

Abstract

Studies On The Effect Of Genetic And Environmental Factors On Yield And Its Components Of Some Sugar Beet Varieties

**Hussein Mohamed EL-Sayed Ahmed.
Doctor of Philosophy.**

Three experiments arranged in randomized complete block design were conducted in the first season (2004/05), where 12 sugar beet varieties were sown in each experiment. The first was foliar sprayed with tap water as a control, the second was foliar sprayed with two liters / fed. from Nitrate Balancer (11.8% boron +0.007% molybdenum) compound before harvest with about one month and the third was foliar sprayed with two liters / fed. Set(11.4 % calcium + 1.4 % boron) compound after thinning directly.

Data recorded:

1-Growth criteria and juice quality:

- Root length (cm).
- Root diameter (cm) was measured in the middle part of the root.
- Root fresh weight (kg / plant).
- Leaves fresh weigh (kg / plant).

2-Yield:

- Root yield (ton / fed).
- Top yield (ton / fed).
- Sugar yield (ton / fed).

3-Quality traits:

- Sucrose percentage.
- Purity percentage .
- Impurities(sodium , potassium and Alpha-amino) .

Statistical Analysis:

A- Agronomic studies:

Data collected were subjected to proper statistical analysis of a randomized complete block design. A combined analysis for the two seasons and locations was done according to the procedures outlined by Le-Clerg *et al* (1966). Homogeneity test of variance was computed by Bartlett's methods (1937)

B- Specific statistical analysis study:

Stability methods:

Several investigators suggested various methods to measure stability parameters, using the original data of root yield per plot for the two sugar beet experiments . These methods had been widely used in previous investigations in different crops . Most of them depended on regression techniques, either phenotypic or genotypic stability. These methods were :

1. Eberhart and Russell method (1966).
2. Tai method (1971).

Eberhart and Russell method (1966) was used measure phenotypic stability, while Tai method (1971) was used to measure genotypic stability.

CONTENTS

	<i>Page</i>
INTRODUCTION	2
REVIEW OF LITERATURE	5
1- Effect of varietal differences.....	5
2- Effect of locations.....	12
3- Effect of fertilizers.....	18
4- Stability of genotypes across environments.....	22
MATERIAL AND METHODS	29
RESULTS AND DISCUSSION	36
A-Morphological characteristics and chemical constituents.....	36
A-I- analysis of variance.....	36
A-II-Mean performance of the traits.....	38
A-II-1- Root length.....	38
A-II-2- Root diameter (cm).....	47
A-II-3- Leaves fresh weight /plant.....	48
A- II-4- Root fresh weight Kg/plant.....	49
A- II-5- α - amino nitrogen percentage.....	50
A- II-6-Sodium percentage (Na %).....	50
A- II-7-Potassium percentage (K%).....	52
B- Yield and its components	56
B-I- analysis of variance.....	56
B-II- Mean performance of the traits.....	59
B-II- 1- Sucrose percentage.....	59
B-II- 2- purity percentage.....	65
B- II-3-Top yield (ton / fed).....	67
B-II- 4- Root yield (ton / fed).....	71
B-II- 5- Sugar yield (ton / fed).....	74
C- Phenotypic and genotypic stability.....	84
ENGLISH SUMMARY	93
REFERENCE	98
ARABIC SUMMARY	