

## Prospects for the Utilization of Eco-Enzymes in the Cultivation of Environmentally Friendly Red Ginger Plants in Ngentak Hamlet, Samigaluh, Kulon Progo DIY

Okti Purwaningsih<sup>1</sup>, Puguh Bintang Pamungkas<sup>2</sup>, Rahmat A Hi Wahid<sup>3</sup>  
Universitas PGRI Yogyakarta

### Article Info

#### Article history:

Received November 20, 2022

Revised December 1, 2022

Accepted December 10, 2022

#### Keywords:

Eco Enzym  
Eco Farming  
Ginger  
Kulon Progo

### ABSTRACT

Yard land has the potential to be developed in order to produce a variety of foodstuffs to medicines, which can be consumed by family members. Utilization of yards can be initiated by KWT Sumber Rejeki, Ngentak Village, by cultivating red ginger plants using a healthy farming system with Eco-enzyme fertilizer application. A healthy farming system is a cultivation system that minimizes the input of chemicals on cultivated land, so as to maintain the quality of the environment and agricultural products produced. Selection of ginger plants for cultivation in the yard, because the ginger plant can be used for spices, traditional medicine, ginger candy, candied ginger, instant drinks, pickled ginger, ginger coffee, ginger syrup, and as an export commodity. The results of the socialization and mentoring carried out, information was obtained that most of the members of Sumber Rejeki KWT have received socialization on medicinal plant cultivation, but they do not know how to cultivate medicinal plants properly, in general, the cultivation of medicinal plants is only planted in moderation, there is no land cultivation and plant maintenance, even though the selection of seeds, processing of planting media and care are very important to produce quality plants. After the socialization and training on ginger cultivation was held, most of the members of KWT Sumber Rejeki were interested in cultivating red ginger in their home gardens, because red ginger plants are able to provide benefits to the community not only in terms of health, but also in terms of finance.

*This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



### Corresponding Author:

Okti Purwaningsih  
Universitas PGRI Yogyakarta  
Email: [oktipurwaningsih71@gmail.com](mailto:oktipurwaningsih71@gmail.com)

### INTRODUCTION

Ngentak hamlet is included in the area of Pagerharjo Village, Samigaluh District, Kulon Progo Regency. The village area has potentially related to the agricultural sector, where there is land use for plantation activities and food crops, but the community's yard has not been used optimally.

Yard land is an area around the house with clear boundaries. According to Rini et al (2016), yards are very important because family members can help yard managers to produce a variety of foodstuffs to medicines. The utilization of yards can be initiated by members of KWT Sumber Rejeki Pedukuhan Ngentak, by cultivating red ginger plants using environmentally friendly farming systems by utilizing Eco-enzymes.

An environmentally friendly agricultural system is a cultivation system that minimizes the input of chemicals on cultivated land so that it can maintain the quality of the environment and the agricultural products

it produces. Atmojo (2007) states that healthy agriculture is an agricultural system that maintains soil fertility and health, helps conserve soil, and slows down the rate of soil degradation.

The ginger plant (*Zingiber officinale* Rosc.) is a type of herbal plant, where this plant can grow in tropical areas. According to Syafitri et al (2018), ginger plants are widely cultivated in several countries, including the US, Bangladesh, China, India, Indonesia, Jamaica, Nepal, Nigeria, and Taiwan. Ginger plants in Indonesia are very diverse, ranging from elephant/rhino ginger to import ginger and red ginger (Pramono, 2020).

The red ginger plant (*Zingiber officinale* Rosc.) belongs to the Zingiberaceae family which is a medicinal plant, a clump of artificial stems, and can generally be harvested at the age of 8-12 months (Gati & Mariska, 2017; Soeparjono, 2016). According to Friska & Daryono (2017) and Koswara & Diniari (2016), the use of red ginger in the community is used for spices, traditional medicine, ginger candy, candied ginger, instant drinks, pickled ginger, ginger coffee, ginger syrup, and as an export commodity.

Mustafa's research (2020) stated that during the Covid-19 pandemic, the ingredients most used to increase immunity were ginger (81.32%), turmeric (68.52%), lemon grass (62.77%), temulawak (48.93%), cinnamon (42.02%) and others (22.04%). Red ginger plants contain quite a large amount of essential oil compared to other types, which is around (1.5-3.8% dry weight), so it is suitable for use as medicinal ingredients or to extract its essential oil (Febriani et al., 2018).

The essential oils contained in plants contain active substances that have the property of preventing and treating several diseases, both mild and serious, for example, colds, dizziness, rheumatism, nausea, impotence, cancer, and heart disease (Aryanta, 2019). Identification of chemical compounds in extracts of red ginger and Javanese chili which contain active compounds efficacious for cancer (Ekowati et al., 2011).

Red ginger production in Indonesia is still very small compared to other countries. According to Hayati (2021), the demand for ginger increased sharply during the Covid-19 pandemic, even in 2019 Indonesia had to import 21,700 tons of ginger. The productivity and content of active compounds in ginger rhizomes are influenced by the cultivation system (monoculture/intercropping/agroforestry) and environmental conditions (altitude, climate, and soil) (Azizah et al., 2019).

Knowledge of red ginger cultivation from seeding to harvest, along with the conditions for its growth, is not widely known by the public. Thus it is necessary to socialize the community, in this case, the members of KWT Sumber Rejeki, as the initiation of the utilization of the yard using herbal plants.

## METHOD OF IMPLEMENTATION

Community service activities were carried out in Ngentak Hamlet, Pagerharjo Village, Samigaluh District, Kulon Progo Regency in March 2022. The community that became a partner for this community service activity was the Sumber Rejeki Women Farmers Group (KWT). The method applied is to hold counseling which takes place at the KWT Sumber Rejeki Secretariat. The counseling activity was attended by village officials, BUMDES, administrators, and members of the Sumber Rejeki KWT. The material for discussion is related to the presentation of the benefits of red ginger plants, and the cultivation of red ginger plants. Besides that, training on ginger cultivation techniques was also carried out in the yard. The number of participants who took part in this community service activity reached 23 participants.

At the end of the activity, the participants in the extension activities were given a post-test questionnaire containing 12 questions, where this questionnaire was used to find out the level of interest of the participants in the material provided related to the cultivation of red ginger plants that apply a healthy farming system in their yards. At the end of the counseling activity, an evaluation is carried out to measure the success of the implementation of the activity, both in terms of theory, as well as the benefits obtained by the community, in this case, members of the Sumber Rejeki KWT.

## RESULTS AND DISCUSSION

Based on the evaluation results carried out by distributing questionnaires to partners, various information can be obtained as presented in the graph below:

In Figure 1 below, information can be obtained that most members of the Sumber Rejeki KWT, namely 60.9%, have received socialization about medicinal plants, while the remaining 39.1% of KWT Sumber Rejeki members have never received information about medicinal plants.

## Kuesioner 1

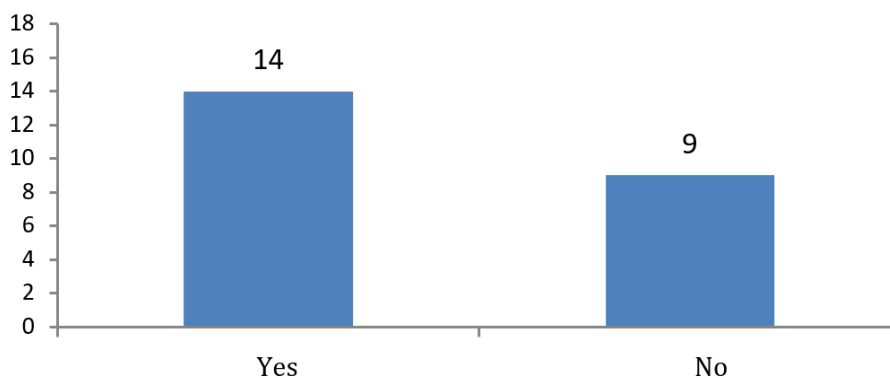


Figure 1. Experience in outreach about medicinal plants.



Figure 2. Discussion of the condition of the yard for red ginger cultivation.

