



# Development of True Shallot Seed Technology as an Effort to Increase Red Onion (*Allium Cepa* L.) Production in Galung Lombok Village, Polewali Mandar, West Sulawesi

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**Abstract:** This community service aims to improve the capacity of shallot farmers in Galung Village, Lombok, Polewali Mandar, in implementing True Shallot Seed (TSS) technology as an effort to increase shallot (*Allium cepa* L.) production. The use of TSS is an innovation that can increase harvest yields and reduce the risk of disease spread, which is often carried by conventional bulbs. The activity method includes focus group discussions (FGD) to understand participant readiness, preparation of extension materials, and implementation of extension that includes an introduction to the TSS method and comparison with traditional cultivation techniques. Evaluation was carried out with a pre-test and post-test to assess the increase in participant understanding. The evaluation results showed an increase in the average score from 41.63 in the pre-test to 76.08 in the post-test, reflecting an increase in understanding of 82.75%. Further analysis showed that age and farming experience factors did not significantly affect the increase in participant understanding. In conclusion, this program has succeeded in increasing farmer knowledge in TSS-based shallot cultivation techniques, which have the potential to support the sustainability of shallot production and strengthen farmers' economic resilience in the future. It is hoped that the TSS method can be applied more widely through the demonstration plot system to increase farmer confidence in adopting this technology.

**Keywords:** Agricultural innovation; Red onion; Shallot seed; Sustainable production; Productivity.

## Introduction

Polewali Mandar Regency is one of the priority areas for extreme poverty based on the Map of Priority Areas for the Acceleration of the Eradication of Extreme Poverty by the Coordinating Ministry for PMK: TNP2K in 2022 (Ardi et al., 2022). Galung Lombok Village, Tinambung District is one of the villages located on the west side of Polewali Mandar Regency, most of whose residents work as farmers, in addition, this location has a shallot cultivation location that has the potential to increase the local economy (Fitriana et al., 2019). This is because shallots are one of the non-substitute spice ingredients whose role and benefits cannot be replaced by other spices (Arham & Purnama, 2024).

The production of shallot commodities in Polewali Mandar Regency has experienced a significant decline

from 2020 to 2023. The decline in shallot production each year in succession, namely reaching 33.1 tons; 16.54 tons; 6 tons; and further decreasing in 2023 by 2.57 tons. This is in contrast to the potential land and economic value of the cultivation and development of shallots which are very large and promising. Moreover, supported by the non-substitution character of shallots, it can be a market guarantee for farmers (Nurjanani et al., 2022; Prakoso & Alpandari, 2021; M. Saidah et al., 2020), so that efforts to increase production in sustainable shallot farming efforts need to be encouraged to increase economic income for shallot farmers. Galung Village, Lombok has a land area for developing shallot cultivation reaching 20 ha which is located on the tops of the hills. The people of Galung Village, Lombok have several obstacles in terms of production and agricultural management related to shallot cultivation.

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The main obstacles faced by the community include the high cost of shallot production farming, minimal knowledge and skills in production and management of shallot cultivation, the planting area is rainfed land, in addition, the community has difficulty obtaining high-quality shallot seeds and farmers are generally hesitant to apply the latest technological innovations in shallot cultivation. Factors for the sustainability of shallot commodity development in Polewali Mandar Regency consist of farmer knowledge, weather and climate, land suitability, and seed quality (Arham & Purnama, 2024).

This shows that shallot farmers in Polewali Mandar Regency, especially in Galung Village, Lombok, need to increase their capacity in shallot cultivation efforts by involving innovations that can improve land quality and shallot seed quality. One of the efforts to improve shallot cultivation and production is through cultivation management with multiple technologies, by introducing the True Shallot Seed (TSS) method compared to previous farmer habits, so that it can increase farmers' income and enthusiasm for developing shallot commodities in the future (M. Saidah et al., 2020; Sayaka et al., 2020). TSS is a cultivation technology using generative seeds from shallot plants that come from true seeds (Moeljani et al., 2021; Saidah et al., 2019), which is different from conventional seeds that generally come from bulbs (Adiyoga, 2023; Dewi et al., 2023).

