The effect of micro-climate to quality and existence of Gedong Gincu Mango

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Abstract. Indonesia as tropical country has various of agro-climate that affected to spread of plants, of course for mango plant. Gedong Gincu mango as a competitive commodities in west java, spread. In three district of west java, Cirebon, Majalengka and Indramayu district. The aims of this research was to analyze the effect of physical environmental components to Gedong Gincu mango characteristics in three districts of west Java, Indonesia. The research was performed in Indramayu, Cirebon, and Majalengka in January-June 2017. The methods of this research was descriptive qualitative. The results showed that the difference of micro-climate, including (rainfall, temperature, and humidity), effected Gedong Gincu mango characteristics, especially size, shape, color and texture of fruit flesh. Gedong Gincu mango from Indramayu has spherical shape, a small size, a strong red color, a hard and thin flesh, a fragrant flavor, and very sweet taste. Gedong Gincu mango from Cirebon has oval shape, a medium size, red color, medium and rather thick flesh, a fragrant flavour and sweet taste. Gedong Gincu mango from Majalengka has a sprawl, large size, yellowish red color, fine meat and thick flesh, a medium flavour and less sweet taste.

1. Introduction

As an export commodities, mango cultivated in more than 87 countries, especially in India, China, Indonesia, Thailand, Philippines, Pakistan and Mexico [1]. Indonesian mango originally came from India. Lebrun et al. reported that mango have 49 variants and thousand cultivars of mango [2]. As popular fruits, they are famous because of their distinctive taste, interested aromatic, beautiful colors and vitamin content [3].

Mango have any types in which each type requires different micro-climate to grow optimally. Arumanias, Golek, Gadung, and Manalagi, for examples, are only suitable cultivated in low-dry areas. On the contrary, Gedong Gincu, Cengkir and Slaa varieties are suitable for growing in wet climates.

Gedong Gincu has huge export opportunity than others mango because Gedong Gincu has specified aromatic, colors of fruits are good in red, sweet tastes and fiber contents [4]. Those characteristics suitable with the demand of importing countries [5]. The center of Gedong Gincu mango in west java is in Cirebon, Indramayu and Majalengka district.

Indonesia is a tropical country that has various agroclimates that affect cultivations. Influential weather factors include sunshine, temperature, rainfall, and humidity. While the influential climate factors are sun radiations, temperature, humidity, wind and transpiration. The climate element besides being in a wide area, also occurs in a narrow space or area. This climate condition in a limited space is called microclimates. Microclimate is very influential on the growth and production of plants, the
development of pests and plant diseases, and the process of weathering and soil formation. The most important microclimates are air humidity, temperature, wind speed, and evaporation. Microclimate is important for plants, animal and human life. Because this micro-climate is in direct contact with living things around it. The state of the micro-element will affect the metabolic state in the body of living things and vice versa. The state of metabolism of living things also affects the conditions of the surrounding microclimate. In addition, the existence of man-made buildings and other inanimate objects also affect the microclimate in a place [6].

Based on the background, the aim of this research was to analyse the effect of physically components to the characteristic of Gedung Gincu mango in each at three different locations at West Java, Indonesia.

2. Research method
The research was conducted in Cirebon, Majalengka and Indramayu district in January-Juni 2107. The methods used was a descriptive qualitative, comparing physically components, including fiber content, size, colors, flesh, tastes, and aromatic of mango. In this research, to investigate it deeply, the farmers were interviewed. Moreover, the secondary data about previous research and characteristic climate in three districts from Agriculture ministry were used. Then those data were analyzed with descriptive analysis.

3. Results and discussion

3.1. Climate characteristic
Based on Agriculture Ministry of Indonesia, three district of West Java as cetral production Gedong Gincu mango have different characterictic of climate and showed in table 1.

| Name of District | Altitude (m above sea level) | Average Rainfall (mm) | Driest Month | Average Annual Temperature °C |
|------------------|-----------------------------|-----------------------|--------------|-------------------------------|
| Cirebon          | 0-130                       | 2,703                 | July         | 24.1                          |
| Indramayu        | 0-18                        | 1,696                 | August       | 27.4                          |
| Majalengka       | 19-857                      | 2,871                 | September    | 26.6                          |

On Java islands, the mountain height reaches 3,767 m above sea level, the highest rainfall in the Bogor region is 630.2 mm per year. Regions that often experience without rain reach several months in the Indramayu and Purwakarta regions. The diversity of rainfall causes by different sun radiation, so its effect to the air temperature and humidity. These conditions result in a variety of agroclimate conditions or microclimates which subsequently lead to the life of flora and fauna. There are at least 26 types of cultivars though commercially developed only 10 types [7].

