Kafrelsheikh University
Faculty of Agriculture
Agronomy Department

جامعة كفر الشيخ
كلية الزراعة
قسم المحاصيل

Effect of double and triple crop sequences and mineral –bio nitrogen fertilizer on wheat productivity.

By

Dina Eed El-Moghazy El-Sherief

B.Sc. Agric. Sci. (Agronomy), Kafrelsheikh Univ., 2007.

M.Sc. Agric. Sci. (Agronomy), Kafrelsheikh Univ., 2013.

Thesis

Submitted in partial Fulfillment of the requirements for the

Degree of Doctor of Philosophy

In

Agriculture Science

Agronomy

2019

Abstract

A two-year study was conducted at Sakha Research Station, Agricultural Research Center (ARC), Kafrelsheikh Governorate, Egypt, during 2013/2014 and 2014/2015 seasons to decrease mineral nitrogen (N) inputs of wheat crop. This study included two experiments each one contained 9 treatments, which were combinations of three cropping sequences (summer crop/Egyptian clover "fahl"/wheat, summer crop/fodder maize/wheat and summer crop/fallow/wheat) and three N- fertilizer treatment for wheat (80 kg N/fed., 60 kg N/fed. + ascobien and 40 kg N/fed. + ascobien). A split plot design with three replications was used for each experiment and combined analysis was done for the two experiments in each season.

The results showed that there were clearly insignificant differences between rice and maize as a preceded summer crop on LAI, number of grains/spike, grains weight/spike, 1000-grains weight, grains yield/m^2, grains yield/fed. and HI of wheat plants in both seasons. The cropping sequence (maize or rice /Egyptian clover "fahl"/wheat) increased significantly all the studied wheat traits compared with the other copping systems in the two seasons. There were insignificant differences between application of 80 kg N/fed. and 60 kg N/fed. + ascobien for grains yield/fed. in the two seasons.

The interaction between preceding crop and cropping sequence affected significantly dry matter accumulation, flag leaf area, plant height, number of fertile tillers/m^2, number of grains/spike, grains weight/spike, 1000-grains weight and grains yield/m^2 in the two seasons. With regardless to preceding summer crop, growing clover in the transition period achieved the highest values of these traits in both seasons.

The interaction between preceding summer crop and nitrogen fertilization treatment was significant for flag leaf area, plant height, grains weight/spike, grains yield/m^2 and grains yield (ardabs/fed.) in both seasons. Regardless to preceding summer crop, adding 80 kg N/fed. achieved the highest values of these characters. On the other hand, fertilized wheat with 80 or 60 kg N/fed. +ascobien produced the optimum grain yield/m^2, grain yield (ardab/fed.), harvest index and protein content.

The interaction between crop sequence and nitrogen fertilization treatment reached significant for number of fertile spikes/m^2, spikelets number/spike and grains weight/spike in the first season, spike length, grains number/spike, 1000-grains weight, grains yield (ardabs/fed.) and protein content (%) in the second season and grains yield/m^2 in both seasons. Growing clover in the transition period and fertilized wheat by 80 or 60 kg N/fed.+ ascobien gave the highest values of these characters.

The interaction among preceding crop, crop sequence and N-fertilization treatment was significant for dry matter accumulation, flag leaf area, plant height, yield and most of its components. The optimum yield and most of its attributes , in addition to the highest protein content (%) and net return was obtained by growing Egyptian clover "fahl" during transition period between preceded maize or rice in the summer season and wheat that fertilized by 60 kg N/fed. + ascobien in the winter season under Kafrelsheikh Governorate.

Keywords: Wheat, Maize, Rice, Egyptian clover, Cropping systems, N fertilizer, Net return**.**

Contents

List of Tables:

List of figures: