

Effect of multi-micronutrient mixture on yield and uptake of micronutrients by wheat (*Triticum aestivum* L.) grown on sandy loam soils of North Gujarat

K.P. PATEL, A.K. PATEL, A.M. PATEL, K.C. PATEL AND V.P. RAMANI

See end of the article for authors' affiliations

Correspondence to :
K.P. PATEL
 Micronutrient Project (ICAR)
 Anand Agricultural
 University,
 ANAND (GUJARAT) INDIA

Accepted : March, 2008

ABSTRACT

A field experiment was conducted on sandy loam soil of North Gujarat region deficient in Fe and marginal in Zn status at Main Wheat Research Station, SDAU, Vijapur (Dist. Mehsana) of north Gujarat agroclimatic zone - IV (AES -I) to study the efficacy of multi-micronutrient mixture in improving crop production of wheat. The higher grain and straw yield as well as yield attributes of wheat were recorded with the soil application of 15 kg FeSO₄ + 8 kg ZnSO₄ per ha. Also, the foliar application of 1.0 % micronutrient mixture (grade for Fe and Zn deficiency) having concentration of Fe- 4.0%, Mn-1.0%, Zn-6.0%, Cu-0.5% and B-0.5% at 30, 40 and 50 days after sowing recorded higher yield as well as micronutrient uptake by wheat.

Key words : Multimicronutrient mixture, Wheat, Yield.

The Zn and Fe deficiency is one of the most frequently encountered micronutrient deficiencies in wheat (*Triticum aestivum*, L). Continuous use of high analysis fertilizers under intensified cropping, and neglect of organic manures manifest the occurrence of wide spread Zn and Fe deficiency. Consequently, alongwith N, P and K, the wide spread deficiencies of micronutrients are frequently reported in soils of India (Singh, 2006) and in soils of Gujarat (Patel *et al.*, 1998). Reports also indicate that Zn and Fe deficiency causes considerable loss in yield of wheat. Widely prevalent Zn and Fe deficiency warrants the need for research on Zn and Fe especially on their usage individually and in mixtures as foliar / soil application. Hence, the present investigation was undertaken to study the effect of different multi-micronutrient mixture grades on growth and yield of wheat.

MATERIALS AND METHODS

A field experiment was conducted at Main Wheat Research Station, SDAU, Vijapur (Dist. Mehsana) during 2000-2002 for studying the efficacy of multi-micronutrient mixture in improving yield of wheat (*Triticum aestivum* L.) (cv. GW 273). The treatments comprised of multimicronutrient mixtures *viz.*, T₁- Control (only NPK); Foliar spray treatments: T₂ - mixture Grade-I (General); T₃ - Grade-II (For Zn deficiency); T₄ - Grade-III (For Fe deficiency); T₅ - Grade-IV (For Zn and Fe deficiency), soil application treatment: T₆ - mixture Grade-V (Soil application) and T₇-Soil application of micronutrients as

Sr. No.	Multimicronutrient mixture grades	Content (%)				
		Fe	Mn	Zn	Cu	B
For foliar spray						
1.	Mixture Grade I (General) : LF-I	2.0	0.5	4.0	0.3	0.5
2.	Mixture Grade II (for Zn deficiency): LF-II	2.0	0.5	8.0	0.5	0.5
3.	Mixture Grade III (for Fe deficiency): LF-III	6.0	1.0	4.0	0.3	0.5
4.	Mixture Grade IV (for Zn & Fe defi.): LF-IV For Soil application	4.0	1.0	6.0	0.5	0.5
5.	Mixture Grade V (Soil application): LF-V	2.0	0.5	5.0	0.2	0.5

per Soil Test Value (STV). The multimicronutrient mixture grades having composition shown as under were prepared in the laboratory. The mixture grades were prepared for supplementation of the micronutrients on the basis of average removal by crops (Grades I and V) and for the areas of Zn or Fe or Zn and Fe deficiencies in soils of Gujarat (Grade II, III and IV, respectively), keeping in view the balanced ratio of micronutrients in the mixture.

The rate of application of T₂, T₃, T₄ and T₅ - Foliar spray was kept @ 1% at 30, 40 and 50 DAS (Days After Sowing). The rate of soil application for T₆ was @ 20 kg/ha and for T₇ (STV) - ZnSO₄ @ 8 kg/ha + FeSO₄ @ 15 kg/ha.

The treatments were replicated four times in randomized block design. The soil of the experimental field was sandy loam in texture and had pH - 7.9, EC_{2.5} - 0.22 dS m⁻¹, Organic Carbon - 0.28 g kg⁻¹, available P₂O₅ - 47.5 kg ha⁻¹, available K₂O - 290 kg ha⁻¹, Fe - 3.66 mg