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THE EFFECT OF PLANTING TIME AND PLANT THICKNESS ON THE QUANTITY OF ROOT AND SHOULDER LEAVING THE SOIL OF AMARANTH

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Abstract: *The amount of roots and shoots remaining in the soil, as well as the total amount of nitrogen, phosphorus, and potassium in the amaranth plant, when it grows well and gives a high yield, first of all depends on the planting period and then on the planting scheme. When amaranth is planted on March 15 in the scheme 60X25-1, it causes 1.5 t/ha of roots and shoots to remain in the field, as well as 77.0 kg/ha of nitrogen, 60.8 kg/ha of phosphorus, and 75.4 kg/ha of potassium.*

Key words: *amaranth, plant, growth and development, yield, experiment, option, return, soil, root, root, angus, phosphorus, nitrogen, potassium.*

Introduction. Today, great importance is being paid to the health of the population all over the world. For this reason, the quality of the food they consume is emphasised, and diseases are prevented. To achieve this, the soil of the existing cultivated land must be clean and rich in organic matter. The purity of the soil depends on the amount of fertiliser applied to the cultivated crop, and the amount of roots that remain in the soil after them is of great importance.

In recent years, great importance has been paid to the planting of medicinal plants in the irrigated areas of our republic. As a result, various types of plants that are useful for human health have been cultivated. This makes it necessary to carry out scientific research on these plants. Along with studying the yield and quality of plants with medicinal properties, it is also important to study their impact on soil fertility, the amount of nutrients, and ecology. Especially important are the residues left in the soil after the harvest and their composition. The amaranth plant, which is planted in large areas in different regions of our republic, is important for its roots and leaves. Because its biological mass, that is, its height, is high, its roots develop strongly, which means that there will be a lot of plant residue left in the soil after planting. Therefore, we aimed to study the amount of root and stem remaining in the soil after the amaranth plant harvest.

Scientific research has been conducted in many countries around the world on the impact of various agricultural crops on the soil, the roots, and the roots that leave them in the soil.

Literature review

According to I. Zh. Sulaimanov et al. [8; 25-27 б.] after the winter wheat repeated sowing of beet crops will have a positive effect on the size of the soil and serve to increase its productivity. Although this crop, which has been studied in practice, yields relatively good results, it is important to select the optimal sowing standards for all repeated crops.

In our studies, we verified that mineral fertilizers, mainly nitrogen fertilizers, are of great importance for the growth and high yield of sugar beet. For sugar beets in the form of sodium nitrate (NaNOi), N200R150K200 kg/ha normal is effective (Sulaymonov, Ergashev, [9; 122-126 б.]).

According to U.N. Nabiev [7; 101 p.], nitrogen fertilisers for winter wheat should be given with juice before planting (30 kg/ha), 50 kg/ha during the budding phase, 75 kg/ha during tuberization, and 25 kg/ha during earing. leaves N52R95K108 kg/ha of nutrients in the soil with roots and shoots.

According to I.Zh.Sulaimonov and others [10; 140-144 б.] in order to increase the efficiency of irrigated land use as a second crop of succeeded suctions, it is best to plant 50-75% of its seeds with seeds (respectively, 84% and 89%), so as to obtain full seedlings of seeds

Ya. Boriev [1; 250–253 p.] In the experiments carried out in the conditions of grey-meadow soils in the Samarkand region, the total amount of peas and then corn grains planted as the first crop was 82–89 ts/ha, and the nutritional units increased by 126% per hectare.

M.T. Tojiev [11; 140–141 p.] in Surkhandarya region, winter wheat left 43.7–45.7 ts/ha of stem and root residues in the 0–50 cm layer of the soil after it, and 45.1 ts in corn planted as a repeated crop.

Research Methodology

Our research was carried out in the light grey soils of the Namangan region, and we described their characteristics.

Grey soils are located at an altitude of 400–1300 m above sea level, and in the southern regions they reach 1500–1600 m. As a result of the long-term use of irrigated grey soils in irrigated agriculture, an agro-irrigation layer with a thickness of 0.6–1 m or more was formed, and the morphological features typical of grey soils have almost disappeared. According to the mechanical composition, the soils are mainly medium and light sandy loams, sandy loams are rare. In some places, from 0.5-1.2 m, pebbles or jagged limestones are laid, and in the submontane plains, they are sometimes skeletal. Depending on the diversity of the mechanical composition of the arable layer of soils and the diversity of agrotechnics, the amount of humus varies widely from 0.79 to 0.98%, sometimes up to 1.75%. Depending on the lower layers of the profile, its amount decreases by 0.5-0.6%, the amount of humus in washed soils is also 0.5-0.6%. The total nitrogen content of humus in grey soils is high, and the ratio of carbon to nitrogen (S:N) is 7:9. The experimental field consists of light grey soils with medium loam mechanical composition, old irrigated, and non-saline.

The experimental system is presented in Table 1. 12 options are arranged in 4 rows in one layer; the total area of each plot is 0.6 x 8.0 = 4.8 m x 50 =240 m^2, and the reference area is 100 m^2. The total area of the experiment was 240 x 4 = 960 m^2 x 12 = 1,115 hectares.

Before planting the experiment (ploughing the land freed from cotton), humus and mobile forms of total nitrogen, phosphorus, potassium, and nutrients (HNO_3, P_2O_5, K_2O) in the 0–30 and 30–50 cm layers of the soil at the beginning and end of the amaranth operation period were determined.

