

# Egg Donor to Improve Klanceng Bee Cultivation in the Rembang PLTU Conservation Area

Nuril Anwar, Aryasti Wuri, Qorik Catur Witya Putra, Muhadjar Effendi Adi Perdana, Uslah Hidayati

**Abstract**— PLTU Rembang (steam coal power plant) consistently carries out reforestation programs in conservation areas as indicated by an increase in tree planting and reforestation in 2022 by 5% compared to the previous year. Along with the consistency of the reforestation program, there were honey bee insects that were found to have colonized. Honey bees are attracted to the nectar and pollen produced by plants. With the presence of these bees, it is increased to be cultivated in conservation areas. Because the benefits that can be obtained from the development of the bee business, especially *Trigona* Sp. Among other things, it can increase business income from the results of beekeeping in the form of honey, propolis pollen and bee colonies. Bee products support the fulfillment of community nutrition and support efforts to conserve natural resources which play an important role in helping pollinate plants. The type of bee that has the potential to be cultivated is the *trigona* sp. Although the production of honey is not as much as the *Apis* sp family, the production of raw propolis (propolis material) is quite a lot. *Trigona* sp is known to be friendly to humans because it does not have a sting (stingless bee) and is also easy to adapt to new environments. However, there are several obstacles in beekeeping either to increase the breeding of the colony or to maintain the colony. Honey production depends on many factors including the availability of feed and the health of the bee colony. Lack of monitoring in bee care causes less alertness in making efforts to repair and restore bee colonies. Initially, only the bee feed was prepared and harvested every month. However, during harvesting, it is not uncommon to find bee colonies in unhealthy conditions, although many other colonies also produce honey. With the egg donor technique, workers can maintain an 8% bee colony in the conservation area of PLTU Rembang.

**Index Terms**— Bee, *trigona* sp, Egg donor, penghijauan, konservasi, Green Power Plant

## 1 INTRODUCTION

*Trigona* bee (*Apis trigona*) known by the regional name Teuweul, or Klanceng or Kelulut or Galo-galo or Bon-Bon is one type of honey-producing bee. *Trigona* bee honey has even better properties than ordinary bee honey (*Apis Mellifera*). Besides honey, the products produced by *trigona* bees are bee pollen and propolis. These three types of products are health foods that have high economic value, besides the *trigona* bee has a very important role in the forest (garden) ecosystem in helping pollinate flowers [1].

*Trigona* bees are black and small, with a body length of between 3-4 mm, and a wingspan of 8 mm. Worker bees have large heads and long jaws. The queen bee is 3-4 times the size of a worker bee, has a large belly like Laron, is brown in color and has short wings. This bee has no sting (stingless bee)[2].

*Trigona* sp. is a group of stingless bees that live socially and in colony at the trunk of trees or woods, bamboo hole, sugar palm stalks and in the soil [3]. Honey is a natural liquid which generally has a sweet taste produced by honey bees (*Apis* sp.) from floral nectar or other parts of plants (extraflora). Kelulut honey is the honey produced by kelulut bees (*Trigona* sp). The kelulut bee is a member of the Meliponidae family (Stingless bee) and has a smaller body size compared to *Apis* bees, making it safe for cultivation [4].

In the life and development of bees are strongly influenced by environmental factors, including temperature, air humidity, rainfall and altitude. Besides, the availability of feed will determine the success of *trigona* bee cultivation [2]. By cultivating *Trigona*, you will get benefits [5], including: ecological benefits: pollination process by bees in connection with feed, 2) economic benefits: the products produced by *Trigona* are honey, propolis, bee pollen, etc., 3) social benefits : as a source of income, opening up business opportunities for the community, research objects and as regional potentials

## 2 CHANGES TO BEES CULTIVATION SYSTEM AT PLTU REMBANG

The old system only provided bee feed and harvested it regularly once a month. However, along with the development of knowledge, routine monitoring is also carried out once a week, so that unhealthy colony conditions are immediately detected and rescued. For some colonies that are detected as unhealthy, immediately check the eggs, honey bags, pollen bags, colony members increase or check the color of the nest is not dull / not fresh. In principle, young eggs and old eggs and young bees must be balanced. It often happens that there are not many young or old eggs, so that later it will interfere with the health of the queen bee. This study aims to keep the bee colony alive, so donated eggs for colonies that are less healthy.

### 2.1 Preparing a Place for the Colony

By utilizing scrap and wood waste at the PLTU Rembang, colonies of wild bees that were originally wild are collected together for easy monitoring, protected from rain and direct sunlight, as well as from pests such as ants and other insects. The clanging boxes are numbered and positioned according to the numbering sequence to make monitoring easier and easier to return to their original location. The most important thing in cultivating, among others, is the placement of positions that should not change so that the soldier bees are not confused when they return after going out looking for food.

### 2.2 Preparation of Bee Feed

In addition to the fact that there are already flower plants in

the landscape area of the PLTU Rembang such as calliandra, termbsesi and several other flower plants such as xanthos lemon and bridal tears which contain a lot of pollen and nec-tar, these plants are also cultivated and seeded. Some are planted in the ground and propagated in fences, but some are planted in pots to allow them to be moved. So that food for bees is still available in abundance.