Furthermore, through questionnaire 2, it was obtained that around 60.9% of KWT Sumber Rejeki members already knew about how to grow medicinal plants, because they had received socialization through other parties. However, they do not know how to cultivate medicinal plants properly. In general, the cultivation of medicinal plants is only moderately planted, there is no tillage and plant maintenance. This of course will affect the quality of the medicinal plants produced.

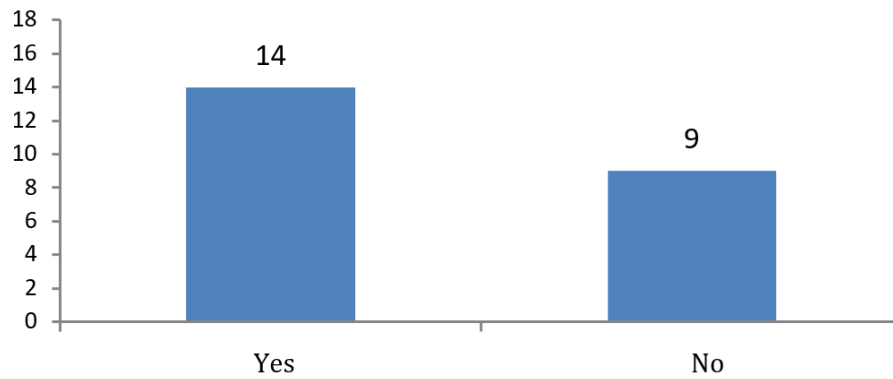
Sukarman et al, (2020) stated that selecting red ginger seeds or seedlings is very important to do so that later they can produce quality plants. Quality seeds can include physical quality, genetic quality, and physiological quality.

In addition to selecting ginger plant seeds, using the right planting medium will support the growth and production of red ginger, because the planting medium is a supplier of nutrients for plant growth (Aidin et al, 2016).

In preparing the planting medium, the addition of organic fertilizer as a soil mixture is very necessary, because organic matter can provide nutritional elements for plants (Soeparjono, 2016).

Therefore the service team conducts training and assistance in the cultivation of red ginger plants using environmentally friendly farming systems by utilizing Eco-enzymes to meet nutrient needs and increase plant resistance to disease. An environmentally friendly agricultural system is a cultivation system that minimizes the input of chemicals on cultivated land so that it can maintain the quality of the environment and the agricultural products it produces.

## Kuesioner 2



**Figure 3. Level of knowledge of KWT members about medicinal plant cultivation.**

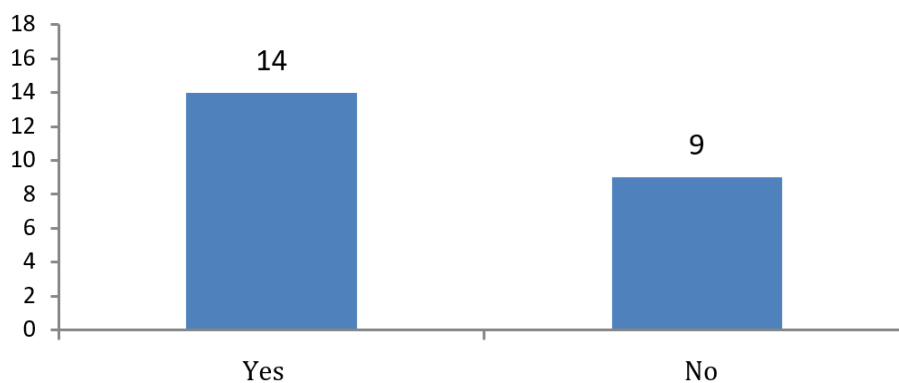


**Figure 4. Socialization of red ginger cultivation.**

Then the results of questionnaire 3 below can be obtained as information about the ease of access in obtaining ginger seeds or seedlings, according to the majority (60.9%) of KWT Sumber Rejeki members stated that it was easy to obtain ginger seeds or seedlings for cultivation.

Seeds or seedlings of ginger plants can be obtained in several areas, both outside and inside Yogyakarta, such as Sleman, Bantul, and Kulon Progo.

