

CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	4
I-Effect of nitrogen fertilizer	4
II-Effect of Phosphorus fertilizer	28
III-Effect of potassium fertilizer	37
IV-The interactions effect of N, P and K fertilizers.....	47
MATERIALS AND METHODS	57
RESULTS AND DISCUSSION	65
I-Effect of nitrogen fertilization	65
i-Mineral nitrogen treatments	65
A-Growth behavior	65
1-Plant height.....	66
2-Stalk diameter	68
3-Number of inter-nodes/ plant	69
4-Number of leaves/ plant	70
5-Leaf area.....	71
B-Forage yield and its components	72
1-Forage yield	73
2-Stripped stalks yield	74
3-Total biomass yield	75
C- Juice yield and its quality	77
1-Juice extraction percentage	77
2- Juice yield	79
3-Syrup extraction percentage	80
4-Syrup yield	80
5-Total soluble solids percentage	81
6-Sucrose percentage	83
7-Reducing sugar percentage	83
8-Purity percentage	84

	Page
ii-Biological nitrogen fertilization (inoculation with <i>Bacillus polymyxa</i>)	87
A-Growth behavior	87
1-Plant height	87
2-Stalk diameter	88
3-Number of inter-nodes/ plant	90
4-Number of leaves/ plant.	90
5-Leaf area	91
B-Forage yield and its components	94
1-Forage yield	94
2-Stripped stalks yield	96
3-Total biomass yield	97
C- Juice yield and its quality	98
1-Juice extraction percentage	98
2- Juice yield	99
3-Syrup extraction percentage	100
4-Syrup yield	100
5-Total soluble solids percentage	101
6-Sucrose percentage	102
7-Reducing sugar percentage	103
8-Purity percentage	103
II-Effect of mineral and biological phosphorus fertilization treatments	104
A-Growth behavior	104
1-Plant height	105
2-Stalk diameter	109
3-Number of inter-nodes/ plant	109
4-Number of leaves/ plant	111
5-Leaf area	113
B-Forage yield and its components	116
1-Forage yield	116
2-Stripped stalks yield	119
3-Total biomass yield	120
C- Juice yield and its quality	123

	Page
1-Juice extraction percentage	123
2- Juice yield	125
3-Syrup extraction percentage	125
4-Syrup yield	126
5-Total soluble solids percentage	128
6-Sucrose percentage	129
7-Reducing sugar percentage	130
8-Purity percentage	131
III-Effect of potassium fertilization	132
A-Growth behavior	132
1-Plant height	132
2-Stalk diameter	134
3-Number of inter-nodes/ plant	134
4-Number of leaves/ plant	135
5-Leaf area	135
B-Forage yield and its components	136
1-Forage yield	137
2-Stripped stalks yield	137
3-Total biomass yield	137
C- Juice yield and its quality	139
1-Juice extraction percentage	139
2- Juice yield	140
3-Syrup extraction percentage	141
4-Syrup yield	142
5-Total soluble solids percentage	143
6-Sucrose percentage	144
7-Reducing sugar percentage	144
8-Purity percentage	145
IV-Interaction effect of the applied fertilizer	
treatments	147
SUMMARY.....	154
REFERENCES	173
ARABIC SUMMARY	