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TECHNOLOGY OF CULTIVATING REGIONIZED VEGETABLE SOY VARIETIES IN UZBEKISTAN

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Annotation. Research has been conducted on the development of elements of the technology for growing vegetable soybeans of the Izumrud, Universal variety. When soaking seeds in sodium humate, as well as using mulch (decomposed sawdust, decomposed manure) affecting plant growth and development. Optimal sowing dates and schemes have been established. The technical and biological ripeness of legumes occurs earlier when sown with seeds soaked in water using mulch, as well as in the variant when soaking seeds in sodium humate. The yield was 11.8 and 12.3 t/ha, respectively, and the lowest yield was noted in the control variant with dry seeds - 11.0 t/ha. Compared to the dried sowing scheme of 70×15 and (50+20) ×15 cm, with a sparse sowing scheme of 70×25 and (50+20) ×25 cm, the height of the main stem in vegetable soybeans decreases. Optimal sowing schemes have been established: single-row sowing scheme 70×20 cm, and with double-row sowing - (50+20) ×20 cm.

Keywords: *vegetable soybeans, sowing dates, sowing schemes, seed mulching, green beans, technical and biological ripeness.*

Introduction

Soybeans are a new vegetable crop for Uzbekistan. It is of great interest for scientific research and implementation in vegetable growing. The cultivation of early-ripening varieties of vegetable soybeans will allow for early yields and make

it possible to timely free up the fields for repeated crops. High-yielding varieties of vegetable soy will allow increasing soy production and providing the population with high-quality protein products. [1, 2].

60 см5 см1,1 смThe vegetable soybean variety Universal is early-ripening, the duration of flowering is 20-30 days. Flowers of the valley. The height of the bush is 40 -. bush leafiness is medium. Branches are formed at the base of the first and second branches and have very short nodes. Leaf is whole, oval-shaped, with a pointed tip. Weak descent. Bob length -, width -. In each bob, 1-3 seeds are formed. From 25 to 65 beans are formed on one plant, of which 90% are two-seeded.

1,0 см0,7 смSeeds in the technical ripeness phase (green beans) are greenish, shiny, flat-oval in shape, length -, diameter -. The period from mass flowering to technical maturity is 20-30 days, and the biological maturity of seeds is 55-60 days. The first harvest of green legumes in technical ripeness is carried out on the 60-65th day after sprouting. Seeds reach biological maturity 90-95 days after germination. The bean yield in technical ripeness is 11 t/ha, and in biological ripeness up to 4 t/ha. The mass of 1000 green seeds is 690 - 720 g. During biological ripening, the seeds are hard, yellow in color, the mass of 1000 seeds is 255 - 270 g. [3].

Vegetable soybeans are used in food, mainly in fresh and frozen form when the seeds have reached technical maturity, that is, when the beans have fully formed and have green color.

Soybeans are rich in enzymes, mineral salts of potassium, calcium, phosphorus, vitamins A, D, E, F, K. Vitamins in soybean seeds are three times more abundant than in dried cow's milk. Vitamin C is found in large quantities in soybean sprouts and vegetable soybean seeds.

In terms of protein complex and content of essential amino acids (lysine, methionine, tryptophan, etc.), soy protein is closer to animal proteins, therefore

animal and human organisms expend minimal effort to convert soy protein into their body proteins. The high solubility of soy protein in water (up to 94%) makes it easily digestible food for humans and valuable feed for animals and birds.

1 кг380 г1 кгSoybeans, as a source of high-quality protein, are also important in livestock feed. For feed, they use jam, meal, flour, grain waste, green mass, herbal flour, hay, silage, and soybean straw. Adding only 10-15% of meal to the diet makes it complete in protein and amino acid composition. Soybean feed is highly nutritious: soybean seeds contain 1.38 units of digestible protein, soy flour - 1.20 and 375, meal - 1.21 and 420, meal - 1.19 and 410, green mass - 0.21 and 35, hay - 0.51 and 140.

Research Methodology

The Izumrud variety of vegetable soybeans, regionalized in 2020, in the IGIEBR of the Academy of Sciences of the Republic of Uzbekistan.

Vegetable soybeans of the Universal variety, regionalized in 2008 at the Research Institute of Soybean Production and Metallurgy.

28 м^{2}7 мExperiments on pre-sowing seed preparation were conducted in 4 variants: sowing with dry seeds (control), sowing with seeds soaked in water (12 hours), sowing with seeds soaked in sodium humate solution (12 hours), sowing with seeds soaked in water using mulch (transformed manure + transformed sawdust). The area of the accounting section consisted of four-row sections along the length. Sowing scheme

70 x 15 cm. Sowing date April 10.

28 м^{2}Experiments on the study of optimal sowing schemes for vegetable soybeans included 6 sowing schemes: 70×15 (control), 70×20, 70×25, (50+20) ×15, (50+20) ×20, (50+20) ×25 cm. The area of the accounting plot was. Before setting up the experiments, soil agrochemical analysis, phenological observations,

biometric measurements, biochemical analysis at technical and biological maturity, and crop accounting were conducted.

