



"VitA Burkina"

Improving vitamin A intakes of women and children through production and consumption of orange-fleshed sweetpotatoes in Burkina Faso

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ABSTRACT

In Burkina Faso, vitamin A deficiency is a public health issue. To remedy this situation, various strategies to control the vitamin deficiency were undertaken, including the promotion of the production of vitamin A rich foods. The production of orange-fleshed sweet potatoes (OFSP) is a strategy with an extremely interesting potential. The production of OFSP remains however limited in Burkina Faso and its low content of dry matter has a considerable impact on its acceptability.

VitA Burkina project, thus aims at increasing the production and consumption of OFSP by the introduction and promotion of OFSP varieties with high yield and high dry matter content in Burkina Faso.

In 2005-2006, agronomic tests on 22 varieties of OFSP from the CIP in Uganda, Burkina Faso and Niger, were carried out in a controlled environment. The observations were made on crops 105 days after planting in the rainy season and dry season and 137 days in the dry season. No parasitic problem was observed during the cultivation. At the harvest, most of the varieties had a better yield during dry season and 137 days after planting. Some varieties had shown however better performance in terms of average weight in the rainy season. But as measurements could be made only at 105 days, it is possible that the storage roots didn't have enough time to develop. Other tests in the rainy season will be carried out this year over a longer period to confirm or reject these preliminary results.

Meanwhile, promotion activities of three OFSP varieties already introduced during the previous projects went on in a new province, namely Komondjari province. In that province, OFSP was introduced during the 2005 rainy season in 11 schools and villages. The schools hosted the nurseries and supplied interested farmers in the village. OFSP production evaluation in the new province revealed that the school constituted an excellent opportunity for OFSP dissemination.

Other activities that could be carried out particularly included the organization of OFSP exchange workshop in September 2005 that resulted in the development of a national action plan for OFSP production, dissemination and promotion.

Together with the Directorate-General of Agricultural Statistics (DGPSA), steps were also taken for the development of more accurate statistical tools for OFSP production. Finally, the project baseline survey could not be implemented and was postponed to the second year of the project in order to occur at the usual period of Sweetpotatoproduction.

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BACKGROUND AND RATIONALE

In Burkina Faso, vitamin A deficiency (VAD) is a public health issue as indicated by the demographic and Health survey of 2003, which revealed an average rate of 7%¹ of night blindness among pregnant women. To face this situation, Burkina Faso implemented several types of interventions including the supplementation in vitamin A capsules during the mass campaigns. This enabled to reach at least 70% of the targeted groups².

Food strategies are also essential to fight against VAD. They include vitamin A enrichment of industrial oils and several other strategies implemented only on a small scale (promotion of red palm oil and gardening). One of the food strategies with a very great potential is the promotion of Orange-fleshed Sweetpotato (OFSP), which has a high content of β -carotene and high dry matter with a good resistance to insects and diseases. OFSP bio-effectiveness was proven³. Sweetpotato cultivation is not new in Burkina Faso. However, it still remains limited to certain areas of the country, and white-fleshed varieties are the most commonly farmed.

Indeed, sweetpotato is cultivated in Burkina on millet, sorghum, maize and cassava farms, in gardens or orchards and in some lowlands. Its annual production is regularly estimated, just like for other food crops (niébé, peanuts and yam), through a national agricultural investigation. The average national production of sweetpotato of 1994-2003 is estimated at 20.840 tons per year. The annual rate production increase seems higher than that of yam despite the lack of promotion for its dissemination⁴ or research⁵. Sweetpotato production is concentrated in the areas of the high-Basins, Plateau Central of the South Center and Mid-west, particularly in Kéné Dougou, Nahouri and Sissili provinces.

The promotion project of OFSP new varieties in Burkina Faso funded by the McKnight Foundation and HKI for four years (2005-2008) aims at improving vitamin A intakes among women and children via the dissemination of OFSP production and consumption. Its implementation is carried out by stages.

This will allow for the documentation of the best strategies, identification of difficulties and constraints and to draw lessons for scale-up.

The results of this project could be used to inform other Sahelian countries, given the similarity of agro-climatic conditions and cultural practices regarding agricultural production and consumption.