## Kuesioner 3



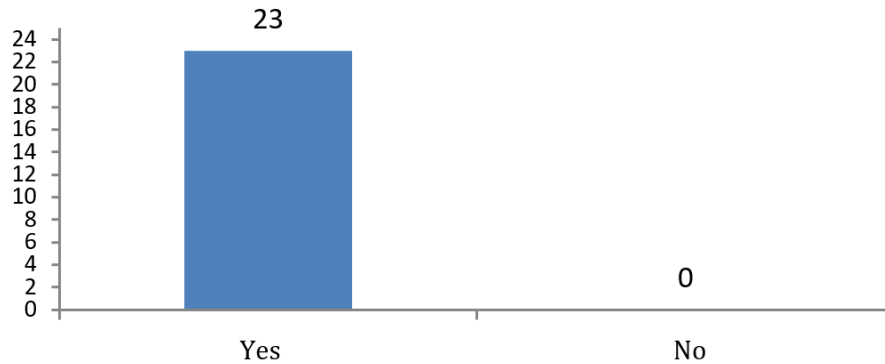
**Figure 5. Ease of access to ginger plant seeds or seeds.**

Furthermore, in questionnaire 4, information can be obtained regarding the readiness of KWT Sumber Rejeki members in preparing land for red ginger cultivation.

It was found that 100% of KWT Sumber Rejeki members indicated that all KWT members had prepared the land for ginger cultivation, where the land prepared by KWT Sumber Rejeki members was their yards.

Yard land is an area around the house with clear boundaries. According to Rini et al (2016), yards are very important because family members can help yard managers to produce a variety of foodstuffs to medicines.

### Kuesioner 4



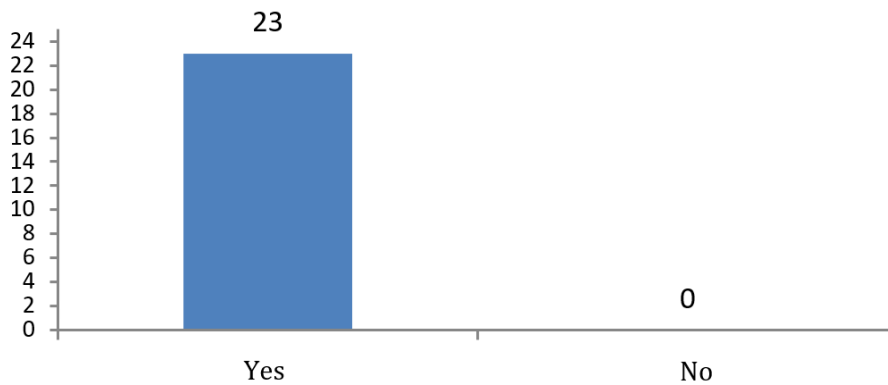
**Figure 6. KWT members' land readiness for ginger cultivation.**

In questionnaire 5, data was obtained that 100% of KWT Sumber Rejeki members had the perception that the cultivation of red ginger to be carried out could improve people's welfare, in this case, the economy and health.

The ginger plant has health benefits, based on experience in the conditions of the Covid-19 pandemic, the ingredients most widely used to increase immunity are ginger (81.32%), turmeric (68.52%), lemon grass (62.77%), Curcuma (48.93%), cinnamon (42.02%) and others (22.04%). Red ginger plants contain quite a large amount of essential oil compared to other types, which is around (1.5-3.8% dry weight), so it is suitable for use as medicinal ingredients or to extract its essential oil (Febriani et al., 2018; Mustofa, 2020).

From an economic standpoint, red ginger plants provide benefits in the market for farmers and the community. Especially if the ginger harvest is processed into derivative products which are higher than raw, such as red ginger powder which can be brewed as a traditional drink or as a mixture for making other culinary preparations, as well as ginger juice or red ginger ice cream which can be processed by the community (Fauzan, et al. al 2020).

