

Short Communication

Effect of different Levels of N-Fertilizer on Yield and Quality of Sunflower (*Helianthus annuus* L.)

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ABSTRACT

Application of nitrogen @ 100, 150 and 200 kg ha⁻¹ gave the grain yield of 16.8, 22.3, 28.7 and 35.4 q ha⁻¹ and differed statistically. Maximum number of filled seed (1024.1 per head) were found with 200 kg N ha⁻¹ compared with no fertilizer (787.4). A gradual increase in number of filled seed, oil and protein contents were obtained with successive doses of nitrogen.

Key Words: N-fertilizer; Yield; Quality; Sunflower

INTRODUCTION

In spite of high yield potential of sunflower, the average yield in Pakistan is very low. Besides other factors, optimum use of nitrogen is one of the major agronomic factors. In the field trials, Jadhav and Jadhav (1980) revealed that the application of nitrogen resulted in increased seed yield, head diameter, weight of seed per head and thousand grains weight. Similarly, Kamel *et al.* (1980) reported yield increase by 21.8, 37.9 and 55.2% with the application of 36, 72 and 108 kg N ha⁻¹. It has also been reported that oil contents were decreased but protein contents were increased by nitrogen application (Singh *et al.*, 1973). The present study was undertaken to see the effect of nitrogen on performance of sunflower, in local conditions.

MATERIALS AND METHODS

Nitrogen 0, 100, 150 and 200 kg ha⁻¹ was applied to sunflower grown on a sandy clay loam field in the field area of the Department of Botany, University of Agriculture, Faisalabad. The experiment was sown in 60 cm apart rows with 30 cm plant to plant distance following RCBD with three replications. The plot size was 7x4.8 m² and variety was Gimsun-94. A basal dose of 50 kg P₂O₅ ha⁻¹ as Single Super Phosphate was applied to all the treatments. Nitrogen as urea was applied in two doses. All the agronomic practices were kept uniform during the study. The number of seeds per head (filled and unfilled), thousand-grain weight and grain yield were recorded. The oil contents in seed were determined by Soxhlet Method and nitrogen by Kjeldahl's Method. The protein was calculated by

multiplying the nitrogen per cent with 6.25. The data were analysed statistically (Steel & Torrie, 1980).

RESULTS AND DISCUSSION

The number of filled seed increased (Table I) with increased nitrogen application, might be due to its important role during fertilization. Moreover, with

Table I. Effect of nitrogen on different growth parameters of sunflower Gimsun-94

| Nitrogen (kg/ha) | Seeds/Head | | 1000 Seed Weight (g) | Grain Yield (q/ha) | Oil (%) | Protein (%) |
|------------------|------------|----------|----------------------|--------------------|---------|-------------|
| | Filled | Unfilled | | | | |
| Control | 687.4e | 115.2 | 32.1d | 168d | 42.66e | 22.7 |
| 100 | 826.0b | 102.7b | 41.8c | 22.3c | 43.7b | 24.5 |
| 150 | 993.2a | 81.7c | 46.3b | 28.7b | 44.9b | 27.9 |
| 200 | 1024.4a | 55.3d | 51.9a | 35.4a | 46.1a | 31.5 |

Means sharing a letter common are statistically non significant

nitrogen, the metabolites translation from source to sink might be increased resulting in more filled seeds. Karami (1980) also found similar results. The plots receiving 100 kg N ha⁻¹ gave 48.8 g weight of 1000 grains, which further increased to 46.3 and 51.9 with 150 and 200 kg N ha⁻¹. These findings are in conformity with those of Jadhav and Jadhav (1980). There was gradual increase in yield with the increasing nitrogen being maximum (35.4 q ha⁻¹) with 200 kg N ha⁻¹. Increasing grain yield with nitrogen proved the idea that sunflower is responsive to nitrogen. Nitrogen @ 0, 100, 150 and 200 kg ha⁻¹ has resulted in 42, 43.7 and 44.9% oil, respectively. With 200 kg N ha⁻¹, 31.5% protein was recorded while control has 22.7%. The protein contents were found linearly increased with the application of nitrogen.

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