

ФГБОУ ВО НОВОСИБИРСКИЙ ГОСУДАРСТВЕННЫЙ АГРАРНЫЙ
УНИВЕРСИТЕТ

Кафедра почвоведения, агрохимии и земледелия

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Ректор ФГБОУ ВО НГАУ

Рудой Е.В.

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ОТЧЕТ

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на выполнение научно-исследовательской работы по теме
«Проведение испытаний применения препарата Агроцен и оценка
его эффективности на посевах сельскохозяйственных культур
в условиях Новосибирской области Новосибирского района»
(культура соя)»

Руководитель:

Гаврилец Т.В., к.б.н., доцент кафедры
почвоведения, агрохимии и земледелия

Исполнители:

Матенькова Е.А. к.б.н., доцент кафедры
почвоведения, агрохимии и земледелия

Клепикова А. студент

Новосибирск, 2021

Introduction

Soy is one of the leading leguminous crops in terms of protein content in seeds. Every year the population needs protein, soybean is an indispensable crop in solving this problem. Currently, the area of its cultivation in Russia is increasing, including in the Novosibirsk region.

Plant growth and development regulators, as well as mineral fertilizers, also have the ability to positively influence the yield and quality of soybean seeds. They increase the adaptability of the culture to water, temperature and other stressful conditions. Maximum efficiency is achieved by a combination of seed treatment and foliar application.

The most promising for the conditions of the zone of unstable moisture are early and early ripening soybean varieties, since they do not fall into severe drought conditions in the second half of summer due to the short periods of vegetation in the phases of flowering and seed formation. In this regard, to justify the increase in the productivity of soybean plants, depending on the use of rhizobial preparations and growth stimulants in the zone of unstable moisture, it is necessary to conduct studies on the example of early ripening varieties.

The purpose of the research: to evaluate the effect of the drug Agrocen on soybeans in the conditions of the forest-steppe of the Ob region.

Tasks:

- to study the influence of Agrocen on the indicators of growth and development
- of soybeans; evaluate the change in biological yield and its structure when using Agrocene in soybean crops.

The experience was laid in the Novosibirsk region in the educational and experimental farm of the NSAU Praktikum. The soil is leached chernozem.

When cultivating soybeans, the main technological operations were used, corresponding to the zonal farming system. In the spring, mineral fertilizers were applied for pre-sowing cultivation - ammonium nitrate at a dose of 30 kg AI/ha. The soybean variety SibNIIK 315 was sown at a rate of 700,000 units/ha. Before sowing, part of the seeds were treated with Agrocene (1 l/t). The seeds were planted to a depth of 3-4 cm. The crops were sown on May 20 using a SS-11 seeder.

To study Agrocen as an antistress agent, it was used in a mixture with herbicides. To do this, one half of the experimental area was treated with a mixture of Bazagran (2 l/ha) and Harmony (7 g/ha) herbicides, and the other half with a tank mixture of Agrocen (0.4 l/ha) with these herbicides. Spraying of crops was carried out using a tractor sprayer OPSh-15 with a working solution consumption rate of 200 l/ha.

Experience options:

1. Seeds without treatment + herbicides
2. Seeds treated with Agrocene + herbicides
3. Seeds without treatment + [herbicides + Agrocen]
4. Seeds treated with Agrocen + [herbicides + Agrocen]

In the course of the research, phenological phases of development, indicators of the state and productivity of plants were observed; biomass and plant height.

The structure of the crop before harvesting was determined by the analysis of sheaf material according to the method of state variety testing of agricultural crops. The analysis technique is standard, set out by B. Dospekhov (1985).

All data were processed mathematically using the Snedecor computer program and Excel.

Hydrometeorological conditions of the growing season

Table 1. - Meteorological indicators of the growing season 2021

of the year according to the HMS "Ogurtsovo"

Month	Air temperature, °C					Precipitation, mm				
	Decades			Average monthly	Deviation from norms	Decades			Amount per month	% of norm
	one	2	3			one	2	3		
May	11.5	14.9	16.3	14.2	3.3	4.0	13.0	8.0	25.0	68.0
June	16.7	17.3	14.6	16.2	- 0.7	22.0	2.0	48.0	72.0	131.0
July	20.4	18.8	20.0	19.7	0.3	18.0	4.0	0.3	22.3	37.0
August	19.8	16.8	17.7	18.1	1.9	24.0	37.0	6.0	67.0	100.0
September	13.6	11.2	3.5	9.4	- 0.6	5.0	30.0	13.0	48.0	112.0

In general, 2021 turned out to be quite favorable for many crops, although the July drought had an impact on the growth and development of soybean plants.

