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# Farmers' knowledge of technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib district

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**Abstract**

The research aimed to identify the level of tomato growers' knowledge of the technical recommendations related to the production and marketing of the tomato crop in Baghdad Governorate/Abu Ghraib District, through the areas of research, as well as identifying the most important problems facing tomato growers. This research was conducted in the Baghdad Governorate/Abu Ghraib District. As it is one of the important districts that is famous for growing the tomato crop, which includes (568) farmers, a sample of 25% of the farmers was chosen, thus the number of farmers studied became 137 farmers, the questionnaire was used as a tool to conduct the research, which consisted of 34 items covering the technical practices related to tomato cultivation. The questionnaire tool was presented to several experts to determine the validity and reliability of the form to achieve the objectives of the research. The Cronbach's alpha equation was used, which had a value of 0.96, and 20 respondents were tested to measure Reliability from outside the sample within the community, and then the data of the respondents was analyzed using the SPSS program and some statistical methods such as frequencies, percentages, and the range law in April 2024.

The results of the research showed that the level of knowledge of the respondents about the technical recommendations related to the production of the tomato crop in Baghdad Governorate/Abu Ghraib District is average and tends to decline. It is concluded from this that this weakness in the level of knowledge in farmers incorrectly practicing the technical recommendations and relying on backward agricultural traditions and customs in growing the tomato crop. It is not based on valid scientific recommendations, and it is also concluded that the performance of the extension organization is not at the required level. The research recommends the need for farmers to monitor the tomato crop and shed light on this important segment of farmers Because the tomato crop is one of the important crops that is included in many foods that are important to the daily Iraqi table, as well as the necessity of paying attention to the tomato crop growers by the agricultural extension organization and publishing what is important, especially the modern agricultural technical recommendations and delivering them to the farmer, distributing guidance bulletins and intensifying seminars for this purpose.

**Keywords:** Farmers' knowledge, tomato crop, Baghdad Governorate

## Introduction

The issue of food security has captured the attention of many researchers, given the steady increase in the global population, and reducing poverty and hunger is one of the Millennium Development Goals, which world leaders have pledged to achieve on various occasions (Orsini *et al*, 2013: 54) [18]. Therefore, efforts must be made to confront hunger, improve farm incomes, and improve food security, especially in the poorest countries. Priority must be given to food security, especially in the poorest countries, to the issue of crop losses (Adepoju and Abimbola, 2014: 21) [17].

International seed production companies extract new types of tomatoes every year to meet the progress in modern methods of agriculture the different purposes for using this crop and the importance of this crop in various countries of the world. Therefore, the number of tomato varieties currently present in the world is very large (Adda, 2018: 12) [16]. Their varieties differ from each other in many aspects, such as the botanical aspect, such as the size of the vegetative growth, the nature of the growth, and the shape and size of the fruit. Tomato varieties also differ from each other according to their uses. Some varieties are suitable for making the paste, others are suitable for fresh consumption, and a third group can withstand long-distance shipping (Abu Goukh., 2017: 11) [7].

The annual global production of tomatoes is about 80 million tons, and China is considered the most productive country Of tomatoes, the United States, Turkey, Italy, and Egypt are among the countries that produce the most tomatoes, and China produces about 31 million tons annually, while farmers in the United States of America produce commercially more than 33 million metric tons annually, and about three-quarters of this crop is produced in California, and tomatoes are grown in All regions in America acknowledge it (Al-Hazzaa, 2013: 34) [3]. Tomato seeds are planted in April and May, and their plants are planted in May and June. This bunch does not succeed in many areas, or the regions of Basra and Karbala, because it

