

Importance of Potassium in Cassava

Cassava is grown in Africa, Asia, and the Americas. In 2014, four Southeast Asian countries were among the top ten producing countries in the world (Table 1). In cassava, potassium stimulates net photosynthetic activity of a given leaf area and increases the translocation of photosynthates to the tuberous roots (Howeler, 2011). Many studies have shown that improving K nutrition of low inherent soil fertility can significantly increase cassava root yield (Sogbedji *et al.*, 2015; Umeh *et al.*, 2015; Taufiq *et al.*, 2013; Ukaoama and Ogbonnaya, 2013; Uwah *et al.*, 2013; Boateng and Boadi, 2010; Olaleye *et al.*, 2007; Wilson and Ovid, 1994). Among cassava cultivars, genetic diversity exists in response to low-K soils as well as to K fertilization. Nevertheless, even cultivars that tolerate low-K soils still respond reasonably to K application. Studies also indicate that K nutrition can improve starch content of cassava (Taufiq *et al.*, 2013; John *et al.*, 2013) and reduce its cyanide content (El-Sharkawy & Cadavid, 2000; John *et al.*, 2013). As root cyanide decreases with higher levels of K, application of K fertilizer to low-K soils will help minimize health hazards, particularly when fresh cassava is used for human consumption.

Cassava exports more than 60% of the total K uptake through the harvested roots, thus depleting soil K (El-Sharkawy & Cadavid, 2000). Byju and colleagues (2012) estimated that a cassava crop will need a total uptake of 15.6 kg K to produce one ton of dry root yield, or about 5.6 kg K to produce one ton of fresh root yield. Long-term experiments in Asia have shown that K deficiency usually becomes the main limiting factor when cassava is grown continuously on the same soil without adequate K fertilization (Howeler, 2011).

Potassium deficiency in cassava is generally found in tropical soils with low activity clay such as in Oxisols, Ultisols and Inceptisols, as well as in Alfisols derived from sandstone (Howeler, 2011). Most light-textured soils have low K reserves, which are rapidly depleted after one or more cassava harvests.

Table 1: Top ten producers of cassava in the world in 2014 (FAO, 2016).

| Rank | Region | Country | Production ('000 tons) | Area harvested ('000 ha) |
|------|----------|------------------------------|------------------------|--------------------------|
| 1 | Africa | Nigeria | 54832 | 7102 |
| 2 | Asia | Thailand | 30022 | 1349 |
| 3 | Asia | Indonesia | 23436 | 1003 |
| 4 | Americas | Brazil | 23242 | 1568 |
| 5 | Africa | Democratic Republic of Congo | 16609 | 2056 |

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|----|--------|----------|-------|-----|
| 6 | Africa | Ghana | 16524 | 889 |
| 7 | Asia | Viet Nam | 10210 | 553 |
| 8 | Asia | Cambodia | 8835 | 360 |
| 9 | Asia | India | 8139 | 228 |
| 10 | Africa | Angola | 7639 | 756 |

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