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Trigona Honey Bee Cultivation as a Sustainable Agricultural Alternative in Bandarsari Village, Padangratu District, Central Lampung Regency

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Abstract. Padangratu District, Central Lampung Regency, is home to Bandarsari Village. The majority of the population works as farmers, mostly in oil palm plantations, rubber plantations, and rice fields. This village's location is ideal for the growth of honey bee agriculture. This service activity seeks to assist in the development of Trigona honey bee farming training as an alternative approach to sustainable agriculture. Residents were instructed in the production of Trigona honey bee growing techniques using lecture methods and field coaching. This is an ideal environment for the production of Trigona honey bees, since it is supported by plentiful natural resources such as fruit trees, plantations, and flowers. This activity is projected to produce information on Trigona honey bee culture and its benefits, knowledge of different forms of natural honey bee feed, and video lessons on Trigona honey bee cultivation. The outputs of Trigona honey bee farming are not just economically valuable. Bees' ecological role will also aid to preserve the plantation ecology and pollinate the fruit and flowers of the inhabitants. Trigona honey products are also advantageous as a source of living pharmacy that generates money. The most significant aspect is that the Trigona bee is stingless, making it safe for inhabitants and simple to care for.

Keyword: Bandarsari, Bee, Trigona, People

Abstrak. *Desa Bandarsari berlokasi Kecamatan Padangratu Kabupaten Lampung Tengah. Sebagian besar penduduknya bermata pencaharian sebagai petani, terutama di perkebunan sawit, karet, dan sawah padi. Lokasi desa ini cocok dijadikan sebagai daerah pengembangan budidaya lebah madu. Kegiatan pengabdian ini bertujuan untuk untuk membantu menyelenggarakan pelatihan budidaya lebah madu trigona sebagai salah satu solusi alternatif pertanian berkelanjutan. Warga diajarkan pelatihan melalui metode ceramah dan penyuluhan lapangan terkait pembuatan Teknik budidaya lebah madu Trigona. Didukung sumber daya alam berupah tanaman buah, perkebunan, dan bunga yang melimpah merupakan kondisi yang cocok untuk budidaya lebah madu Trigona. Luaran yang diharapkan pada kegiatan ini yaitu adanya informasi budiddaya lebah madu Trigona dan keunggulannya, pengetahuan jenis jenis pakan alami lebah madu, video tutorial budidaya lebah madu Trigona. Hasil panen budidaya lebah madu Trigona tidak hanya bernilai*

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ekonomis. Fungsi ekologis lebah juga akan menjaga ekosistem perkebunan dan membantu proses penyerbukan buah dan bunga milik warga. Produk madu Trigona juga memberikan keunggulan sebagai sumber apotek hidup yang memberikan pemasukan. Hal yang tepenting adalah lebah Trigona merupakan lebah tidak bersengat sehingga aman bagi warga dan mudah dalam perawatannya.

Kata Kunci: *Bandarsari, Lebah, Trigona, Masyarakat*

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1 Introduction

Padangratu District, Central Lampung Regency, is home to Bandarsari Village. Bandarsari has 9 hamlets, 24 RT (neighborhood association), 1,476 households, 9,961 people, and an area of 1,740,076 hectares. The majority of the population works as farmers, mostly in oil palm plantations, rubber plantations, and rice fields. The people have a strong gotong royong tradition. This was demonstrated in 2019 when he represented Padangratu District in a mutual cooperation competition that took place throughout Central Lampung Regency.

The COVID-19 epidemic has affected people at all levels of society. Bandarsari Village people are no exception. The era of village autonomy with village finances gives a chance to empower locals with welfare funding sources [1]. According to the early survey results at the location, there were manga fruit trees and a variety of flowers planted in the yards of homeowners' dwellings. Unfortunately, this condition exists solely to improve the aesthetics of a number of residential districts, with little understanding of the ability to boost financial gain.

Many places in Indonesia are now favorable for the growth of honey bee agriculture. Bees, like other species, are heavily impacted by the status of their surroundings [2]. Environmental elements that can have an impact include biotic and abiotic factors that directly or indirectly affect living activities, the status of food in nature, and the growth of bee populations; the more plant varieties there are, the more bee populations that will form [3].

The preliminary survey on the condition of the community surrounding Bandarsari Village reveals the condition of people who are unaware of the potential of Trigona honey bee cultivation, are unaware of the environmental potential of fruit and flower plants for Trigona honey bee cultivation, and require alternative solutions to increase agricultural-based income. Based on the above, the author hopes to assist in the organization of training in trigona honey bee farming as an alternative option to sustainable agriculture.

