

**POTENTIAL OF *Bipolaris bicolor* IN COMBINATION WITH
AMETRYN FOR INHIBITION OF GLYPHOSATE-RESISTANT
GOOSEGRASS (*Eleusine indica*) BIOTYPES**

NUR FAQIHAH BINTI GHAZALI

**FINAL YEAR PROJECT REPORT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF BACHELOR OF SCIENCE IN
AGROTECHNOLOGY (HONS.) HORTICULTURE
TECHNOLOGY IN THE FACULTY OF PLANTATION AND
AGROTECHNOLOGY
UNIVERSITI TEKNOLOGI MARA**


AUGUST 2020

DECLARATION

This Final Year Project is a partial fulfilment of the requirements for a Degree of Bachelor of Science in Agrotechnology (Hons.) Horticulture Technology in the Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA.

It is entirely my own work and has not been submitted to any other University or higher education institution, or for any other academic award in this University. Where use has been made of the work of other people it has been fully acknowledged and fully referenced.

I hereby assign all and every rights in the copyright to this Work to the Universiti Teknologi MARA (“UiTM”), which henceforth shall be the owner of copyright in this work and that, any reproduction or use in any form or by any means whatsoever is prohibited without a written consent of UiTM.

Candidate’s signature :  Date : 16 August 2020
Name : Nur Faqihah Binti Ghazali
Student I.D. No : 2017663142

ABSTRACT

POTENTIAL OF *Bipolaris bicolor* IN COMBINATION WITH AMETRIN FOR INHIBITION OF GLYPHOSATE-RESISTANT GOOSEGRASS (*Eleusine indica*) BIOTYPES

There are several studies on potential use of fungal pathogen, *Bipolaris bicolor* for biological control of goosegrass but there is still a limited study on compatibility of synthetic herbicide with *B. bicolor* for glyphosate-resistant goosegrass control. Thus, this study aimed to examine *in vitro* compatibility between *B. bicolor* and three herbicides under laboratory conditions and to determine the efficacy of a combination of *B. bicolor* and ametryn for inhibition of glyphosate-resistant biotype of goosegrass under greenhouse conditions. Spores of *B. bicolor* was treated with ametryn, flumiozaxin and sodium chlorate at one fifteen their respective recommended rates to determine the most compatible herbicide based on mycelial growth inhibition area in the petri dish. Then, a total four treatments including control plants (non-treated/sprayed) were subjected to goosegrass seedlings at the 3 to 4-leaf stage as follows: T1: Negative control plant, T2: ametryn at one fifteen recommended rate, T3: spore suspension of *B. bicolor* and T4: ametryn plus spore suspension of *B. bicolor*. The assessments was carried out based on plant height, leaf greenness, phytotoxicity of ametryn, disease severity of *B. bicolor* and shoot dry weight reduction daily for one week. The results showed that the lowest inhibitory effect was exhibited by ametryn with 10% of inhibition, whereas flumioxazin and sodium chlorate showed 80 and 30% of inhibition, respectively, implying ametryn is the most compatible herbicide with *B. bicolor*. The most effective treatment for inhibition of goosegrass was *B. bicolor* in combination with ametryn where the height, leaf greenness and shoot dry weight of seedlings were reduced by 50 to 94%, thus leading to plant death at 7 days after treatment. These findings suggest that *B. bicolor* combined with ametryn could be a potential integrated strategy for controlling the glyphosate-resistant biotype of goosegrass.

TABLE OF CONTENTS

	Page
DECLARATION	I
ABSTRACT	III
ABSTRAK	IV
ACKNOWLEDGEMENT	V
TABLE OF CONTENTS	VI
LIST OF FIGURES	VIII
LIST OF TABLES	IX
LIST OF PLATES	X
LIST OF SYMBOLS	XI
LIST OF ABBREVIATIONS	XII
CHAPTER ONE: INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Objectives of Study	3
1.4 Scope of Study	3
1.5 Significance of Study	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 Goosegrass (<i>Eleusine indica</i>)	4
2.2 Herbicide-resistant Biotypes of Goosegrass	6
2.3 Biological Control for Weeds	9
2.4 Fungal Pathogens Isolated from Goosegrass	12
2.5 Weedicide that Control Goosegrass	13
2.5.1 Flumioxazin	13
2.5.2 Ametryn	13
2.5.3 Sodium chlorate	14
2.6 Combination of Herbicide and Fungal Pathogen for Weed Control	14

CHAPTER THREE: MATERIALS AND METHODS	16
3.1 Site of Experiment	16
3.2 Plant Materials and Herbicides	17
3.3 Methods	17
3.3.1 Isolation of <i>Bipolaris bicolor</i>	17
3.3.2 Observation Spore Under Microscope	18
3.3.3 Compatibility of <i>Bipolaris bicolor</i> and Selected Herbicides	18
3.3.4 Post Emergence Application of Selected Herbicide in Combination with <i>Bipolaris bicolor</i>	18
3.4 Assessment Parameter	19
3.4.1 Mycelial Growth Inhibition Area	19
3.4.2 Plant Height	19
3.4.3 Leaf Greenness	19
3.4.4 Phytotoxicity of Ametryn	20
3.4.5 Disease Severity of <i>Bipolaris bicolor</i>	20
3.4.6 Shoot Dry Weight	21
3.5 Experimental Design	22
3.6 Statistical Analysis	24
CHAPTER FOUR: RESULTS AND DISCUSSION	25
4.1 Morphological Characteristics of <i>Bipolaris bicolor</i>	25
4.2 Effects of Selected Herbicides on Mycelial Growth of <i>Bipolaris bicolor</i>	26
4.3 Efficacy of a Combination of <i>Bipolaris bicolor</i> and Ametryn for Inhibition of Goosegrass Seedling	29
CHAPTER FIVE: CONCLUSION	38
5.1 Summary	38
5.2 Recommendations	38
REFERENCES	39
APPENDICES	48
CURRICULUM VITAE	75