

## **EFFECT OF CULTIVATION RATE AND NITROGEN - 137 STRAIN ON LEAF LEVEL CHANGES**

Gulchekhra Nasridinovna Tangirova

Tashkent State Agrarian University

Doctor of Philosophy (PhD) in Agricultural Sciences, Associate Professor

Khurramova G. K.

Tashkent State Agrarian University

2nd Year Student of the Faculty of Agrobiology

Raimjonova G. S.

Tashkent State Agrarian University

2nd Year Student of the Faculty of Agrobiology

Normurodova S. T.

Tashkent State Agrarian University

2nd Year Student of the Faculty of Agrobiology

### **Abstract**

In the article, the leaf surface of different soybean varieties changed depending on their biological characteristics. Planting rates (70, 80, 90 kg/ha) were increased, and the number of leaves per plant decreased when planted with Nitragin-137 strain.1 hectare it is stated that the total leaf level has increased.

**Keywords:** soybean, different varieties, planting rates (70, 80, 90 kg/ha), nitragin-137 strain, leaf level.

### **Introduction**

Like all plants, soybean leaves are one of the main vegetative organs. Because no organ can perform the function of the leaf during the development of the plant. A plant first feeds through its leaves or synthesizes organic matter through the process of photosynthesis. Whether the leaf surface is large or small determines its growth, development and formation of productivity.

A number of scientists have highlighted the information that the number and level of leaves on the stems of soybean varieties depends on the sowing rate, use of nitrogen strain, variety characteristics, soil and climate conditions, and the use of complex agrotechnical measures.

Nitragin treatment of coya seeds has a positive effect on leaf formation when planted. Under the influence of nitragin, the number of leaves increased up to 1.2 during the phases [6].

The number of plant stems is important for obtaining a high yield, and when the seedling thickness is optimal, the vegetation period is extended and the productivity of photosynthesis increases [2].

In the formation of the assimilation apparatus, it is important to correctly determine the thickness of seedlings. If the phase of pod formation begins prematurely, when the development is at a high level, part of the energy produced by photosynthesis is used for its growth. In this case, the leaf surface is greatly expanded, resulting in a decrease in the area of the leaf surface as a result of the shading of the lower and partially middle tier leaves [3, 5].

They studied the development of leaf surface of Coya plant during budding, flowering and pod formation phases. Uzbekskaya-2 variety compared to Orzu variety increased by 1 plant leaf level. It was 282 to 229 cm<sup>2</sup> in the budding phase, increased to 1157-1017 cm<sup>2</sup> in the flowering phase, and 1450-1350 cm<sup>2</sup> in the pod formation phase [1].

The effect of 50, 60, 70 kg/ha of soybean variety "Nafis" on leaf development was studied. As planting rates (50, 60.70 kg/ha) increased in all options, the number of leaves decreased (14.6; 14.9; 13.5 pieces), and the leaf surface (33.0; 34.0; 30.0 m<sup>2</sup>/ha) ga) decreased [4].

In our research, the influence of planting standards and the nitrugin strain on the changes in the leaf level of the used soybean varieties was studied. It is known that the expansion of the leaf surface area depends on the thickness of the seedling. If the number of bushes per hectare is increased and the soil moisture is sufficient, all options will have the maximum leaf surface area. In the studied cultivars, under the influence of planting rate and Nitrugin-137 strain, the productivity of the leaf plate changed continuously during the growing season.

According to the table, the number of flowering heads is 70 kg/ha, and among the soybean varieties studied in nitrogen-free options, the "Dostlik" variety (411.6 cm<sup>2</sup> per 1 bush of the plant; 1 hectare 13.4 thousand m<sup>2</sup>) compared to Uzbekskaya-2 (384.9 cm<sup>2</sup>; 12.5 thousand m<sup>2</sup>/ha) and "Orzu" (313.9 cm<sup>2</sup>; 10.2 m<sup>2</sup>/ha) cultivars with a decrease in leaf level per plant it was observed that the total leaf level increased per hectare. On the other hand, at the planting rate of 70 kg/ha, a relatively high result was observed in the same varieties in the option with nitrogen, and the difference between the option with nitrogen and the options without nitrogen was noticed (respectively, 420.3 cm<sup>2</sup>, 13.9 thousand m<sup>2</sup>/ha; 394.5 cm<sup>2</sup>, 12.9 thousand m<sup>2</sup>/ha; 326.9 cm<sup>2</sup>, 10.8 thousand m<sup>2</sup>/ha). The varieties "Izumrud" (267.0 cm<sup>2</sup>; 8.7 thousand m<sup>2</sup>/ha) and "Medeya" (245.4 cm<sup>2</sup>; 8.0 thousand m<sup>2</sup>/ha) belonging to the selection of Ukraine showed a result close to each other in terms of botanical characteristics. According to this planting rate, the nitrogen-rich options have a leaf surface area of 278.1 cm<sup>2</sup> per plant, and 9.3 thousand m<sup>2</sup> per hectare; 249.4 cm<sup>2</sup> was equal to 8.2 thousand m<sup>2</sup>. At the planting rate of 80 kg/ha per hectare, compared to the planting rate of 70 kg/ha, the area of the leaf surface of 1 plant decreases, 1 hectare it became known that the surface area of the leaf is increasing.