has a moderate climate. One of the most important problems of this bunch is weak nodes due to the high temperature during the flowering and setting stages, and the fruits are exposed to blight. The sun, so it is better to plant varieties with strong vegetative growth and varieties characterized by their ability to set at high temperatures (Morsi *et al*., 2013: 76) [11]. Tomatoes grow well in fertile, warm, well-drained lands, and areas exposed to direct sunlight for not less than 6 hours a day. Tomatoes are one of the favorite crops for cultivation in home gardens because they can be grown in almost all types of lands, in addition to giving a high yield. In a relatively small area, most varieties produce from 7 to 5 kg of fruits per plant, and some tomato varieties can produce fruits that may weigh more than 300 kg each. (Beckles, 2012) [14]. The tomato plant requires relatively warm weather and a lot of sunlight. Tomatoes are mainly grown in greenhouses during cold climates, Tomatoes are usually placed in cages to keep the stems and fruits away from the ground. The tomato plant requires constant irrigation to avoid blossom end rot and fruit cracking. Tomatoes are susceptible to some pests and diseases, including bacterial wilt, early blight, wilt viruses, nematodes, and tomato worms. Many of these problems can be controlled through crop rotation, use of fungicides and pesticides, and planting resistant varieties (Ghirri *et al*, 2012) [15].

The tomato is a plant of high economic importance from the Solanaceae family. Tomatoes are grown in temperate and hot regions and belong to the genus Solanum. Like the potato, tomatoes are consumed in many and varied ways. They can be used as raw fruit without additives, and they are an ingredient in many dishes, sauces, and drinks. Tomatoes can be grown in... Open fields – if done rationally and on a scalable basis, a good source of income. The tomato is a perennial plant, but farmers, in most cases, treat it as an annual. Most commercial tomato growers start crops from seeds (hybrid) in a protected environment. Internally, they prepare the field while waiting for the young seedlings to grow and be ready for transplanting (Al-Omar *et al*., 2012: 65) [4]. On the other hand, vegetables play a major role in the growth of the national economy and providing employment for many workers, and the tomato is one of the horticultural crops of great importance in people's daily food (Mahmoud 2006: 4.) [1]. Tomatoes are one of the most cultivated and consumed crops globally, and they are also one of the most widespread crops in the world, as tomatoes provide a wide range of nutrients and many health benefits to the body (Arab Organization for Agricultural Development, 2007: None) [2]. The tomato crop is considered one of the most important vegetable crops because it is one of the important crops in the Iraqi dietary pattern. It is one of the crops rich in mineral salts and vitamins necessary for human needs, in addition to being one of the main vegetable crops that is consumed in fresh form or manufactured as a staple food for the majority of the population, it is one of the strategic crops aimed at achieving food security to face the steady population increase (Al-Ani, 1985: 650) [9].

Iraq is considered one of the countries where tomato cultivation is good due to its suitable climatic conditions and arable areas. Despite the factors suitable for tomato cultivation, its production does not meet the needs of consumers in terms of quantity and quality, due to the farmers' limited experience with the processes that take place on the fruits after harvesting or after handling them. During its storage, which leads to the destruction of a large percentage of the crop due to mechanical and physiological damage, in addition to the accumulation of the crop and its abundance during the harvest season and the failure to follow the correct methods of marketing, which leads to a decrease in its prices and the farms' economic loss between supply and demand and the variation in prices and the prolongation of the period of their appearance in the markets (Al-Bamroun, 2008: 3) [6]. The marketing of agricultural products is characterized by a large percentage of post-harvest losses ranging between 30-50% of the total production. These quantitative and qualitative losses occur in all stages of the post-harvest system. Marketing guidance is considered one of the branches of agricultural guidance, which is carried out by marketing agricultural crops in general, and vegetable crops. Especially since his interest does not stop at the harvest, but rather extends to include all marketing operations (Shaaban *et al*., 2015: 47) [10]. Therefore, attention must be paid to knowledge, which represents capital based on new and advanced information and ideas that are inexhaustible in use, and it is also considered an effective and vital tool to help farmers carry out their various jobs and activities to achieve economic and social goals and objectives (Hunt. 67, 2003) [19]. The tomato cultivation process begins from harvesting the crop, until the final delivery to the consumer. Farmers' lack of marketing knowledge has led them to follow traditional marketing methods, which has caused high rates of loss during post-harvest operations, especially in horticultural crops, as they are highly perishable like tomatoes, which leads to low returns. Producers, weakening their competitive and marketing ability, and some losses cause a decrease in production, as well as what remains after harvesting the crop, which causes problems with the formation of waste that leads to difficulty in disposing of it (Abu Dhabi Agriculture and Food Safety Authority, 2019) [13]. Given the economic and nutritional importance of the tomato crop, farmers face many problems that lead to the decline and decline in the quality of the fruits and the inability of the product to compete in the local and foreign markets. The decline in quality is due to many reasons, perhaps the most important of which is the exposure of the fruits to significant damage during the harvesting, handling, and marketing processes, in addition to the sensitivity of the crop to temperatures. This is due to its high water content and the prevalence of many incorrect trading methods among farmers (Al-Wakil, 2010: 45) [8].

