

— C O N T E N T —

CHAPTER NO.	TITLE	PAGE NO.
	List of Tables and Plates	
	List of Figures	
	Abbreviations	
	INTRODUCTION	1
I	REVIEW OF LITERATURE ON RESPONSES OF SUGARCANE TO PLANT GROWTH REGULATORS	
A.	INDOL 3-ACETIC ACID (IAA)	7
1.	Introduction	7
2.	Responses of Sugarcane to IAA	7
a.	Germination	7
b.	Vegetable growth	8
c.	Yield and juice quality	9
d.	Metabolic changes	9
i.	Chlorophyll content	9
ii.	Photosynthetic rate	9
iii.	Carbohydrates	9
iv.	Enzymes	10
B.	GIBBERELLINS (GA)	10
1.	Introduction	10
2.	Responses of Sugarcane to GA	11
a.	Germination	11
b.	Vegetative growth	11
c.	Yield and juice quality	13
d.	Metabolic changes	14
i.	Chlorophyll content	14
ii.	Photosynthetic rate	14

.....Contd...

CHAPTER NO.	TITLE	PAGE NO.
	iii. Carbohydrates	14
	iv. Mineral constituents	14
	v. Enzymes	15
C. CYTOKININS		15
1. Introduction		15
2. Responses of Sugarcane to Cytokinins		16
a. Germination		16
b. Vegetative growth		16
c. Yield and juice quality		16
d. Metabolic changes		17
	i. Chlorophyll content	17
	ii. Photosynthetic rate	17
	iii. Mineral constituents	17
	iv. Enzymes	17
D. ABSCISSIC ACID (ABA)		18
E. ETHYLENE		18
1. Introduction		18
2. Responses of Sugarcane to Ethylene		19
a. Vegetative growth		19
b. Yield, juice quality and ripening		19
c. Flowering		21
d. Metabolic changes		21
F. INDOL 3 BUTYRIC ACID (IBA)		22
1. Introduction		22
2. Responses of Sugarcane to IBA		22
a. Yield		22

.....Contd...

CHAPTER NO.	TITLE	PAGE NO.
G. NAPHTHYL ACETIC ACID (NAA)		22
1.	Introduction	22
2.	Responses of Sugarcane to NAA	23
a.	Germination	23
b.	Vegetative growth	23
c.	Yield and juice quality	24
d.	Metabolic changes	24
i.	Chlorophyll content	24
ii.	Enzymes	24
H. ASCORBIC ACID (AA)		25
1.	Introduction	25
2.	Responses of Sugarcane to AA	25
a.	Germination	25
b.	Vegetative growth	25
c.	Yield and juice quality	25
d.	Metabolic changes	26
i.	Chlorophyll content	26
ii.	Photosynthetic rate	26
iii.	Mineral constituents	26
I. 2,4-DICHLOROPHOXY ACETIC ACID (2,4-D)		26
1.	Introduction	26
2.	Responses of Sugarcane to 2,4-D	27
a.	Germination	27
b.	Vegetative growth	27
c.	Yield, juice quality and ripening	27
d.	Metabolic changes	28
i.	Chlorophyll content	28
ii.	Enzymes	28

.....Contd...

CHAPTER NO.	TITLE	PAGE NO.
J. MALEIC HYDRAZIDE (MH)		29
1.	Introduction	29
2.	Responses of Sugarcane to MH	29
a.	Vegetative growth	29
b.	Yield, juice quality and ripening	29
c.	Metabolic changes	30
i.	Chlorophyll content	30
ii.	Enzymes	30
K. CHLORO CHOLINE CHLORIDE (CCC)		31
1.	Introduction	31
2.	Responses of Sugarcane to CCC	31
a.	Germination	31
b.	Vegetative growth	31
c.	Yield, juice quality and ripening	32
d.	Metabolic changes	33
i.	Enzymes	33
L. GLYPHOSINE AND GLYPHOSATE		33
II MATERIAL AND METHOD		
A. MATERIAL		35
1.	About Variety CO.671	35
B. METHODS		36
1.	Presowing Soaking Treatment	36
2.	Bud Analysis	37
a.	Enzymes	37
i.	Nitrate reductase	37

.....Contd...

CHAPTER NO.	TITLE	PAGE NO.
	ii. Peroxidase	38
	iii. Catalase	39
	iv. Dehydrogenase	40
	v. Soluble proteins	40
3.	Germination Studies	41
4.	Growth and Yield Studies	41
	Sucrose Percentage	42
5.	Plant Analysis	43
a.	Inorganic constituents	43
	*Preparation of acid digest	43
	i. Potassium	45
	ii. Calcium	45
	iii. Magnesium	45
	iv. Phosphorus	45
	v. Iron	45
	vi. Manganese	45
	vii. Zinc	45
	viii. Cobalt	45
	viii. Copper	45
b.	Organic constituents	45
	i. Carbohydrates	45
	ii. Total nitrogen	47
	iii. Titratable acid number	48
	iv. Ascorbic acid	49
	v. Total polyphenols	51
c.	Photosynthetic pigments	52
	i. Chlorophylls	52
	ii. Carotenoids	53
	iii. Chlorophyll stability index	54

.....Contd...

CHAPTER NO.	TITLE	PAGE NO.
III RESULTS AND DISCUSSION		
A. EFFECT OF PRESOWING SOAKING TREATMENT OF GROWTH REGULATORS ON BUD ANALYSIS		55
a.	Nitrate reductase	55
b.	Peroxidase	59
c.	Catalase	68
d.	Dehydrogenase	73
B. GERMINATION STUDIES		74
C. GROWTH AND YIELD STUDIES		80
D. EFFECT OF PRESOWING SOAKING TREATMENT OF GROWTH REGULATORS ON INORGANIC CONSTITUENTS		92
a.	Potassium	92
b.	Calcium	99
c.	Magnesium	103
d.	Phosphorus	106
e.	Iron	113
f.	Manganese	118
g.	Zinc	121
h.	Cobalt	125
i.	Copper	127
E. EFFECT OF PRESOWING SOAKING TREATMENT OF GROWTH REGULATORS ON ORGANIC CONSTITUENTS		131
a.	Carbohydrates	131
b.	Total nitrogen	138
c.	Titratable acid number	143
d.	Ascorbic acid	146
e.	Total polyphenols	152
F. EFFECT OF PRESOWING SOAKING TREATMENT OF GROWTH REGULATORS ON PHOTOSYNTHETIC PIGMENTS		155
a.	Chlorophylls and carotenoids	155
b.	Chlorophyll stability index	161

.....Contd....

CHAPTER NO.	TITLE	PAGE NO.
IV	SUMMARY AND CONCLUSIONS	
1.	Germination Study	163
2.	Mineral Nutrition Study	165
	BIBLIOGRAPHY	168-225
	STATEMENT - I	226
	STATEMENT - II	227