Indramayu was located at 107 °52 ' - 108 °36' East Longitude and 6 °15 ' - 6 °40' South Latitude [8]. Based on Table 1 Indramayu has average rainfall lowest than others was 1,696 mm and driest month happened in August. Contrary with average rainfall, Indramayu has average annual temperature highest than others, was 27.4 °C [9].

Majalengka was located at 108 °03 ' - 108 °19' East Longitude and 6°43 ' - 7 °44' South Latitude [10]. Majalengka has highest average rainfall (2,871 mm) than others and driest month happened in September. While, Cirebon has medium characteristic of climate between two other district, average rainfall was 2,703 mm and driest month happened in July [11]. Cirebon also has a special type of wind called angin kumbang [12]. Spesifically, this wind gave direct effect on onion planting, however, all commodities also affected but not significantly.

The differences of altitude, rainfall and types of soil making special agro-climate the three regions Table 1 also showed that driest month happened in different month of each district. Different climate characteristic including altitude, rainfall, and temperatur also type of soils making spesial agro-climate in each district. Each district also have different characteristic of rainfall.
3.2. Physically appearance of Gedong Gincu Mango

Rainy and dry season which happened in three district as central production of Gedong Gincu mango making specific conditions that affected to physical appearance of including color on fruit peel, a fiber in flesh, and flavour. Fruiting period of mango especially Gedong Gincu cultivar was in August to December. In these months, both of Cirebon, Indramayu and Majalengka have lowest rainfall.

At first glance, there is no differences appearance between the mango that produced at Cirebon, Indramayu, and Majalengka. But, with detail observed each mango both of three district have a significat differences. Gedong Gincu mango from Indramayu had characteristic including a round of shape with small size, a strong red color, a thin flesh with hard fiber, a good flavour and very sweet taste. In Indramayu, Gedong Gincu mostly cultivated in Pawidean, Jatisari, Krasak, Jatibarang, and Lohbener subdistrict. The altitude of these sub-district around 0-18 m above sea level with an average rainfall of 1,696 mm and the lowest rainfall of 28 mm.

In Cirebon Gedong Gincu cultivations was spread at two sub-district such Girinata and Sedoing. Gedong Gincu mango from Cirebon had a medium sizes. These mango had a good combinations of sweet and sour flavour with sufficient water content. With these characteristic make Gedong Gincu mango from Cirebon becomes a favorable fruit commodities in international market. In other hand, Gedong Gincu mango from Majalengka had larger size than others and have more water contains. These mangose had a sprawl in shape, yellowish red color, a thick flesh with fine fiber, a medium flavour and less sweet of taste. The physically apperance of Gedong Gincu mango based on colors and size both three district in West Java showed in Figure 1. While, colour and thickness of Gedong Gincu flesh showed in Figure 2.

![Figure 1](image1.png)

**Figure 1.** Physical appearance of Gedong Gincu manggoes based on color and fruit size.

![Figure 2](image2.png)

**Figure 2.** Colour and thickness of Gedong Gincu flesh.

Based on figure 1 and 2 show that micro-climate of each district affected to Gedong Gincu mango characteristic, including size, color, shape, and thickness of flesh. The differences of altitude, rainfall, humidity, and temperature in three districts caused the difference of sunshine duration and photosynthetic intensity of plants in three district. Because each district have difference characteristic of mango so it can be a competitive commodity for each district.
4. Conclusion
The differences of micro-climate (altitude, rainfall, temperature, humidity) affected to characteristic of Gedong gincu mango in each locations (shape, size, color, texture of fruits). Typical characteristics of each region caused Gedong Gincu mango become an especially commodity in each distric.

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