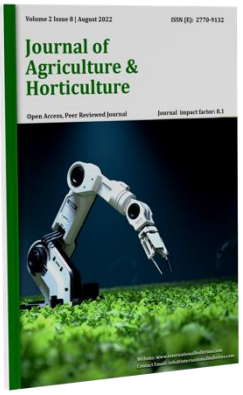

EFFECT OF PLANTING SCHEME ON GROWTH AND PRODUCTIVITY OF SWEET PEPPER "LASTOCHKA" VARIETY

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Abstract: In the article, the results of the research conducted in order to determine the effect of the planting scheme on the growth and productivity of the "Lastochka" variety of sweet pepper are presented with an in-depth scientific analysis.

Key words: greenhouse, sweet pepper, planting scheme, phenological observations, feeding area, leaf plates.

Introduction

When vegetable crops are grown in greenhouses, all microclimate conditions (heat, light, moisture and nutrients) are created artificially. Therefore, it is possible to get the planned harvest only if the created conditions are close to natural conditions and their complex fully meets the biological requirements of the cultivated crop. The created microclimate ensures that all the physiological processes occurring in the plant leaf plates take place in moderation, as well as sufficient accumulation of dry matter.

Materials and methods

Field experiments 2018-2020 were conducted at the field of the experimental farm of the Termiz Institute of Agro-Technology and Innovative Development. This experimental station, where the research was conducted, is located in Surkhandarya region. Therefore, its climate is sharply continental like this region.

Our experiment consisted of five different planting schemes, 5.6 per unit area; 6.6; 8.3; 11.0; and we tried planting 13.3 plants.

Study of sweet pepper variety samples "Methodology of state variety testing of agricultural crops", "Methodology of experimental work in vegetable growing and melon growing", "Methodological recommendations for conducting experiments with vegetable crops in protected ground facilities" guides were used.

The statistical analysis of the results was calculated by the dispersion analysis method in the "Methodology of field experience" (Dospekhov B.A., 1985) "Statistica 7.0 for Windows".

Results and discussions

During 2018-2020, we planted sweet pepper variety "Lastochka" in different feeding areas and at different thicknesses during the transitional season and conducted phenological and biometric monitoring and obtained the following results.

Increasing the number of plants per surface unit was achieved by reducing the distance between plants in the row without changing the spacing of sweet pepper (60 cm) (Table 1).

From the observations, it was found that the survival of seedlings planted in the test feeding area was high, and the error rate was very small. Nevertheless, the number of plants per surface unit exceeding the norm caused an increase in the number of errors. That is, in

our version where 11 and 13.3 seedlings were planted per surface unit, and the amount was on average 1.3 percent or 0.7-0.8 percent more than the control.

In particular, the increase in yield was evident during the growth period of seedlings, when they were sown thickly (60 x 15 cm and (40+20)2 x 24 cm). Between 1.4 and 1.7% of the plants of these variants died during the growing season. In our variant planted in the double row method, the death of plants was twice as much as in the first three planting scheme. This is probably due to the lack of nutrients and light energy in the soil, as well as insufficient moisture.

When taking into account the plants affected by Fusarium wilt disease, the following were found. Seedlings were relatively little damaged by this disease. However, the sharp increase in the number of seedlings planted per unit area caused an increase in the number of seedlings affected by wilt disease. In particular, in the control variant of the experiment, the number of plants affected by verticillosis was 2.4%, while in the version where 11 and 11.3 plantes were planted per surface unit, this figure reached 4.2 and 6.6%. Damage of seedlings by wilt disease when planted thickly must also have influenced the increase in the number of bugs.

Table 1

Effect of planting pattern on sweet pepper error rate and Fusarium wilt disease (2018-2019)

Planting scheme, cm.	Amount of error, %						Damage by fusarium wilt disease, %		
	10 days after planting			before first harvest					
	2018	2019	average	2018	2019	average	2018	2019	average
60x30 (control)	0,5	0,7	0,6	1,1	1,0	1,05	2,1	2,7	2,4
60x25	0,8	0,9	0,8	1,3	0,9	1,1	3,0	2,4	2,7
60x20	0,7	0,5	0,6	1,3	1,5	1,4	3,2	3,4	3,3
60x15	1,5	1,1	1,3	1,4	1,4	1,4	4,0	4,4	4,2
(40+20) 2 x 24	1,2	1,3	1,4	1,8	1,6	1,7	6,3	6,8	6,6

The conducted phenological observations did not provide enough accurate information to determine the effect of the feeding area and planting scheme on the sudden change in the growth and development stages of the plant. The formation of the first fruits of flowering in all studied planting schemes coincided almost at the same time.

The level of light, water and mineral nutrients supply varies when a plant is grown in a greenhouse in a different planting scheme and feeding area. All this had an effect on the growth of the plant, the formation of fruit elements and finally the harvest.

Observations made at the beginning of the first crop and at the end of the yielding period revealed the following.

From the figures presented in Table 2, it is known that without changing the distance between the rows of pepper planted in the greenhouse, reducing the distance between the

sprouts in the row and, as a result, reducing the feeding area, affects the height of the main stem of the plant.

Table 2.

The effect of the planting scheme of sweet pepper variety Lastoka on the growth and development of the above-ground part (2018-2019 year).