After harvesting the amaranth crop in the experimental field (the amount of amaranth stem and root residues from each field was determined, and then the total amount of NRK contained in them was determined), the experimental field was ploughed to a depth of 32–35 cm in the summer.

In the experiment, 100% of the planned phosphorus and potassium fertilisers were applied before ploughing the field, since the mineral fertilisers were applied at the same rate. Nitrogen fertilisers were given 40% of the total nitrogen rate before planting (20%), when 2-3 true leaves were produced (after the single one), and the remaining 40% during fertilisation.

In the experiments, monitoring of the growth and development of plants and calculations were carried out based on the tasks set out in the plan. Also, before the experiment and at the end of the experiment, in order to determine the changes in the amount of nutrients in the soil, soil samples were taken from the tillage (0–30 cm) and under-tillage (30–70 cm) layers, and agrochemical analyses were carried out. Total amounts of potassium, mobile amounts of nutrients and were determined. For the analysis of soil samples, nitrates were analysed by the Grandwald-Lyaju method, mobile phosphorus and exchangeable potassium by the Machigin and Protasov methods, and humus by the I.V. Tyurin method. Total NRC amounts were determined from plant samples taken at the end of the application period.

All observation, analysis, and calculations are adopted at UzPITI's "Methods of Conducting Field Experiments." [3; 147-б.], “Методы агрохимических, агрофизических и микробиологических исследований в полевых хлопковых районах” [5; 187-б.], «Методика полевых опытов с хлопчатником» [6; p. 233] was carried out on the basis of methods. Experimental data of B.A. Dospekhov [4; p. 352] Mathematical analysis was performed based on the “Методика полевого опыта” method.

Table 1
Experience system

№	Planting period	Planting scheme	Theoretical seedling thickness, thousand ha
1	15.03.	60X20-1	83,333
2		60X25-1	66,666
3		60X30-1	55,555
4		60X35-1	47,619
5	25.03.	60X20-1	83,333
6		60X25-1	66,666

7		60X30-1	55,555
8		60X35-1	47,619
9	05.04.	60X20-1	83,333
10		60X25-1	66,666
11		60X30-1	55,555
12		60X35-1	47,619

Table 2

The amount of roots and shoots in the soil, in the 0-30 cm layer of the soil, in t/ha, three-year average, depending on the dates of planting amaranth and the thickness of seedlings

options	Root the remainder	Angiz remains	Total root residue
1	0,93	0,57	1,50
2	0,94	0,58	1,52
3	0,91	0,53	1,44
4	0,90	0,51	1,41
5	0,89	0,53	1,42
6	0,90	0,54	1,44
7	0,87	0,50	1,37
8	0,84	0,48	1,32
9	0,85	0,50	1,35
10	0,87	0,51	1,38
11	0,82	0,46	1,28
12	0,80	0,45	1,25

RESULTS AND DISCUSSION

In the experiment, we determined the plant residues left in the 0–30 cm layer of the soil after harvesting the amaranth plant. For this, amaranth plant residues remaining in the soil on a 1 m^2 surface and a 30 cm layer were studied. After finding the remaining roots and shoots in one hectare by taking the amount of roots and shoots in 1 m^2 and multiplying it by 10,000, a sample was taken from it, crushed in a mill, put in paper bags, written on a label, and brought to the laboratory. It was studied in two replications of the experimental options, which were conducted only in the reference area (Table 2). According to it, we can see that during the first planting period of amaranth seeds, the remaining root residues in the soil are much higher than in other periods. In the first planting period, root residues were in the range of 0.90-0.94 t/ha, in the second period, it was 0.84-0.90 t/ha, and in the third planting period, it was 0.80-0.87 t/ha. Also, if we study the data obtained by planting schemes, the largest amount of root residue was obtained when planting 60X25-1. In addition, when planted in the same planting scheme (60X25-1) in all planting periods, it is 0.94 in options 2, 6 and 10, respectively; it corresponds to an amount of 0.90 and 0.87 t/ha. We also determined the amount of sugar left in the soil, and the options were in the range of 0.45-0.58 t/ha. Amaranth plant yield is in the range of 0.51-0.58 t/ha in the first planting period, 0.58 t/ha in the 60X25-1 planting system, and 0.48–0.54 t/ha in the second planting period

(25.03). In the scheme 60X25-1, it was 0.54 t/ha, and in the third planting period (05.04), it was 0.45-0.51 t/ha, and we can see that it was also 0.51 t/ha. The total amount of roots and stems left after the harvest of the amaranth plant was 1.25–1.52 t/ha, according to the options.

From these data, we can see that the amaranth plant leaves more roots in the soil than the anguz ek akknchkiin. The amount of roots and shoots remaining in the soil depends firstly on the timing of planting and secondly on the planting schemes. The correct determination of the planting dates and the number of seedlings in accordance with the planting schemes ensured the strong growth of the plant roots. This led to the growth of plants and increased productivity.

Conclusion and recommendations

The amaranth plant grows well and gives a high yield, and the amount of roots and shoots that remain in the soil depends first of all on the time of planting and then on the planting scheme. When amaranth is planted on March 15 in the scheme 60X25-1, it ensures that 1.5 t/ha of roots and shoots remain in the field.

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