

Research Article

## Effect of nitrogen and sulphur on quality characteristics and accumulation of some fatty acids in mustard seeds grown under loamy sand soil of North Gujarat

■ J. K. PARMAR AND R.M. PARMAR

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MEMBERS OF RESEARCH FORUM :

**Corresponding author :**

**J.K. PARMAR**, Department of Agricultural Chemistry and Soil Science, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

**Co-authors :**

**R.M. PARMAR**, Department of Agricultural Chemistry and Soil Science, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

**Summary**

A field experiment was conducted to study the response of mustard to nitrogen and sulphur application under loamy sand soil of north Gujarat. Three levels each of N (50, 75 and 100 kg N ha<sup>-1</sup>) and four levels of S (control, 15, 30 and 45 kg S ha<sup>-1</sup>) were tried. Application of nitrogen and sulphur at the rate of 100 kg N ha<sup>-1</sup> and 45 kg ha<sup>-1</sup> significantly increased protein content, chlorophyll 'a', 'b' and total chlorophyll content over rest of level, respectively. Whereas, the effect of nitrogen was non-significant in case of oil content in mustard seed but the application of 40 kg S ha<sup>-1</sup> had significantly increased oil content in mustard seed. The results also revealed that the increasing in levels of nitrogen caused a significant decrease in palmitic, stearic, linolenic and erucic content of oil and its significantly highest value were noted under the lowest level of nitrogen (50 kg N ha<sup>-1</sup>). However, the application of nitrogen at the rate of 100 kg ha<sup>-1</sup> significantly increased oleic and linoleic acid content. Among the different levels of S, application of sulphur at the rate of 45 kg ha<sup>-1</sup> significantly increased palmitic, stearic, oleic and linoleic acid content. Similarly, increasing levels of sulphur caused a significant decrease in linolenic and erucic acid contents. The interaction effects showed that application of 100 kg N ha<sup>-1</sup> and 45 kg S ha<sup>-1</sup> significantly increased chlorophyll 'a', 'b' and total chlorophyll; oleic and linoleic acid over rest of treatment combination. Where as, the interaction effect of N x S was non-significant in respect to oil content; stearic acid, oleic and linolenic acid content of oil.

**Key words :** Chlorophyll, Fatty acids, Mustard, Nitrogen, Sulphur

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## Introduction

Sulphur is the fourth major nutrient in crop production. Most of the crops require as much sulphur as phosphorus. The nitrogen and sulphur requirements of crops are closely related because both nutrients are required for protein synthesis. Sulphur also plays an important role in the chemical composition of seed. Sulphur increases the percentage of oil content of the seed (Chaudhary *et al.*, 1992), glucosinolate content and erucic acid (Bergmann, 1992). Although variation in erucic acid content is low due to interactions between S and N, the influence of S on fatty acid synthesis should always be considered along with the N supply. In this context, Zhao *et al.* (1997) found a

strong interaction between N supply and the proportion of the seed S. Sulphur is involved in the synthesis of chlorophyll and is also required in cruciferae for the synthesis of volatile oil (Bergmann, 1992). Major element nitrogen is required for proper growth and development of crop. Main function of nitrogen is synthesis of protein, metabolism of carbohydrates, synthesis of fatty acid etc.

The nitrogen and sulphur are main nutrient which determine the chlorophyll content and different fatty acid content of mustard oil, therefore the study was undertaken for the evaluation the effect of nitrogen and sulphur on chlorophyll and oil content of mustard oil.