Volume 1, Issue 9, December 2023
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

Establishing the Effects of Growth Regulators on Melon Seeds and Plants

Dusmuratova Saodat Ismailovna,
DSc of Agriculture, Professor

Akhmedova Munisa Abdimazhitovna,
PhD Student Scientific Research Institute of Vegetables, Melon Crops and Potatoes

Abstract
The article describes the effect of nanosilicon preparations and microparticles used in melons on the growth, development and productivity of plants.

Introduction

Currently, extensive measures have been implemented in the Republic of Uzbekistan to maintain and increase the productivity of irrigated lands and to use them effectively. Based on the soil and climate conditions of each region, the use of environmentally safe, biological preparations in the cultivation of vegetables, sugarcane, legumes, oilseeds, and food crops is becoming more relevant in the protection of human health.

The use of nano technology in modern agricultural research is becoming more and more widespread. Nano technology - has a size of 1 to 100 nano microns, in atomic and molecular form. It is widely used in agriculture, animal husbandry, fisheries, and veterinary medicine. In agricultural crops, nanoparticles are used in the form of micro fertilizers, which increase the plant's resistance to diseases, adverse climatic conditions, and productivity. The advantage of these 13 nanoparticles is their active entry into the plant, acceleration of the photosynthesis process, increase in yield and quality, depending on their rate and optimal application period [1].

Thus, in crop production, the use of nano preparations as micro fertilizers provides increased resistance to adverse weather conditions and an increase in yield (on average 1.5-2 times) of almost all food (potatoes, grains, vegetables, fruits and berries) and technical (cotton, flax) crops. The effect here is achieved due to a more active penetration of microelements into the plant due to the nano size of the particles and their neutral (in the electrochemical sense) status. A positive effect of nano magnesium on accelerating photosynthesis in plants is also expected [2, 3, 4, 5].

The Scientists of the Research Institute of Vegetables, Melon Crops and Potatoes have tried applying nano-microparticle preparations to the seeds and seedlings of tomato plants in different variants. The use of manganese dioxide (MnO_2) and iron oxide (Fe_2O_3) 1 g per 10 liters of water per tomato seedlings had a positive effect on plant growth and development [6].

In 2022-2023 of the Experimental field of the Research Institute of Vegetables, Melon Crops and Potatoes, experiments were conducted to substantiate the positive effect of using the Nanosilicon drug in different variants on melon seeds and plants.

Volume 1, Issue 9, December 2023
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

Research Method

Experiments were carried out in 5 variants of Kichkintoy variety of melon, regionalized in the Uzbekistan: 1. Control-1 (freezing seeds in water); 2. Control-2. Nanosilicon - 0.1 g/l seeds treated and given to the plant 2 times with water from the leaf, before flowering); 3. BIO fertilizer-1 g/l (seeds were treated with Nanosilicon at the rate of 0.1 g/l and plants were fed with NPK + microelements 2 times before flowering); 4. MnO_2.-1 g/l (seeds treated with Nanosilicon at the rate of 0.1 g/l and feeding with manganese dioxide 2 times from plant leaves, before flowering); 5. Fe_2O_3-1 g/l (seeds treated with Nanosilicon at the rate of 0.1 g/l and 2nd feeding with iron oxide from plant leaves before flowering).

In the experiments, phenological observations during the growth period of melon and biometric measurements of 10 plants were carried out based on the methods of B.J. Azimov B.B. Azimov (2002) [7] "Methodology of experiments in vegetable growing, potato growing and potato growing". The germination of seeds, the opening of male and female flowers, the period of ripening of the first fruit were determined, the length of the main stems, the number of side branches, the thickness of the stem, and the number of leaves were taken into account.

Results

Melon seeds were treated with Nanosilicon at the rate of 0.1 g/l, and the plant was fed with nano microparticles (at the rate of 1 g/l) twice before flowering. The influence of growth regulators on the duration of interphase periods in melon plants are shown in table 1.