This activity will provide certain benefits;

1. The surrounding community must be encouraged to be more creative.
2. This is an ideal environment for the production of Trigona honey bees, since it is supported by plentiful natural resources such as fruit trees, plantations, and flowers.

3. Trigona honey bee cultivation produces more than simply economic value.
4. The ecological role of bees will also help to protect the plantation environment and pollinate the residents' fruits and flowers.
5. Trigona honey products are also helpful as a source of money-generating living pharmacy.
6. The most important feature is that the Trigona bee is stingless, making it safe for residents and easy to care for.

2 Methods

2.1 Problems of the Targeted Institution

Referring to the issues that have been raised, namely

1. A lack of understanding about Trigona honey bee farming,
2. Awareness of the environmental potential that supports Trigona honey bee cultivation, and
3. Chances to make extra money

The solutions proposed are Trigona honey bee farming training as an alternative solution for sustainable agriculture focuses on several areas, including:

1. Introduction to Trigona honey bee species and their benefits, with the expected outcome is an information about Trigona honey bees and their benefits
2. Types of natural honey bee feed are introduced, with the expected outcome is an understanding about many sorts of natural honey bee food
3. Techniques for cultivating Trigona honey bees, with the expected output is availability of Trigona honey bee cultivation tutorial videos

2.2 Methods

This activity has been carried out at the Bandarsari Village Office Hall utilizing the lecture approach and counseling on Trigona honey bee growing techniques. The following information show all stages of service activities:

1. Preparation. This activity includes the preparation of lecture material, the completion of the participant attendance list, and the submission of lecture material papers (seminar kit).

2. Opening and Remarks It is intended that the event would be formally launched by the Village Head and officials from the Department of Biology, FMIPA, University of Lampung during this activity.
3. Conduct a pre-test. Before attending a lecture, each participant will be given a test question to determine their level of understanding.
4. Counseling or material supply by resource people
   Counseling was provided to offer information on the several species of Trigona honey bees and their benefits, as well as natural foods and growing practices. In addition, there were talks, questions and answers, and demonstrations.
5. Trigona honey bee cultivation methods training
   The training is broken down into phases:
   a. Growing organic food for Trigona honey bees.
   b. Raising awareness of the benefits of Trigona honey bees and their derivative products.
   c. Honeybee colony log preparation: Setting up colony log boxes and harvesting techniques.
   d. Colony propagation
   e. Post-harvest handling and care
6. Training success is monitored and evaluated. This stage is designed to examine the cognitive and psychomotor components of the community's knowledge and absorption of the counseling materials and practices that have been implemented. Cognitive characteristics were assessed at the start and conclusion of the exercise by administering a before and post-test.
7. Closing. The Head of Banjarsari Village and Representatives of the Biology Department, FMIPA, University of Lampung will conclude the series of activities.

3 Results and Discussions

According to research result [4], the honey bees grown included the stinging bee *Apis cerana* Fabr. and six kelulut bee species, including *Genitrigona thoracica*, *Heterotrigona itama*, *Tetrigona apicalis*, *Lepidotrigona terminata*, *Tetragonula testaceitarsis*, and *Tetragonula laeviceps*. Figure 1 depicts a visible distinction between the species *Genitrigona thoracica* and *Heterotrigona itama*. Each nest colony is led by a queen; Figure 2 shows a comparison of the morphology of working class and queen bees *Tetragonula laeviceps*.

Potential bee food sources include forestry plant species such as acacia (*Acacia mangium),* multi-purpose tree species (MPTS) such as rubber (*Hevea brasiliensis*), and fruit-producing plants, shrubs, and shrubs. Trigona bee honey will taste better if it is among plants with thick blossoms,

such as manga and bridal tear flowers. This variety of bloom might be utilized as a natural feed element. Take a look at Figure 3 below,

