

# Preparation Planting Material by Grafting of Pepper (*Piper nigrum* L.) With Malada (*Piper colubrinum* L) for Extensibility in Flooded Land

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**Abstract:-** One of the potential commodities in the plantation sector which has a wide enough market potential, especially in world markets is pepper. Pepper farmers generally cultivate pepper in a bumpy / hilly area so that the plant is not flooded because the roots of the pepper are very sensitive so they can rot easily and die and are very susceptible to root rot and stem rot disease. Malada is also called wild pepper is a plant that has the same genus with pepper but has excess can grow in the watery area and resistant to stem rot disease. To increase the area of pepper to plant grafting of the pepper with malada as rootstock. This study aims to calculate the success of grafting pepper with maladas. The results of this study are expected to provide information on the potential of grafting pepper to

malada so that pepper can be planted in flooded areas and increasing the area of land for pepper growers.

This research was conducted at the State Agricultural Polytechnic of Samarinda, data collection in the Kebun Percontohan laboratory for 6 months, from August 2019 to January 2020. This study was divided into two treatments, namely the first treatment planting time consisted of 2 levels of treatment; t1: August - October 2019 and t2: November 2019 - January 2020. The second treatment is the way the dial is divided into 2 levels of treatment; p1: Malada cuttings are planted first and then grafting p2: Pepper cuttings are directly grafting with malada. The observed variable is growth success.

**The calculation of this study uses a completely randomized design with the test of least significant different (Lsd) alpha 5%. The conclusion of this study is that the best time to connect pepper with malada in the rainy season and direct grafting of pepper with malada is better than grafting done by planting malada first.**

**Keywords:-** Pepper, Malada, Grafting,, Inunted Land (Flooded Land)

## I. INTRODUCTION

Pepper (*Piper nigrum* L.) is a plant whose fruit serves as a spice, herbal medicine, antibacterial and anti-Oxidant. Pepper requirement reaches 350 thousand tons/year. National Pepper production in 2014 reached 91,941 tonnes [1].

Pepper is the oldest and most important product among the world's most traded spices [2]. Pepper of Indonesia is known by the name Muntok white pepper for white pepper and Lampong black pepper for Black pepper [3].

The trunk of pepper is soft and rather flat and has a segment of 7-12 cm long. Pepper branches consist of 4 types namely, orthotrop branches, plagiotrop branches, hanging branches and soil branches [4].

One of the potential commodities in the plantation sector has a considerable market potential, especially in the world market is pepper [5]. East Kalimantan is known as one of the centers producing white pepper, with the product Samarinda White Pepper [6], varieties/clone has developed in East Kalimantan is Malonan I [7].

Pepper in East Kalimantan is a traditional commodity, the original pepper cultivation in Muara Badak since 1912. Since the year 1975 is planted in Batuah Loa Janan village Since then Loa Janan became central to the cultivation of pepper plants [6].

The area of folk pepper in East Kalimantan in 2018 recorded as much as 9,021 Ha with a total production of 6,484 tons of dried pepper. The production of the pepper plants above are fully marketed to meet domestic consumption and export needs. *office of plantation, 2019* in [7].

Pepper farmers generally cultivate pepper in the corrugated/hilly area so that the plant is not inunfulfilled because the roots of the pepper plant is very sensitive so it is easy to rot and die and is very susceptible to root rot disease and rot [8]. Samarinda has a large marginal land that is very easy to inunted in the rainy time so it is difficult to cultivate this plant [7]

So to increase the area of pepper constrained land by the requirement of growing pepper that is not resistant to puddle.

Pepper plants are not resistant to water puddle and will cause a root rot caused by fungi *Phytophthora Capsici* is an obstacle in pepper cultivation in Indonesia [9]. Attacks on the base of the stem and roots can cause the plant to die [10]. The level of fungi attack *Phytophthora capsici* in pepper plants is heavily influenced by the level of crop resistance, the fungus virulence and environmental factors. One alternative to overcome the problem of disease in pepper plants is to use seeds derived from varieties of pepper resistant. Efforts to produce varieties that are resilient is by means of grafting [9].

Malada (*Piper Colubrinum* L) is a woodbrush that is a wild relative of black pepper, native to northern South American plant species is important because its resistance to *Phytophthora capsici* [11] and already cultivated in Indonesia has the ability to grow and develop in a flooded area and a close relative of pepper [12], that has the similarity of the genus so that when the plant is dived it will produce pepper plants as a stem and directly stem Bottom that can grow in the inunted area but is able to produce pepper and resistant to the root rot disease and rot stem [13].