However, the reality of the situation indicates that there is a defect in agricultural operations and that production is often not translated into profits, as it is important to improve the quality and increase the shelf life of the crop by using the optimal method and technology to reduce the amount of waste and improve the quality, which is reflected in the added value and income (Al-Sayyid and Sanaa, 2006: 3) [5]. Transferring new information and knowledge related to a new agricultural idea is the first stage of cognitive behavioral change. Providing information about new agricultural practices that are appropriate for a specific environment is important for farmers and the rural community. Agricultural information is an important

necessity for farmers, especially the innovator, to update his agricultural knowledge and skills, and this requires the necessity of providing him with information. Agricultural technology on an ongoing basis (HASKAH *et al*, 2024) [20]. Agricultural extension is the link between scientific research centers and farmers, as it transmits new agricultural recommendations to the farmers, after ensuring their suitability for them and urging them to accept them to solve their problems, and then conveying the effects of introducing these new recommendations to those conducting the research. Scientific (AL-Hamdany *et al*, 2021) [21, 22].

Agricultural extension seeks to transfer this information, knowledge, results of scientific research, recommendations, experiences, and new and useful agricultural and household economic ideas clearly and understandably to rural people of all characteristics so that they can benefit from them while removing obstacles to their application (AL-Hamdany *et al*, 2021) [21, 22]. The agricultural guide is considered one of the most important sources of information on which the audience of guides relies to obtain their information. Through this method, various information about agricultural innovations is transmitted from their sources to the farmers, and the effect of introducing these innovations is transferred from the guides to the change apparatus He, in turn, transfers them to scientific research centers.

Hence came the idea of this study, which aims to identify the level of tomato growers' knowledge of post-production techniques in Baghdad/Abu Ghraib District and to define the problem of the study by asking the following research questions:

1. What is the degree of farmers' knowledge of the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District?
2. What is the farmers' knowledge of the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District in each field of research (technical recommendations in agricultural practices, technical recommendations in crop production, technical recommendations in agricultural extension activities).
3. What are the personal characteristics of tomato farmers in the Baghdad Governorate/Abu Ghraib District?
4. What are the technical problems that tomato farmers are exposed to in Baghdad Governorate/Abu Ghraib District?

**Objectives**

1. Identifying farmers' knowledge of the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District in general.
2. Identify the level of farmers' knowledge of the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District in each field of research (technical recommendations in agricultural practices, technical recommendations in crop production and cultivation, technical recommendations in agricultural extension activities).
3. Identify the technical problems faced by tomato farmers in the research area.

**Materials and working Methods**

This research was conducted on a sample of 137 individuals, representing 25% of the total 568 tomato farmers registered in the Abu Ghraib District / Baghdad Governorate. A random sample of approximately 20 farmers was selected to conduct the initial test from within the research community outside the sample. Data were collected during April 2024 using a questionnaire prepared for this purpose. The Cronbach's alpha equation was used to find the scale's reliability, which was 0.96 degrees. The descriptive approach was relied upon in presenting the research results through a tabular display of frequencies and percentages. The statistical analysis was done using the statistical program SPSS.

**Quantitative treatment to measure the dependent variable**

Farmers' knowledge of technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District. Knowledge was measured through 34 items. Each respondent was asked to express his point of view on a scale of three categories (low, medium, and high), and values were given. (0, 1), and the actual range ranged between (0-34) degrees, based on the research fields, which are (the field of technical recommendations in agricultural practices, 16 items, the field of technical recommendations in crop production, 8 items, and the field of technical recommendations in agricultural extension activities, 10 items).

