Annals of R.S.C.B., ISSN:1583-6258, Vol. 27, Issue 1, 2023, Pages. 239 -241
Received 25 December 2022; Accepted 01 January 2023

Scientific Bases for Breeding and Fertilizing Cucumber Growing in Producted House to Improve Quality and Quantity of the Product: A Review Article

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Abstract
One of the significant crops with considerable economic and nutritional worth is cucumber. The growth, production, and productivity of this crop have all been increased by the employment of a variety of factors. Chemical fertilizers have been replaced by a variety of organic fertilizers. Studies have shown that these fertilizers are more effective than chemical fertilizers at improving plant traits and overall yield. In addition to the effects of the breeding techniques employed on the cucumber plant, such as breeding on one stem or two stems, or utilizing other techniques to increase output and crop, there are additional factors that are harmful to the plant.

Introduction

One of the most significant summer vegetable crops in Iraq and most of the rest of the world is the cucumber, *Cucumis sativus* L. It belongs to the family Cucurbitaceae. It is grown in open fields, plastic or glass houses, tunnels, on two knobs (spring and fall). Cucumber is planted for its fruits, which are used in pickling, cooking, and salads (Mattalob *etal*, 1989). Due to its many health advantages, including its usage as an analgesic for headaches, its ability to relieve neurological problems, its ability to cleanse the body of toxins, and its ability to provide protection to the skin, cucumber is also employed as a medicinal plant (Al-Degwi, 1996).Due to the significance of this crop and the rising consumer demand for it, experts in the breeding of high-yielding, high-quality hybrid cucumbers have become more and more important. The insertion technique is one of the ways to breed and improve plants (Hassan, 2005).

In addition to cultivating hybrids with unlimited growth and applying some agricultural practices to them, such as varying the number of stems on which plants are raised by breeding and pruning them, the method of breeding is quick and simple to obtain genotypes that can be tested under the conditions of the importing country. These techniques are among those used to boost yield per unit area, and it was for this reason that experts were interested in producing cucumber plants with multiple stems, which would increase yield and lower production costs when using hybrid seeds. a range of services, such as fertilization (Zarzis, 2006). Due to their improper and excessive use with grown crops, chemical fertilizers have been shown to have harmful impacts on human health as well as environmental damage (Bayoumi and Hafiz 2006).Due to their improper and excessive use with grown crops, chemical fertilizers have been shown to have harmful impacts on human health as well as environmental damage (Bayoumi and Hafiz 2006). The breeding techniques for cucumber

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plants were highlighted by the researchers, particularly in the early stages of plant development. Al-Harbi et al. (1996) found that cucumber plants grown on one stem outperformed plants grown on two stems in several ways, including vegetative growth and overall production, but the difference in yield was not as great.

Merghany *etal* (2019) investigation on the impact of nano-nitrogen fertilization on cucumber plants, the quantity of female and male flowers, and the overall yield revealed that the fertilization increased both the quantity of female and male flowers per plant as well as the quantity of fruit. Swiader *etal* (1992) demonstrated a method for growing cucumber plants on a main stem that involved tying each plant to a string from the bottom that extends 2 m from the soil surface to the horizontal wires that are located at the top of the planting lines and regularly directing the plants vertically on these lines as a delayed application of this process results in a broken stem or damage to the leaves. In order to achieve the best yield, Ware emphasized that trimming cucumbers is a crucial operation to achieve a balance between vegetative development and fruiting growth to 45 cm above the soil's surface, all the side branches and female flowers were cut off as part of the pruning process. When two nodes with female flowers have formed on the side branches that continue to grow after that, they will be allowed to continue growing before being pruned. The developing top of the main stem is cut, enabling three side branches to grow, and then left to droop down without being linked to the thread. This process is repeated until reaching the horizontal wire that extends above the plant and to which the thread is attached. Another way to breed cucumber plants was described by Erhardt (2009) as a vertical breeding technique, which forbade the growth of fruits or branches on the first eight nodes. After that, the fruit is allowed to develop without the side branches being permitted to reach a height of 180 cm. Two side branches are then allowed to develop, drooping downward and supporting one another. They only produce fruit at the nodes, not on any subsidiary branches. According to Aly (2006) research, organic fertilizers have a considerably greater impact than chemical fertilizers in terms of improving vegetative growth characteristics, yield volume, and fruit quality. Abdullah *etal* (2012) demonstrated utilizing three cucumber hybrids inside a plastic house in southern Iraq that the hybrid Toshka excelled in plant height and yield for two consecutive seasons.

Abd al-Shammari *etal*. (2013) conducted a field study to investigate the impact of organic fertilizer Azomin and Alga Cifd3000 and different breeding practices one and two stems on three newly introduced cucumber hybrids in Iraq, designated BF372, AS1, and AS2, which were tested for the first time organic fertilizer used was, the results of the experiment demonstrated that plants of the AS1 hybrid that were bred on a single stem and fertilized with Azomin fertilizer had superior plant heights of 3.88 m, whereas those of the same hybrid that were bred using the Alga Cifd3000 fertilizer method had shortest lengths of 6.13 cm., While the maximum percentage of the chlorophyll content in the leaves, or 54.50%, was found in the plants of the same hybrid that were grown on two stems and nourished with Alga Cifd3000 fertilizer. Additionally, the hybrid BF372 plants that were grown on two stems and nourished with Alga Cifd3000 performed particularly well in terms of the time it took for the first flower to open.

Conclusion

In addition to using organic fertilizers as a replacement for chemical fertilizers that could seriously harm human health and cause environmental pollution, the use of a variety of breeding techniques for cucumber plants aids in improving plant growth and increasing the quantitative and qualitative yield.

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