Indicators of growth and development of soybean when using Agroceen

The growth and development of soybean was evaluated by such indicators as: plant height, biomass, number of lateral shoots.

It was found that the use of Agroceen, both for seed treatment and as an antistress agent, had a positive effect on soybean biomass (Fig. 1). The use of Agroceen contributes to the growth of biomass by 126.78-343.88 grams per 1 m² depending on the variant. In variants with the use of Agroceen during vegetation, the biomass of soybean plants significantly increased by 1.44-1.58 times.

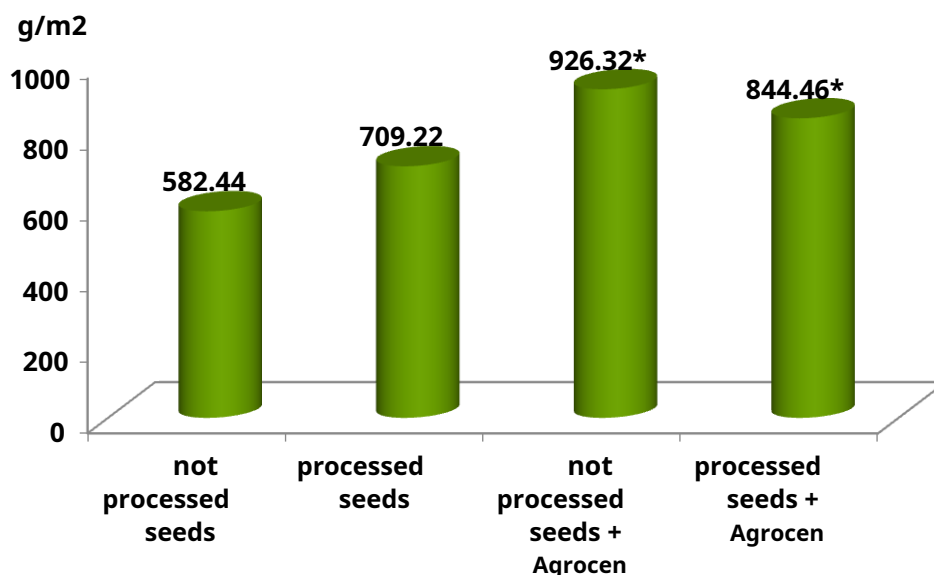


Figure 1 - Accounting for soybean biomass (07/02/2021)

*Reliable at 95% significance level

The height of plants was taken into account 2 times during the growing season. In early July, this indicator significantly increased in relation to untreated seeds (Fig. 2).

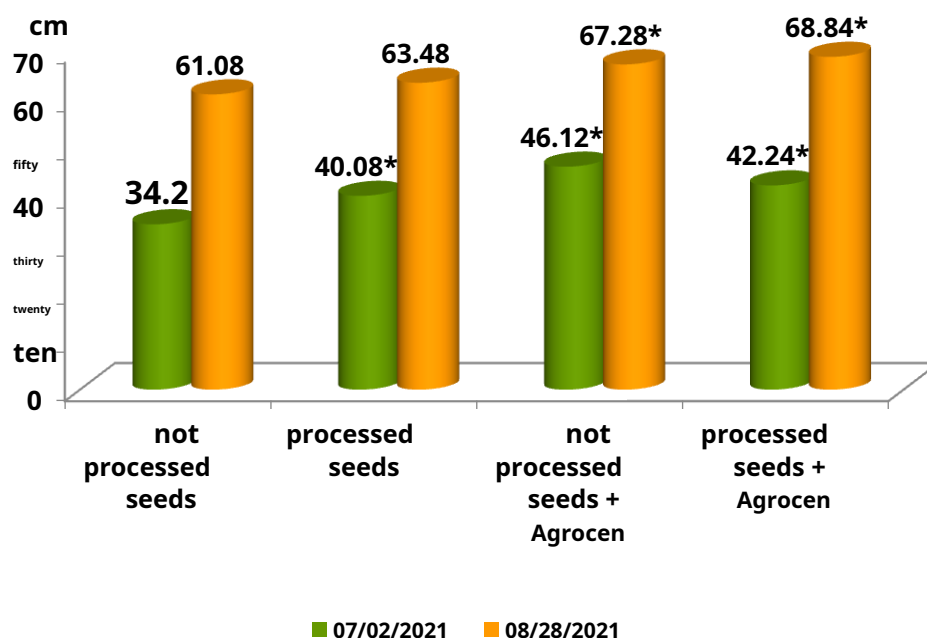


Figure 2 - Plant height against the background of the use of Agrocen

*Reliable at 95% significance level

By the time of harvesting, the positive effect of Agrocene, applied during the growing season as an antistress agent, on the height of soybean plants has been statistically proven. Thus, the height of soybean when using Agrocene during vegetation is 6.2 cm more on untreated seeds and 5.36 cm on treated seeds.

