

Chapter 1

Production and utilisation of sweet potato

1.1 General introduction to the sweet potato crop

Sweet potato (*Ipomoea batatas* Lam.), belonging to the family Convolvulaceae, originated in Central and South America (Steinbauer and Kushman, 1971; Yen, 1982; Thurston, 1984; Otterdijk, 1999). Sweet potato ranks as the world's seventh most important crop and the third most important tuber crop in sub-Saharan Africa after cassava (*Manihot esculenta* Crantz) and yam (*Dioscorea* spp. L.) (Karyeija *et al.*, 1998; Minde *et al.*, 1999; Anonymous, 2002a).

The spread of this crop has been very extensive and is now grown in tropical, subtropical and warmer temperate areas throughout the world (Steinbauer and Kushman, 1971). In Tanzania, Malawi, Mozambique, Zambia and Angola, sweet potato is an important food crop (Moyo *et al.*, 1999). Uganda is the largest African producer and the third largest producer in the whole world, growing approximately 2.2 million metric tones (Karyeija *et al.*, 1998). Nearly 90% of the total African output comes from eastern and southern Africa (Ewell and Mutuura, 1991; Kanju, 2000; Karyeija *et al.*, 2000). The crop was introduced into South Africa from Brazil shortly after the Dutch colonised the Cape in 1652 (Mynhardt and Joubert, 1982; du Plooy, 1986) and today it is grown virtually in all provinces (Laurie *et al.*, 1999; 2000). From these introductions, a few traditional cultivars such as Borrie and Six Months White originated (du Plooy, 1986). The crop is now grown by both small scale and commercial farmers with the main production areas being Limpopo, Mpumalanga, Western Cape, Eastern Cape, Kwazulu Natal and Free State Provinces of South Africa (Laurie, 1996; van der Mescht *et al.*, 1997). According to the official figures, the commercial sweet potato production is smaller than other vegetable crops (Thompson *et al.*, 1999). The average annual output of sweet potato storage roots for the 10 years from 1985/1986 to 1994/1995, was 58 000 tons (van der Mescht *et al.*, 1997; Thompson *et al.*, 1999). The commercial production has

stabilised around 60 000 tons per annum for the past decade and the crop is very popular amongst resource poor farmers. The contribution of this sector is estimated much higher than the figures indicate and is even produced partly for export (Thompson *et al.*, 1999; Minde *et al.*, 1999; Laurie *et al.*, 2000). According to the Directorate Agricultural Statistics of National Department of Agriculture (Anonymous, 2002b), 51 000 (1999/2000) and 53 000 tons (2000/2001) of sweet potato was produced commercially for export.

The crop is widely grown on small scale, primarily to help ensure the food security and as a cash crop of the rural household mostly in parts of central, eastern and southern Africa and it has been used for human consumption for many years (Steinbauer and Kushman, 1971; Scott *et al.*, 2000). Sweet potato is reliable by providing food on marginal and degraded soil with little labour and few or no inputs from outside the farm (Steinbauer and Kushman, 1971; Karyeija *et al.*, 1998; Anonymous, 2002a). It has received less research attention compared to other tropical food and cash crops (Kanju *et al.*, 2000; Scott *et al.*, 2000). According to the FAO's statistics for 1990-1998 over 6.2 million metric tons of sweet potato were harvested from 1.3 million ha in the sub-Saharan Africa (FAO, 1998), with the estimations that by the year 2020, sweet potato production will be 9.4 million metric tons (Scott *et al.*, 2000).

Over 70% of global root and tuber production is produced in developing countries and this includes 87% of sweet potato, 99% of yam and 100% of cassava (Kanju, 2000; Scott *et al.*, 2000). Internationally, 90% of sweet potato is grown in Asia with the major producing countries being China (harvesting 80% of global sweet potato production), Indonesia, India, Japan, Vietnam, the Philippines and the Republic of Korea (Kanju, 2000; Scott *et al.*, 2000). In rural Zambia, 71% of farmers also grow sweet potato (Kanju, 2000).

Root and tuber crops such as cassava and sweet potato produce large quantities of starch (edible energy) in relatively less time than other crops (Scott *et al.*, 2000).

The crop is efficient in the production of carbohydrates, protein, vitamins and cash income per unit of land and time (Steinbauer and Kushman, 1971; Ewell and Mutuura, 1991). Sweet potatoes traditionally grown in sub-Saharan Africa are white-fleshed varieties, which contain little or no beta-carotene (a precursor of vitamin A) (Anonymous, 2002c). Sweet potato varieties with high beta-carotene content (orange-fleshed ones) represent the least expensive source of dietary vitamins. Vitamin A deficiency in sub-Saharan Africa is a serious public health problem in central, eastern and southern Africa affecting young children (6 months to 6 years of age) and pregnant women (Ewell and Mutuura, 1991; Carey *et al.*, 1999; Simwambana *et al.*, 1999; Owour, 2000; Anonymous, 2002c). Eyes are adversely affected due to vitamin A deficiency causing a disease called xerophthalmia (Ewell and Mutuura, 1991; Carey *et al.*, 1999; Simwambana *et al.*, 1999; Owour, 2000). Sweet potatoes also provide vitamin C (ascorbic acid, 35mg/100gfw) whereas other cereal-based foods have none (Ewell and Mutuura, 1991).

The leaves are also a source of protein, containing 2.7-3.4g/100g of raw fresh leaves and are an important vegetable for most rural households in Malawi and other African countries (Ewell and Mutuura, 1991; Moyo *et al.*, 1999; Kanju, 2000) and are also used for animal feed (Steinbauer and Kushman, 1971). They also provide dietary fibre and contain significant amounts of several additional vitamins (thiamine, riboflavin, niacin, pyridoxine, pantothenic acid, folic acid and tocopherol) and the minerals calcium, potassium, phosphorus, magnesium, iron and sodium (Kanju, 2000; Steinbauer and Kushman, 1971; Simwambana *et al.*, 1999). Together with potatoes, sweet potatoes contain an important amino acid, lysine, and are a source of energy (Kanju, 2000; Scott *et al.*, 2000).

Together with cassava, sweet potato is an important food crop with the advantage that it is tolerant to drought, has low demand for nutrients and is capable of providing reasonable yields in seasons where other crops would fail (Minde *et al.*, 1999). Another advantage is that it can be harvested piecemeal to provide daily

fresh food for the family (Karyeija *et al.*, 1998). The major problem of growing sweet potato is shortage of planting material, pests and diseases, in particular virus diseases (Moyo *et al.*, 1999).

1.2 References

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