**Results**

**1. Identifying farmers' knowledge of the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District in general**

The research results indicate that the degrees of farmers' knowledge of technical recommendations related to tomato crop production ranged between (0-34) degrees, with an arithmetic mean of 17.98 degrees, and a standard deviation of 9.45. The respondents were distributed according to their knowledge into three categories according to the law of range, and it became clear that the percentage of respondents (36.49%) fall into the medium level category, the percentage of respondents (21.17%) are in the high-level category, and (40.15%) fall into the low-level category, as shown in Table No. (1).

**Table 1:** Categories of grower knowledge of technical recommendations related to tomato crop production. (N.137)

| Categories | Number | % |
|---|---|---|
| Low (1-12) degrees | 58 | 42.34 |
| Medium (13-24) degrees | 50 | 36.49 |
| High (25 or more) degrees | 29 | 21.17 |
| the total | 137 | 100 |

It is clear from Table 1. that the level of knowledge of the respondents about the technical recommendations related to the production of the tomato crop in Baghdad Governorate/Abu Ghraib District is low, and this may be due to many reasons, including their weak knowledge of the technical recommendations in agricultural practices, as well as the technical recommendations in the production and cultivation of the crop, and also the recommendations Technical agricultural extension activities.

**2. Identify the level of farmers' knowledge of the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District in each field of research (technical recommendations in agricultural practices, technical recommendations in crop production and cultivation, technical recommendations in agricultural extension activities).**

**A. Technical recommendations on agricultural practices**

The research results indicate that the level scores of farmers' knowledge of technical recommendations and agricultural practice ranged between (0-16) degrees, with an arithmetic mean of 7.95 degrees, and a standard deviation of 3.1. The respondents were distributed according to their knowledge into three categories, which were divided according to the number and proportions of respondents for each paragraph of the field. The respondents' percentage of knowledge of the paragraphs ranged between (8.76%-61.31%), as shown in Table No. (2).

**Table 2:** Distribution of respondents according to their level of knowledge of technical recommendations related to agricultural practices for the tomato crop. (N.137)

| S. No | Paragraphs | Levels of knowledge | | | | | |
|---|---|---|---|---|---|---|---|
| | | High | | Medium | | Low | |
| | | N | % | N | % | N | % |
| 1 | Sterilize the soil before planting | 16 | 11.68 | 72 | 52.55 | 49 | 35.77 |
| 2 | Irrigate the land before plowing | 23 | 16.79 | 57 | 41.61 | 57 | 41.60 |
| 3 | Soften the soil with certain bales | 34 | 24.82 | 63 | 45.98 | 40 | 29.20 |
| 4 | Planting a seed is better than a seedling | 25 | 18.25 | 82 | 59.85 | 30 | 21.90 |
| 5 | Fertilize before planting | 27 | 19.71 | 78 | 56.93 | 32 | 23.36 |
| 6 | Know the selection of varieties | 21 | 15.33 | 74 | 54.01 | 42 | 30.66 |
| 7 | Know when to plant | 12 | 8.76 | 84 | 61.31 | 41 | 29.93 |
| 8 | The hoeing process is done after planting | 22 | 16.06 | 77 | 56.20 | 38 | 27.74 |
| 9 | Use foliar fertilization | 13 | 9.49 | 82 | 59.85 | 42 | 30.66 |
| 10 | Use drip irrigation for tomatoes | 26 | 18.98 | 63 | 45.98 | 48 | 35.04 |
| 11 | Use organic fertilization | 35 | 25.55 | 54 | 39.42 | 48 | 35.04 |
| 12 | Seedlings are better than seeds | 44 | 32.11 | 50 | 36.50 | 43 | 31.39 |
| 13 | Seedlings grow faster than seeds | 32 | 23.36 | 64 | 46.72 | 41 | 29.93 |
| 14 | Use of pesticides | 17 | 12.41 | 79 | 57.66 | 41 | 29.93 |
| 15 | Tomatoes are harvested daily | 28 | 20.44 | 67 | 48.91 | 42 | 30.66 |
| 16 | Sorting and grading when marketing | 43 | 31.39 | 40 | 29.20 | 54 | 39.41 |

It is clear from Table 2 that the level of farmers' knowledge of the technical recommendations for agricultural practice. The average tomato crop tends to be low. This may be due to their lack of knowledge of the necessity of irrigating the land before plowing, as well as sorting and grading the crop when marketing in different boxes that have special specifications and according to the desire of the consumer.

