



Contents

C O N T E N T S

Chapter	Title	Page
I	INTRODUCTION	1
II	REVIEW OF LITERATURE ON PROSO MILLET (<u>Panicum miliaceum</u> L.)	7
	1. Introduction	8
	2. Origin	9
	3. Distribution	10
	4. Morphology	12
	5. Floral biology	14
	6. The caryopsis	15
	7. Cytogenetics	17
	8. Crop improvement	19
	9. Chemical composition of proso millet seed and its utility.	20
	10. Cultural practices	29
	A. Adaptation	29
	B. Cultivation	29
	C. Manuring	30
	D. Irrigation	31
	E. Harvesting and Threshing	32
	F. Diseases and Pests of Common millet	32
	11. Physiological studies	36
	A. Germination	36
	B. Growth and growth regulators	37
	C. Tissue culture	39
	D. Photosynthesis	40
	E. Senescence	44
	F. Drought resistance	44
	G. Other physiological studies	46
III	GROWTH AND BIOCHEMICAL CHANGES IN PROSO MILLET (<u>Panicum miliaceum</u> L.)	49
	1. Introduction	50
	2. Material and Methods	54

...

Chapter	Title	Page
III	3. Results and Discussion ..	57
	A. Growth analysis ..	57
	i) Root growth ..	57
	ii) Shoot growth ..	57
	iii) Tillering ..	59
	iv) Biomass production ..	59
	v) Leaf number and leaf area ..	60
	vi) Ear growth ..	62
	vii) Net assimilation rate (NAR) ..	62
	viii) Leaf area ratio (LAR) ..	64
	ix) Relative growth rate (RGR) ..	64
	B. Biochemical changes during growth ..	65
	I) Organic constituents ..	65
	i) TAN (Titratable Acid Number) ..	65
	ii) Carbohydrates ..	67
	iii) Polyphenols ..	68
	iv) Chlorophylls ..	71
	v) Nitrogen ..	72
	vi) Proline ..	73
	II) Inorganic constituents ..	75
	i) Phosphorus ..	75
	ii) Potassium ..	76
	iii) Calcium ..	79
	iv) Magnesium ..	80
	v) Iron ..	83
	vi) Manganese ..	85
	vii) Silicon ..	87
	viii) Sodium ..	88
IV	DROUGHT RESISTANCE ..	91
	(Response of proso millet { <u>Panicum miliaceum</u> L.} to Water stress).	
	1. Introduction ..	92
	2. Material and Methods ..	97

Chapter	Title	Page
IV	3. Results and Discussion ..	98
	A. Effect of water stress on Organic constituents ..	98
	i) Soil moisture and leaf water potential ..	98
	ii) Moisture % ..	99
	iii) TAN (Titratable Acid Number) ..	101
	iv) Total Polyphenols ..	102
	v) Chlorophylls ..	103
	vi) Carbohydrates ..	108
	vii) Total nitrogen ..	110
	viii) Proline ..	112
	B. Effect of water stress on Inorganic constituents ..	118
	i) Phosphorus ..	120
	ii) Potassium ..	122
	iii) Calcium ..	124
	iv) Magnesium ..	126
	v) Iron ..	127
	vi) Manganese ..	128
	vii) Silicon ..	129
	viii) Sodium ..	130
	C. Stomatal behaviour during water stress	135
V	SENSCENCE ..	138
	1. Introduction ..	139
	2. Work from our laboratory ..	145
	3. Scope of present investigation ..	147
	4. Material and methods ..	148
	5. Results and discussion ..	149
	A. Organic constituents ..	149
	i) Chlorophylls ..	149
	ii) TAN ..	150
	iii) Carbohydrates ..	151

Chapter	Title	page
V	A. iv) Total nitrogen ..	152
	v) Total Polyphenols ..	153
	vi) Proline ..	153
	B. Inorganic constituents ..	155
	i) Phosphorus ..	155
	ii) Potassium ..	157
	iii) Calcium ...	158
	iv) Magnesium ..	159
	v) Iron & Manganese ..	160
	vi) Silicon ..	161
	vii) Sodium ..	161
	C. Enzymes and senescence ..	163
	i) Peroxidase ..	163
	ii) Catalase ..	165
	iii) Acid Phosphatase ..	166
	iv) Nitrate reductase ..	167
	SUMMARY AND CONCLUSION ..	170
	BIBLIOGRAPHY ..	179
	STATEMENT-I..	232
	STATEMENT-II ..	233