Vegetative plant multiplication is often chosen by the farmers because it has some advantages especially for the type of crops that are lower growth and power when generative multiplication. Besides, other reasons for vegetative reproduction results are relatively similar to their parent properties [14].

Through the multiplication of the tip between pepper and directly, pepper plants can be cultivated in the inunted area or swamp.

The research aims to calculate the success of the Pepper shoots with Malada. From the results of this research is expected to provide the potential information of pepper connection with directly.

## II. METHOD

### Time and place

Time and Research was conducted at the state Agricultural Polytechnic of Samarinda, the data retrieval of the Kebun Percontohan laboratory for 6 months, from August 2019 until January 2020.

### Tools and Materials

Tools used; Cuttings, and knife oculation. Materials used; Pepper cuttings aged 3 years, 1 month old cuttings imported directly from West Kalimantan.

### Research draft

The study is divided into two treatments i.e. the first treatment of time planting consists of 2 levels of treatment; The draft calculation of this research uses a completely random design when the data obtained real impact or so it continues Dresearch is divided into two treatments (*treatment combination*), namely the first treatment of planting time consists of 2 levels of treatment; The fist treatment is time, t1: August – October 2019

t2: November 2019 – January 2020

And the second treatment is the way the dial is divided into 2 levels of treatment;

p1: Cuttings are planted first and then grafting

p2: Pepper cuttings are directly grafting with malada directly

this study uses a completely randomized design if the treatment has a real or very real effect so tetst followed by *least significant different (lsd) alpha 5%*

### III. RESULTS AND DISCUSSION

After done of a completely randomize design the treatment has a real effect and has Test *least significant different (lsd) 5%* at the time of treatment grew (t) and the way of connecting (p) to the average success of pepper connection and directly effect is very real.

Table 1. Result of test lsd alpha level 5% Average treatment of growth time (w) and grafting (p) success of grafting

	t1	t2	average (t)
p1	0.0000	0.3333	0.1667 <sup>b</sup>
p2	0.1000	0.5333	0.3167 <sup>a</sup>
Average (p)	0.0500 <sup>b</sup>	0.4333 <sup>a</sup>	

The average number followed by the same letter indicates no real difference in the alpha level 5% TEST lsd (t) = 0.14 lsd (p) = 0.14

From the table 1. the best time treatment is (T2) with a value of 0433 that successfully carried out grafting of this alleged grafting affected environment, especially moisture around crops according to [15] on humid environmental conditions, the stage of the leaf's appearance lasts faster, the appearance lasts 7-14 days after planting. The weather condition greatly affects the callus development of a plant in conducting of grafting [16].

So that connections in the rainy months with high humidity the grafting success rate is higher than the start of the rainy season, also malada have a high adaptation to the land that is flooded so that the high success rate in the rainy season is suspected because the plant directly as the rootstock is suitable on wet and flooded soil according to the opinion [17] *P. Colubrinum*, has an adaptation to the condition of the swamp. according to opinion of [18] result show that regardless grafting depending on the month of grafting.

The best grafting treatment is (p2) with a value of 0.3167 that successfully grows predictably way of grafting without planting directly in advance rooting directly has not grown differently in the first way that plants directly that have grown in the polybag its roots are still vulnerable to the movement so that the plants cause failed to connect according to opinion of [19] Factors that affect the failure of the connection is subjected to shock and cause stress crops.

Research on using wild pepper *Piper colubrinum* as a rootstock, the results indicate the discrepancy of physiology, bio-chemistry, structure and form of tissue, and the growth of Slow rootstock [17] thereby inhibiting food intake from the roots to the upper stem (entres) thus slowing the growth of upper stem buds.

The plants of the grafting that are still alive or successful can be seen with the characteristic leaves of the entres are still green and fresh, on the trunk part does not under go discoloration brown or black [20].

Grafting pepper with malada (*P. colubrinum*) which is resistant to *Phytophthora* disease. *P. Colubrinum*, used as a rootstock to control the stem rot and nematode in addition to the adaptation to the swamp condition [19 and 21].

### IV. CONCLUSION

1. The best time to connect pepper with directly in the rainy season
2. Pepper direct connection with directly better than the connection is done by planting directly first

#### Advice

Pepper connection with directly should be done in the rainy month by direct connection.

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