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Preparation of Citrus Planting Material: Socialization in the Ecotourism Activist Community at Pajagan Village, Cisitu Sub-District, Sumedang Regency

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ABSTRACT

The present community service was aimed to socialize techniques for preparing citrus planting materials in the ecotourism activist community at Pajagan Village, Cisitu District, Sumedang Regency. The socialization was attended by 30 people who were a combination of academics, representatives of Pajagan village-owned enterprise (Bumdes), and ecotourism activists whose daily professions are farmers in the Cipicung farmer group, Pajagan. To produce citrus planting material, grafting is a prerequisite vegetative propagation technique for obtaining standardized tangerine planting material. Grafted seedlings are more recommended than seed originated seedling, because of flower quickly, resistant to damping off, pests and diseases. Grafting is performed to connect the upper stem/scion of a tangerine cv. Siam Madu with superior fruit characteristics and the lower stem/rootstock of a sour rough lemon (*Citrus jambhiri*). It is hoped that this outreach activity can grow public interest and knowledge in producing planting material independently in the future.

1. Introduction

Citrus is recognized as the important horticultural commodity worldwide (Zhong and Nicolosi 2020; Spreen et al. 2020), including in Indonesia (FAO 2016). Citrus is highly consumable, in the second rank after bananas, with a total consumption in 2014 of 2.71 kg/capita/year (Susenas 2014). Citrus is popularly consumed due to its rich nutritional status, i.e., source of folate, flavonoid, limonoid, carotenoids (Turner and Burri 2013), phenolic compound, dietary fiber (Rafiq et al. 2018), vitamin C, vitamin A, vitamin B-complex, and vitamin E (Budiarto et al. 2023). Therefore, citrus consumption is strongly recommended to maintain human health.

Because of their popularity, citrus has become a fruiting plant alternative to be developed in Pajagan Village. The village of Pajagan is located in the Cisitu Subdistrict, Sumedang District, West Java Indonesia. This village is composed of nearly 800 families, with detected 779 heads of family. Most of the families earn their living as farmers (204 families) and traders (104 families) (Diskominfosanditik Kab. Sumedang, 2024). Pajagan Village has a windmill park tourist attraction with a backdrop of the Jatigede reservoir, called Paregreug Hill. Pregreug Hill is currently being hit by the problem of lowering tourist visits. It is hoped that the existence of citrus fruit gardens over there will be able to increase the number of visiting tourists. To build a citrus garden, there is a need to prepare high-quality planting materials. The characteristic of high-quality seedling is high varietal purity or true to type, vigorous growth, and being disease-free (Poerwanto and Susila 2014). Numerous farmers encounter challenges in obtaining high-quality seedlings at the onset of cultivation, compelling them to plant seedlings without proper quality assessment, potentially resulting in disappointment during the harvest period (Setiono 2016). Therefore, the present community service was aimed at socializing techniques for preparing citrus planting materials in the ecotourism activist community at Pajagan Village, Cisitu District, Sumedang Regency.

2. Methods

Socialization was carried out in the period of October 2023 in Bukit Pareugreug, Pajagan Village, Jatigede District, Sumedang Regency. Bukit Pareugreug is a windmill tourist park on a hill that focuses on the beautiful backdrop of the blue Jatigede reservoir with the green hills.

Figure 1. Location of socialization to farmers/tourism activists in Bukit Pareugreug, Pajagan Village, Cisitu District, Sumedang Regency.

The object of this socialization is the tourism activist community group. The activity was attended by a minimum of 15 assisted farmer partners, who are members of the Cipicung farmer group, which is central part of the tourism care group in Pajagan Village, Cisitu District, Sumedang (Figure 1). Academics from the Faculty of Agriculture, Padjadjaran University as the trainer and presenter also attended this activity, namely Dr. Rahmat Budiarto, SP., M.Si, (Horticulture Specialist); Prof

Kusumiyati, SP., M.Sc., Ph.D (Horticulture Specialist); Ir. Farida, LM. (Horticulture Specialist); Dr. Agr. Mochamad Arief Soleh, SP., M.Agr (Plantation Specialist); Dr. Wawan Sutari, SP., MP. (Horticulture Specialist); Syariful Mubarok, SP., M.Sc., Ph.D (Horticulture Specialist); Dr. Ir. Luciana Djaya, M.Si (Plant Pathogen Specialist) and Siska Rasiska, SP., M.Si (Plant Pest Specialist). This activity is also attended by the representative of Pajagan Village Owned Enterprise (Bumdes) because of the land ownership issue.

