



## Agrotechnics of the soybean plant, which is sown as a secondary crop, effects of sowing period to the harvest and fertility characteristics of the seeds

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### Abstract

This article highlights the information on the importance of soybean plant as a secondary crop for soil fertility, agro technics of sowing soybean, the effects of soybean during sowing, and the growth of seeds when processing soybean with oxyhumate before sowing.

**Keywords:** soil, fertility, soybean, protein, humus, organic substances, oxyhumate, collection, spider worm, carcinoma, phosphorus and potassium fertilizers, bundle bacteria

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### INTRODUCTION

Due to the low humus and nitrogen content in the soil of Uzbekistan, the importance of grain crops in increasing soil fertility is of great necessity. After the grain crops the amount of organic matter in the soil increases and the water-physical properties of the soil improves. Their residual fragments break down more quickly than other crops. Legumes - grain crops simultaneously tackle with three tasks. Firstly, they are considered as an important factor in the increase of grain production, secondly, it allows to solve the problem of fodder in cattle breeding and, finally, the third, they are main source of improving soil fertility. Advantages of legume-cereal crops are their high-quality, and they rich in protein that produce air nitrogen and produce an environmentally-friendly product that improves soil fertility.

**Soybean.** Soybean (*Glycine*) - one-year-old grassy plants of legumes and oily crop. 10 species are found in the humid tropical and subtropics of Africa and South East Asia, and 1 wild type species in the Far East. Its birthplace is China. Soybean has been produced for a long time. It was sown starting in the 5th millennium BC. It is cultivated in USA, India, Japan, Korea, Indonesia, Ukraine, Moldova, Georgia and Uzbekistan. Worldwide, the soybean planting areas are 73.6 million hectares, the average crop yield is 22.1 center per hectare (2000): and began to spread in Uzbekistan in the 1960s. The root of the normal soybean is well-developed, the lead root, horned, penetrates to the depth of 2 m in the soil, the main part is placed in the augmented layer (bundle bacteria develop). The stem is rough, cylindrical, grows upward, but there are also loose varieties. The height

ranges from 15 cm to 2 m, and the side-horns are 2-8. The leaves are wispy and 8-20 cm in length, the length of leave bundle is 13-15 cm in length, the leaves are tiny, white, or pink, and the leaf is placed in the leaf-side. Fruits are legumes, yellow, black, brown, dark and wispy. Each legume has 2 to 6 grains, with a weight of 1,000 grains up to 40-425 g. It contains 24-45% of protein, 13-37% fat, 20-32% carbohydrates, 1-2% lithitic, D, V, E and other vitamins. Fat, protein and lycitine are obtained from the seeds. The period of growth is 75-200 days. The soybean is warm and humid-loving, and short-day plant. It is well developed at 21-23 ° C. The seeds sprout at 8-10 ° C. Soybean is pollinated from itself. The flowering period lasts for 15-55 days. Soybean flour and oil will be taken out of it. Its grain is used for cooking. Soybean flour is used for the production of milk, cheese and confectionery products. The straw, the collection, the blue stem and the silage are given to the livestock as feed. From 1981 to 1988, the Uzbekistan Radiation Institute produced soybean types of Uzbekistan 2, Uzbekistan 6 and Friendship and zoned for all regions.

**Diseases:** bacteriosis, septoriosi, askoxitosis, fusariosis.

**Pests:** tunnels, spiderworms, and carcinomas.

Soybean crop is of great importance in satisfying the needs of the population of the Republic of Uzbekistan in foodstuffs, in particular, in vegetable oil, in reducing imports, strengthening livestock and poultry feed. Leguminous soybean is the best pasture crop for all

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crops - winter wheat, cotton, corn, vegetable and other crops.

In cultivating abundant and high quality yields of soybeans, it is desirable to select soil fertility and good water supply, as well as to plant crops based on soil condition. We recommend you to pay attention to the followings.



### THE METHODS AND TECHNIQUES OF THE RESEARCH

Depending on the conditions, 90 kg of phosphorus and 60 kg of potassium fertilizers are given 100 percent to the soil of the soybean, and the soil is cleaned from grass residues and roots and flattened.