The project intervenes in three eastern provinces (Gourma, Gnagna and Komondjari) and 1 mid-west province (Sissili). The final recipients are 51,140 women in reproductive age and 22 440

¹Sommer A and Davison FR. 2002. Assessment and control of vitamin A deficiency. The Annecy Accords. *Journal of Nutrition* 132 (9 suppl.) : 2845S-2850S.

²HKI/Direction de la Nutrition (DN). 2004. Les Journées Nationales Micronutriments (JNM). *Bull HKI Burkina* No 24: 1-4.

³ Van Jaarsveld PJ, Faber M, Tanumihardjo SA, Nestel P, Lombard CJ, and Benadé AJS. 2005. Beta-carotene-rich orange-fleshed sweet potato improves the vitamin A status of primary school children assessed with the modified-relative-dose-response test. *Am J Clin Nutr* 81: 1080-7

⁴ INERA/CMFPT. Relecture du plan stratégique de la recherche sur les cultures maraichères, fruitières et plantes à tubercules au Burkina Faso. Rapport de l'Institut National de l'Environnement et de Recherches Agricoles (IN.E.R.A.), mars 2003.

⁵ CNRST/INERA /CTA. Bilan de 10 années de recherche, 1988-1998. INERA/KIT 2000.

children aged between 12 to 59 months from 70 villages. The indirect recipients are primary school pupils, teachers in the project area as well as the populations of the neighboring villages.

1. PROJECT OBJECTIVES AND ACTIVITIES PLANNED FOR 2005

1.1. Project goal

Increase the production and consumption of orange-fleshed sweetpotato with high content of dry matter in two areas of Burkina Faso (Sissili province in the Mid-west and areas in the East).

1.2. Project Objectives

- ⇒ Promote the production and consumption of orange-fleshed potato starting from organized school and village structures and teaching the technical and nutritional practices both at the national and local levels.
- ⇒ Promote solar drying of OFSP with women's groups and NGOs
- ⇒ Increase the financial resources of recipients
- ⇒ Adopt a participative approach in the promotion, follow-up and evaluation of OFSP
- ⇒ Develop and apply a more accurate evaluation system of the production and consumption of sweetpotatoes in collaboration with the national agricultural statistics division
- ⇒ Present, evaluate and disseminate orange-fleshed sweetpotato varieties with high-yield and high content of dry matter.

1.3. Activities planned in 2005.

The main activities planned for the project first year are as follows:

- ✓ Continue OFSP promotion activities in Gourma province;
- ✓ Organize an exchange workshop with researchers, producers teams and NGOs specialized in OFSP promotion and research in East Africa;
- ✓ Receive in Burkina-Faso the cuttings of OFSP new varieties for the first phase of the tests and observations on the experimental sites in Fada and Sissili;
- ✓ Develop and apply in collaboration with the Directorate-General of Forecasts and Agricultural Statistics (DGPSA) a more specific evaluation methodology of the annual sweetpotato production, including OFSP;
- ✓ Ensure advocacy at the national, regional and local levels to make sure the project is known and to create awareness on improvements in food security and control of vitamin A deficiency;
- ✓ Undertake a baseline survey (to be repeated at the end of the project) in the two regions (20 villages per region including 10 control villages)

2. ASSESSMENT OF 2005 ACTION PLAN

2.1. Activities implemented

2.1.1. Signing the draft-agreement

An agreement protocol was signed between HELEN KELLER INTERNATIONAL-Burkina Faso and the Environmental and Agricultural Research and Training Center (CREAF) for INERA, based in Kamboinsé.

Both parties agreed on the implementation of research and technical support tasks in accordance with the four-year action plan (2005-2009) for the control and evaluation of Orange-fleshed sweetpotato varieties in the research stations of Kamboinsé and in operational conditions. After this phase, the best varieties selected will be disseminated in the two project areas through schools, community groupings and individual producers.

2.1.2. Implementation of the agronomic evaluation tests

Initially, the actions plan of the project first year envisioned the selection of OFSP varieties and their introduction to various target groups (traditional sweetpotato producers; cereal producers; women's gardening groups; and school gardens).

Finally, it was decided to devote the entire first year to the selection test in controlled environment. This decision is based on the fact that the quantities were not sufficient for a broad dissemination and that we wished to make a pre-selection in order to maximize chances of success in operational conditions.

