

GUIDELINE FOR GROWING PASTURE AND FODDER

Introduction

The main factor to consider before undertaking livestock rearing is feed, where the main components are pasture grass and fodders. Animals need sufficient quality and balanced diet to ensure maximum health, reproduction and production of milk and meat.

Due to this, the type or species of pasture and fodder of high quality and of high yield need to be produced as feed for the animals. Critical planning regarding animal feed to increase efficiency for easy management of livestock and to upkeep the quality of production to an economical level should be undertaken.

Pasture Management

The objectives in pasture management are to secure maximum quantity of nutritious animal feed, which is distributed as widely as possible throughout the year, and to maintain this high level of production as long as possible. To ensure the efficient utilization of the feed production and thus obtain maximum profit from animals industry.

The six main pasture problems:

- i. Forage dry matter yield
- ii. Forage quality
- iii. Seasonal distribution of forage production
- iv. Forage utilization
- v. Stability or resistance of pasture
- vi. Economics of production

Pasture and Fodder

Characteristics of high quality pasture and fodder:

High yield all the time (i.e. dry matter content)

High nutrient value especially crude protein content

High digestibility

High resilience, can withstand bad conditions like drought, overgrazing but easy to maintain

Fast growth rate; High leaf to stem ratio

Can be easily mixed with other species esp. legumes

Economical; Palatable

List of pasture /fodder and legumes

Name	Saintific name
Star grass	<i>Cynodon plectostachyus</i>
Signal grass	<i>Brachiaria decumbens</i>
	<i>Brachiaria humidicola</i>
Para grass	<i>Brachiaria mutica</i>
Guinea grass	<i>Panicum maximum</i>
	cv.- Colonio cv. Hamil cv. -Typica
Napier grass	<i>Pennisetum purpureum</i>
Kazungula grass	<i>Setaria sphacelata cv. kazungula</i>
Splendida grass	<i>Setaria sphacelata var. splendida</i>
MARDI Digit/Pangola grass	<i>Digitaria setivalva</i>

Legumes

Name	Saintific name
Centro	<i>Centrosema pubscens</i>
Stylo	<i>S tylosanthes guyanensis</i>
Puero / Kudzu Tropic	<i>Pueraria phaseoloides</i>
Calapo	<i>alapogonium mucunoides</i>
Ipil-ipil	<i>Leucaena leucocephala</i>

The choice of pasture/fodder and legumes to be planted depends on:

Type of livestock (cattle, sheep/goat)
Topographical conditions and type of soil
Usage i.e. for grazing or cutting

Land preparation

Before land could be prepared for growing of grass, the land should be cleared. All plants, timber, tree stumps, roots etc. need to be burnt to ashes. If the area is waterlogged, trenches should be dug to drain the water and if the area consists of small mounds and hills, it should be leveled first. Land preparation can be done mechanically for large areas but for small areas, manual labor will suffice. Land preparation is best done on the onset of the dry season.

Stages of land preparation

Ploughing
Dicing /loosening
Harrowing

Ploughing

These are aimed at breaking down the earth, turning over the sod completely to expose the earth containing roots of plants and weeds to the sun. This can be done using a 2disc/3 disc plough.

There are 2 stages of ploughing

Ploughing for the first time (1st Plough)
Second time ploughing or alternate ploughing (2nd Plough)

The time period required between the two stages is approx. 2- 4 weeks depending on the weather, land etc. This is to ensure complete exposure of the soil containing pests and roots to the sun and to provide ample time to soften and loosen the earth to get a good texture.

Combing/breaking the earth

This is to break large pieces of soil to smaller pieces; usually done with a disc harrow at least 2-3 weeks after alternate ploughing.

Rotovating

This is the final stage after combing and breaking down of the soil to smaller pieces, achieved by using a rotovator/ rotary tiller. This is done to achieve a much smaller soil structure esp. at the surface, suitable for root growth and development. However, if the soil is already of small texture, this stage is not necessarily done.

It is advisable that all left over of wood, tree stumps, roots of trees and plants, stones and rocks are thrown away at every stage of the land preparation and that this work need to be carefully conducted to ensure that :-

- the land surface is good with no wood, tree stumps etc as these obstacles can damage farming equipment and cause accidents
- to achieve a suitable soil structure with good air pockets for good circulation and good water holding capacity. These factors are important for healthy root growth and development.
- to rid off all unwanted weeds.

Liming

Land with acidic pH is not suitable for growing grass esp. legumes.

Most of the land in peninsular Malaysia is acidic i.e. with a low pH. The most suitable pH value required is between 5.0-7.0. The type of lime that is normally used is CaMgCO₃.

Liming depends on the pH value of the soil. At least 3.3 ton metric or 1 ton/ metric per acre of lime is required for an expected rise in pH of 0.5. The use of other fertilizers is not encouraged until the acidity is corrected, as acid soil will disturb the absorption of nutrients of the fertilizer by plants/grass. Liming is done immediately after land preparation is ready, or could be done concurrently during soil rotoation i.e. 2 weeks before planting. Liming could be done using a spinner broadcaster or by hand. Nose and mouth masks should be worn to escape from respiratory problems.

