EFFECT OF SOME FERTILIZER TREATMENTS ON SOME FEATURES AND PRODUCTIVITY OF COMMON BEAN PLANTS (PHASEOLUS VULGARIS L.)

By

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Approval Sheet

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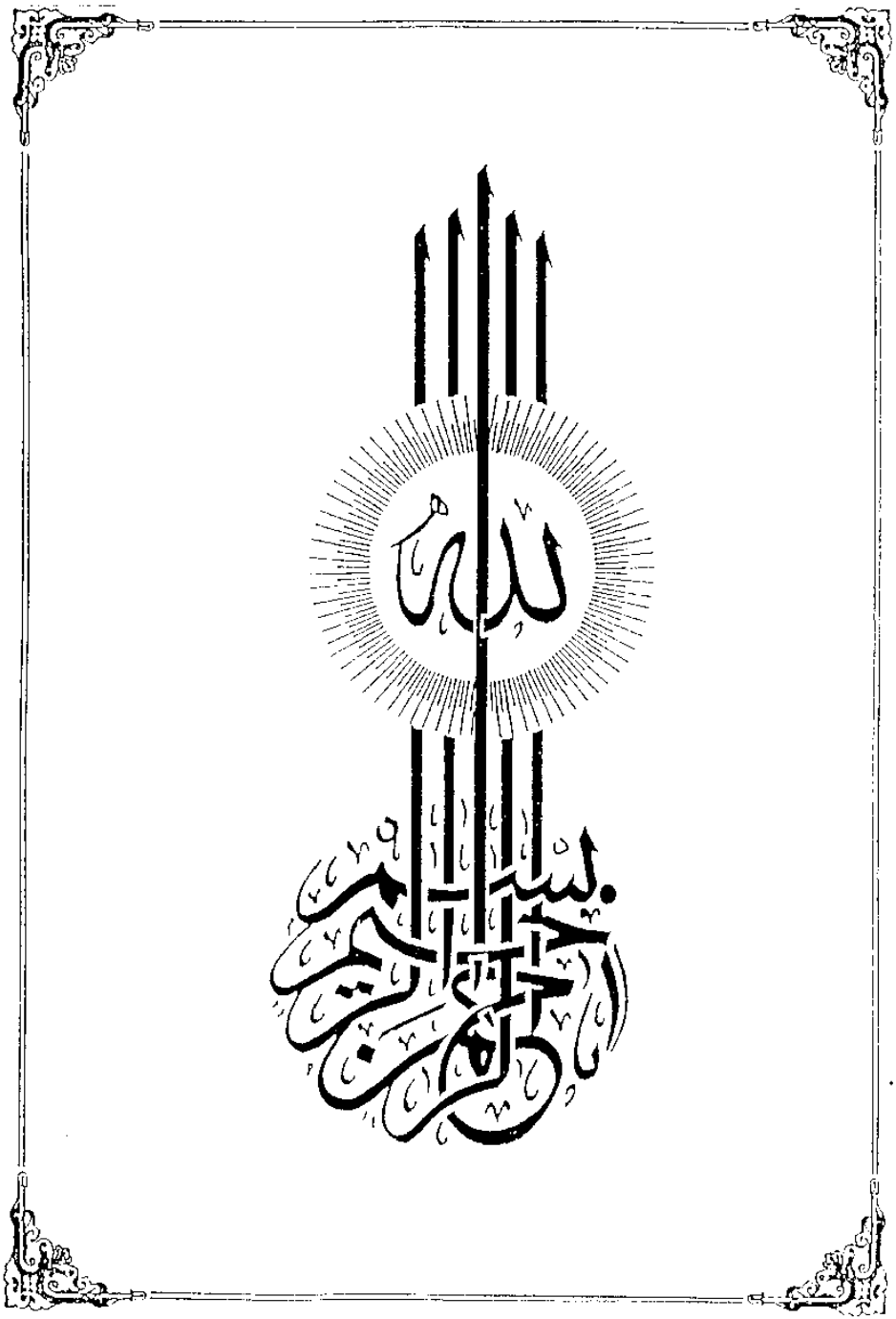