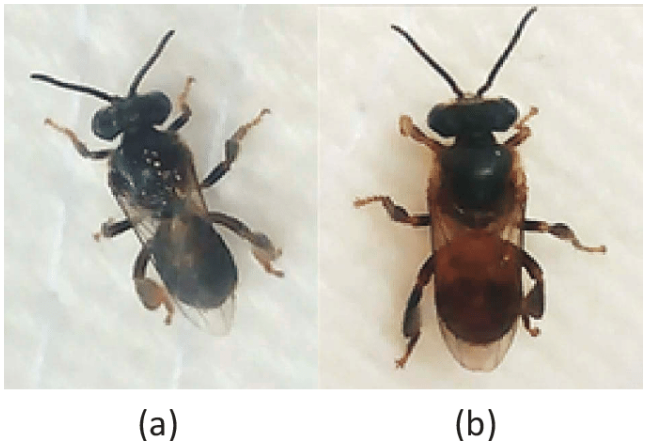


Figure 1. Heterotrigona itama (a) and Genitrigona thoracica (b) morphology

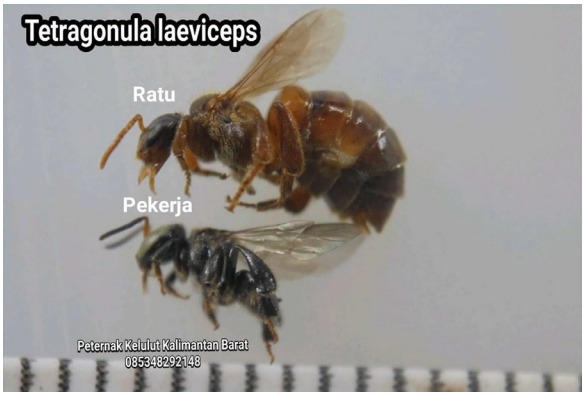
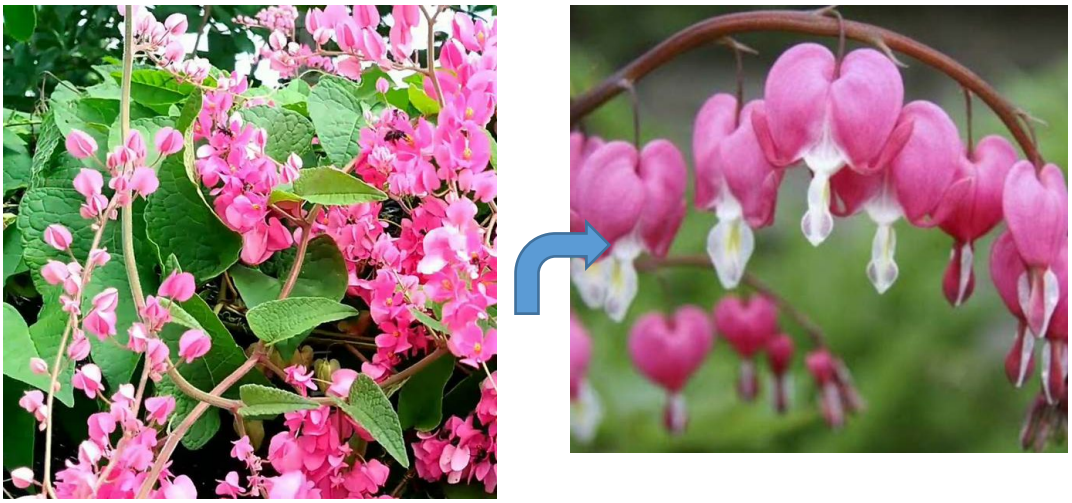


Figure 2 Working class (bottom) and queen morphology (top) Laeviceps tetragonula

Before socializing, the public's grasp of the varieties of flowers and plants around them that have the potential to produce bee feed is typically good. The data in Figure 4 demonstrate this. This demonstrates a high level of awareness of the possibilities of the surrounding environment. On the other hand, they appear to lack sufficient understanding about non-stinging honey bees. The general population is becoming more knowledgeable about a variety of topics, including the type of honey bee, the stage of honey bee production, and the time of harvesting (Figure 5).

Based on direct contacts with the community, it was discovered that there was a high degree of excitement for the production of stingless honey bees (Figure 6). This is reinforced by the high price of honey produced by this kind of bee. In the end, the additional revenue not only benefits farmers, but also the majority of local citizens. However, it has the ability to improve one's level of living. Planting flowering ornamental plants and agricultural goods has only provided aesthetic and entertaining benefit thus far. Following the instruction, the community understood the economic possibilities of raising decorative plants and fruit and flower commodities as a pastime.

Meanwhile, to aid in the transmission of knowledge about the culture of non-stinging honey bees, the author has prepared an instructive movie about honey bee farming, which can be seen at https://youtu.be/5ngOKbgPrGY.



(a)

(b)

Figure 3 Trigona honey bees feed on bridal tear flowers (Antigonon leptopus)(a) and manga blossoms (Mangifera indica)(b).

