

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**SUDAN UNIVERSITY OF SCIENCE  
AND TECHNOLOGY  
COLLEGE OF AGRICULTURAL STUDIES**

**EFFECT OF PHOSPHOROUS AND POTASSIUM  
ON GROWTH YIELD AND YIELD COMPONENTS  
OF THREE CULTIVARS OF MAIZE  
(*Zea mays* L.)**

**A**

**Thesis Presented to the Sudan University of Science  
and Technology in Partial Fulfillment of the  
Requirements for the Degree of M.Sc  
(Agronomy)**

**Prepared by:**

**Hassan Haroun Hassan Mohammed**

**Supervised by:**

**Dr. Ahmed Ali Mohammed Osman**

**2004**

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Department of Crop Science**

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# **DEDICATION**

**To my parents,  
to my wife,  
and to my brothers  
who struggle under hard conditions and  
devote their lives for me to achieve this aim,  
with my great thanks and appreciations**

## **ACKNOWLEDGMENTS**

**First I thank Allah who gave me the effort to finish this work successfully.**

**I sincerely express my warm thank to my supervisor Dr. Ahmed Ali Mohammed for his guidance and support through the research period, to whom I am greatly indebted.**

**I also extend my warm thanks and appreciation to professor Faisal Mirghani Ali for his assistant and help.**

**I am also grateful to the staff members of the Agronomy Department, College of Agricultural Studies, Shambat.**

**Great appreciation to my family for their continuous encouragement and support.**

**Finally, I wish to thank all those who contributed directly or indirectly in this work, but not mention here.**

**Last, but not least, I owe a word of thank and with my best wishes to all.**

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## **ABSTRACT**

**An experiment was conducted for two consecutive seasons (2002/03 and 2003/04) in the experimental farm of the College of Agricultural Studies, Sudan University of Science and Technology at Shambat, to investigate the effect of phosphorous and potassium on growth yield and yield components of three cultivars of maize.**

**The treatments used consisted of three levels of phosphorous, control, (P<sub>0</sub>), 18 kg P<sub>2</sub>O<sub>5</sub>/ha (P<sub>1</sub>), 36 kg P<sub>2</sub>O<sub>5</sub>/ha (P<sub>2</sub>), two levels of potassium, control (K<sub>0</sub>), 36 kg K<sub>2</sub>O/ha (K<sub>1</sub>) and three cultivars of maize, namely; Hudeiba-2, Mugtama-45 and Damazine.**

**The 18 factorial treatments were executed in randomized complete block design, with 3 replications.**

**The parameters studied were plant height, stem diameter, number of green leaves per plant, days to 50% silking and tasseling, number of cobs per plant, cob-diameter, cob-length, cob-weight, number of rows per cob, number of seeds per cob, 100-seeds weight, yield per plant and final yield.**

**The results showed that cultivars were significantly different (P=0.01) in plant height. The cultivar Mugtama-45 (V<sub>2</sub>) showed superiority in growth parameters compared to the other two cultivars (V<sub>1</sub> and V<sub>3</sub>) and the yield is 2.339 ton/ha.**

**The results also showed that there were no significant effects of phosphorous and potassium in both seasons.**

بسم الله الرحمن الرحيم

## خلاصة الأطروحة

أجريت هذه التجربة في الحقل التجريبي بكلية الدراسات الزراعية بجامعة السودان للعلوم والتكنولوجيا بشمبات لموسمين تتالين 03/2002 و04/2003 لدراسة تأثير السماد الفوسفاتي والبوتاسي على نمو وإنتاجية ثلاثة أصناف من الذرة الشامية وهي حديبة-2، مجتمع-45 وصنف دمازين. وقد كانت المعدلات المستعملة للفسفور صفر، 18 كجم فسفور/هكتار و36 كجم فسفور/هكتار، بينما كانت المعدلات المستعملة للبتاسيوم صفر و36 كجم بوتاسيوم/هكتار. تضمنت التجربة 18 معاملة للعينات والأسمدة المختلفة، وأستخدم التصميم العشوائى ذو القطاعات الكاملة والتكرار الثلاثى. معايير النمو التى فحصت كانت كما يلي: طول النبات، سمك النبات وعدد الأوراق الخضراء للنبات. أما معايير الإنتاجية فكانت كما يلي: عدد الكييزان فى النبات، سمك الكوز، وزن الكوز، طول الكوز، عدد الصفوف فى الكوز، عدد البذور فى الكوز، وزن ال 100 حبة وإنتاج الغلة للنبات. أوضحت النتائج بأن الاختلافات بين الأصناف كن معنوياً فقط بالنسبة لطول النبات وكانت الإنتاجية ٢.٣٣٩ طن للهكتار. الصنف مجتمع-45 أظهر تفوقاً بالنسبة لمعايير النمو عن بقية الأصناف. توجد فروقات معنوية ضئيلة بالنسبة لمعدلات السماد الفسفورى والبوتاسى.