

CONTENT

	Page
Dedication	v
Preface	vii
Acknowledgements	x
 INTRODUCTION	
Chapter 1 Tropical Biomass : A Resource for all Seasons	
1. Introduction	1
2. Biomass Property Considerations	2
3. Biomass Multiple Functions	9
4. Energy Hope for Developing Tropical Nations	15
 PART I SUGAR PLANTING vs ENERGY PLANTING	
Chapter 2 Sugar Planting at a Crossroads	
1. Introduction	19
2. Production cost Increases	20
3. Productivity Decline	27
4. Alternative Sweeteners	35
Chapter 3 The Biomass Planting Alternative	
1. Introduction	41
2. A Grand alliance	42
3. Carbohydrate “Production” versus Storage	53
4. Multiple products and benefits	59
5. Intangible benefits	63
6. Comprehending <u>saccharum</u> potentials	66
 PART II ENERGY CANE THEORY	
Chapter 4 Origin of the <u>saccharum</u> Biomass system	
1. Introduction	67
2. Origin of <u>saccharum</u> Species	67
3. Generic relatives ; the Allied Genera	73
4. Establishment of Commercial cane Planting	80
5. Emphasis on sugar vs tonnage	83
Chapter 5 <u>Saccharum</u> as a Growth Mechanism	
1. Introduction	85
2. A Generic Preference for growth	85
3. <u>Saccharum</u> Yield potentials	87
4. Anatomical growth Features	89
5. Physiological Growth Features	96
6. Environmental Compatibility	105
Chapter 6 Alternative grasses integration	
1. Introduction	109
2. Need for Alternative Species inputs	109
3. Botanic Features	114
4. Agronomic features	124
5. Processing feedstock quality	133
6. Social and environmental Benefits	134

PART III ENERGY CANE MANAGEMENT

Chapter 7	Production Assessment and Planning	
1.	Introduction	137
2.	Technical Feasibility	138
3.	Resources assessment	143
4.	Energy cane “Enterprise” structure and control	165
Chapter 8	Seedbed Preparation and Planting	
1.	Introduction	175
2.	Land Pre-Preparation	176
3.	Leveling and grading	182
4.	Final seedbed Preparations	185
5.	Seed Procurement and Planting	191
6.	Post-planting Management	199
7.	Summary of Energy Cane Planting	205
Chapter 9	Growth Management and Monitoring	
1.	Introduction	207
2.	Weed Control	208
3.	Irrigation	211
4.	Fertilization	216
5.	Crop Monitoring	222
6.	Background Monitoring	242
Chapter 10	Harvest and Delivery	
1.	Introduction	253
2.	Preharvest Planning	254
3.	Manual Harvest and Loading	260
4.	Mechanized Harvest	269
5.	Transportation and Delivery	278
6.	Trash harvest and Delivery	282
Chapter 11	Postharvest Management	
1.	Introduction	289
2.	Botanic Status of the Cane	289
3.	Field Management Tasks	293
4.	Crop Reports and Records	300
5.	Ratoon Cropping Outlook	302
Chapter 12	Alternative Grasses Management	
1.	Introduction	305
2.	Planning for Alternative Grasses	306
3.	Short-Rotation Grasses	314
4.	Intermediate – rotation Grasses	320
5.	Grasses and Cane rotations	330
6.	Multiple – Purpose Cropping	332
Chapter 13	Energy Cane Improvement	
1.	Introduction	335
2.	Management of Current Varieties	336
3.	Breeding Potential of <u>saccharum</u>	337
4.	Energy Cane Breeding	341
5.	Conceptual Breeding Changes	347
6.	Alternative grasses Breeding	353

PART IV ENERGY CANE UTILIZATION

Chapter 14	Fermentable Solids Utilization	
1.	Introduction	357
2.	Fermentable Solids Recovery	357
3.	Raw Juice Applications	363
4.	Syrup Applications	364
5.	Molasses Applications	368
6.	Fermentation Wastes Management	371
Chapter 15	Lignocellulose Utilization	
1.	Introduction	377
2.	Lignocellulose Recovery	379
3.	Green Lignocellulose Applications	384
4.	Upgraded Boiler Fuels	388
5.	Solid Fuel Products	394
6.	Liquid Fuels and Feedstocks	399
7.	Chemicals from Lignocellulose	409
8.	Sucrose-Derived Chemicals	413
Chapter 16	Energy Planting vs Food Planting	
1.	Introduction	415
2.	Advocacy of Cane Diversification	416
3.	The “Wait and See” approach	422
4.	Flexible Diversification	425
5.	Energy Vs Food; Tradeoffs and Balances	429
6.	Conclusions	435
	Bibliography	437
	Subject Index	479