



Research Article

## Effect of nitrogen and manganese on yield and uptake of nutrients by oats (*Avena sativa* L.)

■ MUNNALAL, K.C. NATARAJA, B.S. KHERAWAT, BRAJENDRA AND ARVIND KUMAR

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MEMBERS OF RESEARCH FORUM :

**Corresponding author :**

**MUNNA LAL**, Central Research Institute for Dryland Agriculture, Santoshnagar, HYDERABAD (A.P.) INDIA  
Email: munnalalsingh10@gmail.com

**Co-authors :**

**B.S. KHERAWAT, BRAJENDRA AND ARVIND KUMAR**,  
Department of Agricultural Chemistry and Soil Science, R.B.S. College Bichpuri, AGRA (U.P.) INDIA

**K.C. NATARAJA**, Central Research Institute for Dryland Agriculture, Santoshnagar, HYDERABAD (A.P.) INDIA

### Summary

A pot experiment was conducted during *Rabi* season of 2000 - 2001 at Agra Agricultural College to study the effect of nitrogen and manganese on yield and uptake of nutrients by oat (*Avena sativa* L.) common oats. The soil was loamy sand having pH 8.2, EC 0.15 dsm<sup>-1</sup>, Available N 209.6 Kg ha<sup>-1</sup>, available P 14.0 Kg ha<sup>-1</sup>, available K 130.6 Kg ha<sup>-1</sup> and available manganese 3.25 mg kg ha<sup>-1</sup> the design of the experiment is Randomized Block design, the treatments consisted of the four levels of nitrogen (0, 40, 80, 120 kg ha<sup>-1</sup>) and four levels of manganese (0, 2.5, 5.0, and 10 mg kg<sup>-1</sup>). The levels of nitrogen influences the green foliage, dry matter yield, nutrients content and their uptake by oat crop and increased significantly with N<sub>1</sub> @ 40 kg ha<sup>-1</sup>, N<sub>2</sub> @ 80 kg ha<sup>-1</sup> and N<sub>3</sub> @ 120 kg ha<sup>-1</sup> levels of nitrogen as compared to control during both the cuttings. The levels of manganese also affected significantly the green foliage, dry matter production and nutrients composition of oat crop in both the cuttings. The maximum green foliage, dry matter production, nutrients content and their uptake by oat crop were maximum at 10 mg kg<sup>-1</sup> of Manganese over control. However the Nitrogen @ 120 kg<sup>-1</sup> and manganese @ 10 mg kg<sup>-1</sup> provided significantly higher green foliage and dry matter yield of oats over rest of the treatments.

**Key words :** Oat, Nitrogen, Manganese

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## Introduction

Oats (*Avena sativa* L.) is an important fodder crop in north india, which is fertilised by nitrogen to realize the maximum green fodder production and nitrogen is an essential element particularly in the early stages of fodder oats. Nitrogen being a primary nutrient element absorbed by oats crop in larger amounts and is the most limiting factor for affecting crop production. Manganese, one of the essential micronutrients is involved in respiratory process such as oxidation of carbohydrates to carbon dioxide and water, manganese also participates in the metabolism of nitrogen. It activates the enzymes, which are directly involved in the synthesis of chlorophyll. Forage oats can be fed either green or as silage. Oats is high in protein, fat, vitamin B<sub>1</sub> and the minerals such as phosphorus and iron. And provides very nutritious foliage, Hence, the present pot study was, therefore

designed to evaluate the performance of oats under different levels of nitrogen and manganese.

## Resources and Research Methods

A pot experiment was conducted on a sandy loam soil having pH 8.2, EC 0.15 dSm<sup>-1</sup>, available nitrogen 209.6 kg<sup>-1</sup>, available P 14.0 kg<sup>-1</sup>, and available K 130.6 kg<sup>-1</sup> and Mn 3.25 mgkg<sup>-1</sup>. The four levels of nitrogen (0, 40, 80, 120 kg<sup>-1</sup>) and four levels of manganese (0, 2.5, 5.0, and 10 mg kg<sup>-1</sup>) were evaluated in Randomized Block Design with three replications. The sowing of the fodder oats was done on 2<sup>nd</sup> December 2000 with the variety name *Kent*. The basal dose of manganese and nitrogen was applied as manganese chloride and urea at the time of sowing. The recommended doses of phosphorus (40 kg<sup>-1</sup>) and potash (40 kg<sup>-1</sup>) were supplied through single super phosphate and muriate of potash, respectively. The