From the observations, at the planting rate of 90 kg/ha, in turn, compared to the planting rate of 70-80 kg/ha, the reduction of the leaf surface area of 1 bush and 1 hectare it was determined that the surface area of the leaf is increasing.

Compared to other varieties that participated in the experiment, the indicators of the Uzbekskaya-2 variety in terms of botanical characteristics were considered higher, and when we compared the result of the planting rate of 70 kg/ha without nitrogen with the planting rate of 80 kg/ha, the difference in the leaf surface area per 1 plant was 18.9 cm<sup>2</sup> less. But in this case 1 hectare and it was noted that the leaf area is 1.2 thousand m<sup>2</sup> more, and 56.9 cm<sup>2</sup> less and 1.3 thousand m<sup>2</sup>/ha more than the 70 kg/ha planting rate. The variety "Medeya" also has relatively less leaf level according to botanical characteristics, the difference between the planting rate of 70 kg/ha and the planting rate of 80 kg/ha is 14.7 cm<sup>2</sup>; 0.7 thousand m<sup>2</sup>/ha; The difference between planting rate of 90 kg/ha was 37.3 cm<sup>2</sup>, 0.8 thousand m<sup>2</sup>/ha.

In the nitrigenous variants, the difference between the planting rate of 70 kg/ha and the planting rate of 80 kg/ha in the Uzbekskaya-2 variety is 16.3 cm<sup>2</sup>; It was 1.4 thousand m<sup>2</sup>/ha, compared to the planting rate of 90 kg/ha, 53.7 cm<sup>2</sup>, 1.7 thousand m<sup>2</sup>/ha differed. The "Medeya" variety also had a low level of leaves or the same situation was observed (the difference between the planting rate of 70 kg/ha and 80 kg/ha was 7.5 cm<sup>2</sup>, the difference from 0.9 variants was noticed (respectively 420.3 cm<sup>2</sup>, 13.9 thousand m<sup>2</sup>/ha; 394.5 cm<sup>2</sup>, 12.9 thousand m<sup>2</sup>/ha; 326.9 cm<sup>2</sup>, 10.8 thousand m<sup>2</sup>/ha). Ukrainian selection "Izumrud" (267.0 cm<sup>2</sup>; 8.7 thousand m<sup>2</sup>/ha) and "Medeya" (245.4 cm<sup>2</sup>; 8.0 thousand m<sup>2</sup>/ha) showed results close to each other in terms of botanical characteristics. According to this planting method, the leaf surface area per 1 plant was 278.1 cm<sup>2</sup>, 1 hectare 9.3 thousand m<sup>2</sup> in the account; 249.4 cm<sup>2</sup> was equal to 8.2 thousand m<sup>2</sup>. It was found that the leaf surface area of 1 plant decreases at the rate of planting 80 kg/ha per hectare compared to the rate of planting 70 kg/ha, and the leaf surface area per hectare increases.

From the observations, at the planting rate of 90 kg/ha, in turn, compared to the planting rate of 70-80 kg/ha, the reduction of the leaf surface area of 1 bush and 1 hectare it was determined that the surface area of the leaf is increasing. Compared to other varieties that participated in the experiment, the indicators of the Uzbekskaya-2 variety in terms of botanical characters were considered higher, and when we compared the result of the planting rate of 70 kg/ha without nitrogen with the planting rate of 80 kg/ha, the difference in the area of the leaf surface per 1 plant was 18.9 cm<sup>2</sup> less. But in this case 1 hectare and it was noted that the leaf area is 1.2 thousand m<sup>2</sup> more, and 56.9 cm<sup>2</sup> less and 1.3 thousand m<sup>2</sup>/ha more than the 70 kg/ha planting rate. The variety "Medeya" also has relatively less leaf level according to botanical characteristics, the difference between the planting rate of 70 kg/ha and the planting rate of 80 kg/ha is 14.7 cm<sup>2</sup>; 0.7 thousand m<sup>2</sup>/ha; The difference between planting rate of 90 kg/ha was 37.3 cm<sup>2</sup>, 0.8 thousand m<sup>2</sup>/ha. In the nitrigenous variants, the difference between the planting rate of 70 kg/ha and the planting rate of 80 kg/ha in the Uzbekskaya-2 variety is 16.3 cm<sup>2</sup>; It was 1.4 thousand m<sup>2</sup>/ha, compared to the planting rate of 90 kg/ha, 53.7

cm<sup>2</sup>, 1.7 thousand m<sup>2</sup>/ha differed. In the "Medeya" variety, the leaf level was low or the same situation was observed (the difference between the planting rate of 70 kg/ha and 80 kg/ha was 7.5 cm<sup>2</sup>, 0.9 thousand m<sup>2</sup>/ha; planting 70 kg/ha and 90 kg/ha the difference between the standards is 29.9 cm<sup>2</sup>, 1.1 thousand m<sup>2</sup>/ha), as the planting standards increased, the level of leaves in 1 bush decreased, 1 hectare it was noted that it increased uniformly in all varieties.

