SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

UDK:631.53.048

AMARANTH PLANTING PERIODS AND PLANT THICKNESS RATE OF ROOTS AND STEM LEFT IN THE SOIL

https://doi.org/10.5281/zenodo.10156336

A.Yunusov
is a doctoral student of the Andijan Institute of Agriculture and Agrotechnologies
Email:abrorbekyunusov2@gmail.com
Tel:+998911779794
Abdusamatova Dinara Jahongir kizi
Student at Namangan State University
Email:abrorbekyunusov2@gmail.com
Tel:+998911779794

ABSTRACT
The amaranth plant grows well and gives a high yield, and the amount of roots and roots remaining in the soil, as well as the total amount of nitrogen, phosphorus, and potassium contained in them, first of all depend 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-development, yield, experiment, option, return, soil, root, root, 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 emphasized, and diseases are prevented. To achieve this, the soil of the existing agricultural land should be clean and rich in organic matter. The purity of the soil depends on the amount of fertilizers applied to the cultivated crop, and the amount of roots and 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, amount of nutrients, and ecology. The residues left in the soil and their composition after harvesting are especially important. The amaranth plant, which

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

is planted on large areas in different regions of our republic, is important for its roots and leaves. Because of its high biological mass, or height, its roots develop rapidly, resulting in a large amount of plant residues in the soil after planting. As a result, the goal of the experiment was to determine the amount of roots and seeds that remained in the soil after amaranth harvest.

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

Literaturereview

Scientists say that sugar beet has a positive effect on the soil after the crop, especially planting them as a repeat crop after winter wheat has a positive effect on the volume of the soil, plant residues ensure its productivity. Also, the timely application of necessary mineral fertilizers, as applied to other repeated crops, has a positive effect on soil properties with a high yield from crops (I. Sulaymonov et al., [6; p. 25-27]).

I.J. Sulaimanov and D. Ergashev [7; 122-126 p.], according to the information provided by the plant growth and yield, mineral fertilizers are of great importance, especially nitrogen fertilizers. it is effective to give ammonium nitrate fertilizer N200P150K200 from nitrogen fertilizer forms for replanted sugar beet.

A.A.Juroev and I.J.Sulaymonov came to the following conclusion based on the results of their long-term experience: setting the rate of mineral fertilizers at the rate of N200P150K200 kg/ha for replanted sugar beet in the conditions of irrigated gray meadow soils will ensure its root fruit yield of 370 ts/ha. This increases the efficiency of irrigated land use.

I. J. Sulaimanov and others. [8; 140-144 p.] shows that when sugar beet is grown in the conditions of gray-meadow soils, mineral fertilizers at the rate of N200 P150 K200 kg/ha and the use of nitrogen fertilizers in the form of sodium nitrate lead to higher growth and productivity.

Ya. Boriyev [1; 250–253 p.] In the experiments carried out in the gray meadow soils of Samarkand region, peas were the first crop and then corn grains were planted in a total area of 82–89 s/ha, and the nutritional units per hectare increased by 126 %.

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

Research Methodology

We conducted our research in the light gray soils of the Namangan area and described those soils' characteristics.

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

Gray soils are located at an altitude of 400-1300 m above sea level, and in the southern regions it reaches 1500-1600 m. As a result of long-term use of irrigated light gray soils in irrigated agriculture, an agro-irrigation layer with a thickness of 0.6-1 m or more was formed, and the morphological features characteristic of protected gray soils have almost disappeared. According to the mechanical structure, the soils are mainly medium and light sandy loams, sandy loams are rare. In some places, from 0.5-1.2 m, gravel or jagged limestones are laid, and in the submountain plains, they are sometimes skeletal. Depending on the diversity of the mechanical composition of the tillage layer and the variety 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 gray soils is high, and the ratio of carbon to nitrogen (C:N) is equal to 7:9. The experimental field consists of light gray soils with medium loam mechanical composition, old irrigation, and no salinity.

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

Before the experiment (plowing the land freed from cotton), at the beginning and at the end of the amaranth period, humus and mobile forms of total nitrogen, phosphorus, potassium, and nutrients (HNO_3, P_2O_5, K_2O) were determined, as were the physical, physical, and mechanical properties of the soil.

After the harvest of amaranth 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 plowed to a depth of 32-35 cm in the summer.

