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# Guidance on Growing Kaffir Lime Seedlings for Housewives at Pajagan Village, Sumedang

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**ABSTRACT**

Kaffir lime is popularly used by woman, especially housewives for cooking Indonesia dishes. The purpose of present activity was to provide simple guidance on growing kaffir lime for housewives at Pajagan Village, Sumedang, West Java. This counseling was provided for 20 housewives who are members of the Family Empowerment and Welfare (PKK) organization in Pajagan Village. The simple guidance is provided to housewives for planting kaffir lime in their yard, as follows: selecting best seedling, correct transplanting, regular irrigation, effective and efficient fertilizer application and proper harvesting. Housewives were each given one kaffir lime seedling to use as planting practice material. Housewives were very happy, grateful and believed to be more independent in terms of food spice. This activity is hoped to empower housewives to cultivate kaffir lime on their own yard for their daily spice needs.

## 1. Introduction

Kaffir lime (*Citrus hystrix* DC) is a widely appreciated citrus variety, especially for its leaves, which are commonly used as a seasoning in numerous Asian dishes (Wongpornchai, 2012) and also a source of essential oils (Budiarto and Sholikin, 2022). Previous study also reported the bioactivity of kaffir lime extract as an antibacterial and antioxidant agent (Budiarto *et al.*, 2021a). These leaves are easily recognizable due to their unique shape, which resembles the number of eight formation (Budiarto *et al.*, 2021b), consisting of two connected parts: the main leaf blade and the leaf stalk with wings that are the same size as the main leaf blade (Budiarto *et al.*, 2021c). Kaffir lime leaves are typically sold in bulk at both traditional and modern markets (Budiarto *et al.*, 2019).

Kaffir lime plants can be cultivated intensively or non-intensively in home gardens. The planting methods vary, including both monoculture and mixed (polyculture) systems. Various agricultural practice is subjected to improve the leaf production of kaffir lime without harming the essential oil quality, such as artificial shading (Budiarto *et al.*, 2022), pruning, and gibberellin (Budiarto *et al.*, 2023) application. Those agricultural practices are needed to meet the growing population and need for kaffir lime products.

Enhancing knowledge related to the cultivation of kaffir lime plants can foster greater interest among society in growing this plant, particularly among housewives. Housewives are significant users of kaffir lime leaves, especially who live in the village. The village of Pajagan is situated in the Cisitu Subdistrict of the Sumedang District in West Java, Indonesia. This community consists of approximately 800 households, with a recorded total of 779 heads of families. Most of these families derive their livelihoods primarily from agriculture, with 204 families engaged in farming activities, while 104 families are involved in trade (Diskominfosanditik Kab. Sumedang, 2024). In Pajagan Village, housewives are often involved in the family empowerment and welfare (PKK) organization, which facilitates training activities. Therefore, this social event was aimed to provide simple guidance for housewives to cultivate kaffir lime, thereby promoting food independence at the family level.

## 2. Methods

The activity was carried out in the meeting hall of Pajagan Village, Cisitu Subdistrict, Sumedang District, Indonesia on Saturday, July 20, 2024. The participants were 20 housewives who were also members of the local PKK of Pajagan Village (Figure 1). The trainers have participated both on-site and online via Zoom meetings. The trainers were staff of the Faculty of Agriculture, Universitas Padjadjaran, which is led by Dr. Rahmat Budiarto and has 8 members namely Dr. Farida, Dr. Anne Nuraini, Dr. Luciana Djaya, Siska Rasiska, M.Si, Prof. Kusumiyati, Dr. Agr. Mochamad Arief Soleh, Dr. Wawan Sutari, and Dr. Syariful Mubarok. The method of counseling was workshops and seminars where trainers provided information both on-site and online to the housewives and then continued with an interactive discussion and hands-on activities, such as the introduction of good-quality kaffir lime seedlings. Each housewife received a kaffir lime seedling to use as a practice material for planting. They can make self-demonstrations for the kaffir lime farming in their yard. The recipients were delighted and appreciative, expressing gratitude for the opportunity. They believed that this initiative would help them become more self-reliant in growing their own food spices.

