

## Post-Harvest Handling Training for Red Chilies as an Effort to Optimize Harvest Quality in Farmer Group Samarasa

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### ABSTRACT

Red chilies are a horticultural commodity that is susceptible to damage, resulting in a decrease in product quality. The decline in the quality of chilies after harvest occurs due to the ongoing respiration process, so that the chilies wilt (dry) or rot. Other damage to chilies can also occur due to rotting caused by microbes. Therefore, the red chilies produced by the Samarasa farmer group have been directly sold or used by themselves. If the harvest is large in quantity, it will be sold at a cheaper price. This is done because it is feared that red chili harvest products that are stored for a long time will rot and become unsellable. This service activity aims to provide training and assistance regarding post-harvest handling of red chilies so that they can improve their quality and make their shelf life longer. Several stages of service activities carried out include coordination with partners, post-harvest handling training, discussion and evaluation. This activity went well and smoothly. Evaluation results from questionnaires filled out by participants showed an increase in farmers' knowledge and skills regarding how to handle post-harvest red chilies with an increase of 24% and 12% respectively after attending the training.

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## INTROUCTION

The Samarasa Farmer Group is one of the farmer groups in Desa Mesjid Tuha which actively carries out red chili cultivation activities. There are around 20 ha of land that they cultivate using an intercropping system. Red chilies are widely cultivated, apart from being a type of chili that is widely used as a cooking spice (Zamrodah and Pintakami, 2020), also because the price is sometimes high, which attracts farmers to choose it as a planting option. Even though the selling price of chilies at certain times is very promising, chili farming also has many challenges, especially when the chili supply season is abundant and prices fall (Timisela *et al.*, 2020). The problem of fluctuating chili prices was also found among farmers in Mesjid Tuha village. The price of chilies can rise quite drastically, reaching 120 thousand per kg. The increase in the price of chilies is usually due to high public demand to meet the needs of meugang day, namely the Acehnese tradition of cooking beef or buffalo when welcoming big holidays, whether Ramadhan, Eid al-Fitr or Eid al-Adha (Zulfira, 2024). Meanwhile, at other times the price of chilies can also drop drastically to 20 thousand per kg during simultaneous harvest (Saputra, 2024). The chili plants that have been harvested by farmers are generally only sold in raw form after harvest arrives. Harvests that are abundant at one time also cannot be stored for long because they are worried that they will rot. This is because red chilies are a perishable commodity. The decline in the quality of chilies after harvest occurs due to the ongoing respiration process, so that the chilies wilt (dry) or rot. Another damage to chilies is rot caused by microbes such as *Collectrichum* (Ramdan *et al.*, 2019).

The red chili products produced during harvest by the Samarasa farmer group have so far been directly sold or used themselves. If the harvest is large in quantity, it will be sold at a cheaper price. This is done because it is feared that red chili harvest products that are stored for a long time will rot and become unsellable. The decline in the quality of chilies can be caused by physiological factors that are easily damaged, namely the high water content reaching 90.09 percent, and the skin being thin so it is easily attacked by microbes. Therefore, appropriate post-harvest handling techniques need to be applied in order to maintain the quality of the harvest for a longer time.

Post-harvest for chili plants is a continuation of the harvest process for cultivated plants or the results of natural mining, the function of which, among other things, is to make the material from the chili crop harvest not easily damaged and of good quality and easy to store for further processing, including processing into ready-to-use products. (Bekti *et al.*, 2024). Fresh chilies have a very short shelf life, so they need serious handling from harvest to consumer. The level of damage it causes can reach 23 percent to the diluent level. The decline in the quality of chilies is also due to their easily damaged physiological properties, namely their high water content, reaching 90.09 percent, and their thin skin, making them easily attacked by microbes. This high water content results in evapotranspiration continuing so that the chilies wrinkle more quickly, ripen more quickly and are immediately followed by the senescence process (David, 2020). So farmers need to be given understanding and skills regarding how to harvest, sort, cure, transport, store and choose good packaging materials for red chilies.