### Kuesioner 5

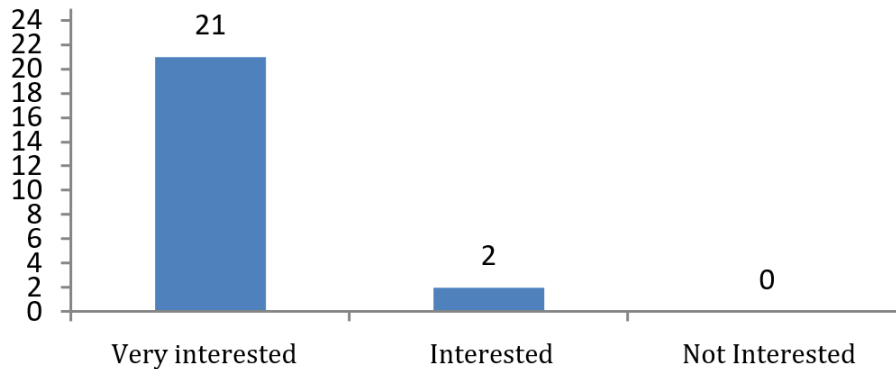


**Figure 7. Perceptions of KWT members regarding increased welfare from ginger cultivation.**

Furthermore, the results of questionnaire 6 regarding public interest in consuming herbal medicines (especially ginger), showed that 91.3% of KWT Sumber Rejeki members were very interested in consuming herbal medicines in terms of prevention and treatment of the diseases they experienced.

According to Mustofa (2020), the ginger plant is the most widely used plant to increase endurance around (81.32%), followed by turmeric (68.52%), lemongrass (62.77%), temulawak (48.93% %), cinnamon (42.02%) and others (22.04%).

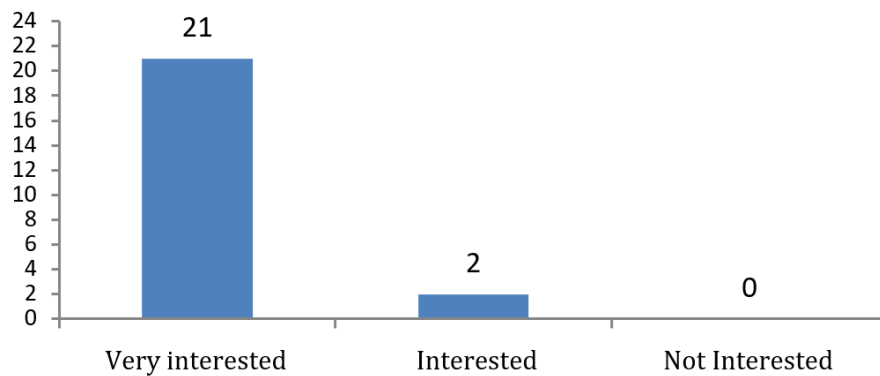
## Kuesioner 6



**Figure 8.** The interest of KWT members is in consuming herbal medicine (ginger plant) to maintain health.

Furthermore, from questionnaire 7 regarding community interest in cultivating environmentally friendly ginger plants after socialization from the service team, it shows that 91.3% of KWT Sumber Rejeki members are very interested in cultivating environmentally friendly ginger plants, this is motivated by meeting the need for medicines and herbs, because the need for herbal medicines is quite high, especially during the Covid-19 pandemic.

## Kuesioner 7



**Figure 9.** The interest of KWT Members in cultivating environmentally friendly ginger.



**Figure 10.** Group photo of the Service Team and members of the Sumber Rejeki KWT and community leaders.

## CONCLUSION

Based on the community service activities that have been carried out, it can be concluded that this community service activity is that all stages of activities (socialization, counseling, and training) regarding red ginger cultivation can be carried out properly. Members of KWT Sumber Rejeki as activity partners are very interested and interested in red ginger cultivation, reflected in their activeness in discussions and in conducting training. The material provided in counseling and training is very helpful for KWT Sumber Rejeki members to carry out red ginger cultivation so that it is hoped that they will obtain optimum production.

## Thank-You Note

Thanks are conveyed to the management, chairman, and members of KWT Sumber Rejeki who have participated in socialization activities for red ginger cultivation.

