INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD ISSN: 2455-0620 Volume - 5, Issue - 11, Nov– 2019
Monthly, Peer-Reviewed, Refereed, Indexed Journal with IC Value: 86.87 Impact Factor: 6.497
Received Date: 06/11/2019 Acceptance Date: 19/11/2019 Publication Date: 30/11/2019

The impact of planting scheme - feeding area on the growth and productivity of Kohlrabi in the double cropping

[1]Dilafruz Murodovna Yakubova, [2]Arip Kadirkhodjaev

[1]Independent researcher, Department of Vegetable Growing, Melon Production and Potato Growing, Tashkent State Agrarian University, Tashkent, Uzbekistan

[2]Candidate of Agricultural Sciences, Docent of Department of Vegetable Growing, Melon Production and Potato Growing, Tashkent State Agrarian University, Tashkent, Uzbekistan

Abstract: *The article highlights the importance of vegetables as food and their curative properties. There is a scientific justification for the planting scheme for the cultivation of kohlrabi as a second crop, which changes proportionally to the increasing of the number of leaves that grow in the plant and also to the length and width of the leaf unit, as well as increasing of the distance between the crops in the row. It is also practically proven that the increasing of the distance between the plants in the rows from 10 cm to 30 cm without changing the distance between the rows will have a positive effect on the viability of the plants per hectare - reducing the error rate. It has been reported that the enlargement of feeding area has a positive influence on the average mass of the fruits of each bush. Moreover, scientifically manifested the benefits of the technology of cultivation of giant type of kohlrabi in a 70 × 25 cm scheme.*

Key Words: *kohlrabi, double cropping, planting scheme, productivity, leaves, leaf stem, leaf length.*

1. INTRODUCTION:

It is known that vegetables are the source of vitamins, macro and micronutrients, phytoncides and many biologically active substances. It also contains antioxidants that prevent the aging process and the development of many diseases boosting the immune system. For this reason, consumption of variety of vegetables throughout the year is the basis for a healthy diet.

The fact that the consumption of vegetables and fruits has led to a decline in the number of diseases which were found in the 30's of the last century. Being a necessary ingredient (components) in food products the vegetables and fruits have a high value (Konankov, 2007; Zuev et al., 2016).

Today, in many developed countries, public healthy diet is viewed as a state policy. The basis of a healthy diet is not only protein-rich and energetic foods, as well as vegetables that are rich in biologically active substances. One of such vegetables is a less common type of kohlrabi. Kohlrabi is like a cabbage and can be called as turnip or brooks. Its stem tastes like white cabbage stem. But the rhizome is soft, juicy and sweet. This is because of its high content of sucrose (4.6%). With this indication it is considered a record type among other types of cabbage. It is called the "northern lemon" because of its high content of Vitamin C, which is superior to vitamin-rich lemons and oranges (Kitaeva I.E, 1977).

According to Balashev N.N, Zeman G.O (1981), the planting of the sapling in 60 cm wide furrows with 10-12 cm distance between the saplings or under a 70 × 20 cm double-row sowing scheme gave a good result due to the compact bush of kohlrabi. At the same time, they noted that as a result of a short growing period, kohlrabi can be grown as a compound crop for vegetables such as white cabbage and tomatoes.

Furthermore, kohlrabi was known as an indispensable component in the production of nutritious vegetable food for children, Volkova E.N (1999), Autko AA (2008).

So, vegetables are of great importance as food in human life. For increasing the efficacy of irrigated arable lands and in order to increase the gross yields, the creation and improvement of new varieties of vegetables with shorter growth periods and more biologically active substances are prior tasks of today. Scientifically-based data on the cultivation of kohlrabi in our dry hot climatic condition are not available in literatures and other sources. Studying this issue has theoretical and practical implications for us in the propagation of the variety of vegetables grown in our conditions and is one of the actual problems of vegetable production.

2. MATERIALS AND METHODS:

In our research, the field experiments were conducted in the soil climatic conditions of experimental plot of Tashkent State Agrarian University in 2017-2018 with the aim of cultivating the 35-day seedling of the Giant varieties of kohlrabi as a second crop.

In the experiment, the 35-day seedlings of kohlrabi were sown in the third decade of July under the following scheme: 70 × 10 cm (control), 70 × 15 cm, 70 × 20 cm, 70 × 25 cm and 70 × 30 cm. Each scheme was arranged in 4 repetitions, consisting of 4 row furrows, in 10 m long. For each repetition, 400, 266, 160 and 132 seedlings were planted according to the planting scheme. The surface of the area under the seedlings which were observed was 140 m^2. Phenological, biometric, and other observations were performed on the experimental plot (Dospekov B.A, 1985) on the basis of current methodological guidelines.

3. RESULTS AND DISCUSSION:

Observations showed that the increasing of the distance between the plants in the rows from 10 cm to 30 cm without changing the distance between the rows, had a different effect on the number and size of leaves per plant (Table 1).

Table 1.

