

Abstract

Title:- A CHEMICAL COMPARATIVE STUDIES BETWEEN ANHYDROUS AMMONIA INJECTION, AMMONIUM SULFATE AND UREA IN SOME SOILS AND THEIR EFFECT ON THE CHEMICAL COMPOSITION OF WHEAT PLANT.

By

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Purpose:-

The current investigation aims to studying the effect of some nitrogen fertilizers (anhydrous ammonia ammonium sulfate and urea) and rates (60, 80 and 100 kg N/fed.) with and without zinc spraying on yield and chemical composition of wheat plant and soil pH under the environmental conditions of Fayoum governorate, Egypt.

Materials and Methods:-

Two field experiments were carried out in Kofor El-Nile (soil 1) and Demo (soil 2), Fayoum Governorate using wheat plant variety Sakha 93. The experiments were arranged in split-split plot design with four replicates; the area of each plot was 10.5 m³. The main treatments were the N-sources. While the sub-split treatments were N rates and sub-split-split treatments were spraying with and without zinc.

Soil samples at depth 0-30 cm were collected before planting (to be chemically and physically analyzed), after injection with anhydrous ammonia, after each irrigation and at harvesting time (to determine soil pH).

Plant samples were taken at 65 and 95 days from planting to determine the dry weight and then digested to determine N, P, K and Zn uptake. Also plant samples were taken at harvesting time to determine 1000 grain weight, 10 spikes weight and grain and straw yield then digest grain and straw to determine N, P, K and Zn uptake.

The obtained results are summarized as follow:

- 1- The highest values of the yield and N, P, K and Zn uptake at all stages of growth and protein percent of grain were obtained with anhydrous ammonia while urea treatments gave the lowest values.
- 2- The obtained yield and N, P and Zn uptake at all stages of growth and protein percent of grain were increased with increasing N-rate from 60 to 80 to 100 kg N/fed. except with anhydrous ammonia the highest grain yield and uptake were obtained with 80 kg N/fed.
- 3- At all stages of growth; K uptake was increased with increasing N-rate from 60 to 80 to 100 kg N/fed. except with anhydrous ammonia and ammonium sulfate the highest uptake of grain and straw were obtained with 80 kg N/fed.
- 4- Application of zinc significantly increases the yield and N, P, K and Zn uptake at different stages of growth and protein percent of grain.
- 5- Injection of anhydrous ammonia into the soil before sowing increased soil pH then after gradual decrease in soil pH took place.
- 6- Application of anhydrous ammonia increased soil pH values after the first irrigation then the soil pH gradually decreased till harvesting time.
- 7- Application of ammonium sulfate and urea decreased soil pH values from the first to the second to the third irrigation then the soil pH gradually increased till harvesting time. The decreasing in soil pH with ammonium sulfate was more than urea.

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