3. Results and discussion

The success of on-farm horticultural agribusiness definitely begins with selecting planting materials (Poerwanto and Susila 2014). This was transmitted to the socialization participants who gathered in the hut to receive knowledge on preparing orange planting materials (Figure 2). Apart from knowledge, participants are also provided with supporting agricultural tools and materials to support the growth of cultivated orange seedlings, including plant tags, high nitrogen fertilizer, root stimulants, NPK fertilizer, pruning shears, fertilizer measuring spoons, grafting tape, grafting knives, training modules, and stationery (Figure 3).

Figure 2. Socialization to farmers/tourism activists in Bukit Pareugreug, Pajagan Village, Cisitu District, Sumedang Regency.

Figure 3. Distribution of supporting agricultural facilities for planting material preparation and cultivation of tangerine citrus in Bukit Pareugreug, Pajagan Village, Cisitu District, Kab. Sumedang.

Concerning citrus cultivation, high-quality planting material also determines the quality, quantity, and continuity of the yield. In general, planting material can be in the form of seeds or seedlings. Seeds are plant organs that function in the generative reproduction process. Seedlings are young planting material that can be developed either from generative propagation techniques (through fertilization, i.e., biological seeds), or vegetative propagation (without fertilization, i.e., grafting and cuttings).

Seedlings are more often used than seeds. Because seedlings can induce faster flowering rather than seeds. For example, tangerine citrus from seeds starts to flower at 4 years after planting, while its grafted seedling can bear fruit at the age of 2 years after planting. To provide high-quality planting material, farmers should buy the grafted seedlings from trusted sellers, as indicated by an attached blue label. However, there is an extra concern when purchasing citrus seedlings because of numerous adulterations and the confusion in detecting citrus variety at the seedling stage; so the findings of Budiarto et al. 2021, can be used as a reference to differentiate tangerine (*Citrus nobilis*) from 20 other citrus types. If forced to buy, farmers should choose certified planting material, to guarantee the authenticity of the variety. Good quality tangerine grafted planting material is characterized by pest- and disease-free, and normal growth.

Grafting is a technique of combining two or more plant species into one, by connecting the upper stem (scion) to the lower stem (rootstock) so that a combination of superior characteristics from both is obtained. The upper stem must be selected from plants that have high desired yields, for example, Pontianak tangerine, Garut tangerine, Medan tangerine, and Madu tangerine, while the lower stems are selected from citrus species with extensive roots and resistance to soil pests, for example, Japansche Citroen (JC) and Rough Lemon (RL). Interestingly, Indonesia has composed of more than 250 citrus genotypes in Indonesia that can be grafted one to another (ICSFRI 2020).

According to ICSFRI (2016) in more detail, grafting begins by determining the grafting spot at a height of 20-25 cm above the soil surface, then making an incision 1-1.5 cm long and 0.5-0.75 cm wide. Grafting is carried out between the segments of the rootstock. The bud of the scion is cut and the size of the incision is the same as the rootstock, then inserted into the rootstock incision and tied with a transparent plastic rope. The plastic rope binding the grafting is opened after 14-21 days.

The grafted shoots that grow are selected and kept with only one of the best shoots and strive to grow straight and upright. They can be branched when they reach a height of 50 cm from the soil surface. Several factors that influence citrus grafting are the sharpness of the tools used, the cleanliness of the knife used, the skills of the grafter, and environmental conditions (temperature less than 30^{o}C and relative humidity more than 70%).

4. Conclusions

Socialization of citrus planting material preparation has been conducted in Bukit Pareugreug, Pajagan Village, Cisitu Subdistrict, Sumedang District. The participant obtains basic principle to produce citrus seedlings by using grafting. Grafting is a vegetative propagation technique for connecting the upper stem of Madu Tangerine citrus scion with superior fruit characteristics and the lower stem of Rough Lemon rootstock. It is hoped that this outreach activity can grow public interest and knowledge in producing planting material independently in the future.

5. Acknowledgment

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6. Authors Note

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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