The condition of plants can also be judged by the number of lateral shoots. The use of Agrocene both for seed treatment and as an antistress agent tends to increase the number of lateral shoots, but this has not been statistically proven (Fig. 3).

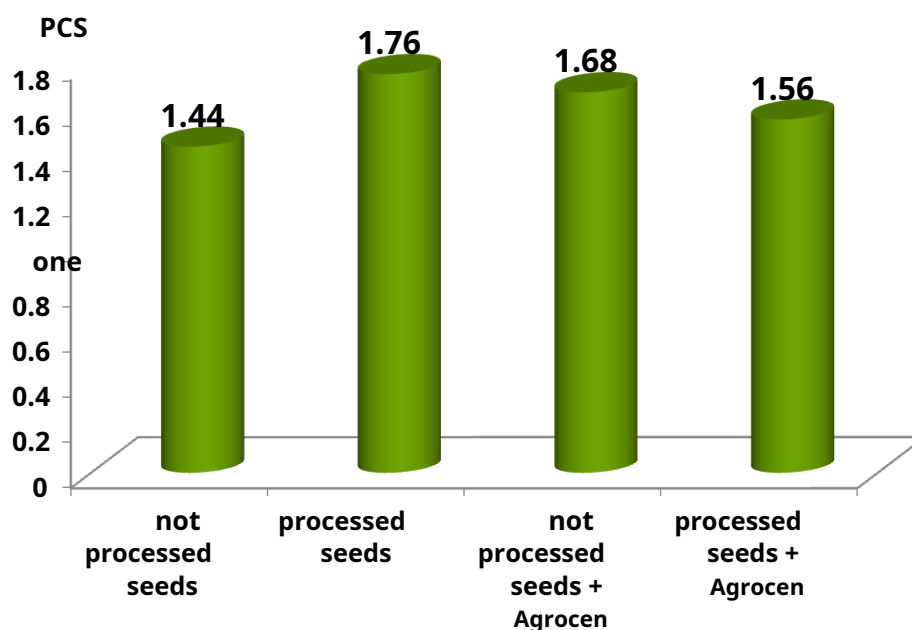


Figure 3 - Number of side shoots

An important indicator that is taken into account at the time of harvesting is the height of attachment of the lower beans (Fig. 4). The low attachment height reduces the possibility of mechanized harvesting.

In the studies conducted, the lower soybeans in all variants were attached at a distance of at least 18 cm from the soil surface. This is a sufficient height to carry out high-quality harvesting and prevent crop loss.

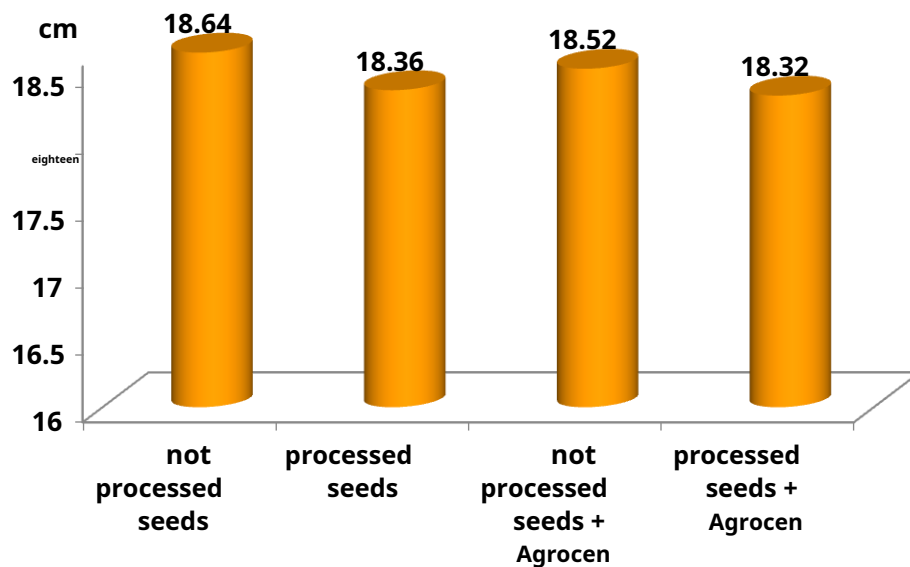


Figure 4 - The height of attachment of the lower beans at the time of harvesting. Thus, the use of Agrocen for seed treatment and as an antistress agent had a positive effect on the growth and development of soybeans.