The development of TSS technology is an important alternative in shallot cultivation because it can reduce the risk of spreading diseases that are often carried by bulbs (Atman, 2021; Nurjanani et al., 2022). In addition, TSS is easier to store and has a longer shelf life, making it an efficient choice for long-term seed supply (Rahayu et al., 2021). Shallot plants grown from TSS also show higher productivity, with better vigor (Andayani, 2020), compared to plants from bulbs (Cennawati & F, 2023; Prakoso & Alpandari, 2021). With these various benefits, the use of TSS is expected to support efforts to increase shallot production sustainably.

The purpose and focus of implementing this community service activity is to increase the knowledge of shallot farmers on the application of TSS technology to shallot cultivation in Galung Lombok Village, Polewali Mandar. With this activity, it is hoped that the application of TSS innovation and technology in shallot cultivation can increase shallot production and productivity.

## Method

This outreach activity took place for one day, on Sunday, October 6, 2024 in Pupenga Hamlet, Galung Lombok Village, Tinambung District, West Sulawesi Province. This activity was attended by members of the

Abadi farmer group and the Seruni women's farmer group as many as 50 participants. The series of implementation of this community service activity includes:

### *Focus Discussion Group (FGD)*

This activity was carried out to determine the level of readiness of the participants and discussions regarding the time and place of the activity. In addition, this FGD also determined the number of participants who would participate. This activity was attended by the community service activity implementing committee, the Chairperson of the farmer group and the women's farmer group at the farmer group house.

### *Preparation for Community Service Activities*

This activity includes purchasing tools and materials for outreach, making pre/posttest questionnaires, outreach materials, and other activity equipment.

### *Implementation of activities*

The extension activities were carried out for one day, starting at 08.00 - 16.00 WITA which took place in the classroom of SDN 092 Pupenga, Galung Village, Lombok. The implementation of the extension activities was carried out by presenting material on double production (PROLIGA) of shallots using True Shallot Seed (TSS), as well as informing the advantages and disadvantages of this method compared to the application of previous shallot cultivation techniques. This activity also showed shallot seeds from seeds and showed the results of the application of the TSS method on red.



**Figure 1.** The atmosphere of implementing community service activities

### *Evaluation of activities*

The evaluation stage is carried out using a questionnaire in the form of a Pre-test and Post-test which aims to determine the level of success and

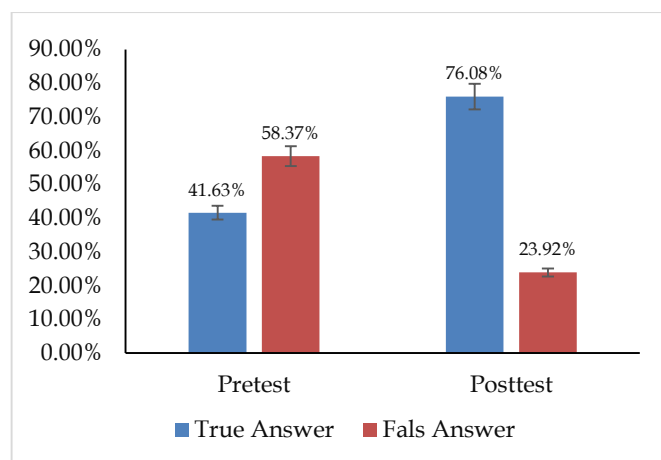
understanding of farmer groups and women farmer groups regarding cultivation technology using the TSS method. The indicator of activity success is concluded from the increase in the pre- and post-test scores given.

