

DEDICATION

To my lovely parents

Wife ... Sons ... Daughters

Brothers ... Sisters and

Firends

Who support

And encourage me with unlimited love

And to all my home at

El Hwarh Tribe in the

Sudan

El Tahiar Bstawi Ali El Hwary

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I am greatly thankful to **ALLAH** who bestowed me with good health, and supports me with ultimate help, strength and patience to accomplish this work successfully and peace.

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ABSTRACT

Two field experiments were carried out for two consecutive winter seasons (2008/09-2009/010) in the Demonstrated Farm, Sudan University of Science and Technology, at Shambat to study the effect of different irrigation intervals and skipping on growth, yield, yield components and water use efficiency of wheat (*Triticum aestivum* L.).

Wheat cultivar Condor was grown under different irrigation conditions in two experiments, the first experiment was: different irrigation intervals namely every 7, 10, 14, 21 and 28 days. While the second experiment was: skipping one-irrigation at different developmental stages namely seedling, tillering, booting, dough and ripening stage in addition to continuous irrigation every 10 days as control. The experimental design was randomized complete block design with four replications. The parameters study were: plant height, dry matter accumulation, number of plants/m², number of tillers/plant, days to five leaf stages, days to 50% heading, days to maturity, number of spikes/m², spikelets/spike, number of grains/spike, 1000-grain weight, grain and straw yield and water use efficiency.

The results showed that there were highly significant differences in the studied parameters due to irrigation intervals, except for days to fifth leaf stage and harvest index in the first season and number of plant/m² in second season, where the irrigation every 7 recorded higher values (slightly different from 10 days) than the others. On the other hand, skipping irrigation had significant effects on

all tested parameters except plants/m² in both seasons and plant height and dry matter accumulation at 45 days of age (booting stage) in the second season. Irrigation every 10 days (control) gave higher values for all parameters less at seedling and ripening stages than the other sensitive stages.

Although, the results showed highly significant effect of the treatments on biomass, straw and grain yield, harvest index, water use efficiency and protein content. In general irrigation every 7-10 days (with less effect of skipping on seedling and ripening stages) gave the highest protein content, grain and straw yield and field water use efficiency.

El Tahiar Bstawi Ali El Hwary

مستخلص الدراسة

أجريت دراسة لتجربتين حقليتين لموسمين شتويين متتاليين (2008/2009 و 2009/2010) بالحقل التجريبي لكلية الدراسات الزراعية، جامعة السودان للعلوم والتكنولوجيا بشمبات. بغرض معرفة أثر اختلاف فترات الري و تغيبه على النمو والانتاجية ومكوناتها وكفاءة استخدام المياه في محصول القمح. أستخدم تصميم القطاعات العشوائية الكاملة بأربعة مكررات.

زرع صنف القمح كندور تحت معاملات ري مختلفة في تجربتين التجربة الاولى : فترات الري المختلفة 7، 10، 14، 21 و 28 يوم. بينما التجربة الثانية هي : تغيب رية واحدة بمراحل نمو مختلفة هي الانبات، الخلفة ، تكوين السنابل، اللبنة ومرحلة النضج بالإضافة الي الري كل 10 ايام مستمرا كشاهد.

تمت دراسة تأثير المعاملات على طول النبات، الوزن الجاف، عدد النباتات في المتر المربع، عدد الخلف في النبات، عدد الايام حتى مرحلة الخمس ورقات، عدد الايام حتى مرحلة الازهار، عدد الايام حتى مرحلة النضج، عدد السنابل في المتر المربع، عدد السنبيلات في السنبلة، عدد الحبوب في السنبلة، وزن الآلف حبة والانتاجية وكفاءة استخدام المياه . دلت النتائج على وجود فروقات معنوية عالية بين المعاملات في المعايير المدروسة بين فترات الري فيما عدا عدد الايام حتى مرحلة الخمس ورقات ودليل الحصاد في الموسم الاول و عدد النباتات في المتر المربع في الموسم الثاني، وأعطت فترة الري كل 7 أيام قيما أعلى باختلاف طفيف مع 10 أيام مقارنة ببقية الفترات. من ناحية أخرى كان لنظام تغيب الري تأثيرا معنويا على كل الصفات تحت الدراسة فيما عدا عدد النباتات في المتر المربع في الموسمين وطول النبات والوزن الجاف عند 45 يوم (مرحلة تكوين السنابل) للموسم الثاني، وسجل نظام الري المستمر كل 10 أيام قيما أعلى باختلاف طفيف من التغيب في مرحلتي الانبات والنضج مقارنة ببقية المراحل الحرجه.

كذلك أظهرت النتائج تأثيرا معنويا للمعاملات على كتلة المادة الحية، انتاجية الحبوب والتبن، دليل الحصاد ، كفاءة استخدام المياه ونسبة البروتين حيث اعطت فترة الري مستمرا كل 7-10 أيام (مع اختلاف طفيف لنظام تغيب الري في مرحلتي الانبات والنضج) أعلى انتاجية للحبوب والتبن ونسبة البروتين و أعلى كفاءة استخدام للماء الحقلي.

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