

**EFFECT OF ORGANIC MANURING, PLANTING DENSITY
AND N FERTILIZATION LEVELS ON YIELD AND ITS
RELATION TO PHOTOSYNTHATE PARTITIONING
PARAMETERS OF SUNFLOWER USING DRIP
IRRIGATION SYSTEM UNDER SANDY
SOIL CONDITIONS**

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ABSTRACT: Two field experiments were conducted at an administration field in Ramsis Agriculture Farm, Abo-Hammad Distinct, Sharkia Governorate, Egypt under Agronomy Department supervision, Faculty of Agriculture, Zagazig University, during 2004 and 2005 seasons to study the effect of organic manuring (check and 3 ton compost/fad.), two planting densities (one plant/hill giving 23000 plant/fad. and two plants/hill giving 46000 plant/fad.) and four N levels (30, 60, 90 and 120 kgN/fad.) on photosynthate partitioning parameters and yield of sunflower grown under sandy soil conditions using drip irrigation system.

Data of combined analysis revealed that addition of 3 ton compost/fad. brought a significant increase in each of plant height, head diameter, head dry weight/plant, 100-seed weight, seed weight/plant, leaf area index (LAI), relative photosynthetic potential (RPP of seed and biological yields/plant), seed, straw and biological yields/fad., harvest index (H I), crop index (C I) and oil yield/fad. Whereas RPP straw, migration coefficient (MC) and seed oil content were not significantly affected by compost application.

Decreasing plant population from 46000 to 23000 plants/fad. significantly increased head diameter, head dry weight/plant, 100-seed weight, seed weight/plant, LAI, seed, straw, biological and oil yields/fad., but significantly decreased plant height, RPP seed, straw

and biological yields/plant, HI and CI. However, MC and seed oil content were not significantly affected by varying plant population according to combined analysis.

Data of combined analysis revealed that increasing N application level up to 120 kgN/fad. significantly increased each of plant height, head diameter, head dry weight/plant, 100 seed weight, seed weight/plant, LAI, RPP seed, MC, seed, straw, biological and oil yields/fad., but decreased RPP straw, HI and CI. Meantime, seed oil content responded to N addition up to 90 kgN/fad. Also, plants received 120 kgN/fad. had higher RPP-biological than those received 30 kgN/fad.

Significant interactions between the studied factors indicated that the addition of compost increased the response of sunflower to the increase of N level particularly when planted at 23000 plants/fad.

Results of the interactions between compost and planting density and between planting density and N levels recommended that sunflower should be fertilized with 3 ton compost/fad. and 120 kgN/fad. and planted by 23000 plant/fad. and this N level should be increased in the future, as the response of seed yield/fad. was linear when compost was added.

Oil yield/fad. was positively correlated with each of plant dry weight, seed yield/plant, 100-seed weight, straw yield/fad., seed yield/fad. and seed oil percentage where correlation coefficients were 0.954, 0.948, 0.932, 0.961, 0.992 and 0.625 in respective order.

Key words : Sunflower, nitrogen levels, compost, planting density.

INTRODUCTION

In Egypt, cotton seed is the main source of edible oil followed by soybean. The production from this commodity (10%) is still far below the actual needs (El-Zaher *et al.*, 2001). Sunflower may play an important role to partially

narrow the gap between actual consumption and national production of the edible oil as it has been successfully grown at widely scattered geographical areas. This wide adaptability led to the fact that sunflower can be