Planting scheme, cm.	Before the first harvest			At the end of the growing season		
	The length of the main stem, cm	Number of lateral branches, pcs	The number of leaves per plant, pcs	The length of the main stem, cm	Number of lateral branches, pcs	The number of leaves per plant, pcs
60x30 (control)	34,5	3,4	110	40,2	3,7	119
60x25	35,8	4,1	126	42,1	4,4	128
60x20	40,4	4,2	124	44,3	4,6	131
60x15	44,8	3,1	107	43,1	4,0	119
(40+20)2 x24	42,6	3,4	101	42,9	3,9	111

Among the studied planting schemes, the plant height is 44.8 in the version where 11 and 13.3 seedlings are planted per surface unit; reached 42.6 or 12-8 cm higher than the control variant plants. The rest of the variants of our experiment were in the range of 34-40 cm.

The field of nutrition had a dramatic effect on the formation of branches and leaves. That is, 4.1 - 4.2 lateral branches were formed in each plant of seedlings planted in 0.15 and 0.12 m^2 of feeding area. This indicator did not exceed 3.1 units in the last two variants of the experiment, or produced 0.3 units less buds compared to the plants of the control variant.

Sweet pepper produces the most leaf plates when it is planted in the greenhouse soil in the scheme of 60x25 and 60x20 cm. Plants of these two variants produced an average of 126-124 leaves. The plants of the last two variants produced 3-9 fewer leaves than the average control plants.

When the seedlings planted in different feeding areas were transferred to the formation of the surface of the earth and the changes that occur in them at the end of the yielding phase, the regularity of the first harvest period was preserved. That is, in the last two options, where the seedlings were planted thickly, the plants were short.

A sweet pepper plant grown in different nutrient conditions produces different assimilative surface leaf layers, all of which result in different numbers of fruiting elements and yield. As the observations, taking into account the elements of the fruit and the average weight of the fruit, the number of them began to increase as the area of nutrition increased.

The number of sweet pepper fruit elements (buds, flowers and unformed fruits) depends on the area of nutrition of the plant and the distance between the plants in the row.

As the number of seedlings planted per surface unit increases, the number of fruit elements per plant decreases. For example, in the control variant, the number of fruit elements per plant was 21 during the period of fruiting, while in our two options, their number was 3-6 less. During this period, the number of formed fruits differs sharply, but in the option planted with 13.3 seedlings per surface area, the number of formed fruits is 1.1 less than the control option, and 1.3-0.9 less formed fruits compared to the plants of the second and fourth options.

Plants that produce large, tall, numerous branches in turn produce heavy fruits. Plants of the variant planted with 5.6 and 6.6 seedlings per square meter produce large fruits with thick flesh and weight of 62-63 g. As the distance between the plants in the row decreased, the average weight of the fruits also decreased. The average weight of the fruits of the last three variants of the experiment did not exceed 59-42 g. In particular, the fruit produced in the variant planted in double rows, where 13.3 seedlings were grown per unit area, was very small, and the average weight was 42 g.

Table 3

Effect of planting scheme on the formation of fruit elements and fruit weight of "Lastochka" variety of sweet pepper. (2018-2019 year)

Planting scheme, cm.*	At the time of fruit ripening			When the harvest is complete		
	Number of fruit elements, pcs	The number of shaped fruits, pcs	Average fruit weight, g	Number of fruit elements, pcs	The number of shaped fruits, pcs	Average fruit weight, g
60x30 (control)	21,0	5,2	62	38	5,7	68
60x25	20,7	5,4	63	38	5,2	67
60x20	18,9	5,5	59	31	5,0	64
60x15	18,0	5,0	45	29	4,8	47
(40+20) 2 x 24	15,2	4,1	42	27	4,0	40

These observations were also carried out during the last period of the pepper yielding stage and similar data were obtained to the results of the previous observations. However, it should be said that during this period, the number of fruit elements was more compared to the period of the first observation - the regularity of the first period was preserved.

In conclusion, it can be stated that in order to obtain large and heavy fruit from sweet pepper, it should be planted in a greenhouse area of 60x25, 60x20 cm or 6.3 per surface unit; Planting 8.3 seedlings will be in accordance with the purpose.

Productivity depends not only on the yield per plant, but also on the number of plants per unit area.

The observations made on the calculation of the yield indicate that the productivity of plants in different feeding areas and different thicknesses is not similar to each other.

Table 4

Effect of planting method on the yield per unit area (2018-2019 year)

Planting scheme, cm.	Yield, kg/ha			Relative to control, %
	2018	2019	Average	
60x30 (control)	5,3	5,2	5,2	100,0
60x25	6,2	6,4	6,3	121,2
60x20	5,1	4,9	5,0	92,6
60x15	4,2	4,5	4,3	79,6
(40+20) 2x24	3,4	4,3	3,7	68,5

From the figures presented in Table 4, it is known that if the plant is sufficiently provided with microclimate conditions and nutrients in the greenhouse, but the number of plants present in the surface unit is different, it affects the gross yield from each plant and the total area differently.

At the same time, the fruit elements formed in each plant and the formation of small or large or thick fleshy fruits have a positive or negative effect on productivity.

In the tested planting schemes, the highest quality yield per plant and unit of surface area was obtained from the variant planted with 6.6 seedlings per m, 6.3 kg/m. 5.2 kg/m was obtained from the control version of the experiment. 60x20 and 60x15, and from the option planted in double rows ((40+20)2 x24 cm) respectively: 3.4; 4.3 and 3.7 kg/m studied feeding areas 0.12; In our opinion, the reason why plants grown at 0.09 and 0.072 m yield less than the control option is probably due to the fact that they cannot fully use the light energy and the nutrients in the soil they occupy are insufficient. In addition, it is probably due to the fact that the leaf plates do not accumulate enough dry matter to perform physiological processes in a timely manner.

So, in order to obtain a high and quality harvest of sweet pepper from the Lastochka variety, it would be appropriate to plant 6.6 seedlings per surface unit in a 60x25 cm scheme in greenhouses during the transitional season.

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