrition and illumination of plants [9].Sowing is carried out in seed beds with a high seeding rate of soybean seeds 850-1000 thousand/ha, with a subsequent fueling of intense irrigation, and the sprouting is carried out processing of crops with herbicides on damp soil fertility. The method helps to increase yields regardless of weather conditions and save herbicide consumption.

Research result. The analysis showed that currently there are traditional methods of cultivation of soybeans that have significant disadvantages and costs.When the reservoir is rotated to a depth of 25-30 cm, there is a large fuel consumption of 25-32 l/ha, there are irregularities in the microrelief, which must be leveled and bear additional costs, also this treatment is accompanied by the destruction of the microbiota in the soil and the structure of the soil as well as rapid evaporation of moisture.

Traditional one-component fungicidal seed treatment with the proposed methods and preparations is not always accompanied by sufficient efficiency.

Wide-row sowing with a distance of 60 cm between paired rows (crowding of sown seeds in paired rows, which in turn is the cause of uneven feeding area of soybean plants).

There is no guarantee of obtaining a full uniform germination as spring presowing treatment of soil quickly dries the top layer of soil to a depth of seeding, and in the absence of spring rain creates a real threat of getting full of seedlings. That subsequently adversely affects the growth and further development of plants, and this in turn leads to low yields, low quality of products, with high cost.

The consequence of the above factors is the insufficient number of soybean plants per unit area. The herbicide treatment occurs mostly in dry agricultural conditions, which leads to ambiguous efficacy of herbicides. When watering by the usual method, water erosion of the soil occurs, namely fine-grained parts of the soil, organic substances, introduced mineral fertilizers are washed away by irrigation water and demolished in the direction of movement of irrigation water, and all this leads to environmental pollution.

Implementation of the developed innovative scheme of soybean cultivation eliminates all these shortcomings.

The use of minimal technology in basic tillage. The main advantage of minimum and zero technologies in the economic sense, is a significant increase in productivity, increase the profitability of grain production, and in the technological sense, the minimization of processing reduces the duration of work, making them the most optimal, which in turn has a positive impact on crop yields.

Continuous cultivation contributes to the significant destruction of weeds.

Pre-sowingtillage (spring).

Early spring harrowing in two tracks at the first opportunity to enter the field. Cultivation to a depth of 10-12 cm or disking in 2 tracks with harrowing, produce two-fold continuous cultivation of the field in order to destroy sprouted weeds. Herbicide with a tank mix combination products produced before and after shadowee depending on the monitoring and evaluation of the UAV. Edge processing fields, as on the roadside to reside and overwinter pests which spreads by new shoots.

Hack seed beds with a width of 90-140 cm (depending on soil type) and cutting lateral grooves ensures the implementation of the feed irrigation immediately after sowing and there is no fear of drying out the top layer of soil to a depth of seeding, because after sowing in the fields is fueling watering, which is calling and vegasredcasino at the same time. This ensures the production of uniform friendly shoots of soybean seeds and weeds in the "one wave".

Irrigated immediately after planting, providing for water loading irrigation and outdoor watering is no gap in time. Watering is done in the mode of feeding (feed watering) without slyvania, the minimum water soil erosion, as the bottom of irrigation furrows through the loosened layer of soil in the horizon untouched minimum tillage.

Technological scheme of integrated protection system and innovative technologies on soybean crops in the South-East of Kazakhstan

