

DIAGNOSTIC CRITERIA FOR FERTILIZING IRRIGATED POTATOES ON  
ENTISOLS UNDER ARID CLIMATE OF OMAN

Rahmatullah<sup>1</sup>

**ABSTRACT**

Soil, water and plant leaf samples were collected for irrigated potatoes growing on 21 farms in Barka area. Soils on all the farms belonged to Entisols except one Aridisols. The soils were coarse textured, alkaline in reaction, highly calcareous and were saline ( $EC > 4$  dS/m) on 48% of the farms. Exceptionally low organic matter in all samples revealed a universal deficiency of N on these soils. Both available P and available K were deficient in 90% of the samples. Boron, Fe and Cu were adequate in all the samples. But there was a widespread Zn and Mn deficiency. Zinc was  $< 0.8$  mg/kg in 76% of the samples and Mn was  $< 1$  mg/kg in 81% of the samples.

Macronutrients N, P and K were deficient in 43, 10 and 14% of the plant tissue samples, respectively. Magnesium was deficient in 5% of the samples. Micronutrients Zn, Cu and Fe were sufficient in all plant tissue samples. Boron was deficient in 53% of the samples. A widespread Mn deficiency in 86% of the samples was related to necrotic spots on plant leaves. Adequate levels calculated by modified Mitscherlich equation for plant were 25 mg P/kg soil and 180 mg K/kg soil. Each for Zn and Cu it was 1 mg/kg. While it was 2 mg/kg for Mn and 8 mg/kg for Fe.

Recently agriculture in the Batinah Coastal Plains of Oman has been developed vigorously and is contributing 60% of the agricultural production of the country. The Batinah region occupying an area of 12500 sq. km. is 3.98% of the total area of Oman. The average yield of potatoes was about 26 t ha<sup>-1</sup> from 164 ha in Batinah during 1991 (MAF, 1993b). Potatoes in Batinah are cultivated during winter when the mean temperature is 15 to 24° C. But due to scanty unpredictable annual precipitation of 76 - 100 mm potatoes are grown by artificial irrigation on coarse textured, alkaline calcareous soils belonging either to Entisols, Aridisols or Inceptisols predominantly found in Oman (MAF., 1993a). Application of chemical fertilizers is almost indispensable on these soils for economical crop production. Potato is a high yielding crop requiring ample amount of nutrients in a short period of time. For fertilizer recommendations to local communities we mostly have to rely upon interpretative guidelines for soil test results developed for potatoes grown on different type of soils under temperate climate. We initiated a preliminary study to survey farmer's fields