

TABLE OF CONTENTS

	page
Acknowledgement	iii
Abstract in Thai	iv
Abstract in English	vi
List of tables	xi
List of Figures	xiii
Chapter 1 Introduction	1
Chapter 2 Literature Review	5
1. Origin and distribution of lychee	5
2. Climate of lychee growing areas	5
3. Lychee in Thailand	7
4. Bontany of “Kom”, “Hong Huay” and “Chakrapad”	9
5. Factor of flowering	10
5.1 Phenology and shoot development	11
5.2 Type of shoots	12
5.2.1 Vegetative shoots	13
5.2.2 Reproductive shoots	13
5.2.3 Mixed and transition shoots	14
5.3 Role of growth substances in shoot initiation	14
5.3.1 Auxins	15
5.3.2 Gibberellins (GAs)	16
5.3.3 Cytokinins (CKs)	17
5.3.4 Ethylene	18
5.3.5 Paclobutrazol	19
5.3.6 Potassium chlorate	21
5.4 Effects of environment on shoot induction	22
5.4.1 Temperature	23
5.4.2 Water relations	24

	page
5.4.3 Nitrogen	25
5.4.4 Pruning and girdling	26
6. Inflorescence and flowers	27
Chapter 3 Materials and Methods	
Experiment 1 Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on lychees cv. Kom flowering.	28
Experiment 2 Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 2 years old lychees cv. Chakrapad flowering.	30
Experiment 3 Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 8 years old lychees cv. Chakrapad flowering.	31
Experiment 4 Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 2 years old lychees cv. Hong Huay off-season flowering at immature leaves stage.	32
Experiment 5 Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 2 years old lychees cv. Hong Huay off-season flowering at mature leaves stage.	34
Experiment 6 Effect of potassium chlorate (KClO ₃) with paclobutrazol (PP333) on 14 years old lychees cv. Hong Huay off-season flowering.	35
Experiment 7 Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 14 years old lychees cv. Hong Huay on-season flowering.	36
Chapter 4 Results	
1. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on lychees cv. Kom flowering.	43
2. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 2 years old lychees cv. Chakrapad flowering.	45
3. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 8 years old lychees cv. Chakrapad flowering.	46

	page
4. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 2 years old lychees cv. Hong Huay off-season flowering at immature leaves stage.	47
5. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 2 years old lychees cv. Hong Huay off-season flowering at mature leaves stage.	48
6. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 14 years old lychees cv. Hong Huay off-season flowering.	49
7. Effect of potassium chlorate (KClO ₃) and paclobutrazol (PP333) on 14 years old lychees cv. Hong Huay on-season flowering.	51
Chapter 5 Discussion	62
Chapter 6 Conclusion	72
References	74
Curriculum vitae	86

LIST OF TABLES

Table		Page
1	The harvesting time of lychee in Thailand separated by the production zone.	9
2	Effect of KClO ₃ and PP333 on flowering time, flowering percentage/tree, number of panicle/tree, panicle length and panicle width of lychee cv. Kom.	44
3	Effect of KClO ₃ and PP333 on flowering time, flowering percentage/tree, number of panicle/tree, panicle length and panicle width of lychee cv. Chakrapad.	45
4	Effect of KClO ₃ and PP333 on flowering time after treatment, percentage of flowering tree, number of panicle/tree, panicle length and panicle width of lychee cv. Chakrapad.	46
5	Effect of KClO ₃ and PP333 on flowering time after treatment, flowering percentage, number of panicle/tree, panicle length and panicle width of lychee cv. Hong Huay.	48
6	Effect of KClO ₃ and PP333 on flowering time, flowering percentage, number of panicle/tree, panicle length and panicle width of lychee cv. Hong Huay.	49
7	Effect of KClO ₃ and PP333 on leaf flushing percentage, number of new shoot/old shoot, leaf length and leaf width of lychee cv. Hong Huay.	50
8	Effect of KClO ₃ and PP333 on flowering time, flowering percentage/tree, number of panicle/tree, panicle length and panicle width of lychee cv. Hong Huay.	51
9	Effect of KClO ₃ and PP333 on leaf flushing percentage, number of new shoot/old shoot, leaf length and leaf width of lychee cv. Hong Huay.	52
10	Effect of KClO ₃ and PP333 on flowering time, flowering percentage/tree, panicle length and panicle width of lychee cv. Hong Huay.	53
11	Effect of KClO ₃ and PP333 on IAA leaf-diffusate content of lychee cv. Hong Huay.	54
12	Effect of KClO ₃ and PP333 on GA-like substances content (µg g/FW) of shoots of lychee cv. Hong Huay.	55

Table	Page
13 Effect of KClO_3 and PP333 on cytokinin-like substances content (ng g/FW) of shoots of lychee cv. Hong Huay.	56
14 Effect of KClO_3 and PP333 on ethylene content of shoots of lychee cv. Hong Huay.	57
15 Effect of KClO_3 and PP333 on total non-structural carbohydrate of leaves of lychee cv. Hong Huay.	58
16 Effect of KClO_3 and PP333 on total non-structural carbohydrate of shoots of lychee cv. Hong Huay.	59
17 Effect of KClO_3 and PP333 on reducing sugar (RS) content in leaves of lychee cv. Hong Huay.	60
18 Effect of KClO_3 and PP333 on reducing sugar (RS) content in shoots of lychee cv. Hong Huay.	61

LIST OF FIGURES

Figure		Page
1	Growth cycle of lychee in Central and Northern Thailand	8
2	Lychee trees cv. Kom grown in pots	29
3	Lychee trees cv Chakrapad grown in pots	31
4	Canopy of 2 years old lychee trees cv. Hong Huay	33
5	Canopy of 14 years old lychee trees cv. Hong Huay	36
6	Panicle of 8 years old lychee tress cv. Chakrapad	47
7	Panicle of 14 years old lychee tress cv. Hong Huay	53

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
 Copyright© by Chiang Mai University
 All rights reserved