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List of Abbreviations

Abu 70----------Sorghum vulgar.

C^o----------Celsius, Degree centigrade.

Ca++----------Calcium.

cm----------Centimeter.

CL---------- Chlorine.

C.V----------Coefficient of Variation.

CWR----------Crop Water Requirement.

DM ---------- Dry Matter.

ds/m^{-1}-------- ----------Decisiemens per meter.

ds / cm^{-1}----------Decisiemens per centimeter.

EC----------Electrical Conductivity

EC_e----------Electrical Conductivity of Saturated Soil past extract.

EC_o----------Reference crop evapotranspiration, mm/day.

Et_c----------Crop evapatranspiration, mm/day.

Ec_w----------Electrical conductivity of water.

ESP ---------- ---- ------Exchangeable Sodium Percentage.

et al----------And others.

etc.----------etcetera , and so on.

F.---------- flat.

F.A.O---------- Food and Agriculture Organization of the United Nations.

F.C---------- Field Capacity.

Fig---------- Figure.

FWUE----------Field Water Use Efficiency.

G----------Garawia.

gm----------Gramm.

ha----------Hectare

hr----------Hour

http:----------Hyper Text Transfer Protocol.

Ib----------Pound

i.e.----------That is:.

ICRISAT----------International Crop Research Institute for the Semi-Arid Tropics.

Kc----------Crop Coefficient.

kg----------Kilo gram.

kg/ha----------Kilo gram per hectare.

Km----------Kilometer.

km^2----------Square Kilometer.

U.K.----------University of Khartoum.

L.A.----------Leaf Area.

L.R----------Leaching Requirements.

L.S.D----------The Least Significant Difference.

m----------Meter.

m^2----------Square Meter.

m^3----------Cubic Meter.

Ma^{++-}----------Magnesium.

mm----------Millimeter.

M ha----------Million Hectare.

MJ/M/day----------Sun Shine Hours and Solar Radiation..

mm/h----------Millimeter per hour.

MSL----------Meter above Sea Level.

Na^{+}----------Sodium anion.

NRWDC----------National Rural Water Development Corporation.

PE----------Polyethylene.

pp:----------Page

PSD----------Particle Size Distribution.

Ph----------Potential of hydrogen.

R----------Ridge

RCBD----------Randomize Complete Block Design.

RMA----------Risk Management Agency.

SAR----------Sodium adsorption ratio.

S.D----------Standard Deviation.

S.E.----------Standard Error.

S q km----------Square Kilometer.

S q ml----------Square mile.

SUST--------- ----------Sudan University of Science and Technology.

Ton/ha----------Tons per hectare

USDA----------United States Department of Agriculture.

v/v----------Volume over volume.

W.U.E----------water use efficiency

www:----------World wide web.

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Abstract

A field experiment was conducted during the period from November (2010) to early January, (2012), in two consecutive seasons, in the demonstration Farm of the College of Animal Production, Sudan University of Science and Technology, at Kuku, to study the performance of two Sorghum Cultivars (*Sorghum bicolor)* "Abu 70" and (*Sorghum Sudanese*) "Garawia" on a saline soil under four irrigation intervals 7-10-14-21 days, on two different soil preparation methods (ridged and flat). Irrigation water supply was from domestic water supply net work. Soil samples and irrigation water samples were analyzed chemically to determine the actual soil and irrigation water salinity degree, the average Ec_e and Ec_w, were found to be 4.4 / ds/m, 0.285/ds/m for soil and irrigation water respectively. The treatments were arranged in a Randomized Complete Block Design (RCBD), with four replications, with an area of 4*5 =20 m^2, the data were subjected to statistical analysis using, MSTAT, Computer program. Calculation was done to determine the amount of crop water requirements in (m^3) per plot, the application of irrigation water was measured by a 2 inch flow meter.

The fresh and dry matter yields were taken 70 days after sowing.

