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## EFFICACY OF PLANT GROWTH REGULATING PREPARATIONS IN THE CULTIVATION OF VEGETABLE CROPS

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### ABSTRACT

*The article presents the results of the study on the efficacy of the application of plant growth regulating preparations Rostmoment and Epin plus in the cultivation of vegetable crops. As a result of the application of Rostmoment from the growth regulating preparations to white cabbage, the yield increased to 81 t/ha. The yield of carrot was 73-75 t/ha, the quality indicators of roots improved. The total yield of garlic reached 45.5-45.9 t/ha.*

**KEY WORDS:** *growth regulating preparations, productivity, white cabbage, carrot, garlic.*

The use of growth regulating compounds is one of the main issues of vegetable growing, and it is carried out with the implementation of ways of improving technologies [1]. Before applying growth-regulating preparations into practice, it is necessary to consider the types of vegetables they are used for, the measured proportion for application, rate of application and methods of application [2,3,4,5].

The purpose of the research is to determine the effectiveness of using growth regulating preparations Rostmoment and Sodium Gummat during the development phases of vegetable crops and their application rates.

The research was conducted in the educational experimental farm of TashSAU during 2021-2022. The object of the research is Navruz cultivar of white cabbage, Baraka cultivar of carrot and Mayskiy VIR cultivar of winter garlic. The soil of experimental site is a typical gray soil, watery environment, pH=6.7, humus content is 1.2-1.5%. The soil is enriched with macro- and micronutrients at a high level. The calculation area is 20 m<sup>2</sup>. The experiment is triplicated [10,11,12].

The Rostmoment preparation normalizes biochemical processes in the cell and improves metabolism, due to the fact that it contains a wide spectrum of amino acids. These amino acids have biostimulant properties, affect the growth and development of plants, and create a high absorption capacity in the soil [6].

We compared the effectiveness of the growth regulator Rostmoment with Sodium gummate. The concentration of these preparations in the treatment was 1%. Working liquid was used in the amount of 300 l/ha.

The first irrigation was conducted in the form of 200 ml per plant when the seedlings were fully planted, and the second irrigation was done in the form of 500 ml per plant at the beginning of cabbage cupping stage.

3-4 weeks after transplanting the seedlings into the soil, the plants were sprayed with the growth regulating preparations, the 2nd spraying was carried out when the cabbages were fully cupped. Root carrots are treated with preparations for the first time in the phase when 5-6 real leaves have formed; the second treatment was carried out at the beginning of the formation of roots, after 15 days the third treatment was done. The effect of Rostmoment was determined in doses of 3.0 and 5.0 kg/ha, while Sodium gummate was used in the amount of 3 kg/ha for efficacy.

The options for experimenting with garlic were as follows:

1. Control (water)
2. Spraying Sodium gummate (seeds treated with 2% solution, plants with 3 kg/ha rate before planting); the first spraying was done when 3-5 true leaves appeared; the second time in the root development phase.



3. Spraying Rostmoment (garlic seeds treated with 0.1% solution, plants with 2 kg/ha rate before planting).
  4. Rostmoment (garlic seeds treated with 0.1% solution, spraying plants at the rate of 4 kg/ha before planting).
- Working liquid rate was 300 l/ha.

Agricultural technics of growing crops was carried out on the basis of regulations.

Phytosanitary monitoring was carried out in the agrocenosis of vegetable crops during the growing season. The methods of observations on the growth and development of plants were carried out on the basis of tests of phyto regulators [7,8,9, 13, 14, 15, 16]. For mathematical and statistical processing of the obtained results Microsoft Excel 2010 and statisticade programs were used and determined by the method of B.A.Dospekhov (1985).

It was observed that the weight and yield of the head of white cabbage were increased during the double watering (1% concentration) and one time spraying (1% concentration) of Rostmoment preparation (Table 1).

**Table-1**

**The Efficacy of The Application of Growth Regulating Preparations in The Cultivation of White Cabbage**

№	Experiment options	Average weight of cabbage head (kg)	Head Height (cm)	Head Diameter (cm)	Yield (c/ha)
1	Control (water)	1,6	15,1	16,3	572
2	Rostmoment (3 kg/ha)	2,2	17,5	18,7	789
3	Sodium gummat	1,9	16,2	16,8	685
Spraying to plants (1%)					
1	Control (water)	1,3	15,5	14,8	496
2	Rostmoment (5 kg/ha)	2,0	16,6	18,1	762
3	Sodium gummat	1,6	14,9	16,6	605

The Rostmoment preparation increased the weight of the cabbage head by 0.6 kg compared to the control when the plants were watered for the second time. As a result of spraying the preparation to plants, the mass of the cabbage head increased by 0.7 kg, the yield was 789 and 762 c/ha.