According to the table, when we compare the changes in the leaf level of soybean varieties from the beginning of the flowering phase to the end of flowering, at the planting rate of 70 kg/ha, the mid-season Uzbekskaya-2 variety, which has a growing period close to the "Dostlik" variety, in the option without nitrogen, the leaf level is 1019.9 cm<sup>2</sup> per plant, with nitrogen, while it was 1029.2 cm<sup>2</sup> in the options, the difference in leaf area per hectare was 33.1 thousand m<sup>2</sup> in the option without nitrogen and 33.8 thousand m<sup>2</sup> in the options with nitrogen. 575.3 cm<sup>2</sup>, respectively, in the early "Medeya" variety of Ukrainian selection; 707.1 cm<sup>2</sup>, 18.5 thousand m<sup>2</sup>; It was found that the difference in leaf level change between the beginning of the flowering phase and the end of flowering is large, making up 23.3 thousand m<sup>2</sup>. This is due to the precocious nature of this variety and its relatively low height, and the leaf surface is naturally small due to the few leaves and side branches. It was noted that the change of the leaf level per 1 bush was greater in all varieties at the planting rate of 80 kg/ha compared to the planting rate of 90 kg/ha, and the difference of the leaf level at the rate of 1 hectare was noted. That is, in the Uzbekskaya-2 variety, the planting rate of 80 kg/ha was 1321.0 cm<sup>2</sup> of leaf area per plant in the nitrogen-free variant, and 1398.1 cm<sup>2</sup> in the nitrogen-containing variant. 1 hectare the leaf surface area is 49.4 thousand m<sup>2</sup>, in the nitrogen version it is 52.8 thousand m<sup>2</sup>, while the planting rate of 90 kg/ha in the nitrogen-free version is 1223.1 cm<sup>2</sup>, 1256.2 cm<sup>2</sup> and 51.7 thousand m<sup>2</sup>, 53.9 thousand m<sup>2</sup>.

In the experiment, it was found that the planting rate of 80 kg/ha is acceptable for the "Medeya" variety when the leaf area was studied per hectare. Our observations showed early onset of yellowing of leaves in variants with high planting rate and no nitragin strain. When nitragin was applied and the planting rate was reduced, it was observed that the yellowing of the leaves and the ripening phase were extended by several days. In all cultivars, the leaf surface area increased until the end of the flowering phase and the maximum level coincided with the pod filling phase. Among the studied mid-early and early-early varieties, the leaf level was the smallest in "Medeya" variety. The leaf surface area was almost the same in all cultivars at the beginning of the growing season. At the end of the growing season, due to the complete ripening of the pods and the shedding of the lower, middle and upper tier leaves, the leaf level naturally decreased. In "Dostlik" and Uzbekskaya-2 cultivars, it was found that the change of the leaf level in the stage of pod filling was not significant in this phase, compared to the difference between the beginning of flowering and the end of flowering. It was observed that the results of early "Orzu" and mid-early "Izumrud" varieties are close to each other. The highest result on the level of leaves per 1 plant was observed in varieties "Dostlik" (1861.9 cm<sup>2</sup>) and Uzbekskaya-2 (1836.6 cm<sup>2</sup>) in nitrogen-rich variants at the planting

rate of 70 kg/ha. In these options, it was observed that the leaf surface area per hectare was 80-90 kg/ha compared to the planting standards, that is, 61.4 thousand m<sup>2</sup> and 60.2 m<sup>2</sup>. The results of these varieties in the 80 kg/ha nitrogen variant were as follows: 1800.3 cm<sup>2</sup> in the "Dostlik" variety, and 1800.3 cm<sup>2</sup> in the Uzbekskaya-2 variety. 1773.3 cm<sup>2</sup> was equal to Higher than other varieties, in turn 1 hectare it was also noted that the leaf area in these varieties (respectively 68.0 thousand m<sup>2</sup>, 67.0 thousand m<sup>2</sup>) had the highest index.

When the planting rate was 90 kg/ha, the index of the leaf level of 1 plant was less than the planting rate of 70-80 kg/ha even in the phase of pod filling, but 1 hectare. It was clear from the experimental data that the leaf level indicators in all varieties were in the range of 4.6-7.3 thousand m<sup>2</sup> compared to the planting rate of 70 kg/ha, and 0.7-0.9 thousand m<sup>2</sup> more than the planting rate of 80 kg/ha.

In our experiment, it was noted that the nitruginous option, 80 kg/ha, is acceptable for the size of the leaf level or the planting rate in the pod filling phase.

In conclusion, we emphasize that the leaf level of the studied soybean varieties changes depending on the biological characteristics of the varieties and the direct influence of soil and climate conditions. When the seedling thickness was increased and planted with Nitragin strain, the number of leaves per plant decreased. 1 hectare and the total leaf level in the account increases.

These indicators showed that varieties vary according to botanical characteristics, biological and physiological characteristics, agrotechnical measures and soil-climatic conditions. Therefore, according to the biological and physiological characteristics of each variety, soil and climate conditions, the planting rate and feeding area are determined separately.

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