The main parameters were dry and fresh matter yields. The crop factor (kc) was taken using CROP WAT Program .based on Penman Monteith equation for Khartoum area. The Studied growth parameters were: crop height, stem thickness, leaves number, Leaf Area (L.A.), and the root depth.

The highest value for calculated Eto (Penman Monteith) was during the developing and maturity stage. The values ranged between: (6.99, 6.08, 5.29)

mm/ day. This trend was similar for the values of crop factors (kc), which ranged between (0.3 to 1.02).

The results showed higher dry matter yields for shorter intervals 7, 10 days, with significant differences. The shorter irrigation intervals showed higher yields for the different soil preparation methods, with significant differences. The interaction between the two crops, the interaction between intervals and soil preparation methods. The results of the fresh matter yields followed the same pattern. All growth parameters for the two crops and under the two soil preparation methods gave significant differences in favor of the shorter irrigation intervals.

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ملخص الاطروحة

اجريت التجربة الحقلية خلال الفترة من نوفمبر0 2010 الي اوائل يناير-2012 ،خلال موسمين متتابعيين ، في المزرعة التجريبية لكلية علوم وتكنولوجيا الانتاج الحيواني جامعة السودان للعلوم والتكنولوجيا ،SUST– بكوكو لدراسة اداء محصولي علف ابوسبعين والجراوية في ارض ملحية تحت ظروف ري علي فترات مختلفة في مهد مستوي و مهد مخطط (سرابات) ، مصدر مياه الري من شبكة مياه المدن .

تم تحليل عينات التربه ومياه الري كيميائيا لمعرفة درجة الملوحة فى مستخلص التربة و ماء الري (مياه المدن) . بمتوسط 4.4 و 0.285 ds/m للتربة و ماء الري على التوالى .

وزعت معاملات التجربه باستخدام تصميم القطاعات العشوائيه الكامله (R C B D) بأ ربعة مكررات تم تحليل البيانات احصائيا بواسطة برنامج MSTAT .

اجريت العمليات الحسابيه لتقدير الاحتياجات المائية اللازم اضافتها بالمتر المكعب للحوض الواحد .تم قياس مياه الري المطلوبه والتحكم فيها باستخدام عداد متري 2 بوصه لكل فترات الري 7 -10 -14 -21 يوما.

للحصول على الانتاجية الطازجة والجافة تم الحصاد بعد 70 يوما من الزراعة . الانتاجية الخضراء والجافة تمثل اهم قياسات التجربة. القراءات التي تمت دراستها في التجربة شملت طول النبات سمك الساق وعدد الاوراق ومساحة الورقة وطول الجذر تم استخدام معامل المحصول بالاستعانة ببرنامج ال CROP WAT لمنطقة الخرطوم باستخدام معادلة بنمان-مونتيث .

كانت اعلي قيمة للبخر نتح المرجعي بطريقة بنمان –مونتيث خلال فترتي الاستطالة و النضج حيث تراوحت هذه القيم (6.99-6.08-5.29) ملم/ اليوم. وهذه النتيجة تنطبق ايضا علي معامل المحصول حيث تراوح بين (0.3-الي 1.02).

اظهرت نتائج الانتاجية تفوق الفترات القصيرة بين الريات 7- 10 يوما بفروقات معنوية. كما اظهرت الفترات القصيرة فروقات معنوية خلال معاملات طرق تحضير التربة وايضا المقارنة بين المحصولين . والتفاعل البيني بين فترات الري وطرق تحضير التربة.

اظهرت نتائج انتاجية الوزن الطازج نفس النمط الوارد في الانتاجية بالوزن الجاف .حيث تفوقت فترات الري القصيره 7 - 10 يوم علي الفترات من 14 - 21 يوم من خلال معاملات: فترات الري ، طرق تحضير التربة ،المقارنة بين المحصولين والربط بين فترات الري وطرق تحضير التربة .

.كما اوضحت نتائج التحليل للمحصولين خلال عمليتى تحضير التربة فروقات معنوية لصالح وتفوق الفترات القصيرة بين الريات .