# EFFECT OF SOME CULTURAL PRACTICES ON GROWTH AND YIELD OF SOME NEW RELEASED RICE CULTIVARS

**By**


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**B.Sc. Agric. Sci. (Agronomy), Fac. Agric., Cairo Univ., 1998**
**M.Sc. Agric. Sci. (Agronomy), Fac. Agric., Cairo Univ., 2003**


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**APPROVAL SHEET**

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**Date: 4 / 2 /2010**

**SUPERVISION SHEET**

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**استمارة معلومات الرسائل التى تمت مناقشتها**

**الكليـة/المعهد: كلية الزراعة-جامعة القاهرة** **القسم: محاصيل**

**١- الدرجة العلمية :** ماجستير [ ] دكتوراه [✓]

**٢- بيانات الرسالة:**

عنوان الرسالة باللغة العربيـة:

**تأثير بعض المعاملات الزراعية على نمو ومحصول بعض أصناف الأرز الجديدة**

عنوان الرسالة باللغة الأجنبية:

**EFFECT OF SOME CULTURAL PRACTICES ON GROWTH AND YIELD OF SOME NEW RELEASED RICE CULTIVARS**

التخصص الدقيق : **انتاج محاصيل الحبوب**

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**٥- مستخلص الرسالة (Abstract)**

**٥-١ باللغة العربية :** بشرط ألا يزيد عن ٧ أسطر

**(الكلمات الدالة: أصناف الأرز- التسميد المعدنى- التسميد العضوى- منع الماء(الأجهاد المائى)- امتلاء الحبوب)**

لدراسة استخدام اليوريا او سلفات الأمونيوم اوالسماد البلدى وبعض التوافيق المختلفة بينهما لزراعة الأرز و استجابة ثلاثة أصناف للأجهاد المائى خلال مراحل النمو المختلفة اجريت تجربتان بمركز البحوث فى الأرز بسخا –كفر الشيخ ٢٠٠٥ ، ٢٠٠٦. استخدام السماد المعدنى سواء اليوريا او سلفات الأمونيوم بنسبة ٧٥ % من الجرعة الموصى بها واضافة ٢٥ % من السماد البلدى اظهر نفس الأستجابة عند استخدام الجرعة الموصى بها من السماد المعدنى سواء اليوريا او سلفات الأمونيوم. تعرض نباتات الأرز للأجهاد المائى بعد التزهير وخلال النضج اللبنى للحبوب اظهر نقص كبير فى المحصول ويؤثر على الصفات التكنولوجية للحبوب. يمكن منع الماء قبل الحصاد وذلك عند النضج العجينى للحبوب دون حدوث نقص معنوى فى المحصول وبذلك نعمل على توفير كمية من الماء المستخدم للزراعة.

**٥-٢ باللغة الأجنبية :** بشرط ألا يزيد عن ٧ أسطر

**(Key Words: Rice cultivars- Mineral fertilizer- Organic fertilizer- Water withholding- Grain filling)**

Adding urea or ammonium sulphate ($A\backslash SO_4$) with farmyard manure (FYM) as a source of nitrogen and response of three rice cultivars to water withholding at various growth stages was studied at Rice Research, Sakha, Kafr EL-Sheikh, 2005, 2006. the combination of urea or ($A\backslash SO_4$) with FYM in 75:25 ratio and full dose of urea or ($A\backslash SO_4$) gave the same effect of yield and yield components of rice. It is possible to accelerate water withholding before harvesting at dough stage but, grain yield decresded under water stress at complete heading or milkey stage.

**٦- أهم النتائج التطبيقية التى تم التوصل إليها:**
(لا تزيد عن سطرين لكل منها)

**٦-١** اضافه اليوريا او سلفات الأمونيوم عند تسميد الأرزاظهر نفس الإستجابة.

**٦-٢** اضافه ٢٥ % سماد عضوى من الكمية الموصى بها من السماد النيتروجينى اظهر نفس الإستجابة للسماد المعدنى الى جانب تحسين الخواص الفيزيائية والكيماوية للتربة وتقليل التلوث

**٦-٣** تعرض نباتات الأرز للأجهاد المائى بعد التزهير وخلال النضج اللبنى للحبوب يعمل على حدوث نقص كبير فى المحصول ويؤثر على الصفات التكنولوجية للحبوب.

**٦-٤** يمكن منع الماء قبل الحصاد وذلك عند النضج العجينى للحبوب دون حدوث نقص معنوى فى محصول الحبوب وبذلك نعمل على توفير كمية من الماء المستخدم للزراعة.

**٧- ما هى الجهات التى يمكن أن تستفيد من هذا البحث:**
(اذكر هذه الجهات مع شرح أهمية البحث لهذه الجهة بما لا يزيد عن أربعة سطور لكل جهة )

**٧-١** جهات علمية مثل كليات الزراعة بالجهات المختلفة.

**٧-٢** مراكز البحوث الزراعية.

**٧-٣** الأرشاد الزراعى بوزارة الزراعة.

**٧-٤** الباحثين والعاملين في نفس مجال التخصص.

**٨- <u>هل توجد علاقة قائمة بإحدى هذه الجهات :</u>** **نعم** ☑ **لا** ☐

**في حالة نعم اذكر هذه الجهات :**
**٨-١ مركز البحوث الزراعية**

**٨-٢**

**٨-٣**

**ما هي طبيعة العلاقة :**
مشـــروع بحثـــي ☐

تعاون أكاديمي ☑

مشروع ممول من جهة ثالثة ☐ (اذكر ما هي : )

أخري ☐ ( تذكر )

**٩-هل توافق على التعاون مع جهات مستفيدة من خلال الجامعة :**

**لا** ☐ **(لماذا** **)**

**نعم** ☑

(أ) لتطبيق البحث : ☑

(ب) لاستكمال البحث: ☐

(ج) أخري : ☐ **(تذكر** **)**

**١٠- هل تم نشر بحوث مستخرجة من الرسالة فى مجلات أو مؤتمرات علمية**
(تذكر مع جهة النشر و المكان و التاريخ )

١٠-١ تـأثير مصـادر النيتـروجين المعـدنى و العضـوى والتوافيـق بينهمـا علـى محصـول الأرز و مكوناتة.

