

Table of Contents

Chapter 1

INTRODUCTION	1
OVERVIEW	2
CONTEXT OF PRESENT RESEARCH	2
REFERENCES	6

Chapter 2

Nitrogen Management in No Tillage Grain Sorghum Production.	9
I. Rate and Time of Application	
ABSTRACT	10
INTRODUCTION	12
MATERIALS AND METHODS	15
RESULTS AND DISCUSSION	18
CONCLUSIONS	30
REFERENCES	32

Chapter 3

Nitrogen Management of No Tillage Grain Sorghum Production.	
II. Partitioning N applications to coincide with crop N needs	36
ABSTRACT	37
INTRODUCTION	38

MATERIALS AND METHODS	41
RESULTS AND DISCUSSION	43
CONCLUSIONS	49
REFERENCES	50

Chapter 4

Residual Profile Mineral-N Influence on Sorghum Response to

Applied Nitrogen.....	52
-----------------------	----

ABSTRACT	53
INTRODUCTION	55
MATERIALS AND METHODS	58
RESULTS AND DISCUSSION	61
CONCLUSIONS	72
REFERENCES	73

Chapter 5

Summary and Conclusions	76
-------------------------------	----

APPENDIX A. GROWTH STAGES OF SORGHUM PLANT	81
--	----

APPENDIX B. DETAILS OF FIELD OPERATIONS PERFORMED DURING THE GROWING SEASON	83
--	----

APPENDIX C. CHEMICAL ANALYSES OF SOIL SAMPLES TAKEN WITH DEPTH PRIOR TO PLANTING AT ALL	
--	--

LOCATIONS	85
APPENDIX D. RAINFALL DISTRIBUTION AND MAXIMUM AND MINIMUM TEMPERATURE DURING THE GROWING SEASON FOR VARIOUS LOCATIONS	89
APPENDIX E. GRAIN SORGHUM YIELD RESPONSE TO SIDE-DRESS N APPLICATION IN CONJUNCTION WITH THE STARTER BAND-N	96
APPENDIX F. RESPONSE SURFACES DESCRIBING ESTIMATED PROFIT AS A FUNCTION OF N APPLICATION RATE AT STARTER BAND-N AND SIDE-DRESS N	105
APPENDIX G. GRAIN YIELD RESPONSE AS A FUNCTION OF N APPLICATION RATES AT PLANTING, FIRST SIDE- DRESSING AND SECOND SIDE-DRESSING	114
APPENDIX H. RESPONSE SURFACES DESCRIBING ESTIMATED PROFIT AS A FUNCTION OF N APPLICATION RATE AT FIRST SIDE-DRESS AND SECOND SIDE-DRESS N	120
APPENDIX I. GRAIN SORGHUM YIELD RESPONSE TO APPLIED N ...	126
APPENDIX J. SOIL PROFILE DESCRIPTIONS FOR EXPERIMENTAL LOCATIONS	128
VITA	137