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THE STUDY AND THE DESIGN OF MASS MARSH OR GRASS PULLER  
MECHANISM

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“I declare that this report is done by my own unless the citation with the mentioned references for each.”

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*Dedicate to my beloved parents, classmates and my very best friends,  
Hasbullah Mohd Isa and Khairul Izlan Mohamad. Thank you for everything.*

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## ABSTRAK

Rumput dan lalang cenderung merebak dengan cepat di halaman rumah atau kawasan terbiar. Lazimnya, rumput dan lalang dipotong menggunakan mesin pemotong rumput. Ini tidak menjejaskan sistem akar rumput kerana ia akan tumbuh semula dan berkembang kembali dari system akar yang asal. Sebelum ini, penyodok dan peralatan lain juga digunakan untuk mengeluarkan sistem akar rumput tetapi semua kaedah tersebut didapati tidak berkesan untuk membuang sistem akar. Tambahan pula telah di dapati ia sangat menyusahkan dan membuang masa.

Rumput dan lalang merupakan tumbuhan yang tidak diperlukan dalam bidang pertanian mahupun hiasan. Terdapat berbagai jenis rumput dan lalang dan setiapnya mempunyai perbezaan struktur mengikut spesiesnya. Tumbuhan ini mampu untuk membiak dengan cepat dan pantas di samping mendatangkan kesan negatif kepada persekitaran. Model rekabentuk mesin mencabut rumput di reka berdasarkan alatan yang sedia ada menggunakan aplikasi konsep yang sama. Rekabentuk di buat bagi kegunaan kawasan yang luas dan keberkesannya untuk mencabut rumput atau lalang bersama-sama sistem akarnya.

## ABSTRACT

Unwanted plants such as weeds have a tendency to grow very quickly on grass lawns and flowerbeds. Typically, such weeds are cut at their stems by lawnmowers or manual cutter. This does not damage the root system of weed and the weed therefore grows back very quickly from their already established root system. Spades and other hand held instruments have been used in the past in an attempt to dig out the root system of the weeds but those methods have not been found to effectively remove the root system and moreover have been found to be cumbersome and time consuming.

Unwanted grass was useless in agriculture on any other field. There are many types and species of grass and each of it have their own physical structure base on their species. The unwanted grass can grow and multiply faster in the same time bring an effect to the environment. A grass puller mechanism were develop base on the patent and manually remove stem tool by using the same concept. The design for use in a wider space and can remove not only the grass but also the stem successfully.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND

Grass is a plant that grows into group usually at clearing and idle place. Plants which come under weed group has special features that is as tolerant on growth environment, produce seed total that many and have competing strength high. Hence these plants grow and multiply quickly without restriction.

Usually the method used to eliminate grass or grass is by using plant chemical. But Malaysia heavily relies on chemical plant usage of herbicide. Too often herbicide application will disturb agriculture ecosystem. The study outcome carried out shows that plant chemical give effect to on microbial population and natural decomposition activity. Yet this effect behave temporary because the population and rate of decomposition cure after 4 previous weeks running again as usual. However microbe degradation rate for dependent herbicide to soil type, structure clams herbicide, and humidity and temperature environmental factors.

Herbicide application which were too often will enable material decomposition which will produce new substance that more toxic. Lately, some species of weed and grass reported being ineffective for pesticide. Land poisoning

case in Malaysia also improved each year by those arise of environments problems. To tackle this problem, action on different techniques as culture and biology to control weed, or by the other method is manually using equipment and effective machine to control the breed of grass.

## **1.2 PROBLEM STATEMENT**

There is no such a machine or tool that can pull or extract grass from the root to control the breeding of the grass from spread around by their rhizome. Some other equipment are not suitable to extract long grass or weed from wasteland area because hard quality of land. Some cases just remove the grass but damage land and vicinity. Most obvious weakness is the ability to extract grass or weed until to source region. This is important because purpose weeded above all in to eliminate weed existence by control his breeding.

In Malaysia, still practice a plant chemical usage to kill grass or more acquaint as weed. Even so there is some equipment in whose make to meet customary consumer need from areas of agriculture but this equipment seems not suitable to general usefulness as there among function in case user whose not in comfortable in the situation or by special groups which have the limited capability.

Since many method and equipment been use to remove weeded or grass but all methods find not effective to pull all weed root and find out trouble by waste consumer time. Weed special feature which can breed easily make a more effective method needed to control him breeding from early.



### **1.3 OBJECTIVES**

The study and the design of mass marsh or grass puller mechanism

1. Study the root and stem of marsh or grass
2. Analyze of the method of grass pulling
3. Design and fabricate the prototype of the marsh and grass puller.

### **1.4 SCOPE**

The study will cover about the basic introduction of grass by physical property and the root system of grass *Imperata Cylindrica* or called by name '*lalang*', method on how related equipment working and study of the new design.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 GRASS : IMPERATA CYLINDRICA



Figure 2.1: Grass Imperata Cylindrica type  
(Source: Yosri, (2005))

Scientific name	:	Imperata Cylindrica
Family	:	Gramineae (Poaceae)
Proper name	:	Cogongrass
Call Name	:	Lalang

*Imperata Cylindrica* is sepsis grass in small group by Panicoideae, supper Andropogonodae, and tribe Androponeae. Cogongrass or grass can live and sprouting from 2 feet and achieve to 10 feet. Leaf blade grass is broadly 2 centimeter and have end that sharp. With thin leaf and as knife in complete with crystal silica microscopic. Lower part of leaf have thin capillary in his surface but increasingly tenuous when approaching the top. When this plant is inactive, it change become blonde chocolate colour beginning from the underside plant. But the leaf parts have been dead remaining standing and resist decay.