This service activity aims to provide training and assistance to the Samarasa farmer group regarding post-harvest handling of red chilies so that farmers can minimize yield losses due to damage to the red chili harvest.

## METHOD

The activity implementation method consists of the five stages (Figure 1):

### 1. Coordinate with partners

At this stage, the implementing team coordinates with partners regarding the implementation of a series of service activities, conducts direct surveys of partners' conditions, plans the time and place for carrying out activities, and takes care of the administration of correspondence.

## 2. Pre-test

The pre-test was carried out by giving a questionnaire containing a number of questions to the participants. The purpose of the pre-test is to measure the initial knowledge of training participants regarding material regarding post-harvest handling of red chilies.

## 3. Training on post-harvest handling of red chilies

Post-harvest handling training activities will also be carried out with participants from all members of the Samarasa farmer group. In this activity, an explanation and methods will be provided that can be used to ensure that the red chili harvest can last longer. The implementing team will also practice by providing examples of treatment directly so that participants can understand it well. During the training and manufacturing process, students will also accompany and help activity participants until completion. This activity targets improving participants' skills in handling the red chili harvest according to its intended use.

## 4. Discussion

At this stage participants are given the opportunity to ask questions or share experiences related to post-harvest red chili material.

## 5. Evaluation

Evaluation is carried out through a post test, namely by giving back a number of questions to measure the increase in participants' knowledge and skills after attending the training.

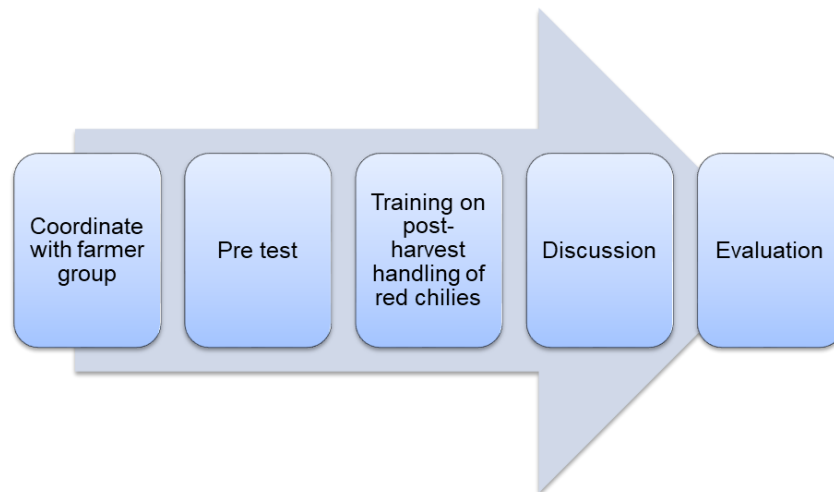


FIGURE 1. Method flow chart

## RESULT AND DISCUSSION

Stages of implementing community service activities in Mesjid Tuha involving Samarasa farmer group partners include coordination with partners, training and evaluation. Coordination was carried out to start a series of service activities. Coordination is carried out between the activity implementation team, farmer groups and agricultural extension workers (Figure 2). At this stage, the technical mechanism for implementing community service activities is discussed, which includes activity stages, determining the schedule, participants and the needs needed during the activity. The head of the farmer group, Syamsul Rizal, said that the Samarasa farmer group has around 40 members. The types of commodities cultivated vary depending on the planting season. Among the commodities being planted are rice and vegetables. The chili plants have been harvested and the land is being processed for replanting.



**FIGURE 2.** Coordination of service activities with farmer group partners

Training activities were carried out at the house of the head of the farmer group located in Mesjid Tuha Village (Figure 3). This activity was attended by 35 farmers who are members of the Samarasa farmer group. On this occasion the implementing team provided training materials in turn. Participants were also given the opportunity to ask questions and discuss material regarding post-harvest handling and processing of red chili products.