Planting/sowing

Growing of grass is best done in the rainy season; therefore the rainfall pattern of an area need to be taken into consideration as optimum moisture is required for effective germination and growth. The use of irrigator or sprinkler will help in maintaining correct moisture without depending too much on the rain. For waterlogged area, irrigation is required to drain off excess water.

Seed rates per hectare or distances for planting need to be taken into consideration as these factors will determine good growth and density and preventing growth of weeds.

There are 2 methods of growing;
Using seeds; Using cuttings

Growing using seeds

The species, quality and type of planting determines the qt. of seeds required for a hectare. If the percentage of germination is good, the quantity used will be reduced and vice versa. Below are quantities of seeding rate required for several grasses and legumes (provided the seed is of good quality and properly stored)

Type of grass & rate of sowing (kg/hectare)

<i>Name</i>	<i>Rate kg / ha</i>
<i>Brachiaria decumbens, br.humidecola</i>	2 - 6
<i>Brachiaria mutica</i>	2 - 5
<i>Panicum maximum</i>	3 - 6
<i>Setaria</i>	5 - 7
Ipil-ipil	4 - 6
Centro	3 - 5
Stylo	2 - 5
Puero	1 - 3

In a mixed pasture the ratio of grass to legumes should not exceed 40%.

Harvesting/cutting pasture and fodder

First Cut

The time for first cutting/grazing depends on several factors like the species and fertility of soil of pasture. A too early cutting/grazing will damage the growth of grasses due to the weak root system. Generally it could be done a few days before flowering. This can be predicted by observation i.e. when a small proportion of the grasses in the area start to flower. At this stage the percentage of dry matter content is at its highest and the percentage crude protein content is high.

Further cuttings

The rate of growth after cutting reaches a much higher optimum level compared to freshly grown grass. The flowering stage is a good sign to determine the time for cutting. Based on experiences and studies conducted, below are resting period or the intervals between each cutting or grazing of several kinds of pasture or fodder that is deemed suitable for practice to ease management.

Types of pasture /fodder	Resting period (weeks)
<i>Brachiaria decumbens</i>	4 - 5
<i>Pennisetum purpureum</i>	5 - 6
<i>Brachiaria mutica</i>	3 - 4
<i>Panicum maximum</i>	4 - 5
<i>Setaria</i>	4 - 5

Besides the fertilization factor which is recommended for most types of pasture/legumes with rapid growth is 10-15 cm. The first cutting for Napier grass is 7 cm above the ground to allow for more growth of new shoots. The next cutting can be done at a height of 10-15 cm above ground.

Dry Matter yield

Below is the average dry matter yield (ton/hectare/year) of a few types of pasture/fodder that is cut every 6 weeks from two types of soil series:

Pasture/Fodder	Average dry matter yield (tan/ha/yr)
Signal grass	25.5
Para grass	12.1
Star grass	16.2
Guinea grass - cv.- <i>Colonio</i>	18.6
Guinea grass : cv. <i>Hamil</i>	17.6
Napier grass : - Local	23.2
Napier grass : - Uganda	16.9
Kazungula grass	18.2
Splendida grass	17.6

Fertilization

Fertilization means increasing or replacing of nutrients required by plants (Nitrogen, phosphorus and potassium) to the land so that these elements can be taken and used by the plants for its own growth. Besides this, fertilization is for getting

- a continuous high quality and high yield
- a long life

Types of fertilizer

- Organic fertilizer
- Chemical fertilizer

Types of fertilization

- i. Initial fertilization
- ii. Maintenance fertilization

Initial fertilization is first done before or during planting. It is aimed at improving/encouraging root establishment and a healthy and strong initial growth for continuous growth and development.

Rate of fertilization

Generally the rate that is recommended for pure grass (not mixed with legumes) depending on the conditions in peninsular Malaysia is:

N : P : K = 60 : 30 : 30

60 kg. Nitrogen/ha
30 kg. Phosphorus/ha
30 kg. Potash/ha

eg :

N	UREA	46 % N
P	Triple Super Phosphate	46 % P ₂ O ₅
K	Muriate of Potash	60 % K ₂ O

The rate of initial fertilization depends on several factors. Land originating from virgin forest that is recently cleared usually contains high nutrient contents. Only phosphates need to be added to this type of land to improve growth of root. The fertilizer that is normally used are TSP, CIRP, GRP. If TSP is used, the rate is 245kg/hectare or 100 kg/hectare.

The rate of initial fertilization recommended for mixed pastures with legumes are:-

P : K = 30 : 30

eg:

P	30 kg. Phosphorus/ha	(65 kg.T.S.P/ha)
K	30 kg. Potash/ha	(50 kg. Muriate of Potash/ha)

Liming is necessary and a must to correct the pH of the land for mixed pastures and legumes.

This type of fertilization is done once, or several times at a certain rate. However, fertilization after each cutting or grazing is recommended. The quantity required for each fertilization is derived by dividing the quantity of fertilizer required in a year by the no. of fertilization. The recycling of animal wastes and sludge is greatly encouraged as it is economically viable i.e. at no cost.

Note:

P - P₂O₅ - x 2.21 P₂O₅ - P - x 0.44 K₂O - K - x 0.83 K - K₂O - x 1.2