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ABSTRACT

Field experiments were carried out at Barrage Research Station during summer seasons of 1987, 1988 and 1989. This work aimed to study the influence of organic manure, source of N application,(Calcium nitrate and ammonium sulphate at a rate of 60 kg N/fed.) and the different methods of application, besides foliar spray with Zn, Mo and P was added either as folair or as soil application and inoculation with rhizobial cultures on plant growth, formation of nodules on roots, chemical composition, yield and quality of green and dry yields of common bean plants. Seeds of Giza 3 cultivar sown on 30th, 13th and 16th of March.

The results showed that chicken manure stimualted plant growth as leaves number and leaf area and increased also by all N treatments and Zn or P spray.

The nutritional status, in leaves, was affected to different extents with the tested growth factors including chicken manure, nitrogen sources and mineral nutrition.

Application of manure significant increase in the green pods as well as seed yields. Nitrogen treatments were effective for increasing the green pod and dry seed yields except for calcium nitrate added once. While mineral fertilizer treatments had slight favourable effects on the green yield. The dry seed increased by zinc sprays.

The pod characterstics and quality of seeds was affected by the different tested growth factors.

Inoculation seedlings or seeds gave the highest growth besides good nodulation. The interaction showed that the green yield increased significantly by appling the nitrogen plus inoculation.

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INTRODUCTION

Common bean, Phaseolus vulgaris, L., is among the most important vegetable crops grown in Egypt for local consumption and export as well as it provides a high protein component of the average diet.

The total cultivated area of common bean plants devoted for green pods production, in Egypt, was 26, 216 feddans, in 1989, yielded about 114, 278 tons. The total area of the dry seeds production reached 20, 268 feddan which yielded reached 20, 511 tons.

Little is known about nutrient requirements for new cultivars because the levels of nodulation and nitrogen fixation are variable and are low under our local environmental conditions. It was therefore valuable to determine the best source of nitrogen (nitrate or ammonia) and its method of application, besides the effect of foliar spraying with Zinc, molybdenum and phosphorus on growth and yield of common bean Giza 3,cultivar.

It has bean also reported that plants of Phaseolus vulgaris grown at different localities in Egypt fail to form effective nodules even after inoculation with their spesific strain. Hence, under both laboratory and field conditions.

The main objectives of this study in brief are :

1. Effect of manure, source and method of nitrogen application on growth and yield of Phaseolus vulgaris L.

2. Effect of manure and spraying with Zn, Mo and P, as well as soil phosphorus addition, on growth and yield of Phaseolus vulgaris. L.

3.a) The effect of some different Rhizobium phaseoli L. strains on some cultivars of common bean and nodulation relationship.

3.b) Response of common bean plants to inoculation and nodulation relationship under sterilized conditions.

3.c) Effect of inoculation, nitrogen, growth and yield of Phaseolus vulgaris. L.

REVIEW OF LITERATURE

1. Effect of organic manure and sources or method of application of nitrogen on growth and yield of Phaseolus vulgaris, L.

1. Plant Growth :

1.1. Manure effect :

Manure fertilizer is considered an important source of humus, macro and micro elements carier, increases the activity of the useful micro organisms and could be a source of promoting agent.

Hashimoto and Yamamoto (1973) found that farm yard manure (FYM) produced an excellent growth for soybean plants. Masuda (1976) also pointed that FYM applied to kidney beans caused a significant improvement in their plant growth. Omran et al., (1979) also found that dry matter yield of horse beans Vicia faba and barley increased with FYM application.

Araujo et al., (1982) reported that cattle manure significantly increased dry matter in Phaseolus vulgaris plants.

Ohu et al., (1984) found that organic matter incorporation increased height, leaf area index and root dry matter of bush bean plants.