Action	Thetimingof	Purpose	Toolsandequipmentused
The application of mineral fertilizers under the main processing of the soil	October-November	Enriching the soil and providing plants with basic nutrients, increasing resistance to a complex of diseases	P_2O_5 90 kg / ha Spreader of mineral fertilizers RUM-1200 LANDINI tractor
Applicationoforganicfertilizers	October-November	Soil enrichment with nutrients of organic origin	Manure 60 tons / ha Spreader of organic fertilizers ROWE – 6000 tractor LANDINI
Fidexperta and recovery of seeds protective-stimulating composition No. 28978 Innovation patent of RK No. 28978	March-April	Improvement of seeds from the complex of fungal and bacterial infection, pests and stimulation of germination and growth of the root system.	The fungicide TMTD FAC. - 6-8 kg / ton, Extrasol 4-6 l / ton. Cruiser 2-4 l/ton Ekorost 4 l / ton of Etchingmachine PSM-25.
Tillage Innovation patent of RK No. 25383, No. 24791	March-April	Enrichment of soil by trace elements in a natural way, the activation of soil microflora, including mikroorganizmovantagonists	Seeding of siderates into the soil, combined machine for soil tillage DANTE SPS-3. Tractor NEW HOLLAND
Application of innovative method of sowing soybean seeds Innovation patent of RK No. 26825, No. 25202	April-may	The increase in yield due to uniform distribution of seed and fertilizer in area fields and the seeding depth of soybeans, cost savings of herbicides	Combined pneumatic seed drill KAPPA SP 5 tractor LANDINI
The fight against a complex of weeds prior to emergence of soybeans	April-may	Suppression of growth of weeds in the early stages of development and as reservers of sucking pests and viral infection.	A tank mix of Zenkor Ultra 0.5-0.6 l/ha + Tornado 500 2l/ha. Borey 0.1 l/ha, Bitoksibatsillin 2 kg /ha maximum flow 600 l/ha. Sprayer RICOSMA ATTILA EVO 24 tractor LANDINI
Struggle with the complex of weeds after emergence in the phase before the appearance of 5-6 real leaves	may-June	Suppression of growth of weeds in the early stages of development and as reservers of sucking pests and viral infection.	A tank mix of pulsar 0.8 l/ha + basagran 1.5 l/ha. Bitoksibatsillin 2 kg/ha rate of the working fluid 300 l/ha. Sprayer RICOSMA ATTILA EVO 24 tractor LANDINI
Cultivation of soil between rows	may-June	Loosening of the top layers of soil, improvement of soil aeration, pest population reduction and root rot damage	Spiky rotary harrow ROMPICROSTA MTZ – 82.1 tractor
SubsoilIrrigation	June-August	Поддержание оптимального водного баланса почвы, снижение и поражения корневыми гнилями	Система подпочвенного орошенияIrritec
Pestcontrol	June	Pest population suppression and reducing the spread of viral diseases	Akarin 0.15 l/ha. Bitoksibatsillin 2 kg/ha or AK kobelek 2 kg/ha. Extrasol 4-6 l/ha. Northwind 0.1-0.2 l/ha rate of the working fluid 300 l/ha Sprayer RICOSMA ATTILA EVO 24 tractor LANDINI
Harvest	September-October	Timely harvesting, minimization of losses, minimal injury of soybeans in accordance with the characteristics of each variety	Combine harvester CASE 5040 with the system of threshing and separation of grain and harvest AXIAL FLOW part is equipped with a system TERRA FLEX

Feeding irrigation without a time gap between sowing and irrigation ensures the germination of soybeans and weeds in the "one wave". This is a guarantee of active vegetation at an early stage of plant growth and, accordingly, the key to increasing the average yield.

Processing of crops by herbicides in the early phase of development on damp soil fertility, and are actively vegetating plants almost ensures the complete elimination of weeds while reducing pesticide loads in 1.5-2 times.

By increasing the seeding rate of soybeans allows you to bring the density of standing plants before harvesting to 600 000 – 800 000 on one hectare. Sowing of soybeans is carried out by a specially designed seeder in the seed beds and seeds of cultivated plants are placed evenly, and this in turn provides the most rational area of nutrition for each plant, due to this significantly increases the productivity of each plant, and has a positive effect on increasing the yield of cultivated crops and improves product quality.

When feeding irrigation according to the proposed innovative solution, the length of the rut increases to 1000 meters (this depends on the type of soil and the slope of the field).

The use of rational irrigation increases the productivity of the irrigator up to 50-70 ha, conducted feed irrigation and good quality without blemishes and without water erosion of the soil.

Tillage with minimal technology preserves its natural structure, does not reduce its natural fertility and retains moisture. The innovative scheme of soybean cultivation is effective in the development of waste early irrigated land.

