



TABLE OF CONTENTS

CHAPTER I	1
INTRODUCTION.....	1
Biorational pest control measure	1
Biological control.....	2
Botanical control	6
Biochemical control	7
Pesticide usage in selected agricultural crops.....	9
Effect of pesticides.....	11
Objectives	14
Summary of the chapter	15
CHAPTER II.....	21
MATERIALS AND METHODS	21
Study area.....	21
Geological location and climate of Vadodara.....	21
Field studies	22
Collection of insect pests	23
Sampling Technique	23
Collection method.....	24
Host plants of insect pests and their population dynamics	25
Host Plants and Assessment of incidence and infestation rate of insect pest	25
Population dynamics	25

Current practices of usage of pesticides and the Biorational alternative to these pesticides in the selected agricultural crop	26
Laboratory Work.....	26
Preservation and Identification of insects collected from the fields	26
Mass Multiplication	27
Control of one of the insect pest (mealybug) without the use of insecticides	28
Biology and control methods of Mealybugs in the laboratory	28
Biology of mealybug.....	28
Isolation and identification of pheromones from mealybugs	28
Collection of volatile chemicals.....	28
Confinement and wash method.....	29
Adsorbent method	29
Identification of Pheromones	29
Behavioral Bioassays	30
Effect of botanicals on female mealybug.....	31
Selection of plant species and preparation of leaf extracts	31
Repellency bioassays	31
Effect of insecticides on predators and parasitoids of mealybugs	32
On mealybug.....	33
On biological control agents	33
Statistical Analysis.....	34
CHAPTER III	50
RESULTS	50
Field work	50
Mealybug, <i>Phenacoccus solenopsis</i>	51

Nature of damage.....	51
Mode of spread of mealybug	52
Population Dynamics	62
Biorational alternative used in Vadodara.....	71
Cultural control	71
Mechanical control.....	72
Biological control.....	73
Botanical management.....	74
Chemical control.....	74
Laboratory work.....	75
Rearing and breeding of the selected Insect pests in the laboratory	75
Study of the biology.....	75
Bio semiotic studies	80
Isolation and identification of a pheromone lure from Mealybug	82
Experiments with Insecticides	86
To study the bio efficacy of botanicals against <i>Phenacoccus solenopsis</i>	90
CHAPTER IV.....	104
DISCUSSION	104
Study period	104
Field work	105
Population dynamics.....	106
Biorational alternatives	109
Laboratory work.....	113
Biology.....	114
Biological control.....	115

Botanical control	118
Pheromone	119
CHAPTER V	122
CONCLUSION, SIGNIFICANT FINDINGS AND RECOMMENDATIONS.....	122
CHAPTER VI.....	130
LITERATURE CITED	130
ANNEXURE I	151
ANNEXURE II.....	153
ANNEXURE III	154
ANNEXURE IV	155
ANNEXURE V	156