

# بسم الله الرحمن الرحيم





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم





# جامعة عين شمس

التوثيق الإلكتروني والميكرو فيلم

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# **SUGARCANE SELECTION FOR WATER CONSUMPTION DECREASE**

By

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B.Sc. Agric. Sc. (Plant Production), Ain Shamus Univ, (2012)

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**Approval Sheet**

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## **ABSTRACT**

**Abd El-Aziz Abd El-Naby Gaber: Sugarcane Selection For Water Consumption Decrease, Unpublished M.Sc. Thesis, Department of Salt and Dry Farming Technology, Arid land Agricultural graduate studies and Research Institute, 2021**

The present investigation included two experiments: first (ripening experiments); was carried out during two growing seasons (2018/19 and 2019/20) at El-Mattana Agriculture Research Station, Luxor Governorate latitude 25° 36' N and longitude 32° 29' E (L1) to find highest genotype in yield and quality throughout the three age at harvest (10, 11 and 12 months age). Second (drought experiment); was carried out at Giza Agricultural Research Station, Giza Governorate latitude 29°59' N and longitude 31° 12' E (L2) to find out the most genotype was drought tolerant in growth throughout three irrigation water levels (60, 80 and 100 irrigation water level IWL).

Experiments were carried out using a randomized complete block design with three replications (ripening experiments) and a randomized complete block design with five replications (drought experiment)

Ripening experiments contains 44 clones in addition to cultivated variety (GT.54-9) as compared with three harvest ages at two sugarcane growing seasons. The studied traits were get at every harvest dates for all genotypes i.e. Stalk height and diameter, stalk number/m<sup>2</sup>, single stalk weight and brix reading in first season; in addition to those traits, sucrose, purity, sugar recovery and cane and sugar yields in second season.

Respect of all studied traits showed that, significant differences were recorded between genotypes, whereas, clone 4 had the highest value in stalk diameter and single stalk weight, meanwhile, clones 21 and 24 surpassed all other genotypes concluding the commercial variety in cane and sugar yields.

The results showed that, the differences between harvest ages were significant and traits were recorded heights values when genotypes were harvested at 12 month age old except number of stalks/m<sup>2</sup> it was insignificant difference between three harvest ages, and also the brix reading was the highest value was recorded at 11 and 12 month age old, in first season. As same as, the same trend were occurred in the second season the highest values were recorded when all genotypes were harvested after 12 month age old, except purity% it was insignificant.

In relation to the genotypes x harvest ages interaction (GxH), significant differences were detected in all traits. In first season, clones 21 and 24 outperformed the number of stalks/m<sup>2</sup> in the three harvest ages. Meanwhile, in second season, clone 21 had highest yield in cane and sugar earlier when harvested after 11 months only, meanwhile clone 24 recorded one in cane yield only.

**Drought experiment:** had a pot experiment was carried out to evaluate twenty sugarcane clones, compared with the cultivated variety GT.54-9, under three irrigation water levels IWL (100, 80 and 60% of IWL). The traits FW of the shoot and root, root: shoot ratio, LAI, LAR, Chla, Chlb, Chla :Chlb ratio, carotenoids and free proline were assessed.

From this study clones 17 had height shoot fresh weight under water stress condition, as same as, clones 1, 18 and 19 had great behavior under water stress. In addition to most of sugarcane tested clones were not affected by increase the degree of water stress from 100 to 80% of IWL. The LAI, Chl.a and Chl.b traits showed the high correlation with shoot fresh weight, whereas, free proline had strong relationships with root fresh weight under sugarcane drought stress.