Rational science-based use of plant protection against weeds, diseases and pests. The decline and rejection of the use of massive chemical treatments (application of herbicides and other pesticides) and increased biological on organic products.

The proposed innovative scheme of soybean cultivation is effective in that it requires less labor per unit area compared to traditional methods (irrigators, handymen), which in modern conditions is important (table).

For the analysis of economic efficiency of applied innovations 3 variants of comparison of technological schemes were used (figures 1, 2).

– Option 1 on the background of natural soil fertility (without fertilizer) and monopoles soy for 3 years: Option 1 according to the traditional scheme, Option 1 innovative scheme.

– Option 2 against the background of the use of minimum doses of fertilizers, where the predecessor was winter cereals: Option 2 according to the traditional scheme, Option 2 according to the innovative scheme.

– Option 3 with application of macro and micronutrients and growth regulators on the predecessor of corn: Option 3 according to the traditional scheme, Option 3, innovative scheme.

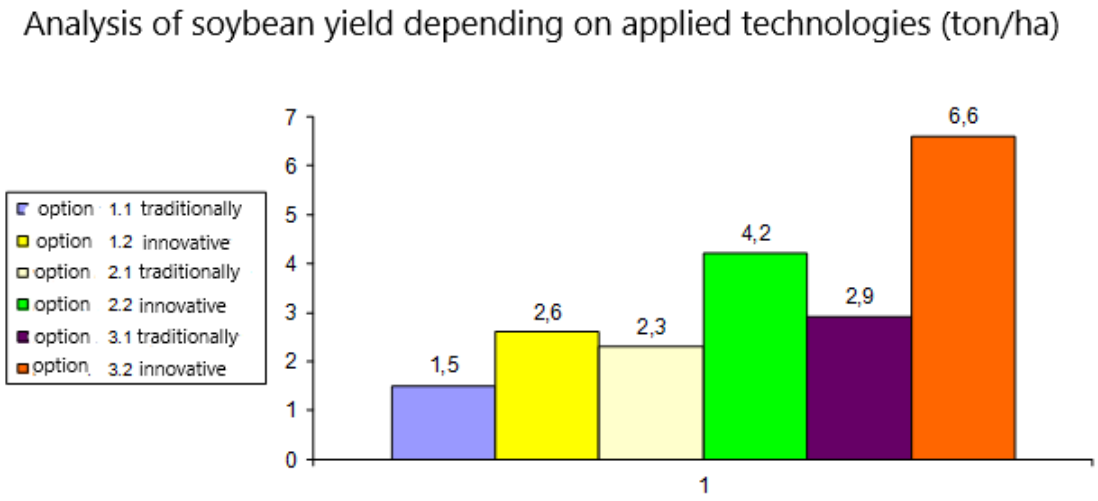

Figure 1 – Soybean yield Analysis

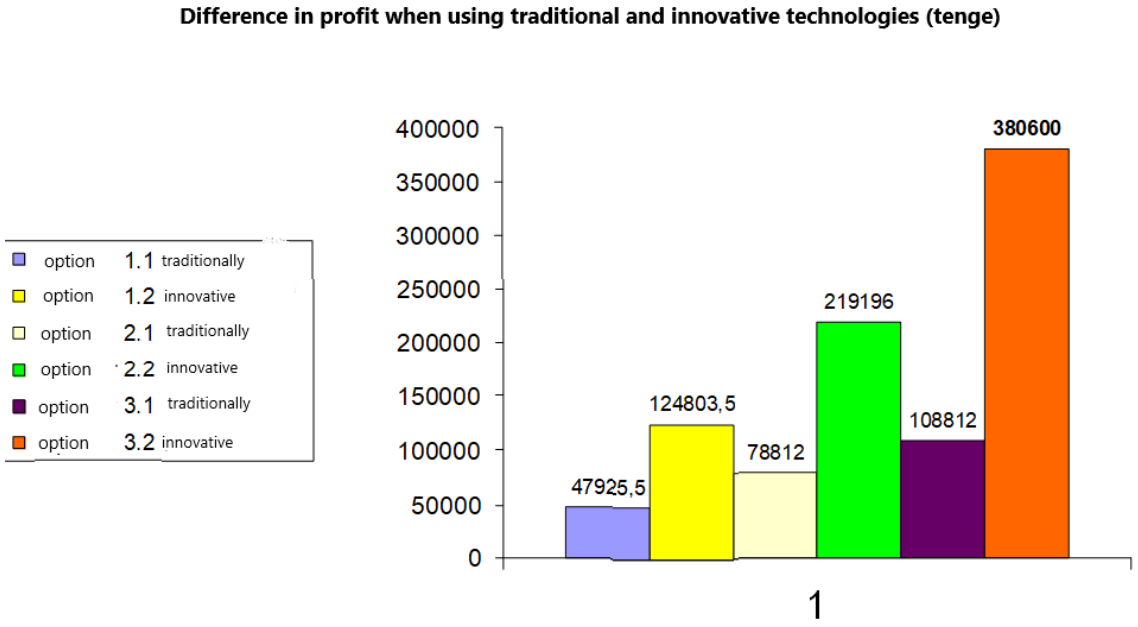

Figure 2 – Difference in soybean profits under different technologies

As illustrated in the graphic format above, our innovative approach has resulted in a yield of 4 times more soybeans per 1 hectare compared to the traditional soybean cultivation technology widely used in this region. Despite the fact that the cost of growing soybeans by innovative technology was slightly higher than the traditional net profit per 1 hectare was 8 times more.

Conclusion. The results of field testing of our technology show the possibility of obtaining a high yield and a significant profit compared to the established technology of soybean cultivation in the South-East of Kazakhstan.