Because of the absence of bacteria adapted to soybean soil, the seeds should be processed at 600-800 g / hectare with one of the bioavailability of Rizotoptin, Rizobium, and Bradirizobium before sowing the seeds, otherwise biological nitrogen does not accumulate in the roots of soybean. Spread somewhere around the sunlight At the same time, the bio-fertilizers are spread on the seeds, which are sunlight is insufficient and mixed thoroughly, then covered with a cloth for some time. Processed seeds should be planted on that day, otherwise beneficial bacteria will lose their strength. The best time for planting soybean is that the soil in the 0-10 cm layer is around 12-14°C. In rows between 60-70 cm, average 60 to 80 kg of seeds will be sown, with an average of 350-400 thousand seedlings per hectare. It is best to sow the seeds 4-5 cm deep in the pneumatic SPCH-6-8. It is desirable to complete the seeding work in the southern regions by the end of March, in the central regions from the first half of April and from the second decade in the northern regions until the end of April. It is important to recover the seeds due to the natural moisture content of the soil. If moisture is not sufficient in the soil, it is necessary to provide slight water for the field. Otherwise, the sown areas will lose their self-sufficiency and the thickness of the seedlings will be less than normal. When the first three leaves are sprouted, the seeds are cultivated in order to provide air exchange in the soil and to improve heat and water

permeability. The KRX-4 cultivator should be placed at least 10-12 cm in depth and 8-10 cm from the plants. During the vegetation, the rows are cultivated at least 2-3 times a year, depending on soil conditions. Cuttings are used to clean the field from weeds. Depending on soil conditions, it is desirable to deeply cultivation of shallow parts.

### THE RESULTS OF THE RESEARCH AND THEIR DISCUSSION

According to data, in order to obtain high yields of soybean crops, 70-75 kg of nitrogen, 90 kg of phosphorus and 60 kg potassium fertilizers should be given in pure form. The first nutritional feeding should be carried out before the soaring process. At the same time, nitrogen of 30-35 kg / hectare is given to a depth of 12-14 cm soil with a fertilizer cultivator. The second nitrogen feeding is carried out during the blossoming and flowering process at a depth of 16 to 18 cm per 40 kg / ha. The late delivery of nitrogen fertilizers will postpone the growth of the crop. Depending on the soil conditions, the first irrigation is carried out at the average of 600-650 m<sup>3</sup> / ha at the stage of flourishing and blossoming, the second during the flowering-and-breeding period, and the third one at the time of graining at the level of 800-850 m<sup>3</sup> / ha. It is also desirable to irrigate every 15 to 20 days in order to ensure that moisture is sufficient in the soybean ripening phase. Timely implementation of irrigation works ensures full grain availability. If moisture is missing, soybean will be small, resulting in a sharp decline in the yield. Soya bean crops suffer from spider worms, as well as pests, the autumn tuna and pelargia. Usage of biological and chemical anti-inflammatory measures is a good way to combate against them. It is desirable to distribute the golden-eye imoga against the infected pests at the rates and in the order. In chemical resistance, it is necessary to use complex drugs. In order to combat against aphids, sagans, tobacco tripsys and other pests, "Merspilan" (0.15 l / ha), "Karbafos" (0.6-1.0 l / ha), "Deltafos" (1.0 l / ha), Aplaud (0.5 kg / ha), Admiral (0.5 l / ha), Politrin-K (1.0 l / ha), Kalipso (0.1 l / ha), "Vertmek" (0.5 l / ha), "Fufanon" (1.0 l / ha), "Koragen" (0.04-0.05 l / ha), "Avaunt" (0.4-0.45 l / ha) drugs should be sprayed with the OVX sprayer injected into the tractor, with the use of 300 liters of water per hectare. To combat against spiderworm, use of 30 to 40 kg of sulfur in hectare should be sprayed, moreover, chemicals, Omayt (1.5 l / ha), Neron (1.0-1.2 l / ha), Vertmek (0.2-0.3 l / ha) and Fufanon (1.2 l per ha) can be used.

