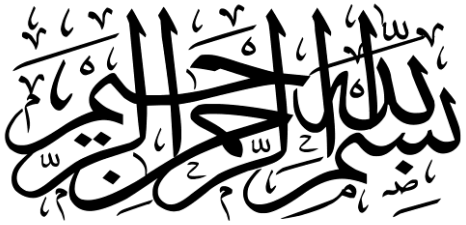

(قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا

إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ)

تحليل منحنيات استجابة محصول القمح للتسميد الآزوتي وعلاقته بتلوث البيئة

رسالة مقدمة من الطالبة

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جامعة عين شمس

2014

صفحة الموافقة على الرسالة

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ANALYSIS OF THE RESPONSE CURVES OF WHEAT YIELD TO NITROGEN FERTILIZATION AS RELATED TO ENVIRONMENT POLLUTION

Submitted By

Hayam Mohamed said Mahmoud

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A thesis submitted in Partial Fulfillment
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The Requirement for the Doctor of Philosophy Degree
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Department of Environmental Agricultural Science
Institute of Environmental Studies and Research
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APPROVAL SHEET

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شكر وتقدير

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الاستاذ الدكتور/ فتحي عشماوي احمد
أستاذ – المعمل المركزي لبحوث التصميم والتحليل الإحصائي – مركز البحوث الزراعية

الدكتور/ هاني صابر سيد سعودي
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CONTENTS

ABSTRACT

Hayam Saed Mohamed .Analysis of yield response curve of wheat yield to nitrogen fertilization as related to environment pollution Unpublished Doctor of Philosophy in Agriculture environment Science, Inst. of Environ. Studies and Res., Ain shams univ.2014.

Two field experiments were conducted at Giza Agric. Res. Station, Agric. Res. Cent., Giza Governorate, Egypt during 2009/2010 and 2010/2011 seasons. The experiments aimed to study the response of some wheat cultivars namely: Giza 168, Sakha 94, Gemmeiza 10 and Sids 12 to six different N fertilizer levels (0, 25, 50, 75, 100 and 125 kg N/fad) and determine the degree of the response of grain yield to N fertilizer levels in order to estimate the economic optimum N rate. Also, to investigate the relation between grain yield and some related characters using some multivariate procedures *i.e.* correlation and path-coefficient analysis. The design used was strip-plot in three replicates where wheat cultivars were arranged in the vertical strips while N fertilizer levels were in the horizontal strips.

The results could be summarized as follows:

1- The tested wheat cultivars significantly affected growth characters, yield components, biological, grain and straw yields but insignificantly affected harvest index.

2- The increase in N fertilizer level significantly affected growth, yield components, biological, grain and straw yields but harvest index was not significantly influenced by N level.

3- The quadratic model worked well for describing the relation between grain yield and N fertilizer levels.

4- The economic optimum N rate ranged from 55 to 87.47 Kg N/fad.

5- Grain yield exhibited highly significant and positive correlation with each of plant height, flag leaf area, number og =f spikes/m^2, spike length, number of spikelets/spike, kernels/spike, kernel weight/spike and 1000-kernel weight.

6- Weight of 1000 kernels and number of spikelets/spike were the most important contributing characters in the total variability of grain yield.

INTRODUCTION

Increasing wheat production is a national target in Egypt to fulfill the food security for the people. This target could be achieved by increasing wheat area in the Delta and the Valley as well as in the new reclaimed lands and by growing high yielding cultivars and developing more adequate practices.

Fertilizer Nitrogen is among the most important factors having profound effects on yield of wheat. Selection of the most appropriate nitrogen fertilization rate is a major decision affecting the profitability of wheat production and the effect of agriculture on the environment. This has been done via fitting some type of response models to the yield data collected when several rates of fertilization are applied over several environments (sites and years). These models are fitted to help in predicting economic optimum nitrogen fertilizer rate and maximum yield or either one. These decisions are more important now than ever before because using fertilizer nitrogen has greatly increased during the last decades and because there is increasing concern about environmental impacts associated with the use of this fertilizer

Yield is a very complicated variable. It is a final outcome of several components. Hence, it is necessary to determine the variables having the greatest effect on the yield and estimate their relative importance to the total yield variation. The objectives of the current study were to: 1) Investigate the response of some wheat cultivars to various levels of nitrogen application. 2) Determine the degree of the relationship between wheat grain yield and N fertilizer level. 3) Estimate the economic optimum N rate. and 4) Determine the most important contributing variables in the total variability of wheat grain yield.