B-Technical recommendations for crop production.

The research results indicate that the levels of farmers' knowledge of technical recommendations in crop production ranged between (0-8) degrees, with an arithmetic mean of 4.18 degrees, and a standard deviation of 3.3. The respondents were distributed according to their knowledge into three categories, which were divided according to the number and proportions of respondents for each of the paragraphs. The field and the percentages of respondents' knowledge of the paragraphs ranged between (27.01%-43.07%), as shown in Table No. (3).

**Table 3:** Distribution of respondents according to their level of knowledge of technical recommendations related to tomato crop production. (N.137)

| S. No | Paragraphs | Levels of knowledge | | | | | |
|---|---|---|---|---|---|---|---|
| | | High | | Medium | | Low | |
| | | N | % | N | % | N | % |
| 1 | Safe use of pesticides | 45 | 32.84 | 42 | 30.66 | 50 | 36.50 |
| 2 | Know how to store tomatoes | 42 | 30.66 | 47 | 34.31 | 48 | 35.04 |
| 3 | Pay attention to the symptoms of agricultural diseases and pests | 40 | 29.20 | 56 | 43.07 | 41 | 29.93 |
| 4 | Harvesting the crop in a modern way was adopted | 39 | 28.47 | 48 | 35.04 | 50 | 36.50 |
| 5 | I have access to modern methods of irrigation | 37 | 27.01 | 49 | 35.77 | 51 | 37.23 |
| 6 | Use selected and improved seeds | 45 | 32.84 | 46 | 33.58 | 46 | 33.58 |
| 7 | Pay attention to the timing of crop maturity | 49 | 35.77 | 47 | 34.31 | 41 | 29.93 |
| 8 | Use a pesticide that is safe for humans | 47 | 34.31 | 46 | 33.58 | 44 | 32.11 |

It can be seen from Table 3 that the levels of farmers' knowledge of technical recommendations in the production of tomato crops tend to be average and low. This may be due to their lack of knowledge of the safe use of agricultural pesticides that cause problems and harm to humans, as well as their lack of knowledge of using modern irrigation methods such as drip irrigation or spraying, which may The reason is its high material cost.

**T-Technical recommendations for agricultural extension activities**

The research results indicate that the level scores of farmers'

knowledge of technical recommendations for agricultural extension activities ranged between (0-10) degrees, with an arithmetic mean of 5.21 degrees, and a standard deviation of 3.11. The respondents were distributed according to their knowledge into three categories, which were divided according to the number and proportions of respondents for each paragraph of the field. The respondents' percentage of knowledge of the paragraphs ranged between (8.76%-72.26%), as shown in Table No (4).

**Table 4:** Distribution of respondents according to their level of knowledge of technical recommendations related to extension activities for the tomato crop. (N.137)

| S. No | Paragraphs | Levels of knowledge | | | | | |
|---|---|---|---|---|---|---|---|
| | | High | | Medium | | Low | |
| | | N | % | N | % | N | % |
| 1 | Attending counseling meetings | 19 | 13.87 | 26 | 18.98 | 92 | 67.15 |
| 2 | Watch guidance programs | 12 | 8.76 | 30 | 21.89 | 95 | 69.35 |
| 3 | Listening to radio programs | 20 | 14.59 | 18 | 13.14 | 99 | 72.26 |
| 4 | Visit the agricultural guide | 30 | 21.89 | 18 | 13.14 | 89 | 64.96 |
| 5 | Visit the guidance center | 24 | 17.53 | 30 | 21.89 | 83 | 60.58 |
| 6 | Attending guidance seminars | 20 | 14.49 | 24 | 17.53 | 93 | 67.88 |
| 7 | Visit the research station | 13 | 9.49 | 26 | 18.98 | 98 | 71.53 |
| 8 | Invite the guide to visit the farm | 16 | 11.68 | 27 | 19.71 | 94 | 68.61 |
| 9 | Visit the extension farm | 25 | 18.25 | 14 | 10.22 | 98 | 71.53 |
| 10 | Get training about tomatoes | 33 | 24.09 | 21 | 15.33 | 83 | 60.58 |

It is clear from Table 4 that the levels of farmers' knowledge of technical recommendations for agricultural extension activities related to the tomato crop are low. The reason may be due to their not listening to radio and television programs related to the tomato crop, as well as the difficulty of inviting the agricultural extension worker to visit the farm and give him appropriate directions related to the crop.