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

In the experiments, monitoring of the growth and development of plants and calculations were carried out based on the tasks defined on the basis of 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 plowed (0–30 cm) and undertilled (30–70 cm) layers, and agrochemical analyses were carried out. Total amounts of humus and nitrogen, phosphorus and potassium, and mobile amounts of nutrients were also determined. For the analysis

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

of soil samples, nitrates were analyzed by the Grandwald-Lyaju method, mobile phosphorus and exchangeable potassium by the Machigin and Protasov method, and humus by the I.V. Tyurin method. Total NRC amounts were determined from the plant samples taken at the end of the application period.

All observation, analysis and calculations were adopted at UzPITI "Methods of conducting field experiments" [3;p.147], "Методы агрохимических, агрофизических и микробиологических исследований в полевых хлопковых раёнах" [5; 187-b.], "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 опйта" method.

Table 1

Experience system

№	Planting period	Planting scheme	Theoretical seedling thickness, thousand bush/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 rest**	**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

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

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

Table 3

The total amount of nitrogen, phosphorus and potassium in the roots and shoots of amaranth leaves, in %, three-year average

options	Root The rest	Angiz ns	In the root			InAngiz			Nutrients remaining in soil, kg/ha		
			N	P	K	N	P	K	N	P	K
1	0,93	0,57	0,05	0,04	0,05	0,04	0,04	0,05	69,3	60,0	75,0
2	0,94	0,58	0,05	0,04	0,06	0,04	0,04	0,05	77,0	60,8	75,4
3	0,91	0,53	0,05	0,03	0,05	0,04	0,04	0,04	66,7	48,5	66,7
4	0,90	0,51	0,05	0,03	0,05	0,04	0,04	0,04	66,3	47,4	65,4
5	0,89	0,53	0,05	0,04	0,06	0,04	0,04	0,05	65,7	57,8	79,9
6	0,90	0,54	0,05	0,04	0,06	0,04	0,03	0,05	66,6	52,2	81,0
7	0,87	0,50	0,04	0,04	0,05	0,04	0,03	0,04	54,8	49,8	63,5
8	0,84	0,48	0,04	0,04	0,05	0,04	0,04	0,04	52,8	52,8	61,2
9	0,85	0,50	0,04	0,04	0,05	0,04	0,04	0,04	54,8	54,0	62,5
10	0,87	0,51	0,04	0,04	0,05	0,04	0,04	0,04	55,2	55,2	63,9
11	0,82	0,46	0,03	0,04	0,04	0,04	0,03	0,04	43,0	46,6	51,2
12	0,80	0,45	0,03	0,04	0,05	0,04	0,04	0,04	42,0	50,0	58,0

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 in 1 m² surface and 30 cm layer were studied. This is by taking the amount of roots and shoots left in 1 m² and multiplying the amount removed by 10,000.After finding the remaining roots and shoots in one hectare, take a sample of it, grind it in a mill, and put it in paper bags. put it on a label and brought it 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. It was found to be 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

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

and 10, respectively; It corresponded to the amount of 0.90 and 0.87 t/ha. We also determined the amount of sugar remaining in the soil, and the options ranged from 0.45 to 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 0.0 in the second planting period (25.03). 48-0.54 t/ha in the scheme 60x25-1, it is 0.54 t/ha, and in the third planting period (05.04) it is 0.45-0.51 t/ha, and 0 We can see that it was .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 grass. 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 required number of seedlings in accordance with the planting schemes ensured the strong growth of the plant roots. This led to better growth of plants and an increase in productivity.

We also determined the total amount of nutrients in the roots and leaves of the amaranth plant. The amount of nitrogen in the root left by the plant was in the range of 0.03-0.05% according to the options. The most nitrogen was observed in the first planting period of the experiment (15.03) in options 1-4, they were the same 0.05%. Also, the amount of nitrogen in the roots was in the range of 0.04-0.05% in the 5-8 variants planted in the second planting period (25.03). In the third planting period (05.04), its amount is slightly reduced, and it can be seen that it is in the range of 0.03-0.04% according to options 9-12. From these data we can see that plants can be planted on time and absorb the required amount of nitrogenous nutrients from the soil. When we studied the amount of phosphorus in the amaranth root, it was in the range of 0.03-0.04%. In this case, the highest indicator was reached on 15.03 when it was planted in the 60x25-1 system, which was 0.04%. It is also worth noting that the phosphorus content was higher when planted in the 60x25-1 system in all planting periods. When we determined the amount of potassium, it was observed in the analysis that it was almost the same amount as the amount of nitrogen (in some cases it was more than nitrogen in options 2, 5, 6) and it was 0.04-0.06%.