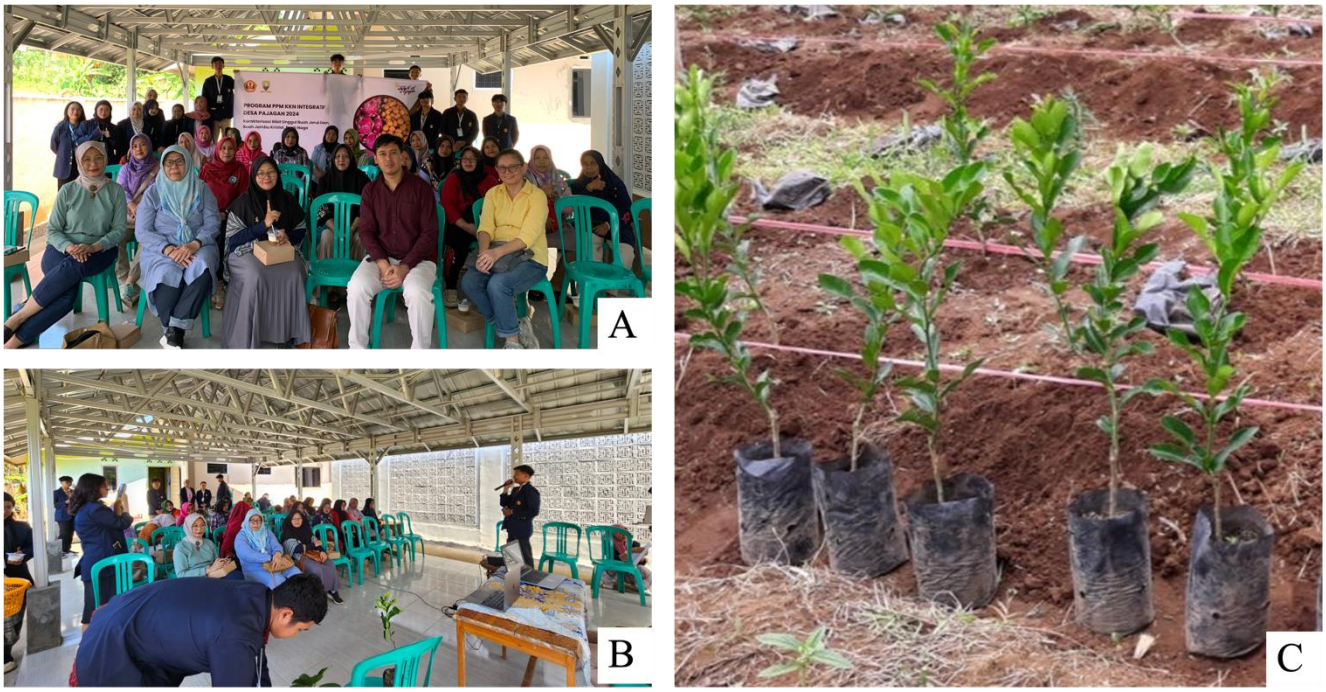


**Figure 1.** The counseling was joined by faculty staff (A) and 20 housewives (B) regarding the guidance on growing kaffir lime at the home-scale level and the distribution of seedlings for housewives (C) in the meeting hall of Pajagan Village, Sumedang.

## 3. Results and discussion

### *3.1. Planting materials*

Preparation of planting materials in the form of seedlings from vegetative propagation, namely grafting or budding. Grafting is a technique of combining two or more plants that are generally different varieties to combine the superior characteristics of both. In the grafting process, the upper stem is also called a scion, while the lower stem is also called a rootstock. The upper stem must be selected from the Kaffir Lime variety, while the lower stem is usually selected from a citrus variety with extensive roots and pest and disease-free soil. Examples include Rough Lemon (RL) and Japonsche Citroen (JC). Seedlings can be purchased from seed providers or seedling supply stores, provided that they have a blue label [a sign of quality seedlings and guaranteed authenticity of the variety, a minimum height of the upper stem is 50 cm from the grafting point, and are free from pests and diseases.

### *3.2 Transplanting*

Transplanting is the process of moving seedling planting material to cultivated land or growing pots. Planting on cultivated land generally uses varying planting distances, depending on the purpose of cultivating kaffir lime. Before planting, it is a good idea to cultivate the soil. For leaf production purposes, kaffir lime plants can be planted closely with a planting distance of 50 x 50 cm (Figure 4). However, for the purpose of producing kaffir lime fruit, plants need a larger planting distance, for example 3 x 3 m. The transplanting process must be carried out carefully so that not many plant roots are damaged, so that the plant recovery process in its new growing place runs faster. Transplanting is generally done manually by hand.