Impact of planting scheme of kohlrabi in the double cropping on the number leaves, leaf stem and leaf length of Giant variety (in 2017-2018)

Planting scheme	Feeding area, m^2	Number of leaves, pcs/bush	In comparison with control %	Mean length of leaf stem, cm	Leaf's average	
					length, cm	width, cm
70×10 cm (control)	0.07	18.8	100	11.2	15.4	11.2
70×15 cm	0.11	21.6	114.9	12.7	17.8	13.9
70×20 cm	0.14	22.1	117.6	14.3	20.4	14.8
70×25 cm	0.175	24.8	131.9	15.2	21.9	15.1
70×30 cm	0.21	25.1	133.5	15.9	24.8	15.8

The total number of leaves per bush was 18.8 pieces until the maturation period of the stem fruits of the seedlings planted under 70 × 10 cm (control) scheme in the experiment. It was determined that the distance between the plants in the row grew from 10 cm to 30 cm and the number of leaves per plant increased from 14.9% to 33.5%. Increasing the feeding area from 0.07 m^2 (control) to 0.21 m^2 positively influenced the leaf stem and leaf length, consequently, the leaf stem length constituted from 11.2 cm to 15.9 cm and the leaf length varied from 15.4 to 24.8 cm relatively.

Thus, the reduction of the number of seedlings per surface unit from 14.3 bushes/m^2 in the Standard planting scheme to 4.7 pcs/m^2 to the final planting scheme would have a positive effect on increasing the number of leaves, longer leaf stem and leaf formation.

The planting scheme affects not only the number and quality of leaves per stem, but also the survival, yield and quality of the seedlings too (Table 2).

Table 2.

The influence of planting scheme on error rate, productivity and quality of Giant variety of kohlrabi in double cropping (in 2017-2018)

Planting scheme	Error rate, %	Per hectare		Yield		Mean mass of marketable stem fruit, g
		Number of died plants, thousand/pcs	Number of actual plants, thousand/pcs	t/ha	Compared to control, %	
70×10 cm (control)	5,8	8285	134572	28,8	100	210,9
70×15 cm	4,1	3725	87184	30,5	105,9	350,1
70×20 cm	2,2	1571	69857	31,7	110,1	453,8
70×25 cm	1,2	686	56457	33,8	117,4	598,7
70×30 cm	1,1	524	47096	28,7	99,7	610,2

According to observations (Table 2) it is obvious that increasing the distance between plants in the rows from 10 cm to 30 cm has a different effect on the survival of the seedlings. 5.1% of the seedlings planted at a distance of 10 cm died during the growing season, resulting in a reduction of seedlings by 8.285 pcs per hectare. It was found that

increasing the distance between plants from 5 cm to 15-30 cm compared to the control variant had a positive effect on germination viability, ranging from 4.1 to 1.1%.

Among the studied planting schemes, the least error rate was observed in the last two variants of the experiment, ranging from 1.2-1.1%. This can be thought to be due to the biological requirement of Giant variety of kohlrabi for the feeding area of 0.175 and 0.21 m^2.

The planting scheme affected not only the error rate but also the mass of stem fruits formed on each bush and the yield per hectare.

In the control planting scheme (70×10 cm), the actual number of plants per hectare was 134572 pieces but the average mass of stem fruits on each bush was not more than 210.9 g.

In subsequent variants of the experiment, the increasing in the distance between plants in the rows from 15 cm to 30 cm confirmed the proportional increase in the weight of the stem fruits and their mean weight was 350.1 ... 610.2 g. Higher or less weight of stem fruit has influenced on the yield per hectare to be more or less. Among the planting schemes studied, the highest yield (33.8 t / ha, 119.0%) was produced from the plants growing in the fourth planting scheme (70×25 cm) in the experiment. The reason of the high and qualitative yield production of these seedlings grown by this planting scheme is, in our opinion, sufficient nutrients on the surface of 0.175 m^2 and the full utilization of light energy, as well as, less error rates.

Average mass of stem fruit of the last variant seedlings (70×30 cm) was 610,2 g/ha per bush or it was 399,3 g/ha more than control variant stem fruit mass, while compared to the variant grown in 0,175 m^2 feeding area it showed 11,5 g/ha more indication, however, the total yield was the same with the yield obtained in the variant of the first planting scheme, but was 18,0% less than the yield of the fourth planting scheme (70×25 см). This was due to a significant reduction in the number of plants per hectare.

4. CONCLUSION:

When the Giant variety of kohlrabi is planted in 0.175-0.21 m^2 feeding area, it forms 6-7 pieces more vigor leaves on each bush compared to control planting scheme. Cultivation of kohlrabi under 70×10 cm scheme in double cropping leads to high rate (5.8%) of error per hectare. Planting the kohlrabi under a 70×25 cm scheme provides the highest yield (33.8 t/ha) with best quality.

REFERENCES:

1. Konankov P.F. (2007). Vegetables – the base of healthy diet. Potato and vegetables. Moscow. 1: 8-9.
2. Zuyev V.I., Mavlyanova R.F., Dusmuratova S.I., Buriev Kh.Ch. (2016). Vegetables - are food and spice. Tashkent: Navruz. 306 p.
3. Kitaeva I.E. (1977). Cabbage. In Moscow worker. 57-61.
4. Balashev N.N., Zeman G.O. (1977). Vegetable growing. Publishing “Ukituvchi”. Tashkent. 306 p.
5. Volkova E.N. (1999). Sorting agrotechnics for kohlrabi. Potato and vegetables. 5: 28-29.
6. Autko A.A. (2004). In the world of vegetables. Minsk: UP. “Technoprint”, 568 p.
7. Dospekhov B.A. (1985). Methods of field experiments. Moscow: Agropromizdat. 361 p.
8. Larina T.V., Gessler N.I., Bezzubov A.A., Yelizarovo L.G. (1991). The content of vitamin U (S methylmethyline) in cabbage crops. Bulletin of higher educational institutions. Food technology. Moscow, 1-3: 27-29.
9. Pivovarov V.F., Starsev V.I. (2006). Cabbage, its types and varieties. Moscow, ARSRISSVC (ВНИИССОК). 192 p.