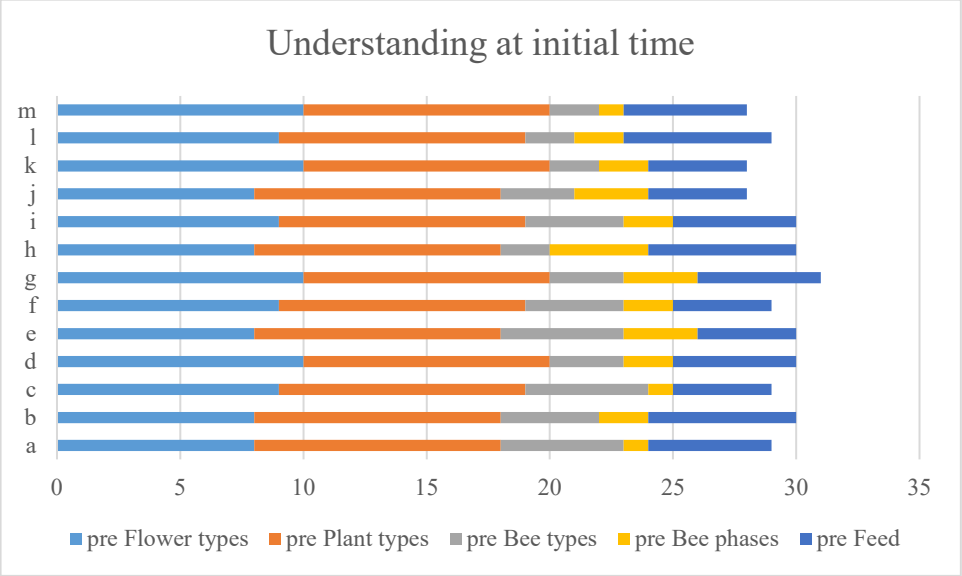


Figure 4. People's knowledge level prior to information sharing and lecturing

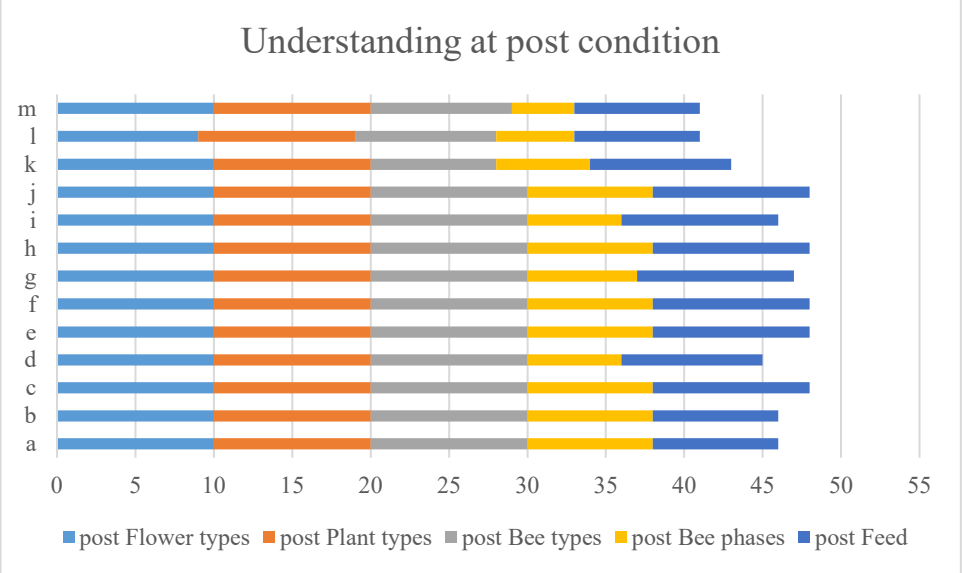


Figure 5. People's knowledge status following information sharing and lecturing

This study found that several studies have demonstrated the usefulness of employing video as a medium for students, not to mention the broader public. It appears that using films might provide a soothing environment for persons who are studying. It may also make people more engaged and easier to comprehend the topic because the video has images and music that allow them to see the material immediately. These new studies also share the teaching technique utilized by the researcher/teacher while performing teaching and learning activities in the classroom, which appears to be separated into three parts, namely, pre-activity, main activity, and post-activity [5].

Figure 6.Activities in the Bandarsari Village Hall during community service

4 Conclusions

This community service effort helped to establish Trigona honey bee farming training as an alternate way to sustainable agriculture. Residents were taught Trigona honey bee rearing practices using lecture methods and field counseling. This is an ideal environment for the production of Trigona honey bees, thanks to plentiful natural resources such as fruit trees, plantations, and flowers.

5 Acknowledgments

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