Biological yield of soybean and its structure

Determination of indicators of the crop structure, such as plant stand density before harvesting, the weight of 1000 seeds, the number of beans and seeds per plant, is necessary for a general biological characterization and substantiation of the results obtained.

The safety of soybean plants at the time of harvesting was the highest in the variant where Agrocen was applied twice (seed treatment + vegetation treatment). This can be explained by the weakening and destruction of various pathogens; a decrease in the susceptibility of plants to water and temperature environmental stresses; increased extraction of nutrients from the soil (Table 2).

By the number of beans on one plant and seeds in a bean, there is a tendency to increase, no significant differences were found.

Table 2. - Influence of Agrocen on soybean yield
and its structure

Option	Qty plants per 1 m ² , PCS	Qty beans per 1 plant, PCS	Qty seeds in bob, piece	Weight 1000 seeds, g	yield, c/ha
Not processed seeds	60	10.60	1.70	159.48	17.60
Processed seeds	64	11.28	1.92	167.86*	23.04
Not processed seeds + Agrocen	61	13.12	1.86	178.08*	26.42*
Processed seeds + Agrocen	70*	12.76	1.94	172.02*	30.30*

*Reliable at 95% significance level

Seed treatment with Agrocene increases the weight of 1000 seeds by 8.38 g compared to untreated. Additional application of Agrocen during vegetation increases this indicator by 18.6 g against the background of untreated seeds and by 12.54 in the case of seed treatment with Agrocen.

The maximum biological yield was noted in the variants with the use of Agrocen for vegetation. Against the background of untreated seeds, it amounted to 26.42 centners/ha, when seeds were treated with Agrocene - 30.3 centners/ha. Most of all, the weight of 1000 seeds and the safety of soybean plants at the time of harvesting influenced the yield of soybeans.

The use of Agrocene made it possible to obtain an additional yield increase (Fig. 5).

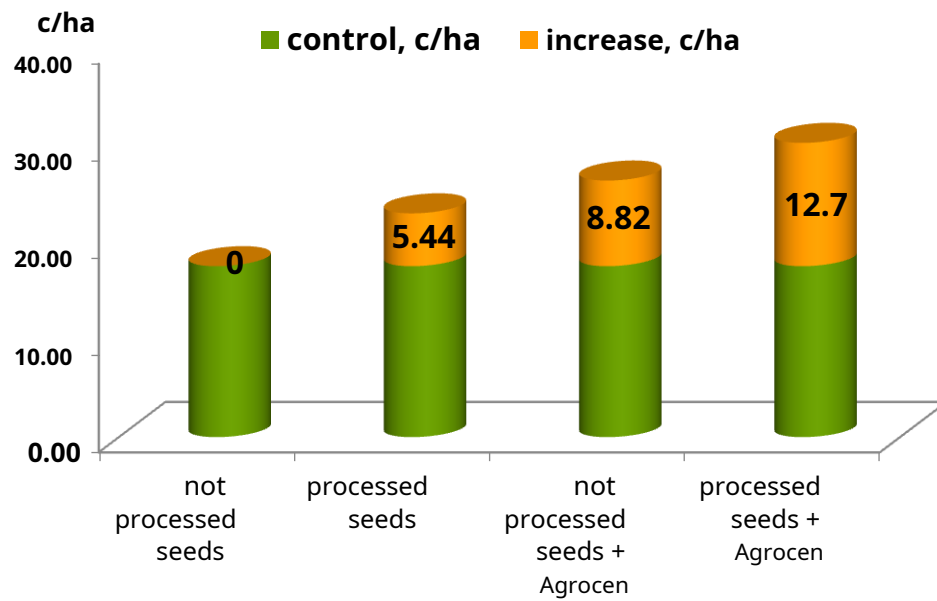


Figure 5. - The increase in seed yield by

Treatment Agrocen made it possible get
 additionally 5.44 c/ha of soybeans. The increase in yield from the introduction of Agrocen, during
 the growing season, was 8.82 centners/ha on untreated seeds and 12.7 centners/ha when seeds
 were treated with Agrocene.

conclusions

The use of Agrocen in vegetation increases the biomass of plants

soybeans.

Seed treatment with Agrocene does not affect plant height by the end of the growing season. The introduction of Agrocene as an antistressant significantly increases the height of plants and during the entire growing season.

Agrocen contributes to better preservation of plants by the time of harvesting, tends to increase the number of pods per plant and seeds per pod. The drug, regardless of the method of use (seed treatment or vegetation treatment), increases the weight of 1000 soybean seeds.

The maximum biological yield was noted in the variants with the use of Agrocen for vegetation. Against the background of untreated seeds, it amounted to 26.42 centners/ha, when seeds were treated with Agrocene - 30.3 centners/ha.