

CONTENTS

Chapter No	SI.NO	Title	Page No.
Introduction			
I	1.1	Spices - foreign exchange earner	1
	1.2	Turmeric - economically important spice	2
	1.3	Need for increasing productivity of turmeric through mechanization	5
	1.4	Benefits of mechanised crop production	5
	1.5	Tractorisation in farming	5
	1.6	Conventional method of turmeric harvesting	6
	1.7	Mechanical method of turmeric harvesting	6
	1.8	Need for turmeric harvester	7
	1.9	Objectives	8
Review of literature			
II	2.1	Soil-tool interaction models	9
	2.2	Soil parameters	12
	2.3	Crop parameters	13
	2.4	Development of root-crop harvesting systems	14
	2.5	Economics of mechanical harvesting	31
Materials and methods			
III	3.1	Turmeric plant and its morphology	34
	3.2	Turmeric harvesting	38
	3.3	Soil parameters	40
	3.4	Crop parameters	42
	3.5	Machine and operational parameters	45
	3.6	Selection of variables of harvesting mechanism	51
	3.7	Optimisation of variables for harvesting mechanism	59
	3.8	Statistical analysis of variables	60
	3.9	Description of harvesting methods	61
	3.10	Performance evaluation of the prototype harvester	68
	3.11	Field performance evaluation of the prototype harvester	71
	3.12	Cost economics	72

		Results and Discussion	
IV	4.1	Soil parameters	73
	4.2	Crop parameters	75
	4.3	Conventional method of harvesting	78
	4.4	Optimization of machine parameters of tractor mounted turmeric harvester	83
	4.5	Development of prototype turmeric harvester	121
	4.6	Field performance evaluation of prototype harvester	122
	4.7	Cost economics	129
V		Summary and conclusion	134
		Bibliography	
		Appendices	