**FIGURE 3.** Delivery of training materials

In material related to post-harvest handling, the implementer said that post-harvest red chilies need to be carried out properly following the principles of good handling practices (GHP) which include harvesting, sorting, curing, transportation, storage and packaging. Harvesting of red chilies is carried out at the right level of maturity, depending on the variety, chilies can be harvested at the age of 60 to 75 days after planting for those planted in the lowlands and at three to four months for those in the highlands. Chilies are harvested after the fruit is 75 percent red (Ana, *et al.*, 2023). Fruit that is harvested too young will wilt quickly, lose weight quickly, spoil quickly, and will not be able to withstand the shocks of transportation.

Storing at low temperatures is the best way to maintain the freshness of chilies. The optimal temperature of the cooler depends on the chili variety and its ripeness. Cooling using a refrigerator is generally easier than other methods. Good storage can extend the life and freshness of chilies without causing physical or chemical changes. The method usually used is to store fresh chilies at a cold temperature, around 4oC. Cooling aims to suppress the level of development of microorganisms and biochemical changes (Putri *et al.*, 2020). Storage with controlled and modified air can inhibit metabolism thereby delaying fruit ripening and rotting. Therefore, chilies that will be stored should be healthy, uniformly ripe, and packaged well. Based on the type of packaging material, banana leaves provide the

best quality in storing packaged fresh red chilies because banana leaves provide the lowest weight loss value and provide the highest value in maintaining water content, vitamin C, organoleptic test values, texture, color and aroma (Rochayat and Munika , 2015).

The packaging commonly used is bamboo baskets, wooden crates and plastic. The ideal packaging is easy to lift, safe, economical, and can guarantee product cleanliness. Another packaging commonly used by traders is mesh with a capacity of nine to 100 kg. This packaging is very practical, but cannot protect chilies from mechanical and physiological damage, especially when weighed and in transportation equipment. The packaging volume should not exceed 25 kg because packaging that is too large can reduce the quality of the chilies, especially those at the bottom.

Physiological damage can occur due to metabolic disturbances in materials during transportation (Siahaan and Purwanto, 2020). Chilies can experience mechanical damage due to contact with the container or with other chilies due to shock. The respiration process that is still ongoing in stacked chilies produces H<sub>2</sub>O, CO<sub>2</sub> and energy in the form of heat. If the heat produced is excessive, it will cause the chilies to wilt, respiration becomes faster, and cell tissue dies.



FIGURE 4. Training participants

The training participants were enthusiastic in participating in the training (Figure 4). This can be seen from the large number of participants asking questions and discussing the material presented. The results of the questionnaire data (Figure 5) show that there has been an increase in participants' knowledge and skills regarding post-harvest handling of red chilies. The increase is especially visible in the aspect of farmer knowledge. Basically, there are several things in post-harvest management that have been implemented by farmers, but they don't yet know the essence of these things. For example, the curing process to remove field heat from red chilies has been implemented but they do not yet know the purpose of this. So that through this training there is input of knowledge to farmers regarding good practices in handling harvests.

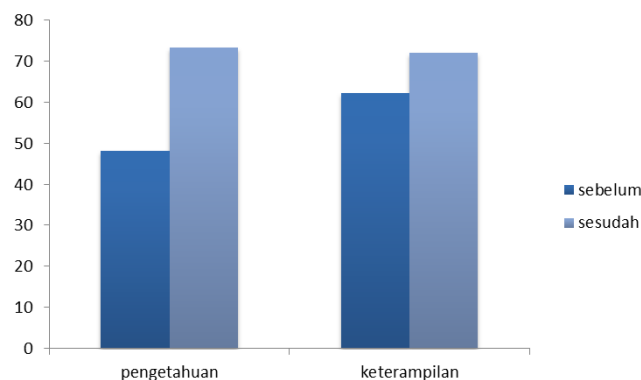


FIGURE 5. Comparison of farmer knowledge and skills aspects before and after post-harvest handling training

## CONCLUSION

Training activities on post-harvest handling of red chilies in Mesjid Tuha Village with partners from the Samarasa farmer group ran actively, well and smoothly. Participants were enthusiastic in participating in the activity until the end. Based on the evaluation results, there was an increase in farmers' knowledge by 24% and skills increased by 12% after attending the training.

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