Harvesting was carried out manually, repeatedly, in one session. The yield structure was determined under laboratory conditions.

Research results

We conducted research on the pre-sowing preparation of soybean seeds, as well as the selection of optimal sowing schemes for the regionalized soybean variety "Universal."

To select the best method of pre-sowing seed preparation, we tested the following options:

1. Sowing dried seeds (control);

2. Sowing seeds soaked in water (for 12 hours);

300 г3. Sowing seeds soaked in sodium humate solution (for 12 hours) at a rate of 1 ton of seeds;

4. Sowing seeds soaked in water using mulch (transformed manure + transformed sawdust);

Soybeans are hung at a stable soil temperature of +12...+14°C to a depth of 3-5 cm. Seeds need to be sown in moist soil. The sowing dates of soybean seeds largely determine its yield.

Studies conducted at the Research Institute of Early-ripening Varieties of the Universal variety in 2015-2018 and the Institute of Early-ripening Varieties of the Izumrud variety of the Academy of Sciences of the Republic of Uzbekistan in 2020-2022 showed differences in yield accumulation depending on the sowing dates. The optimal period for sowing seeds and forming a high yield is the period from April 1

to 20. At these two sowing dates, the green soybean beans are harvested in July. This allows the field to be freed up for repeated crops (potatoes, onions, radishes, corn for green fodder).

When sowing on March 20, in the first year of sowing, when the soil was not yet sufficiently developed, seed rot was observed in the soil and seedlings did not appear. In the second year, at the same sowing date, the seedlings were better, but the yield was not high. When sowing on April 20, the yield was higher than before. Sowing seeds on April 30 turned out to be too late, as the growing season of soybean plants stretched to September and the yield was not high. It should be noted that both in early and later periods, soybean yields were slightly less than 20.03 - 33.2 c/ha, 1.04 - 35.6 c/ha, 30.04 - 36.1 c/ha. The highest yield was noted when sowing 20.04 - 38.5 c/ha. In the control variant 10.04 - 37.7 c/ha.

To determine the optimal density of vegetable soybean plants, the following sowing schemes were studied:

70 см15 см1. Single planting, with distance between rows and between plants in a row - control. (95.2 thousand units/ha).

70 см20 см2. Single-row sowing, with distance between rows and between plants in a row. (71.4 thousand units/ha).

70 см25 см3. Single-row sowing, with distance between rows and between plants in a row. (57.1 thousand plants/ha).

70 см20 см15 см4. Planting is two-row, with distance between rows, between rows in the row, and between plants in each row. (50+20) × 15. (190. 4 pcs./ha).

70 см5. Two-row planting with distance between rows, 20cm between rows and 20cm between plants. (50+20) ×20. (142.8 thousand plants/ha).

70 см25 см6. Two-row planting with distance between rows, between rows 20cm and between plants. (50+20) ×25. (114.2 thousand units/ha).

The field similarity of soybean seeds varied depending on the treatment methods and was 90.1% when sown with dry seeds, 97.1% when soaked in sodium humate solution, and 97.4% when soaked in water with subsequent soil moistening. Soaking seeds in sodium humate promotes earlier emergence of seedlings by 6.3 days, soaking seeds in water using mulching - by 6.5 days, in the control variant sowing with dry seeds - by 11.4 days.

1 гаOur research showed that pre-sowing seed treatment had a certain influence on the time of seedling emergence. The highest yield (12.3 t/ha per hectare) was noted when soaking seeds soaked in water with the subsequent use of mulch (transformed manure + transformed sawdust), and when soaking seeds in sodium humate solution, a yield of 11.8 t/ha was obtained.

20 см15 смWe have established that the highest soybean yield was recorded when sown in 2 rows with row spacing in the row and plant spacing in each row (50+20) x15 cm and with a sowing scheme (50+20) x20 cm. Accordingly, the soybean yield in technical ripeness under the scheme (50+20) x15 cm was 21.0 t/ha, and under the scheme (50+20) x20 cm - 17.0 t/ha, in the control variant 70x15 cm - 11 t/ha.

Vivodi

Based on our research, the following conclusions can be drawn:

Seeds soaked in sodium humate solution must be suspended only in moist soil, otherwise the seed germination will decrease, which will lead to thinning of crops. When using mulch (decomposed sawdust and decomposed manure), harmonious seedlings appear, and plant growth and development improve.

2. The technical and biological ripeness of legumes occurs earlier when sown with seeds soaked in water using mulch, as well as in the variant when soaking seeds in sodium humate. The yield was 11.8 and 12.3 t/ha, respectively, and the lowest yield was noted in the control variant with dry seeds - 11.0 t/ha.

3. Compared to the dried sowing scheme of 70×15 and (50+20) ×15 cm, with a sparse sowing scheme of 70×25 and (50+20) ×25 cm, the height of the main stem in vegetable soybeans decreases.

4. Optimal sowing schemes have been established: single-row sowing scheme 70×20 cm, and double-row sowing scheme - (50+20) ×20 cm.

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