Soybeans are considered as a protein-rich crop, whose growing period is shorter. It exploits a pure nitrogen in the air, thanks to the bounding bacteria in the roots of the plant. It can be used to improve the physical chemical composition of the soil and provide biological 80-100 kg of pure nitrogen by sowing it on lands after

wheat crops. Soybean sown from June 20 to July 10 will be ripen in September and early October. For sowing winter wheat or cotton, the lands can be cultivated after soybean sowing. It does not only provide pure nitrogen during the growth period, but also produces 80-100 pure nitrogen in its roots, and also provides a favorable environment for microorganisms in the soil. Soybeans are the most nutritious for livestock, which accelerates their obesity. If it is scattered on the field, it will enrich the soil. In the context of soils of the Tashkent region of Uzbekistan, Mamurov and Yormatova (2007) found that the time of sowing has a significant impact on the growth and development of soybean crops. Before sowing, the soybean seeds are sprouted in separate joints and mixed with 37 nitrogen stamms in the sun-free space at the recommendation of the Institute of Microbiology. In the experiment, the sorts of the soybean were sown in three consecutive terms, on 15th, 25th June, 5th July, 70m in line and 3 cm in cross-section. It has been found out that there is a significant increase in the height of the soybean crop, planted in different planting times, the number of seedlings in a plant and its productivity. The height of the plant was reduced by the delay of the seeding time, which was planted on the 15th of June, on June 25th - 86 centimeters and on July 5 - 80 centimeters. The tallest vegetation was observed on the 15th of June, and was 13 centimeters long, due to the height of the plant planted on the 5th of July. When watching the number of branches formed in a plant, depending on the duration of the sowing season, on June 15, 53 branches, on June 25, 46 branches, on July 5, was 39 branches were produced. The highest indicator was observed in the plant cultivated on early June 15, and as of July 5, the number of branches was 14 times higher. With a delay of sowing time, the number of branches in one plant has diminished. The same law has been observed to detect the yield of soybean crops in a single plant, with the sowing of early planting on June 15, 28 center, on July 25, 25 center and on July 5, 22 center crops were taken. The most favorable indicator of this was observed in the period that was planted on the 15th of June and was harvested at 6 ha /c. So, with the delay of planting time, the crop yields have also dropped. It was found out that the most favorable sowing season was the early 15th of July, it leads to the high growth of the plant, the greater number of branches in a plant, and the higher yields.

When soya seeds are treated with oxyhumate before sowing, soybean growth rate has accelerated.

**Influence of Oxyhumate.** In recent years, oxyhumate has been used as a biologically active ingredient in agriculture, increasing the germination of

various herbs and potatoes and the survival of crops. Oxyhumate effect as a growth and development regulator is evident in the early stages of plant growth. It increases the rate of access to the phenolic phases, accelerates the growth and development of the plant, increases the yield and improves the product quality.

As a result, it has been found out that the oxygen content is characterized by the composition and type of soil, soil and humus, calcium, nitrogen and phosphorus, soil condition, air temperature, soil moisture, type of cultivated crops and their ages, pre-sowing time, vegetation root and upper part processing, and other factors.

The influence of oxyhumate on soya bean seeds and the growth energy of the tumors were studied in the laboratory. In experiments 0.01% solution of oxyhumate was used and soybean seeds were watered for 12 hours. As a control, soybean seeds were sprayed in distilled water. The results are shown in **Table 1**.

According to experimental results, soybean varieties studied by 0.01% of oxyhumate concentration will increase sharply in the temperature of 15°C (20-30%). The intensity of growth of soybean tumors also accelerates due to oxyhumate. The effect of the oxyhumate on growth and development as a stimulant really developed during the early stages of plant growth (Shekhar et al. 2016).

**Table 1.**

Fertility %	The height of tumour, cm			Seed fertility, s/ha
	4 daily	5 daily	6 daily	
81.4±1.47	3.1±0.12	3.4±0.11	3.8±0.12	19.3±0.60
95.6±1.21	3.4±0.13	3.9±0.12	4.5±0.14	20.8±0.55

## CONCLUSIONS

In the Khorezm region, it is mentioned about the planting of soybean crops from recultivated leguminous crops after winter wheat, with 90 kg of phosphorus and 60 kg of potassium fertilizers, the field is cleared from the remains and roots of weeds. In the soil of the republic, due to the absence of bacteria adapted to soybean seeds, the soil must be processed at 600-800 g / ha with one of the bio-fertilizers, such as Rizoptin, Rizobium, and Bradirizobium, otherwise biological nitrogen will not accumulate in the root crop. In a place where the sunlight does not fall, the bio-fertilizers are sprinkled evenly over seeds and mixed and covered thoroughly with a cloth over a short period of time. In the case of that agro-technical activities are carried out in a timely manner, with full compliance with the above recommendations, and we can achieve the production of high quality yields.

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