### 2.3 Routine Monitoring

There are 100 clunk boxes which are always monitored weekly so that developments and obstacles can be handled quickly.



Figure 1. Unhealthy colony

Some guidelines are also followed so that from this periodic monitoring can maintain the quality of the colony. Unhealthy colonies are shown in Figure 1. Unhealthy colonies are indicated by the number of egg cells, honey bags and pollen bags not increasing, tends to decrease in number and quality.

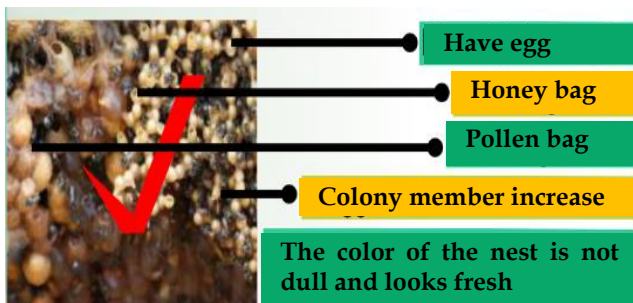


Figure 2. Healthy colony

Healthy colonies are shown in Figure 2. Healthy colonies are shown by balanced eggs, honey bags, pollen pockets, colony members increase, the color of the nest is not dull and looks fresh.

### 2.4 Worker bee egg donor

For some unhealthy colonies, the number of egg cells is not increased by egg donors, so that the colony is maintained. The procedure for egg donation is as follows:

1. Prepare a stup of a super-breed trigona bee colony (a healthy colony and lots of eggs). Gambar 2 adalah con-toh koloni super. Figure 3 is an example of a super col-ony



Figure 3. One of the super colonies in PLTU Rembang

2. Take old eggs from healthy colonies, prepare them in containers to be donated to less healthy colonies. Figure 4 shows the egg retrieval process in a super colony.



Figure 4. The process of taking eggs in super colonies

3. Insert and place old eggs into unhealthy colonies to increase worker bees. The process of inserting eggs is shown in figure 5.



Figure 5. The process of adding eggs

4. After the old eggs are positioned in a suitable location, the colonies continue to be observed after a week. If it's still not enough, then another donor from the super colony is done. Figure 6 is the process of the old egg being positioned in the appropriate location.



Figure 6. Process of the old egg being positioned in the appropriate location

From some of the worker's egg donors brought significant changes.

## 4 CONCLUSION

The egg donor method was able to save 5 colonies out of 100 colonies in PLTU Rembang. So that from 100 colonies in PLTU Rembang, 5% unhealthy colony could survive and are able to produce

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- Nuril Anwar is a Civil Servant at the Department of Agriculture and Food Rembang Regency. Jl. Pemuda No. 77 Telp/Fax (0295)699193 Rembang 59217 Graduate from Bachelor Degree Departemen of Animal Husbandary, Study Program Livestock Production Brawijaya University Malang and postgraduate from Stikubank University Semarang On Management Human Resources.
- Aryasti Wuri is an environmental engineering at Steam Coal Power Plant PLTU Rembang. PT PJB UBJ O&M PLTU Rembang Kl. Raya Semarang-Surabaya Km 130, Ds. Leran Kec. Sluke Rembang. Telp (0295)4552779 – Faks : (0295)4552779 – Faks : (0295)4552791. She receive the bachelor degree in environmental from Airlangga University. Kampus Merr C, Jl. Dr. Ir. H. Soekarno, Mulyarejo, Surabaya.
- Qorik Catur Witya Putra is an environmental engineering at Steam Coal Power Plant PLTU Rembang. PT PJB UBJ O&M PLTU Rembang Jl. Raya Semarang-Surabaya Km 130, Ds. Leran Kec. Sluke Rembang. Telp (0295)4552779 – Faks : (0295)4552791 He receive the bachelor degree in environmental from Airlangga University. Kampus Merr C, Jl.Dr.Ir.H.Soekarno, Mulyarejo, Surabaya
- Muhadjar Efendi Adi Perdana is an environmental engineering at Steam Coal Power Plant PLTU Rembang. PT PJB UBJ O&M PLTU Rembang Jl. Raya Semarang-Surabaya Km 130, Ds. Leran Kec. Sluke Rembang. Telp (0295)4552779 – Faks : (0295)4552791 He receive the bachelor degree in ocean engineering from Sepuluh Nopember Institute of Technology Kampus ITS Sukolilo – Surabaya.
- Uslah Hidayati is Supervisor Senior in Environment department at Steam Coal Power Plant PLTU Rembang. She is tasked with managing the environment, reforestation, maintaining a harmonious ecosystem and striving to realize renewable energy to create environmentally friendly plants. PT PJB UBJ O&M PLTU Rembang Jl. Raya Semarang-Surabaya Km 130, Ds. Leran Kec. Sluke Rembang. Telp (0295)4552779 – Faks : (0295)4552791