**Table-2**

**Efficacy of Preparations in the Cultivation of Carrot**

№	Experiment options	Root length (cm)	Root diameter (cm)	Stem density (cm)	Average weight of root (gr)	Yield (c/ha)
1	Control (water)	15,0	3,6	1,6	115	472
2	Rostmoment (3 kg/ha)	16,6	4,2	2,2	198,6	759,5
3	Rostmoment (5 kg/ha)	16,7	4,3	2,0	193,2	735,8
4	Sodium gummat	16,2	3,8	1,6	155,6	595,2

When growth regulators were used in carrot cultivation (3.0-5.0 kg/ha), it can be seen from Table 2 that the diameter of the root fruit increased with statistical accuracy (4.3-4.2 cm), the yield was 735.8-759.5 (c/ha) due to the increase in stem density (2.2-2.0 cm) and in the mass of the root (198.6-193.2g).

The amount of dry matter (13.5%), carotene (13.1%), sugar content (7.8%) and nitrate content was observed when Rostmoment preparation was applied at a rate 3kg/ha (Table 3).

**Table-3**

**Changes in the content of carrot fruit in the application of growth regulators**

№	Experiment options	Dry matter %	Monosaccharides %	Total content of sugar %	Carotene, mg %	Nitrates, mg/kg
1	Control (water)	11,8	3,48	6,45	13,2	1255
2	Rostmoment (2,0 kg/ha)	12,4	5,24	7,68	13,1	858
3	Rostmoment (4 kg/ha)	13,5	4,49	6,58	11,5	1096
4	Sodium gummat	10,9	3,75	5,45	9,4	1324



When Rostmoment preparation was applied to winter garlic at a rate of 2.4 kg/ha, active plant growth and leaf formation were observed, the weight of garlic increased (82.5-85.6 g) and the average weight was 74.6-78.5 g, and the unit area was determined to increase too (Table 4).

**Table-4**  
**Productivity Structure of Winter Garlic**

№	Experiment options	Garlic mass (g)		Yield (t/ha)		Yield (t/ha)	Added to control, t/ha
		Share of Large Garlic	Share of Medium Garlic	Share of Large Garlic	Share of Medium Garlic		
1	Control (water)	76,0	69,5	21,6	19,5	41,3	-
2	Rostmoment (2,0 kg/ha)	84,6	74,6	24,3	22,4	45,5	+2,9
3	Rostmoment (4 kg/ha)	82,5	78,5	23,6	21,2	45,9	4,4
4	Sodium gummat	80,6	73,8	23,0	21,0	44,2	+2,9

The total yield of garlic in experimental options was 45.5-45.9% and it was observed that it increased by 4.2-4.6 t/ha compared to the control.

When sodium gummat was used, the yield of large garlic was 23.0 t/ha, and the medium garlic yield was 21.1 t/ha.

In the control variant, the average number of garlic cloves was 10.6 pieces (the maximum was 11 pieces).

When Rostmoment preparation was applied in the rate of 4 kg/ha, the garlic cloves was observed to be 10.4 pieces and their sizes were larger. The diameter of the garlic in the experiment was 3.9-5.0 cm. The lowest indicator was observed in the control variant (3.9 cm). When Rostmoment preparation was applied at the rate of 4.0 kg/ha, the diameter of the garlic was 5 cm. The height of the garlic ranged from 3.7 cm to 4.2 cm.

So, when studying the effectiveness of the Rostmoment preparation, it was found that it affects the quality and yield of vegetables when used in the recommended amount. When it used in white cabbage, the average weight of the vegetable was 2.0 kg, the yield reached 761.0-790 t/ha. An increase in product quality indicators and in yield was observed when the preparation was used in carrot cultivation.

It was found that when the preparation was used in the cultivation of garlic, the yield was 45.5-45.9 t/ha, and the share of large garlic increased.

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