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V. SUMMARY AND CONCULUSIONS

The present study was carried out at Nubaria Agriculture Research Station, Agriculture Research Center, Ministry of Agriculture. The effect of skipping irrigation's on yield, yield components, and agronomic characters of four maize (*Zea mays L.*) hybrids were investigated in the two growing seasons of 1997 and 1999. Due to failure in applying some of the irrigation treatments in 1998, the results presented and discussed are those of 1997 and 1999 only.

The experimental design was split-plot with 3 replicates in both seasons. Six irrigation treatments were randomly assigned to the main plots and four hybrids to the sub-plots.

Data were collected for grain yield, number of ears/plant, number of rows/ear, number of kernels/row, weight of 100 kernels, ear length, ear width, plant height, ear height, number of barren stalks, days to mid-tasseling, days to mid-silking, silking-tasseling interval, and ear-leaf area.

Data of our results and analyses could be summarized in the following:

(1) Skipping any of the scheduled irrigation significantly decreased grain yield. Skipping the three irrigations, (3^{rd}, 5^{th}, and 7^{th}) resulted in the lowest grain yield in 1997. This treatment of skipping irrigation at the vegetative, seed setting, and maturity stages yielded 4.09 t./ha compared to 8.93 t./ha. given by the control treatment. The grain yield reduction was 54.2%. In 1999, however, skipping irrigation at preflowering and grain-filling stages (the 4^{th} and 6^{th} irrigations) resulted in the lowest grain yield of 5.26t/ha. Yield reduction percentages due to this treatment was 51.0% as compared to the control treatment.

(2) Skipping any irrigation in 1997 and 1999 resulted in significantly lower number of ears/plant, except skipping the 5^{th} irrigation. The highest significant reduction in number ears/plant in both seasons was resulted from skipping irrigation at vegetative, seed setting, and maturity stages (the 3^{rd}, 5^{th}, and 7^{th} irrigations) and skipping irrigation at preflowering and grain-filling stages (skipping the 4^{th} and 6^{th} irrigations). The percent reduction ranged between 16.5-33%.

(3) Skipping irrigation at vegetative, seed setting, and maturity stages, (the 3^{rd}, 5^{th}, and 7^{th} irrigations) resulted in the lowest no. of rows/ear followed by skipping irrigation at preflowering and grain filling stages (the 4^{th} and 6^{th} irrigations).

(4) The lowest number of kernels/row in 1997 and 1999 seasons were counted from skipping irrigation at vegetative, seed setting, and maturity stages (the 3^{rd}, 5^{th}, and 7^{th} irrigations).

(5) Skipping irrigation at preflowering and grain filling stages (skipping the 4^{th} and 6^{th} irrigations) resulted in the lowest 100-kernel weight in 1997 followed by skipping irrigation at vegetative, seed setting, and grain maturity stages (the 3^{rd}, 5^{th}, and 7^{th} irrigations). The treatments involving skipping two irrigations (at vegetative growth and seed-setting, (3^{rd} and 5^{th} irrigations), or at seed setting and kernel maturity, (5^{th} and 7^{th} irrigations) ranked as the second lower in 100-kernel weight. The latter were not significantly different from each other.

(6) Irrigation treatments in 1997 and 1999 resulted in highly significant decrease in ear length and width below the control irrigation. The greatest significant decrease in ear length and width were obtained from skipping irrigation at vegetative, early seed setting, and grain maturity stages (the 3^{rd}, 5^{th}, and 7^{th} irrigations) and skipping irrigation at

preflowering and grain filling-stages (the 4^{th} and 6^{th} irrigations). Skipping the 5^{th} irrigation resulted in insignificant decrease below the control in both seasons.

(7) The highest significant reduction in plant height was obtained by skipping the earlier irrigations (the 3^{rd}, and 5^{th}, and 7^{th} irrigations). As mentioned, these coincided vegetative, seed setting, and grain maturity stages.

(8) Skipping any irrigation in 1997 and 1999 seasons resulted in significant decrease in ear height than the control irrigation. The lowest values of ear height was measured due to skipping irrigation at vegetative, seed setting, and grain maturity stages (the 3^{rd}, 5^{th}, and 7^{th} irrigations), and skipping the third and fifth irrigations treatment and the 4^{th} and 6^{th} treatment.

(9) Higher numbers of barren plants were resulting from skipping irrigation at vegetative, early seed setting, and grain maturity stages and skipping the 4^{th} and 6^{th} irrigations during preflowering and grain filling stages.

No barren plants were seen in the control treatment in 1999 and almost in 1997. Generally, means of barren plants in 1997 were considerably higher than those in 1999. This indicates better growing conditions in 1999.