## Result and Discussion

The beneficiaries of this community service activity are members of the Abadi Farmers Group and the Seruni Women Farmers Group, Galung Village, Lombok. This activity provides basic knowledge about shallot cultivation using TSS. This concept is part of the PROLIGA shallot plant. The achievements of this activity were measured against 50 random training participants. The results of the analysis of these measurements are as follows:

### *General Profile of Farmers Based on Age and Farming Experience*

Based on the data obtained, the average age of training participants was 45.8 years, with an age range between 20 and 80 years. The majority of training participants were over 35 years old, this shows that most of the participants in this extension are adult farmers who have experience in shallot cultivation, in addition, this mature age indicates the participants' interest in the new technology provided, especially regarding this TSS method. In terms of farming experience, their average experience was 5.6 years, with a median of 3 years, which indicates that half of the participants who attended had farming experience of less than or equal to 3 years. This indicates that there is a significant variation in farming experience among farmers, while some farmers have quite long farming experience (up to 30 years), there are also relatively new farmers (0 years of experience). 2. Improving Understanding of Extension Materials Based on Pre-test and Post-test Scores



**Figure 2.** Changes in participants' knowledge based on pretest and posttest answers

The average pre-test score of 41.63 indicates a low level of initial understanding of shallot seed nursery technology among shallot farmers. By participating in the counseling, the average post-test score increased significantly to 76.08. This indicates that the counseling material has succeeded in improving farmers' understanding of the nursery technology presented. The average increase of 34.45 points or around 82.75% shows the effectiveness of counseling in improving farmers' knowledge. This fairly high increase illustrates that counseling provides substantial educational benefits for farmers.

### *Analysis of the Relationship between Age, Farming Experience, and Knowledge Improvement*

Although the increase in the average post-test score indicates that the extension was successful in general, it is also important to consider the factors of age and experience. In this study, differences in age and experience did not appear to be barriers to knowledge improvement. However, younger farmers or those newer to farming may have more room for improvement compared to more experienced farmers.

**Correlation of Age and Test Scores:** A weak negative correlation was found between age and test scores (pre-test: -0.051; post-test: -0.219). This suggests that in this group, age tends to be slightly associated with a decrease in test scores, although the effect is weak. It could be that younger farmers are quicker to understand the extension materials or are more familiar with new approaches and technologies.

**Correlation of Farming Experience and Test Scores:** Farming experience had a fairly strong negative correlation with pre-test (-0.409) and post-test (-0.275) scores. This indicates that farming experience is directly negatively related to understanding the nursery technology material provided. This means that experienced farmers do not know enough about the new aspects tested in the test. The knowledge provided in the extension may include new aspects that are not much related to previous farming experience, so that both novice and experienced farmers have almost the same chance in initial understanding and knowledge improvement.

**Pre-Test and Post-Test Relationship:** A fairly strong positive correlation (0.392) between the pre-test and post-test indicates that participants who already have a better initial understanding tend to respond better to the extension and obtain higher results in the post-test. This suggests that initial knowledge plays an important role in how much benefit can be taken from the extension.

Overall, these results indicate that the extension program plays an important role in improving the technical knowledge of shallot farmers, which has the potential to support better agricultural practices in the

future. Future recommendations may involve adjusting extension materials or methods to better accommodate the needs of farmers with different levels of experience.

### Sustainability of Community Service Program



**Figure 3.** a) nursery facilities for Abadi farmer group, b) red onion seeds (TSS) ready to be sown, c) TSS sowing in KWT Seruni nursery, d) TSS has been sown

As an effort to sustain this extension, both target groups received facilities in the form of a nursery (seedling house) for shallot seeds. Through the construction of these facilities, the target groups can apply the knowledge gained in the extension. These nursery facilities are the initial steps taken to implement increased shallot production based on TSS. Members of the farmer groups and women's farmer groups can develop seeds that have been sown on their respective lands.

### Conclusion

This community service activity gave a positive response to the increase in knowledge of participants in Galung Lombok Village, Polewali Mandar regarding the development of shallot cultivation using the TSS method by 82.75%. This activity can also convince extension participants to apply the TSS method to shallot cultivation. The development of TSS in shallot cultivation should be practiced directly by implementing a demonstration plot system to trigger the community to immediately implement the TSS method on shallot cultivation land. Adoption of technology can be measured by changes in farmers' attitudes in cultivation efforts that are carried out to be based on the technological innovation provided. Therefore, in order for the sustainability of this program to be realized, support from all parties is needed, starting from farmers, entrepreneurs, government, and the community who use shallot agricultural products. Collaboration of all

parties must continue to run to realize the hopes of partners, namely increasing shallot productivity many times over from before

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