Nutrients in amaranth plant pulp differed dramatically from those in roots. The amount of nitrogen in the root is slightly less than that of the root. In this case, nitrogen was the same 0.04%, and the amount of phosphorus was 0.03-0.04%. In this case, the minimum was observed only in options 6, 7, 11, 0.03%. The amount of potassium in plant pulp was in the range of 0.04-0.05%. However, the amount of nitrogen in the remaining roots and shoots per hectare is 42.0-77.0 kg/ha nitrogen, 46.6-60.8 kg/ha phosphorus and 51.2-81 kg/ha. we can see the amount of potassium left in the soil.

JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

Conclusion/Recommendations

The amaranth plant grows well and gives a high yield, and the amount of roots and roots remaining in the soil, as well as the total amount of nitrogen, phosphorus, and potassium contained in them, 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, 75.4 kg/ha of potassium. provides.

RESULTS AND DISCUSSION:

1. Bo‘riyev Ya. O‘mishdosh ekinlar va tuproq unumdorligi, Suv va resurs tejovchi texnologiyalar. Toshkent, 2008 yil, 250-253 betlar.
2. Gutin N.G. Kornevaya sistema polevыx kultur: Moskva. –Kolos.-1964, S-120.
3. Dala tajribalarini o‘tkazish uslublari / Uslubiy qo‘llanma. – Toshkent. O‘zPITI, 2007. – 147 b.
4. Доспехов Б.А. Методика полевого опыта. - М. Изд-во «Агропромиздат», 1985. – 352 с.
5. Методы агрохимических, агрофизических и микробиологических исследований в полевых хлопковых раёнах – Ташкент. СаюзНИХИ, 1977. – 187 с.
6. Методика полевых опытов с хлопчатником. – Ташкент. СаюзНИХИ, 1981. – 233 с.
7. Nabiyev U.N. Och tusli bo‘z tuproqlarda kuzgi bug‘doy uchun azotli o‘g‘itlar qo‘llash muddatlarining samaradorligi mavzusidagi q.x.f.f.d. (PhD) ilmiy darajasini olish uchun disertasiya, Tashkent, 2023yil, 101-bet
8. Сулаймонов И. Ж. и др. REPETITIVE CULTIVATION OF SUGAR BEET SEEDS IS ASSOCIATED WITH THE SOWING OF PLANTING SEEDLINGS //Межнародний науковий журнал Інтернаука. – 2018. – Т. 1. – №. 1. – С. 25-27.
9. Sulaymonov I. J., Ergashev D. INFLUENCE OF FORM AND NORMS OF NITROGEN FERTILIZERS ON THE DEVELOPMENT OF PAVORNO SUGAR BEET //Scientific and Technical Journal of Namangan Institute of Engineering and Technology. – 2020. – Т. 2. – №. 9. – С. 122-126.
10. Sulaymonov I. et al. BEETROOT EFFECT ON THE TOTAL MASS OF SOIL //Scientific and Technical Journal of Namangan Institute of Engineering and Technology. – 2020. – Т. 2. – №. 2. – С. 140-144.
11. Tojiyev M., Tojiyev Q.,Mamaraimov T. Kuzgi bug‘doydan so‘ng ekilgan oraliq va siderat ekinlarning o‘sishi, rivojlanishi xamda xosildorligi,

JOURNAL OF AGRICULTURE AND LIFE SCIENCES
ISSN(Online): 2984-6706
SJIF Impact Factor |(2023): 5.988|
Volume-6, Issue-4, Published |20-11-2023|

Dexqonchilik tizimida ziroatlardan mo‘l xosil olish texnologiyalari. Toshkent 2010 yil, 140-141 betlar.

12. Omonillo o‘g‘li X. A. AGROCHEMICAL INDICATORS OF THE SOIL DEPENDING ON THE STANDARDS OF MINERAL FERTILIZERS //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 1. – C. 741-746.

13. Khabibullaev A. O. EFFECT OF MINERAL FERTILISERS APPLIED TO AMARANT PLANTS ON NITROGEN DYNAMICS IN THE SOIL //SCIENTIFIC ASPECTS AND TRENDS IN THE FIELD OF SCIENTIFIC RESEARCH. – 2023. – T. 1. – №. 10. – C. 7-12.

14. Omonilloyevich, Fayziyev Xayrullaxon, and Xabibullayev Abdullazizxon Omonillo o‘g‘li. "FERTILIZERS USED IN CULTIVATION OF MEDICINAL AMARANTH PLANT AND NATURAL SOURCES ENRICHED WITH COMPOUNDS OBTAINED FROM CHICKEN EGG SHELLS AS NATURAL BIOACTIVE FERTILIZER." *Finland International Scientific Journal of Education, Social Science & Humanities* 11.1 (2023): 321-325.