

Orange-fleshed sweet potato dissemination process in the Gourma Province (Burkina Faso)

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Sweet potato (*Ipomoea batatas*) is a plant with a high ecological adjustment capacity. Its water requirements are around 600 mm/120 to 210 days cycle at a temperature ranging between 25 and 35 °C. There are a large number of sweet potato cultivars worldwide. The white-fleshed cultivar is the most widely grown in Burkina Faso, as in most West African countries (1). Only orange-fleshed varieties have a high content of pro-vitamin A carotenoids.

Vitamin A deficiency is quite common in Burkina Faso. A survey conducted in the rural Sanmatenga Province has revealed low serum retinol levels (below 0.70 µmol/l) among 85% of children aged 12–36 months and 64% of

their mothers (2). Similarly, the 2003 Health and Demography Survey showed a 7% national prevalence of night-blindness during their latest pregnancy among mothers of under-fives (3). It is in such a context that HKI and UNICEF have jointly implemented a school and community based gardening project in 20 villages in the Gourma Province (Eastern Region), one of the poorest provinces in the country. This project includes the introduction and dissemination of sweet potato cultivation as a component in the fight against vitamin A deficiency. This document gives an account of the various stages in the implementation of the project.

Identification of varieties to be extended

Primary varieties selected for experimentation

The pilot site of HKI Niamey has provided seed for seven varieties of orange-fleshed sweet potato from Kenya (locally called *Narumintang*, *Caromex*, *Jewel*, *Taining 64*, *Karma*, *CN 1442-59* and *Ming Shu*) for testing at the Fada experimental site. Two other cultivars from Burkina Faso (locally called *Lantaogo BF* and *Lantaogo 2*) were also tested. The experimentation aimed at identifying high yield cultivars with a high carotenoid content that can adjust to environmental conditions so as to make them available to populations.

Table 1. Mean content of β -carotene (BC) and other carotenoids (CAR) in various cultivars (in $\mu\text{g}/100\text{g}$ of edible parts). Yield in tons/ha, Fada, 2002

Varieties	BC	CAR	Yield
Narumintang (O)	2348	208	2
Caromex (O)	2045	286	18
Jewel (O)	1911	199	22
Taining 64 (Oy)	774	31	27
Karma (Oy)	429	130	25
Lantaogo Bf	170	83	
Cn 1442-59 (Oy)	95	27	27
Lantaogo 2	38	3	
Ming Shu (Ly)	7	33	25

Color of the flesh: O=orange, Oy=orange yellow, Ly=light yellow.



Vitamin A activity of primary varieties

Following the first crop, samples of tubers of the various cultivars were taken and analyzed at the analytical chemistry laboratory of the University of Ouagadougou (4). The carotenoid content of the various cultivars recorded in Table 1 was determined by high performance liquid chromatography (HPLC). Analyses revealed that in some varieties, such as *Caromex* and *Karma*, there are major variations among tubers and even among the various parts in the same tuber. Regarding uniformity of carotenoid content, *Narumintang* and *Jewel* have the best performances.

Yield study

Following seed production for all the varieties in the pilot garden, each of the 16 project schools was given two varieties to conduct adaptability tests and yield assessment prior to school closure for vacation. Depending on circumstances, the potato fields were established within the school garden or on other more appropriate locations selected in collaboration with schools' parents' associations. Cropping time was announced ahead of time by project coordination to ensure yield assessment (Table 1).

No yield assessment was conducted on the two local varieties because of a severe pest attack.

Varieties selected for promotion

The varieties *Jewel*, *Taining 64* and *Caromex* were selected for promotion based on an indicator combining yield and the content and heterogeneity of carotenoids. After three years of promotion, the *Taining 64*, *Jewel* and *Caromex* varieties represented 53%, 36% and 11% respectively of orange-fleshed sweet potato production at the 2004/2005 cropping season (5).

Variety dissemination strategy

The *Fada* experimental site is one of the several channels used in the dissemination strategy for orange-fleshed sweet potato. The experimental site was established on a plot offered by the Fada N'Gourma local authority and located by the side of a permanent lake. It was the first seed production site for the three selected varieties. Cuttings were made available to schools, women's associations, farmers and secondary sites.

Schools and women's associations were involved to test variety

adaptability in real conditions in various locations, to assess yield and taste acceptance by beneficiaries (schoolchildren, teachers and the population at large). Later on, schools and experimental farms on secondary sites became sweet potato cutting / seed multiplication and dissemination points targeting the rest of the village community.

In order to carry out extensive promotion of orange-fleshed sweet potatoes, strategic sites for the usual mass production of white-fleshed sweet potato were identified by agriculture extension workers. Producers from these sites, called innova-



tion farmers, were supervised to produce seeds in nurseries and to popularize plant material among producers.

Agriculture extension agents and the project coordinator were in charge of close monitoring. This integrated monitoring aims at ensuring a more extensive integration of orange-fleshed sweet potato into the market gardening system of Eastern Burkina village communities.

Production and consumption


Taining 64 and *Jewel* are the most frequently grown varieties. Totally unknown in the project area in 2000/2001, their production has been constantly increasing since 2002 (Figure 1).

All the varieties grown are boiled, fried or broiled before eating. Broiled sweet potato seems to be the main form of consumption among schoolchildren. A survey conducted in six project villages during the harvesting period and involving 342 adult respondents showed that women eat sweet potato more frequently than men, for whom it tends to be complementary to family food. Sweet potato is available on the market between October and December at a relatively low cost.

Conclusion

Orange-fleshed sweet potato is a crop that deserves special attention in market gardening development strategies in Burkina Faso. Indeed, its promotion would contribute towards improving food security by bridging the gap between two cropping seasons or when cereal harvests are poor, and by bringing more diversity into the diet. Orange-fleshed sweet potato offers the advantage of a high level of vitamin A activity compared to the white-fleshed variety. Besides its rich nutritional



value, sweet potato is easy to grow and can adjust itself to soil with poor fertility (6). Its good level of drought tolerance and fairly good yields are strong arguments to support its extension in arid ecosystems like the one prevailing in the Gourma Province. The experimental approach adopted in this project enabled village communities to have a set of three selected varieties of orange-fleshed sweet potato (*Jewel*, *Taining 64* and *Caromex*). These three varieties are increasingly becoming an important seasonal source of provitamin A in Eastern Burkina Faso. Their promotion in other regions affected by food insecurity is strongly recommended. 

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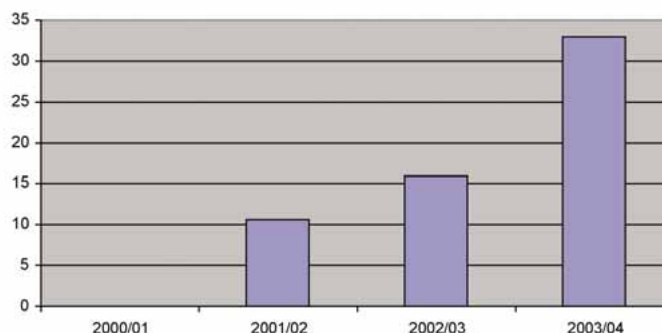


Figure 1. Orange-fleshed sweet potato production (in tons) in the Gourma Province