

**Effect of Nitrogen and Phosphorus  
Fertilizers on Yield and Yield  
Components of Three Cultivars  
of Maize (*Zea mays*)**

**By**

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# **DEDICATION**

**To my parents,  
to my wife 'Samia' and my  
sons,  
and to my friends with  
respect**

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**Above all I render my thanks to the merciful ALLAH who offer me all things to accomplish this study.**

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## ABSTRACT

Field experiments were conducted in the Demonstration Farm of People's Arms Defense Camp at El-Getaina (White Nile) for the two consecutive seasons (summer and winter) 2001/02 to study the effect of nitrogen and phosphorus fertilizers on yield and yield components of three cultivars of maize (*Zea mays* L.) under irrigation.

The treatments used consisted of three levels of nitrogen control ( $N_0$ ), 43 kg N/ha, ( $N_1$ ), 86 kg N/ha ( $N_2$ ), two levels of phosphorus control ( $P_0$ ), 43 kg  $P_2O_5$ /ha, ( $P_1$ ) and three cultivars, Giza-2 ( $V_1$ ), Mugtama-45 ( $V_2$ ) and Pannar-6480 ( $V_3$ ).

The 18 factorial treatments were executed in randomized complete block design, with 5 replications.

The results obtained showed that the nitrogen fertilizer had a significant effect on growth of maize cultivars, particularly plant height and leaves number, leaf area and dry weight of plant. Nitrogen fertilizer also significantly affected final seed yield and some yield components, cob yield and number of seeds per cob. When phosphorus fertilizer has no significant effect on seed yield.

The studies obtained showed negligible differences between the two seasons (summer and winter) in seed yield.

This suggest that the maize crop can be grown successfully in both seasons, but since there is few winter crops, it would be possible to treat maize as a winter crop in the area to intensively and diversify the rotations.

بسم الله الرحمن الرحيم

## ملخص الأطروحة

أجريت تجربة حقلية بمعسكر الدفاع الشعبي بالقطينة (النيل الأبيض) لموسمين 2001/2002 فى العروتين الصيفية والشتوية على التوالى لدراسة تأثير السماد الأزوتى والفوسفاتى على نمو وإنتاجية ثلاثة أصناف من الذرة الشامية جيزا-2، مجتمع-45 وبنار-6480 تحت ظروف الري الإصطناعى.

وقد كانت المعدلات المستعملة للأزوت صفر، 43 كجم أزوت/هكتار و 86 كجم أزوت/هكتار، والمعدلات المستعملة للفوسفات كانت صفر، 43 كجم فسفور/هكتار، حيث كان مصدر الأزوت سماد اليوريا (46% أزوت) والفسفور سماد الفوسفات (48% فسفور) على التوالى.

تضمنت التجربة 18 معاملة للعينات والأسمدة المختلفة، وكان التصميم الإحصائى المستعمل لهذه التجربة هو التصميم العشوائى ذو القطاعات الكاملة والتكرار الخماسى.

أوضحت النتائج أن للسماذ الأزوتى كان له تأثيراً  
معنوياً على زيادة إنتاجية الحبوب وعدد الحبوب فى  
الكوز (القندول) ووزن الكيزان ولم يكن هنالك تأثير  
معنوى للفسفور على الإنتاجية ومكونات الإنتاج.  
إتضح أن الزيادة فى الإنتاجية كانت بسبب الزيادة  
فى وزن الكيزان (القناديل) وعدد الحبوب فى الكوز  
الواحد.

أوضحت النتائج أن الإنتاجية ومكوناتها كانت  
متماثلة تقريباً فى الموسمين الأمر الذى يوضح أنه يمكن  
زراعة المحصول فى أى من الموسمين الشتوى والصيفى.  
وحيث أن هنالك نقص فى المحاصيل الشتوية  
بالدورات الزراعية فيمكن الإعتماد بزراعة محصول الذرة  
الشامية فى العروة الشتوية الأمر الذى يمكن من تكثيف  
وتنوع الدورات الزراعية فى منطقة الدراسة.