Table 1. The influence of growth regulators on the duration of interphase periods in melon plants of the Kichkintoy variety (2022-2023)

№	Experiment options	From sowing seeds to germination, day	From germination to flowering of male flowers	From germination to flowering of female flowers, day	From germination to maturation of the first fruit, day
1	Control-1 *(water)*	11	37	52	90
2	Control+ Nanosilicon 0.1 g/l	9	36	50	87
3	Nanosilicon 0.1 g/l + BIO fertilizer-1 g/l	9	35	49	86
4	Nanosilicon 0.1 g/l + MnO_2-1 g/l	9	35	48	84
5	Nanosilicon 0.1 g/l + Fe_2O_3-1 g/l	9	34	46	82

Volume 1, Issue 9, December 2023
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

It was noted that the opening of male flowers was established 1-3 days earlier than in the control version. In all tested variants, early flowering of female flowers was observed 3-4 days earlier than in the control, and in the variant with nanosilicon+Fe2O3-1 g/l, flowering was observed 6 days earlier than in the control.

The faster the period from germination to maturation of the first fruit, this is the early ripening feature of melon, and it was found that in all the tested options, the indicators were 4-6 days earlier than the control, and in the 5th option it was 8 days earlier. Table 2 shows the results of the effects of the tested drugs on the biometric parameters and productivity of melon plants.

The obtained results show that all growth control preparations were superior to the control in terms of length of the main stem, number of side branches, thickness of the stem and number of leaves (table 2).

Table 2. The influence of growth regulators on the growth and productivity of melon plants (2022-2023)

№	Experiment options	Biometric Measurements				Total Productivity	
		Length of the main stem, cm	Number of lateral branches	Stem thickness, cm	Number of leaves, pieces	t/ ha	comparing to the control, %
1	Control 1 *(water)*	116,0	3	0,7	29,7	17,4	100
2	Control+ Nanosilicon 0.1 g/l	120,7	3	0,7	34,7	18,6	106,9
3	Nanosilicon 0.1 g/l + BIO fertilizer-1 g/l	140,4	4	0,8	50,4	19,0	109,1
4	Nanosilicon 0.1 g/l + MnO_2-1 g/l	135,0	4	0,9	59,7	20,4	117,2
5	Nanosilicon 0.1 g/l + Fe_2O_3-1 g/l	139,1	4	0,9	68,9	21,1	121,2

As a result of the growth of the above-ground vegetative part of the plants, it was determined that the overall productivity was superior to the control as a result of the positive effect on the photosynthesis process. In the control variant, 17.4t/ha yield was obtained, and the use of microparticle preparations with nanosilicon ensured an increase in yield up to 7-21%.

Summary

Studies have established that when treating melon seeds of the Kichkintoy variety with nanosilicon at a rate of 0.1 g/l, and providing plant feeding (twice, before flowering) with preparations from nano microparticles (at a rate of 1 g/l) during the growing season, they have a positive effect on plant growth and development, the yield was 2-3.7 t/ha, or 7-21% higher than the control.

Volume 1, Issue 9, December 2023
ISSN (E): 2938-3781

References:

1. Tarasova E.Yu., Korosteleva V.P., Ponomarev V.Ya. Application of nanotechnology in agriculture.//Bulletin of Kazan Technological University. 2012. -P.121.
2. Nurmeeva E.K. Latest developments in the field of nanotechnology at Lehigh University, USA/ // Vestnik Kazan. technol. un-ta. - 2012. - No. 8 - pp. 40-42.
3. Zinurova R.I. et al. Features of the development of Nano industry in the Russian Federation // Vestnik Kazan. technol. un-ta. - 2012. - No. 12 - pp. 311-313.
4. Bero I.L. Development of biotechnology at the present stage of life support for society / I.L. Bero, A.Ya. Samuylenko, S.A. Grin // Veterinarian. - 2010. - No. 3 - P. 3-5.
5. Lysenko E.G. On the development of nanotechnologies in the system of fundamental research of agricultural science / E.G. Lysenko, V.A. Bykov, I.A. Tikhonovich // Bulletin of the Russian Academy of Agricultural Sciences. - 2008. -№2. - P. 6/
6. Alimukhamedov S.S., Kholdorov M.U., Mamatov S.K. Nano microparticles and the benefits of their use in tomato crop //Agrochemical protection and plant quarantine. Scientific and practical magazine. Tashkent. 2022. - B. 100.
7. Azimov B.J., Azimov B.B. "Methodology of conducting experiments in vegetable growing, rice growing and potato growing". - T: "Uzbekistan" - 2002.- B. 23-24.

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8