

AEROPONICS AS INNOVATIVE APPROACH IN AGROENGINEERING

Ivanov Y.R., *yarlion99@gmail.com*

Dmytro Motornyi Tavria State Agrotechnological University

The main principle of aeroponics is aerosol spraying in closed or semi-closed area of a nutrient aqueous solution.

The principle is similar to hydroponic systems, where the roots are placed in the soil environment, into which water is pumped with nutrients. And in aeroponics, the roots just hang in the air and are sprayed with special devices [1].

Aeroponics has contributed to advances in several areas of study including root morphology, nutrient uptake, drought and flood stress, and responses to variations in oxygen and/or carbon dioxide root zone concentrations [2].

Aeroponics leads to success in the space industry. Because it has become possible to grow plants in space, and this is very important for future expeditions and revitalization of new planets.

For the functioning of system, the seeds are planted in pieces of foam stuffed in tiny pots that are fully provided with light and a sprayed mixture.

Without soil, plants grow very quickly because they consume more oxygen, and are also isolated from pests and diseases associated with the soil [3].

These systems allow easily to build large vertical farms. It is also incredibly economical, as it requires 95% less moisture.

Thanks to aeroponics, you can grow: leafy greens, culinary herbs, tomatoes, cucumbers, strawberries, as well as other plants grown in hydroponics. And harvesting is usually easier, especially for root crops.

But it has also disadvantages. The nutrients in the water must be accurately calculated. The roots must be sprayed every few minutes, and if it does not happen, the plant will die. Therefore, there must be no problems with electricity. Moreover, professional equipment costs a lot of money.

References

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Language adviser: Odnoromanenko M.V., Teacher of the Department of Foreign Languages

GROWING OF BEREHYNIA MELON IN THE CONDITIONS OF THE SOUTHERN STEPPE ZONE OF UKRAINE

Kalinin O.V., *kalinin.oleg1998@gmail.com*

Dmytro Motornyi Tavria State Agrotechnological University

Melon (*Melo sativus*) is an annual plant of the the Gourd family. In Ukraine, the main area of melons is concentrated in the south and south-east, since this area has favorable soil and climatic conditions, which are necessary for timely harvesting. Mass melons are grown in Mykolaiv, Odessa, Kherson, Zaporizhzhia, Dnipropetrovsk regions.

Melon pulp contains a lot of iron, potassium, calcium, magnesium, B, C and A vitamins, carotene and pectins. Thanks to them, melon is a means of preventing cardiovascular diseases, reducing blood cholesterol [1, p.84].

The purpose of the research was to find out whether the adverse abiotic factors of the Southern Steppe zone would affect the planned yield, which was grown on irrigated fields.

Berehynia is a mid-season transportable variety of melon, suitable for storage for 15-30 days. The period of ripening is between 74-92 days. Yield can reach 180-280 centners per hectare. Fruits are smooth with oval or spherical form, weighing 1.2-3 kg. The colour of the ripe fruits is yellow-orange with a medium grid or with its elements [1, p.147].

For the research an area of dark chestnut soils was chosen. The content of nutrition was the following (mg / kg): N - 105 mg / kg; P₂O₅ - 130 mg / kg; K₂O - 148 mg / kg. The density of the solid phase ranges from 2.53 to 2.68 g / cm³, increasing with depth. The density of the upper humus horizon is 1.15-1.17 g / cm³ and is favorable for cultivated crops.

In 2018, winter wheat was the predecessor on this area. After the removal of the predecessor, the stubble was peeled, followed by harrowing where it was necessary. The plowing took place on October 5th. After the onset of the physical maturity of the soil, a harrowing was conducted in the spring to close the moisture.

Melons are sown when average daily temperature is around 15-18 C, according to the climatic conditions of the southern steppe zone, it is in the third decade of April or the first decade of May. By this time it is necessary to keep the field clear of weeds, due to this in the middle of April another harrowing and cultivation were carried out.

The melon was sown on May 2nd on a depth of 4 cm by the SUPN-8 seeder. Before sowing, the seeds were treated with a plant growth regulator "Vympel 2" using the method of inlay in the standards recommended by the manufacturer. First seedlings were obtained on day 14, i.e. May 16th. On May 17th, cultivation was conducted, and the next day the first manual weeding started (lasted for 3 days). On May 21st, the first irrigation was started using the 450 Fg / frigate irrigation system, which lasted for 2 days. After irrigation, the first treatment with the fertilizer "Karbamid" in combination with the growth regulator "Vympel 2" and potassium humate in the norms recommended by the manufacturer was carried out. There were only three treatments, during the second and third treatments were added insecticides against pests Bi-58 in the norms recommended by the manufacturer for this crop. Watering, weeding and cultivation also took place three times. On August 2nd, the harvest began, ending in early September. Productivity per hectare in 2018 was 17 tones per hectare, exceeding the expected yield by 14%.

In conclusion we can point out that the Southern Steppe zone of Ukraine is one of the best zone for melon cultivation, but it is necessary to take into account the predecessors, built technology and irrigation system.

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Language adviser: Lemeshchenko-Lagoda V.V., Teacher of the Department of Foreign languages

THE ROLE OF ELECTRIC TRANSPORT IN MODERN LIFE

Kolodii S.V., *kolad.gard@gmail.com*

Dmytro Motornyi Tavria State Agrotechnological University

Now more and more often you can notice electric vehicles in the streets, gradually introducing ourselves into our lives. Each time there are more and more types of electric vehicles. Just on the contrary, any transport previously used by us is replaced with an electric one or a new one is being invented. For example, if we used to ride bicycles, scooters or rollers, now there is an electric bike, an electric scooter and even electric rollers, not to mention electric cars.