(10) The data indicate that skipping irrigation at vegetative, seed setting, and grain maturity stages, or skipping irrigation at preflowering and grain filling stages, or skipping irrigation at vegetative and seed setting caused highest significant earliness in the 50% tasseling in 1997, with no significant differences among them. In 1999 season, however, skipping irrigation at preflowering and grain-filling stages resulted in the highest

significant earliness (shown the lowest number of days to 50% tasseling) followed by skipping irrigation at vegetative, seed setting, and grain maturity stages.

(11) In 1997 season, skipping irrigation at vegetative, seed setting, and grain maturity stages, resulted in the highest significant decrease in number of days to 50% silking compared to the control (60.92 versus 63.33 days). In 1999 season, skipping irrigation at preflowering and grain-filling stages caused the highest significant decrease in number of days to 50% silking followed by the treatments which involved skipping irrigation at vegetative and seed setting stages.

(12) The highest significant increase in tasseling-silking interval resulted from skipping irrigation at preflowering and grain-filling stages compared to the control in both seasons. This treatment resulted in T-S intervals of 4.5 and 3.08 days versus 1.5 and 1.75 days for the control treatment.

(13) Highly significant differences in ear-leaf area due to different irrigation treatments were found in both seasons of study, except for skipping the 5^{th} irrigation in 1999 season. The highest reduction in ear-leaf area resulted from skipping irrigation at vegetative and seed setting stages, (the 3^{rd} and 5^{th} irrigations) and skipping irrigation at vegetative, seed setting, and grain maturity stages, (the 3^{rd}, 5^{th}, and 7^{th} irrigations). The reductions in ear-leaf area below the control were 24.4 and 24.0% in 1997 and 27.9 and 21.8% in 1999 season, respectively.

Means of hybrids show that S.C.10 had the highest grain yield in both seasons. Grain yield means were 6.21 and 8.09t/ha., for the two successive years. These means significantly exceeded those of all other hybrids, except that of T.W.C.352 in 1997.

(1) The data show that the S.C.10 was the best yielding in the prevalent conditions, especially under drought stress, in the newly reclaimed lands of Nubaria area. The T.W.C. 352 was the best yielding under unfavorable environmental conditions prevailed in 1997, whereas S.C.10 genotype reacted and responded better under favorable environmental conditions prevailed in 1999.

(2) No significant differences were found in ears/plant between the studied hybrids.

(3) The T.W.C.352 had the highest number of rows/ear in 1997 and 1999 seasons than other cultivars.

(4) The S.C.10 showed the highest significant number of kernels/row than all other hybrids in the two seasons followed by T.W.C.324 and S.C.160. The T.W.C.352 had the lowest numbers of kernels/row in both seasons.

(5) The S.C.10 had significantly higher 100-kernel weights in 1997 and 1999 seasons. No significant differences were detected among the T.W.C.324 and T.W.C.352 hybrids in both seasons.

(6) The S.C.10 had the highest ear length in 1997 and 1999 seasons. The T.W.C.324 and S.C.160 ranked as second and third with a significant difference.

(7) The T.W.C.352 had the thickest significant ears than all other hyrbids in 1997 and 1999. The S.C.10 ranked second, but was significantly higher than S.C.160 and T.W.C.324 in both seasons.

(8) The S.C.10 was the tallest significant cross than other ones in 1997 and 1999 seasons. The T.W.C.324 ranked as second. The S.C.160 and T.W.C.352 were the shortest hyrbids.

(9) The S.C.10 had the highest significant ear height in 1997 and 1999

seasons. The T.W.C.324 and S.C.160 ranked as second.

(10) No significant differences were found in number of barren plants among all cultivars during 1997 and 1999 seasons.

(11) T.W.C.324 and S.C.10 were almost equal and tasseled significantly late than all other hybrids in 1997 season, followed by S.C.160. The T.W.C.352 was the earliest significant hybrid in 50% tasseling. In 1999 season, however, the S.C.10 was the latest significant in 50% tasseling followed by T.W.C.324 and S.C.160. The T.W.C.352 tasseled earlier than all hybrids showing significant differences.

(12) S.C.10 and T.W.C.324 hybrids were not significantly different in their silking date and were significantly late than other hybrids in both seasons of study.

(13) In 1997 season, the TSI for the S.C.160 hybrid was significantly longer than those of all other hybrids. Other hybrids did not differ significantly in their TSI. In 1999 season, no significant different were found among all the hybrids.

(14) The S.C.10 and T.W.C.324 had the highest significant ear-leaf area than other hybrids in both seasons.