## REFERENCES

- [1]. Aidin, A., Sahiri, N., & Madauna, I. (2016). The effect of rhizome types and the composition of planting media on the growth of red ginger (*Zingiber Officinale Rosc.*). *J. Agrotekbis*, 4(4), 394–402.
- [2]. Aryanta, I. W. R. (2019). Manfaat jahe untuk kesehatan. *Widya Kesehatan*, 1(2), 39–43. <https://doi.org/10.32795/widyakesehatan.v1i2.463>.
- [3]. Atmojo, S. W. (2007). *Pertanian Organik, Integrasi Ternak dan Tanaman*. Solo Pos, 7 Maret 2007.
- [4]. Azizah, N., Purnamaningsih, S. L., & Fajriani, S. (2019). Land characteristics impact productivity and quality of ginger (*Zingiber officinale rosc*) in Java, Indonesia. *Agrivita*, 41(3), 439–449. <https://doi.org/10.17503/agrivita.v41i3.2321>.
- [5]. Ekowati, H., Septiyarningsih, & Harwoko. (2011). An extract of *Zingiber officinale* and *Piper retrofractum* combination and its effect to cancer cell line. *Indonesian Journal of Cancer Chemoprevention*, 2(1), 173. <https://doi.org/10.14499/indonesianjancanchemoprev2iss1pp173-181>.
- [6]. Fauzan, S., Rahmadani, D. F., Devi, L.S., Akyun, Q., Aulia, W. (2020). Pemberdayaan Masyarakat Desa Seketi Melalui Inovasi Olahan Jahe Merah. *Sinergi Jurnal Pengabdian*, 2 (2), 65-68.
- [7]. Febriani, Y., Riasari, H., Winingsih, W., Aulifa, L., & Permatasari, A. (2018). Potensi pemanfaatan ampas jahe merah (*Zingiber officinale Roscoe*) sebagai obat analgetik. *Indonesian Journal of Pharmaceutical Science and Technology*, 1(1), 57–64.
- [8]. Friska, M., & Daryono, B. S. (2017). Karakter fenotip jahe merah (*Zingiber officinale Roxb. var rubrum Rosc.*) hasil poliploidisasi dengan kolkisin. *AlKauniah: Jurnal Biologi*, 10(2), 91–97. <https://doi.org/10.15408/kauniah.v10i2>.
- [9]. Hayati, N. E. 2021. Domestic Ginger Balance Still Positive. Accessed from: <http://hortikultura.pertanian.go.id/?p=7397>.
- [10]. Gati, E., & Mariska, Ik. (2017). Perbanyak cepat jahe merah melalui teknik kultur jaringan. In *Buletin Penelitian Tanaman Rempah dan Obat* (Vol. 3, Issue 1, pp. 35–38). <https://doi.org/10.21082/bullitro.v3n1.1988.33-38>.
- [11]. Koswara, S., & Diniari, A. (2016). Peningkatan mutu dan cara produksi pada industri minuman jahe merah instandi Desa Benteng, Ciampea, Bogor. *Agrokreatif Jurnal Ilmiah Pengabdian Kepada Masyarakat*, 1(2), 149. <https://doi.org/10.29244/agrokreatif.1.2.149-1614813>.
- [12]. Mustofa, Fanie Indrian. (2020). Study on the Use of Herbal Medicine by the Community to Increase Body Endurance During the Covid-19 Outbreak (Research Report). Project Reports. Tawangmangu Center for Research and Development of Medicinal Plants and Traditional Medicines, Tawangmangu, Indonesia.
- [13]. Pramono, S. (2020). Utilisation and functional components evaluation of ginger. In *Ginger Cultivation and Its Antimicrobial and Pharmacological Potentials* (pp. 1–14).
- [14]. Soeparjono, S. (2016). The effect of media composition and organic fertilizer concentration on the growth and yield of red ginger rhizome (*Zingiber officinale Rosc.*). *Agriculture and Agricultural Science Procedia*, 9, 450–455. <https://doi.org/10.1016/j.aaspro.2016.02.162>.
- [15]. Sukarman, S., Rusmin, D., & Melati, M. (2020). Pengaruh lokasi produksi dan lama penyimpanan terhadap mutu benih jahe (*Zingiber officinale L.*). *Jurnal Penelitian Tanaman Industri*, 14 (3), 119. <https://doi.org/10.21082/jlitri.v14n3.2008.119-124>
- [16]. Syafitri, D. M., Levita, J., Mutakin, M., & Diantini, A. (2018). A review: is ginger (*Zingiber officinale var. Roscoe*) potential for future phytomedicine? *Indonesian Journal of Applied Sciences*, 8(1), 8–13. <https://doi.org/10.24198/ijas.v8i1.16466>.