Congongrass or grass grows wildly in clearing places. Some use of grass is making paper, roof, mat or bag. Even so, his public use is in medical field. Grass use in an astringent (body tissue), diuretic (casting process), emollient (skin), haemostatic (red blood cell), and tonic (medications). Grass reputed has specialties to fight bacteria elements and cancer. Young grass may be eliminated cook, his root have sugar content and starch. Past human dug the ground to get grass root will be collected, cut, and dried to sugar.

Names are different according to area and place. Spear grass in Nigeria, Bladly grass in Australia, Lalang in Malaysia, Gi in Fijian, Ngi, Paille de dys, Paillote, *Imperata cylidrique*, Imperate, Satintail, and Kasoring in Palauan, Cotton wool grass, Cotranh in Vietnam, Illuk in Sri Lankan, Yakha in Loas, Kunai in New Guinea, Silver spike in southern Africa and Cogon grass in United States.

## 2.2 GRASS PHYSICAL CHARACTERISTIC

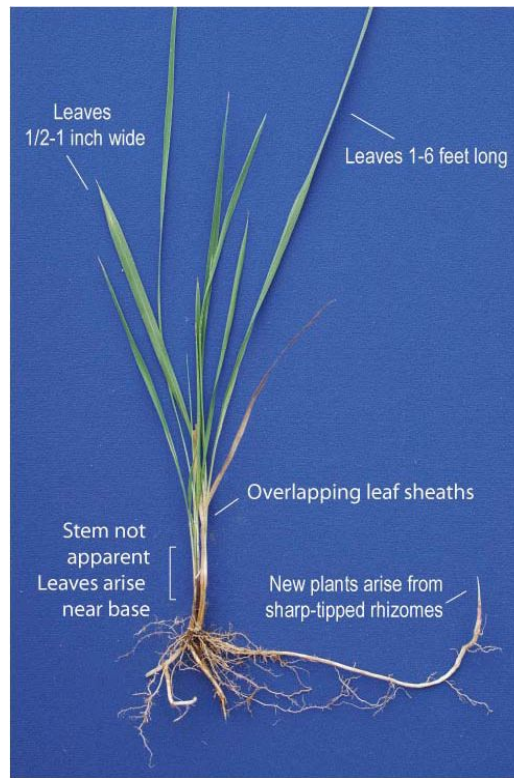


Figure 2.2: Basic physical characteristic.

(Source: University of Georgia – Bugwood network)

Grass or his scientific name *Imperata Cylindrica* is aggressive that natural striker plant in most areas especially area Asia. It disturbing ecosystem system function, reduce area for habitat wild, stunt different plant growth, and become cause of the fire. Generally there are variety classes of weed species. Although each species seem as similar, grass has unique combination make his recognition process hard. Basis species commonly found is Vasey grass (*Paspalum urvillei*), Johnsongrass (*Sorghum haplense*), Silver beardgrass (*Bothriochloa laguroides*), And Broomsedge (*Andropogon virginicus*).

### 2.2.1 GRASS: RHIZOME ROOT



Figure 2.3: Root of grass.

Coogongrass usually spread by rhizome root via underground root. Tree roots cogongrass or better known with grass, shaped sharp at the end. It extends and project quickly from one end to other new root. Sometimes this root tense grow interrupt in among different plant.

Most of rhizome root grow creeping curtain surface of the ground but sometimes for some age of grass it can reach depth 3 feet in the earth. Root system supply grass thick and leafy. It has much sharp side and in protect with piece of colored thin membrane white. Grass root has also separate particle parts which connect strongly.



Figure 2.4: Rhizome root harp side and particle segment connect strongly

(Source: University of Georgia – Bugwood network)





 <p>UGA2152032</p>	
<p><u>Vasey Grass</u> Thin root system, not extensive and lacking thick, segmented rhizomes.</p>	<p><u>Silver Beardgrass</u> Root system fibrous, lacking rhizomes.</p>
	 <p>UGA1459237</p> <p>UGA1459242</p>
<p><u>Broomsedge</u> Root system fibrous, lacking rhizomes.</p>	<p><u>Johnsongrass</u> Rhizomes system not as extensive, lacking scaly coverings.</p>

Figure 2.5: Root for different species  
(Source: University of Georgia – Bugwood network)



### 2.2.2 GRASS: PLANT BASE



Figure 2.6: Plant base part

Congongrass or grass is vague or has no apparent stem like other plant. Grass is type of short plant or shrub. Once glance it is look like it only consist a leaf till the underground part which have the root rhizomes. This makes leaves appear to arise directly from or close to the ground. But overlapping sheaths give a rounded appearance to a plant base.

All vegetation does not arise from one dense clump instead the plants are more to spread out. There are light green in color or sometimes look like reddish. Often there a lot of thatch around the base because of the rhizome root or dead waste of grass.



Figure 2.7: Spread out leaf and thatch around base.





	
<p><u>Vasey Grass</u></p> <p>Base thick and flattened, often with a reddish purple colour. Plant is very bunched in appearance</p>	<p><u>Silver Beardgrass</u></p> <p>Plant base has a strongly bunched appearance with apparent stems</p>
	
<p><u>Broomsedge</u></p> <p>Plant base has a strongly bunched appearance with very apparent stems</p>	<p><u>Johnsongrass</u></p> <p>Plant base also rounded but very thick and do not be appear bunched</p>

Figure 2.8: Plant base for different species  
(Source: University of Georgia – Bugwood network)