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
ACKNOWLEDGEMENTS

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

I wish to express my sincere gratitude and appreciation to my supervisor professor Faisal Mirghani Ali for his invaluable guidance and help during the stages of the practical work and preparation of 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) موسمين 2002/2001 في العروتين الصيفية والشتوية على التوالي لدراسة تأثير السماد الأروتي والفوسفاتي على نمو وإنتاجية ثلاثة أصناف من الذرة الشامية جيزا-2، مجتمع-45 وبانار-6480 تحت ظروف الرى الإصطناعي.

وقد كانت المعالد المستعملة للأروتي صفر، 43 كجم أروتي/هكتار و 86 كجم أروتي/هكتار، والمعالد المستعملة الفوسفات كانت صفر، 43 كجم فسفور/هكتار، حيث كان مصدر الأروتي سماد اليوريا (46% أروتي) والفوسفور سماد الفوسفات (48% فسفور) على التوالي.

تضمنت التجربة 18 معاملة للعينات والأسمدة المختلفة، وكان التصميم الإحصائي المستعمل لهذه التجربة هو التصميم العشوائي ذو القطاعات الكاملة والتكرار الخماسي.
أوضحت النتائج أن للسماد الأروتي كان له تأثيراً معنويًّا على زيادة إنتاجية الجحب وعدد الحبوب في الكوز (القناديل) ووزن الكيزان ولم يمكن هثالك تأثير معنوي للفسفور على الإنتاجية ومكونات الإنتاج.

أوضح أن الزيادة في الإنتاجية كانت بسبب الزيادة في وزن الكيزان (القناديل) وعدد الحبوب في الكوز الواحد.

أوضحت النتائج أن الإنتاجية ومكوناتها كانت متماثلة تقريباً في المواسمين الأمر الذي يوضح أنه يمكن زراعة المحصول في أي من المواسمين الشتوي والصيفي. وحيث أن هثالك نقص في المحاصيل الشتوية بالدورات الزراعية فيمكن الإعتماد بزراعة محصول الذرة الشامية في العروة الشتوية الأمر الذي يمكن من تكثيف وتنويع الدورات الزراعية في منطقة الدراسة.