شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

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SUGARCANE SELECTION FOR WATER CONSUMPTION DECREASE

By

ABDELAZIZ ABDEL NABY ABDELAZIZ GABER
B.Sc. Agric. Sc. (Plant Production), Ain Shamus Univ, (2012)

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Arid land Agricultural graduate studies and Research Institute
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Approval Sheet

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ABDELAZIZ ABDEL NABY ABDELAZIZ GABER

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This thesis for M. Sc. degree has been approved by:

Dr. Mohamed Saad Moghazy Abd El-Aty ……..……..…...
Prof of Agronomy, Faculty of Agriculture, Kafr El-Sheikh University.

Dr. Afaf Mohamed Tolba ……..…..……
Prof. Emeritus of Agronomy, Faculty of Agriculture, Ain Shams University.

Dr. Yasser Abd El-Gawad El-Gabry ……..…..……
Associate Prof. of Agronomy, Faculty of Agriculture, Ain Shams University.

Dr. Ayman Farid Abou-Hadid ……..……
Prof. Emeritus of Vegetable Crops, Faculty of Agriculture, Ain Shams University.

Date of Examination: / /2021

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

Under the supervision of:

Dr. Ayman Farid Abou-Hadid

Prof. Emeritus of Vegetable Crops, Department of Horticulture, Faculty of Agriculture, Ain Shams University (Principal Supervisor).

Dr. Yasser Abd El-Gawad El-Gabry

Associate Prof. of Agronomy, Department of Crops, Faculty of Agriculture, Ain Shams University

Dr. Mahmoud Hamdy Mohamed Ebid

Researcher of Breeding Crops, Department of Breeding and Genetic, Sugar Crops Research Institute, Agricultural Research Center.

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Abd El-Aziz Abd El-Naby Gaber: Sugarcane Selection For Water Consumption Decrease, Unpublished M.Sc.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 25º 36′ N and longitude 32º 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 29º59′ N and longitude 31º 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).

Experimentswere 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^2, 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^2 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^2 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, Chl*a*, Chl*b*, Chl*a* :Chl*b* 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 andChl.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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