### *3.3 Irrigation*

In kaffir lime plants, water is an essential need that functions as a raw material for photosynthesis, a component of plant performance, a nutrient transporter, a solvent for biochemical reactions, and a regulator of plant body temperature. Kaffir lime leaf production efforts need to be supported by adequate irrigation techniques to produce high yields. Irrigation of kaffir lime plants is generally carried out once a day in the morning or evening. Irrigation is not necessary if the rain occurs in the field with moderate and high intensity. Irrigation of kaffir lime can be done by surface flow, sprinkled, or using drip irrigation. However, among the three, the practice of surface flow and sprinkled is the most common in kaffir lime planting compared to drip irrigation techniques.

### *3.4 Fertilization*

Fertilization required for the production of kaffir lime leaves is organic and inorganic fertilization. Organic fertilization is generally carried out during soil processing, with a dose of 500 g per planting hole, then mixing it with the excavated soil and leaving the planting hole open for 2 weeks. Inorganic fertilization is carried out according to the recommended dose of the citrus center (per plant), namely 20 g Nitrogen, 10 g $P_2O_5$, and 5 g $K_2O$; with a recommended fertilization interval of 2-3 times a year (Balitjestro, 2009). Examples of nitrogen fertilizers on the market are ammonium sulfate or ZA (N content ranging from 20-21%), urea (N content around 45%), and NPK 16-16-16 (N content around 16%). Examples of phosphate fertilizers include super phosphate or SP36 (P content in the form of $P_2O_5$ around 36%), triple super phosphate or TSP (P content in the form of $P_2O_5$ around 46-48%) and NPK 16-16-16 (P content around 16%). Examples of potassium fertilizers include potassium magnesium sulfate (K content in the form of $K_2O$ around 21-30%), potassium sulfate or ZK (K content in the form of $K_2O$ around 48-52%), potassium chloride or KCl (K content in the form of $K_2O$ around 52-55%) and NPK 16-16-16 (K content around 16%). The provision of this macro inorganic fertilizer is done by burying the fertilizer around the kaffir lime plantation. The provision of micronutrient fertilizers is also no less important and can use leaf fertilizer developed by Balitjestro called Microcit (Balitjestro 2009). In reality, in the field, there is no standard and uniform dosage between farmers in terms of fertilization, because financial conditions and household spending priorities differ between farmers.

### *3.5 Harvesting*

The harvest of kaffir lime leaves can generally be done every day in a non-intensive cultivation system carried out in polyculture/mixed planting in the yard. Leaves that are suitable for harvesting are all leaves that have developed perfectly and are green to dark green (Figure 2). In an intensive cultivation system such as that carried out by several farmers in Tulungagung, a harvest cycle is implemented once every 6 months. Farmers can postpone the harvest for up to 2 months if they intend to wait for a better price. The price of kaffir lime leaves has the potential to increase approaching Eid al-Fitr or Eid al-Adha.

Harvesting can be done in the morning or evening, manually using a sickle to cut the orange canopy. The pruning height is around 30 cm above the ground. The part of the plant that has been pruned is then taken to a shady place to separate the leaves from the branches or stems. The separation process can be done with bare hands or gloves to protect against scratches from kaffir lime thorns. The thorns on kaffir lime are generally shorter in plants that are developed vegetatively through grafting/budding, while plants that are developed from seeds still have long and large thorns. Based on the survey results, the leaf production of Tulungagung farmers is estimated at 0.1 kg per year per plant. At the beginning of the planting period, the production of kaffir lime leaves is still quite low and will increase over time (Budiarto *et al.*, 2019).


**Figure 2.** The new flush coming out from the well-maintained kaffir lime plant (A) and the mature green leaf are ready to harvest for daily cooking spice (B)

## 4. Conclusions

This counseling enriched the knowledge of housewives regarding the cultivation of kaffir lime seedlings as their source of cooking spice daily. The simple guidance to plant kaffir lime is started with the use of best quality planting materials, careful and correct maintenance, such as transplanting, irrigation, fertilizer application, and harvesting.

## 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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