

## Development of Botanical Composition in Maribaya Pasture, Brebes, Central Java

N. Umami<sup>1\*</sup>, N. Ngadiyono<sup>1</sup>, Panjono<sup>1</sup>, N. Agus F<sup>1</sup>, M. Shirothul H<sup>1</sup>, I.G.S. Budisatria<sup>1</sup>, Y. Hendrawati<sup>2</sup>, I. Subroto<sup>2</sup>

<sup>1</sup>Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta

<sup>2</sup>Agency of Animal Science and Health of Brebes Regency, Brebes.

\*Corresponding E-mail : nafiatul.umami@ugm.ac.id

### Abstract

The research was aimed to observe the development of botanical composition in Maribaya pastures. The sampling method was cluster random sampling. The observed variables were the type of forages and the botanical composition in the pasture. Botanical composition was measured by using Line Intercept method and the production was measured by the estimation of botany production for each square meter using its dry matter measurement. The botani sampling was performed using square with size of 1x1 m<sup>2</sup>. The observation was performed before the pasture made (at 2015) and after the pasture made (at 2017). Based on the research result, it was found that there was significant difference between the forage type in the pasture at 2015 and at 2017. It happens due to the adjustment for the Jabres cattle feed.

### 1. Introduction

Livestock activities are important part in supporting the implementation of integrated agricultural system in Indonesia. Among farmers, especially rural farmers, beef cattle is an important asset, cannot be separated from the agricultural system. One of the problems that often occur in the maintenance pattern of traditional beef cattle is the limited land for forage feed. Commonly, used forages come from the processed (productive) and unprocessed (unproductive) land. Meanwhile, most of the land is in the not productive land for plants. This phenomena happens in Maribaya village, Bumiayu District, Brebes Regency, Central Java.

Some breeders in the Maribaya region, Bumiayu Subdistrict, Brebes District, Central Java get forage for ruminants from farming areas as well as from agricultural remains and also in the watershed. The area around the river flow is the main place for the availability of forage sources of feed. For example is in the Yellow River. This area is the main place for farmers to take forage feed, but this area is also one of the forage sites that has been revegetated earlier. Therefore, the measurement of forage production and its quality is required to take a strategical step in utilizing the forage in order to increase the livestock population in the area. Observation of plants that can grow well in terms of quality and quantity is needed to know the development of pastures. Maribaya grazing paddock is a new pasture of grazing in Java island. It requires observation and maintenance with proper management. For this reason research about the development of Maribaya grazing is needed to make scientific studies related to the future development.

In order to create a standardized pasture, it is necessary to adjust the botanical composition that lives in the area. Since 2015, some efforts has been made to optimize the certain botanical composition as a source of forage feed. This study was conducted to evaluate the the botanical



composition optimization results in Maribaya Pasture. The number of botanical compositions was observed before optimization (in 2015) and after optimization (in 2017).

## 2. Materials and Methods

This research was conducted in Maribaya village, Bumiayu District, Brebes Regency, Central Java. This research used 1x1 m square, lux meter, sickle, trash bag, sack, meter, hoe, sickle, scissor, wooden pin, rope, masking tape, newsprint and stationery.

The measurements of forage condition and other staple crops were performed using Line Intercept method. Observations on the number of botanical compositions were performed before optimization (in 2015) and after optimization (2017).

## 3. Results and Discussion

Plant species is one of the factors affecting plant growth. Forage feed physiologically has grown properties in specific areas corresponding to each plant. These properties must be considered in every forage planting and should be adapted to the quality of the forage adaptation which will ultimately impact the success rate of the forage development effort. The factors about the management of grazing areas should also be considered in the order to develop the herbs of feed in addition to growth factors. One of the core activities is the management of forages. Technical factors that need to be considered in the business of feed forage management in grazing area are soil fertility, physiological condition of forage feed which become marker if nutrient deficiency is needed, and the existence of water (Hasan, 2012).

Pastureland should be developed with a dry-resistant plant species, consisting of grasses and legumes. The botanical composition of Maribaya Pasture was shown in Table 1. In the beginning of Maribaya Pasture development, the botanical composition was consist of many grasses and legumes, either usefull or useless for livestock feed. The optimization of botanical composition was performed for 2 years in order to eliminate the useless plant and maximize the usefull plant growth.

**Table 1.** Botanical Composition in 2015 and 2017 of Maribaya Pasture, Brebes Regency

No.	Botani Type	Occurence in 2015	Occurence in 2017
1.	Elephant Grass	√	√
2.	King Grass	√	√
3.	Setaria sphacelata	√	√
4.	Alang-Alang	√	√
5.	Wangi Root	√	√
6.	Granjangan	√	√
7.	Carpet Grass	√	√
8.	Signal Grass		√
9.	Lamtoro		√
10.	Glirisidia		√
11.	Imperata		√
12.	Sentro		√

The types of grasses in Maribaya Pasture at 2015 are Elephant Grass, Grass King, *Setaria sphacelata*, Alang-Alang, Wangi Root, Granjangan, Grass Field, while the existing legume type was leguminous tree species and shrubs, legume *Gliricidea maculata* or *Leucaena leucocephala*, *Euchresta Horsfieldii* Benn, and *Gliricidia sepium*. And for the bush legume there are *stylosanthes*, *clitoria*, and *Mimosa pudica*.

