

## Effect of different sources of iron and sulphur on nutrient concentration and uptake by groundnut

A.L. Singh, Y.C. Joshi & Vidya Chaudhari

National Research Centre for Groundnut, Timbawadi, Junagadh-362 015, Gujarat, India

Received 4 August 1989; accepted in revised form 14 May 1990

**Key words:** Calcareous soil, excess water, groundnut (*Arachis hypogaea* L.), iron, lime, macro nutrients concentration and uptake, sulphur, zinc

### Abstract

The pot experiment showed that application of lime (20% CaCO<sub>3</sub>) and excess irrigation (watering at -0.3 bar) increased Ca and decreased N, P, K and Mg concentration of leaf and stem and their uptake by groundnut. The application of agricultural grade iron sulphate, zinc sulphate, iron pyrite, gypsum, phosphogypsum and elemental sulphur in the soil and iron sulphate, zinc sulphate and Fe-EDTA on the foliage increased the N, P, K and Mg concentration of leaf and stem and their uptake by groundnut. The gypsum and phosphogypsum was also found to increase the calcium concentration of leaf and stem and its uptake by groundnut. The study suggested that soil application of iron sulphate, iron pyrite, zinc sulphate, gypsum, phosphogypsum and elemental sulphur in the calcareous soil increased the availability of most of the macro nutrients causing their absorption by groundnut plant.

### Introduction

Groundnut is one of the most important oilseed crop which suffer from chlorosis caused by iron and sulphur deficiencies due to presence of high calcium carbonate and moisture in the soil and irrigation of crop with water relatively high in bicarbonates [5, 10, 11, 12, 13]. For healthy growth plant need a continuous supply of these nutrients during their growth. Though the soil has enough of iron and sulphur, plants are not able to take it because of induced non-availabilities of these elements due to some factors at the time of their requirement. The studies of lime and excess moisture inducing chlorosis in plants have identified the importance of relationship between free CaCO<sub>3</sub>, HCO<sub>3</sub><sup>-</sup>, pH, O<sub>2</sub> and CO<sub>2</sub> in soil system [3, 7] and chlorosis of leaves and established that effective control of chlorosis must involve the use of nutrient efficient cul-

tivars and effective acid based iron and sulphur fertilizers [9, 14, 16]. In a previous paper [15] it has been concluded that chlorosis of groundnut due to excess moisture and lime application can be corrected by the application of iron, zinc and sulphur containing fertilizers. These fertilizers decrease chlorosis by increasing the uptake of Fe, Zn and S by groundnut plant. In this paper the effect of these iron and sulphur containing fertilizers on the concentration and uptake of different macronutrients by groundnut plant is reported.

### Materials and methods

#### Soil and experimentation

The pot experiment was conducted at the National Research Centre for Groundnut,