**Effect of some mineral and organic nitrogen sources and their combinations on yield and yield components of rice.**

**(**J. Agric. Sci. Mansoura Univ., 34 (7):8025-8032, 2009**).**

**٢-١٠**

**١١- هل سبق التقدم لتسجيل براءات اختراع** (تذكر مع الجهة و المكان و التاريخ )

**نعم** ☐ **لا** ☑

**١٢- هل توافق على إعطاء البيانات المذكورة فى هذه الاستمارة لجهات أخرى**

**نعم** ☑ **لا** ☐

توقيع الطالب:
ربيع محمد عبد السلام محمد

توقيع المشرفين:
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## ABSTRACT

The combination of urea or ammonium sulphate ($A/SO_4$) with farmyard manure (FYM) as well as using anyone of them alone as a source of nitrogen for rice cultivation was studied at Rice Research and Training Center (RRTC), Sakha, Kafr EL- Sheikh Governorate, Egypt during 2005 and 2006 seasons. The results revealed that, grain and straw yields and yield components significantly affected with the application of nitrogen fertilizer. There were no significant differences between urea and ammonium sulphate on the above characters. The ability of FYM alone to provide nitrogen is insufficient because of its lower N- content and higher C\N ratio. Generally, the combination of urea or ammonium sulphate with FYM in 75:25 ratio and full dose of mineral fertilizer either urea or ammonium sulphate gave the same effect of yield and yield components of rice.

To study the response of three rice cultivars (Giza 178, Sakha 104 and Giza 182) to water withholding at various growth stages (water withholding at complete heading, at milk ripe stage and dough stage as compared to continuous flooding) two field experments were carried out at (RRTC) during 20005 and 2006 seasons. It was found that, water withholding at various growth stages significantly decreased number of panicles/$m^2$, panicle length, panicle weight, 1000 - grain weight, number of grains/panicle, grain yield, straw yield, hulling %, milling %, head rice %, gel temperature and gel consistency as compared to continous flooding. Water withholding at dough stage was in the same level of significant with continous flooding concerning the previously mentioned charactes. On contrast, number of unfille grains/panicle and amylose content significantly increased with increasing the severity of water withholding from heading stage to dougt stage. Giza 178 and Sakha 104 were similar in their performances but superior to Giza 182 in panicle weight, 1000 - grain weight, number of filled grains/panicle, technoloy characters, gel temperature and gel consistency. There was insignificant difference among the tested cultivars in grain yield and straw yield

**Key Words:** Rice cultivars- Mineral fertilization- Organic fertilization- Water withholding- Grain filling

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# INTRODUCTION

Rice (*Oryza sativa* L.) crop plays a significant role in Egypt strategy for sustaining the food self- sufficiency. Rice, which occupies about 1.5 million fed produces approximately 6 million metric tons of rough rice annually (Ministry of Agriculture and Land Reclamation, Egypt, 2009). Several forms of mineral fertilizers as well as organic nitrogen manure, especially farmyard manure (FYM) and chicken manure are commonly used in Egypt. Organic matter of soil is considered to be the magic remedy for all types of soil. The applications of organic manures enrich the soil with nutrient element and humus which is the final product of decomposition of organic matter. Humus has a very vital role in improving soil physical and chemical properties. It increases the water holding capacity of soil as a result of its colloidal status, and also humus increase the cation exchange capacity of soil which is a remedy of one weakness of light textured soil.

Farmyard manure (FYM) has a good residual effect on the succeeding crops following the manured crop. In this connection, Fan *et al.(*2005) reported that balanced fertilized and long term addition of organic material to soil should be encourage to maximize the use of stored soil arrest grain yield decline and ensure sustainable productivity. In recent years, worldwide awareness of the need to use renewable of energy has revived the use of organic manures. Secondary reasons often given for the increased use of organic materials are need

to improve environmental conditions and public health and the need to reduce costs of fertilizing crops.

Increasing nitrogen efficiency through use best nitrogen sources is one of the most important factors that limit productivity of rice. Among various nitrogen fertilizer sources, ammonium sulphate and urea are the most common mineral forms required for growth and yield of rice plant. There is a renewed interest in organic manures, such as farmyard manures, compost and green manures, as sources of plant nutrients.

Rice is adapted to grow in flooded soil, though it also grows well in non-flooded soils under upland conditions. Rice is a semi - aquatic plant that requires more water than any other crop in the Egyptian agricultural system. Under Egyptian conditions, rice is one of the major water- consuming crops, and continuous flooding is the only method used for irrigation. Our share in the water of river Nile is insufficient for both reclaiming and irrigation purposes. Limited water resources and considerable increase in population had forced research workers to find ways to economize the water use without any loss in grain yield. Research had shown that rice can grow under shallow water far better than under deep submergence. Shallow water increase water temperature during the day and lowers it during night, thus allowing more tillering and better growth for rice. Most Egyptian rice varieties higher grain yields when soil water content is kept near saturation throughout the season to simulate continuous flooding (RRTC, 1996). This indicates that better yield does not necessarily require standing water on the soil surface.