3-Identify the technical problems faced by tomato farmers in the research area.

The results of the research showed that many problems affect farmers' knowledge of technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District. The problems were arranged by the respondents based on their importance from their point of view according to percentages, and as shown in Table 5.

**Table 5:** Problems facing the farmers surveyed with technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District. (N.137)

| S. No | Problems | N | % |
|---|---|---|---|
| 1 | Lack of seed availability in associations when planting during the growing season | 99 | 72.26 |
| 2 | Lack of availability of good, high-yielding tomato varieties | 111 | 81.02 |
| 3 | High production requirements such as fertilizers and fuel | 120 | 87.59 |
| 4 | Lack of cooperative marketing of tomato crops | 124 | 90.51 |
| 5 | Exploitation of traders when buying tomato crops | 100 | 72.99 |
| 6 | Low yield from tomato cultivation compared to other crops | 109 | 79.56 |
| 7 | The lack of a fixed price policy by the state | 130 | 94.89 |
| 8 | Production decreases when it reaches the harvesting stage | 77 | 56.20 |
| 9 | Lack of irrigation water during the growing season | 63 | 45.99 |
| 10 | Infection of tomato crops with pests and diseases | 84 | 61.31 |
| 11 | High agricultural labor prices | 88 | 64.23 |
| 12 | Commercial fraud of pesticides and weak oversight | 123 | 89.78 |
| 13 | Lack of coordination between farmers and agricultural extension | 102 | 74.45 |
| 14 | The scarcity of tomato factories | 105 | 76.64 |
| 15 | Weak role of the agricultural extension worker in communicating with farmers | 118 | 86.13 |
| 16 | Lack of interest from extension agents and media in disseminating information related to the tomato crop | 112 | 81.75 |
| 17 | Lack of support for farmers by the state | 116 | 84.67 |

It is clear from Table No. (5). The most common problem facing farmers' knowledge of technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District is the lack of a fixed price policy by the state with a value of (94.89), as well as the problem of (lack of cooperative marketing of the tomato crop) with a value of (90.51). It is followed by the problem of (commercial adulteration of pesticides and weak control) with a percentage of (89.78), as well as the problem of (rising production requirements such as fertilizers and fuel) with a percentage of (87.59), as well as the problem of (weak role of the agricultural extension worker in communicating with farmers) with a percentage of (87.59). 86.13), and it may be due to the lack of sufficient time for the agricultural extension worker to reach all the farmers. This indicates that the agricultural extension workers are busy with administrative and routine matters, which leads to the loss of time in the effort required to implement extension activities for the farmers.

## Conclusions

The results of the research showed that the level of knowledge of the respondents about the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District is average and tends to decline. It is concluded that this weakness in the level of knowledge of farmers incorrectly practicing the technical recommendations and relying on backward agricultural traditions and customs in cultivating Tomato yield is not based on valid scientific recommendations.

It is clear that the level of knowledge of the respondents about the technical recommendations related to tomato crop production in Baghdad Governorate/Abu Ghraib District in the areas of research is average and tends to decline, especially in the field of extension activities, which are weak, and listening to and watching them is few, and it is concluded from this that the performance of the extension organization is not at the required level.

## Recommendations

The need for farmers to follow the tomato crop and shed light on this important segment of farmers because this crop has a major economic aspect in the life of the Iraqi family. It consumes a lot of it and is considered one of the important crops that is included in many foods that are important to the daily Iraqi table.

The agricultural extension organization must pay attention to tomato crop cultivators, publish what is important, especially modern agricultural technical recommendations, and deliver them to the farmer, distribute guidance bulletins, and intensify seminars for this purpose.

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