Based on the identification results in the Maribaya Pasture at 2017, there is an increase in the number of grass species present in the area. It happens because there are some optimization effort. This area will be used for grazing. Some types of forage were found in the pasture. They are Grass Signal (*Brachiaria decumbens*), Lamtoro (*Leucaena leucocephala* L.), Local grass or field grass (*Axonopus compressus*), Gliricidia (*Gliricidia maculata*), Imperata (*Imperata cylindrica* (L.) Raeusch, and Sento (*Centrosema pubescens*). Each type of forage has different appearance and characteristics.

Grass Signal (*Brachiaria decumbens*). The characteristics of this forage are long-spreading, longevity, height between 80 cm to 150 cm, leafy, short, dark green leaf texture, and grows well in rainfall conditions 1200 to 1750 mm/year. It has function as pasture grass and cut grass (Figure 1).



**Figure 1.** Grass Signal (*Brachiaria decumbens*)

Lamtoro (*Leucaena leucocephala* L.). This forage came from central America. The characteristics of this forage are 2 to 10 meters tall, deep-rooted, has a double-pinnate leaf, dark gray-green leaf color, grows well in rainfall conditions ranging from 700 to 1650 mm / year and altitude of place between 700 up to 1200 meter above sea surface. It can be protein sources for livestock and also can be used as fertilizer plants (Figure 2).



**Figure 2.** Lamtoro (*Leucaena leucocephala* L.)

Local grass or field grass (*Axonopus compressus*). It has shallow rooting characteristics, roots out of stolon books, long stolons and branches in all directions, leafy strands of the leaves, downy feathered and stemmed. The length of the leaves reaches 30 cm, while the width is 1.5 cm and has a compound interest in the form of grains (Figure 3).



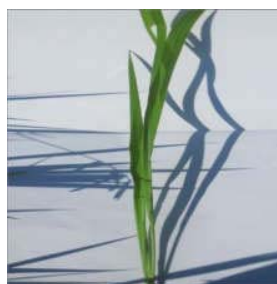
**Figure 3.** Carpet grass (*Axonopus compressus*)

*Gliricidia* (*Gliricidia maculata*). It has light brown or whitish brown trunks, stems grown, stem branches often come out at the bottom of the stem, the length of the petiole is 15 to 40 cm, a leaf stalk has 7 to 17 strands leaves with size 1x3 cm to 3x6 cm. The flowers are pale pink, medium size and the upper surface of the leaves are bright green, while the lower surface is pale green (Figure 4).



**Figure 4.** Gliricidia (*Gliricidia maculata*)

*Imperata cylindrica* (L.) Raeusch). It classified as annual grasses that favor sunlight. It has flammable parts on the ground and roots of rhizomes or rhizomes that spread widely below the soil surface. The breeding of this forage is through seeds and roots rhizomes and have allelopathy that can inhibit other nearby plants (Figure 5).



**Figure 5.** Alang-alang (*Imperata cylindrica* (L.) Raeusch)

Sentros (*Centrosema pubescens*). It has characteristics of growing, climbing or twisting, rather hairy and non-woody stems and adaptable to less fertile soils, acidic pH, inundated water or ugly drainage (Figure 6)



Figure 6. Sentro (*Centrosema pubescens*)

#### 4. Conclusion

Based on the results of this study, it can be concluded that Maribaya Pasture has the potential of forage feed as a source of protein and fiber. There is a increase in the number of grass species that present in the area at 2015 and 2017. In 2017, the forages are Grass Signal (*Brachiaria decumbens*), Lamtoro (*Leucaena leucocephala* L.), Local Grass or Field Grass (*Axonopus compressus*), Glirisidia (*Gliricidia maculata*), Imperata (*Imperata cylindrica* (L.) Raeusch), and Sentro (*Centrosema pubescens*). Each type of forage has different appearance and characteristics. It means that the introduction of high quality forage in Maribaya Pasture is success. Further research is needed to optimize the potential of Maribaya Pasture.

#### Acknowledgment

The author gives thanks to Ministry of Research and Higher Education of Indonesian Republic which has fully funded this research through Universitas Gadjah Mada, Yogyakarta, in the form of *Penelitian Unggulan Perguruan Tinggi Grant* with contract number of 2470/UN1.P.III/DIT-LIT/LT/2017.

#### Reference

- [1] Reksohadiprodjo, S. 1994. Produksi Hijauan Makanan Ternak. Badan Penerbitan Fakultas Ekonomi (BPFE) Universitas Gajah Mada, Yogyakarta.
- [2] Sawen, D. dan M. Junaidi. 2011. Potensi Padang Penggembalaan Alam Pada Dua Kabupaten Di Provinsi Papua Barat. Seminar Nasional Teknologi Peternakan dan Veteriner.
- [3] Susetyo, S. 1980. Padang Penggembalaan. Departemen Ilmu Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor, Bogor.
- [4] Williamson, G. dan W. J. A. Payne. 1993. Pengantar Peternakan di Daerah Tropis. Gadjah Mada University Press. Yogyakarta.