Research was conducted in the framework of the budget program 267 "Increasing availability of knowledge and scientific research", the routine 101 "program-oriented funding of research and activities", according to the specifics 156 "Payment of consulting services and research" on the scientific and technical program "Creation of innovative agro-technology Park for the implementation of precision farming". Research work continues.

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МАЙБҰРШАҚ ДАҚЫЛЫН ИННОВАЦИЯЛЫҚ ТЕХНОЛОГИЯМЕН ӨСІРУ ЖӘНЕ ЗИЯНДЫ АҒЗАЛАРДАН БІРЕГЕЙ ҚОРҒАУ ЖҮЙЕСІ

Аннотация. Мақалада Алматы облысы«Байсерке Агро» ЖШС және «Agropark Ontustik» ЖШС егістігінде жүргізілген зерттеулердің нәтижесі келтірілген.

Майбұршақ дақылын егудің инновациялық технологиясының сызбасы 2013-2016 жылдары «Байсерке Агро» ЖШС-нің 650 га егістігіне енгізіліп, 2018 жылдан бастап «Agropark Ontustik» ЖШС-де жүргізілуде.

Әр түрлі топырақ-климаттық аймақтарда майбұршақ тұқымын себудің ең оңтайлы әдістері жөніндегі мәселелер шешімін таппай келеді. Бұл әртүрлі табиғи және агротехникалық жағдайлардың, сондай-ақ сорттық құрамның салдарынан.

Түйін сөздер: майбұршақ, инновациалық технология, бірегей қорғау жүйесі, өңдеу, әдіс.

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ИНТЕГРИРОВАННАЯ СИСТЕМА ЗАЩИТЫ СОИ ОТ ВРЕДИТЕЛЕЙ И ИННОВАЦИОННАЯ ТЕХНОЛОГИЯ ВОЗДЕЛЫВАНИЯ

Аннотация. В статье изложены данные о проведении исследований на посевах ТОО «Байсерке Агро» и ТОО «Agropark Ontustik» Алматинской области.

Разработанная инновационная схема возделывания сои внедрена на посевах ТОО «Байсерке Агро» на площади 650 га, 2013-2016гг. и начиная с 2018 г все работы проводятся в ТОО «Agropark Ontustik».

Вопрос о лучших способах посева сои в различных почвенно-климатических зонах, остался не разрешенным. Это является следствием различных природных и агротехнических условий, а также, сортового состава.

Ключевые слова: сои, инновационные технологий, интегрированной системы защиты, обработка, способ.

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