Potassium Nutrition of Cassava

R.H. HOWELER
Centro Internacional de Agricultura Tropical
Cali, Colombia

Cassava (Manihot esculenta Crantz) is the most important root crop and the fourth most important source of food calories in the tropics (Cock, 1982). It is also potentially one of the most efficient producers of calories (De Vries et al., 1967). Nestel (1973) has estimated that it is a basic food source for more than 300 million people in the tropics. Since 75% of the population of the developing tropical countries suffers from calorie deficiency (Anon., 1976), cassava is an important food crop to relieve this deficit.

Apart from its use as a human food, cassava is also grown as an energy source for animal feed, especially for chickens (Gallus domesticus) and pigs (Sus domesticus). This market is expected to increase rapidly as more tropical countries try to substitute imported grains with locally grown cassava. Furthermore, cassava has important uses for starch and alcohol production, the latter especially in Brazil where the government is stimulating the use of alcohol as an automotive fuel.

Cassava belongs to the family of Euphorbiaceae. It grows from planted stem cuttings into a 1- to 3-m tall bush, the thickened roots of which are generally harvested after 8 to 18 months. In 1980, world cassava production was estimated at 118 million tons, with 38% in Africa, 35% in Asia, and 27% in South America (Cock, 1982).1 By far the largest producer is Brazil, with 25 to 30 million tons yr⁻¹. The average world yield is about 8.7 tons of fresh roots ha⁻¹ (equivalent to 3 to 3.5 tons of grain ha⁻¹), which is far below the potential yield of 80 tons ha⁻¹ produced under experimental conditions. The large gap between actual and potential yield is due to the unfavorable conditions under which this crop is generally grown. It is largely produced by subsistence farmers without any inputs of fertilizers, pesticides, etc. It is usually grown on small plots, on extremely acid and infertile soils, on steep and often eroded slopes, and in areas with prolonged dry seasons without irrigation. Under these adverse conditions, cassava still produces several tons of dry matter yearly, whereas most of the more demanding food crops would not produce at all. Most of the soils currently used for cassava are Oxisols or Ultisols (Tan & Bertrand, 1972), which are generally low in both total and available K⁺. Although the plant produces reasonably good yields under these conditions, due to certain adaptation mechanisms to a low K supply (Spear et al., 1978a), the production of high and stable yields is possible only on soils well supplied with K or with adequate K fertilization.

1Ton throughout the chapter refers to metric ton, or tonne.