**Keywords:** Sugarcane, drought stress, maturity, harvest ages, correlation and clones selection.

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## CONTENTS

Title	Page
<b>LIST OF TABLES</b>	<b>III</b>
<b>1- INTRODUCTION</b>	<b>1</b>
<b>2- REVIEW OF LITERATURE</b>	<b>4</b>
2.1. Performance of sugarcane clones	4
2.2. Earliness of sugarcane clones	9
2.3. Drought tolerance of sugar cane	12
<b>3- MATERIALS AND METHODS</b>	<b>19</b>
<b>4- RESULTS AND DISCUSSION</b>	<b>28</b>
4.1. Ripening trail	28
4.1.1 The first growing season (2018-2019)	28
4.1.1.1 Stalk height	28
4.1.1.2 Stalk diameter (cm)	30
4.1.1.3 Number of stalks/m <sup>2</sup>	31
4.1.1.4 Single stalk weight (kg)	32
4.1.1.5 Brix reading	35
4.1.2 The second growing season (2019/2020)	37
4.1.2.1 Growth characters	37
4.1.2.1.1 Stalk height (cm)	37
4.1.2.1.2 Stalk diameter (cm)	39
4.1.2.1.3 Number of stalks/m <sup>2</sup>	40
4.1.2.1.4 Single stalk weight (kg)	41
4.1.2.2 Juice quality	43
4.1.2.2.1 Brix reading	43
4.1.2.2.2 Sucrose percentage	45
4.1.2.2.3 Purity percentage	46
4.1.2.2.4 Sugar recovery percentage	47
4.1.2.3 Cane and sugar yields	50

## II

4.1.2.3.1 Cane yield (t/fed.)	50
4.1.2.3.2 Sugar yield (t/fed)	51
- Correlation study	53
4.2. Second Experiment: Drought	56
4.2.1 Morphological traits	56
4.2.1.1 Shoot fresh weight g/plant	56
4.2.1.2 Root fresh weight g/plant	58
4.2.1.3 Root: shoot ratio (on the basis of fresh weight	59
4.2.2 Growth indices	60
4.2.2.1 Leaf area Index (LAI)	60
4.2.2.2 Leaf area ratio (LAR cm <sup>2</sup> g <sup>-1</sup> )	61
4.2.3 Physiological parameters	63
4.2.3.1 Chlorophylls <i>a</i> and <i>b</i> (Chl. <i>a</i> and Chl. <i>b</i> )	63
4.2.3.2 Chlorophyll <i>a</i> : <i>b</i> ratio	63
4.2.3.3 Carotenoids content	65
4.2.3.4 Free Proline	66
4.2.4 Phenotypic correlation	67
<b>5- SUMMARY</b>	<b>70</b>
<b>6- REFERENCES</b>	<b>84</b>

## LIST OF TABLES

Table No.		Page
1	Average monthly meteorological data for Luxor Governorate during 2018-2019 and 2019-2020 seasons	19
2	Mechanical and chemical analyses of the soil at the three experimental sites	20
3	Sugarcane populations used in this study and number of selected clones from each population in two seasons	21
4	Sugarcane hybrids names were used and number of tested clones from each hybrid	25
5	Mean performance of plant height and diameter (cm) for forty-five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2018/2019	29
6	Mean performance of stalk number/m <sup>2</sup> and single stalk weight (kg) for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2018/2019	34
7	Mean performance of brix reading for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2018/2019.	35
8	Mean performance of stalk height and diameter (cm) for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2019/2020	38
9	Mean performance of number of millable canes m <sup>-2</sup> and single stalk weight (kg) for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2019/2020	42
10	Mean performance of brix reading and Sucrose percentage for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2019/2020	44



<b>Table No.</b>		<b>Page</b>
11	Mean performance of plant height and diameter (cm) for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2019/2020	49
12	Mean performance of cane and sugar yields (t/fed) for forty five genotypes (G) evaluated under three harvest ages (H) and their interactions in season 2019/2020	52
13	Correlations coefficient between studied traits under pooled three harvest ages	54
14	Effect of irrigation level on shoot and root fresh weights and root: shoot ratio of sugarcane genotypes	57
15	Effect of irrigation level on leaf area index (LAI) and leaf area ratio (LAR) of sugarcane genotypes	62
16	Effect of irrigation level on chlorophyll (Chl.) <i>a</i> and <i>b</i> contents and Chl. <i>a</i> : Chl. <i>b</i> ratio of sugarcane genotypes	64
17	Effect of irrigation level on carotenoids and proline contents of sugarcane genotypes	66
18	Phenotypic correlations coefficient between studied traits under three levels of IWL	68