Material:

In July 2005, 17 OFSP new varieties received from the CIP in Uganda were introduced for setting up adaptability and productivity tests with 5 other varieties including three from Niger and two from the south center of Burkina-Faso. Two sites, that of Kamboinsé on CREAM's plots in the Center region and that of Fada Gourma in the East of the country, were selected to host the tests in the dry season.

Methods:

Two types of observation were carried out:

- First, multiplication and observation of the varieties in nursery;
- Fischer block tests with four replications of all the varieties planted in the nursery;

Nursery: initially, five small cuttings for each variety were delivered and planted in observation and multiplication nursery on July 27, 2005 at Kamboinsé research station. Each variety was planted on a single line of two meters without repetition.

Spacing between ridges was 0.80 and 0.50 between seedlings on the ridge.

Each plot was supplied with fertilizers as follows before plantation: 10 t/ha well prepared manure; 350 kg ha⁻¹ of NPK 12-22-22 (0.6S); 1 Mg;

After planting, 150 kg/ha of urea were spread in two applications; 75 kg ha⁻¹ of urea were brought two weeks after hilling and 75 kg ha⁻¹ of urea four weeks after the first application.

The first harvest of tubers resulting from the nursery occurred on November 10, 2005, i.e. 105 days after plantation and it was possible to make preliminary observations.

Test of evaluation in season dries

Twenty-two varieties were planted in Fischer blocks with four replications on November 10, 2005.

Each variety was planted on three ridges of 2m each. Spacing between the ridges was 1m. On the ridge, seedlings were spaced by 0.50 m, that is, a density of 20.000 seedlings per hectare. The total surface was of $33 \times 25 = 825 \text{ m}^2$ while the useful surface was 110 m^2 .

The same fertilization as in the rainy season was used and irrigation was made twice a week for the first four weeks after plantation, then once a week as from the fourth week.

The following observations were made during the farming:

- Date of hilling: (beginning and at 50 %)
- Date of flowering (beginning and at 50 %) for seedlings that flower;
- Beginning of tuberization (date);
- Harvest date;
- Types of pests and diseases found during farming and their incidences on the variety;
- Vegetable development (little - average - abundant) with 15; 30; 45; 60; 75 and 90 days after plantation.

The following observations were made during harvest:

- Number of seedlings collected;
- Number of tubers per foot;
- Average weight of tuber by variety;
- Total weight of harvest by variety;
- Marketable total weight by variety;
- Percentage of the damage caused by weevils compared to the total;
- Tuber form (length and diameter);
- Fresh weight and dry weight of 5 tubers by treatment;

Three harvest dates were adopted (105 dap; 137 dap; 177 dap).

Most of the observations were made on the 105th day after planting and on the 137th day after planting except that the average length and diameter were measured on the 137th day.

Data for the dry season test were analyzed using PLABSTAT software.

Agronomic test results

All the varieties developed very well during the tests. No parasitic problem was observed during the on-station cultivation in the rainy season.

Tables 1, 2, 3 and 4 appended summarize the main part of the results obtained for all the parameters studied for the first two harvests (105 and 137 dap).

Number and average weight of tubers

The number of tuberous roots per foot varied from 1 to 6 in the rainy season and from two to nine in the dry season without significant difference between harvest on the 105th and 137th days after planting.

The varieties with the greatest number of tuberous roots (8 or 9) in the dry season were as follows: CIP Breeding Line 199062-1; CIP Breeding Line 199004-2; Jewel 566638; Tainung 440125 n° 64; Centenaria 144401128.

However, when one is particularly interested in saleable sweetpotatoes per area, the number decreases. The varieties that gave the most saleable tubers (4 to 5) are: CIP Breeding Line 199062-1; CIP Breeding Line 199004-2; Jewel 566638; Tiébélé-2 room; Caromex Fada; Resisto 440001.

The average weight of tubers varied according to the season and variety. The varieties that had more increased average weights in the rainy season are: Zapallo 420027 (500 G); Saliboro 187017-

1 (666 G); Excel 440016 (200 G); Tib-4 440060 (458 G) and Jewel 566638 (240 G). While the other OFSP varieties presented higher average weights in the dry season and which improved at 137 days after planting.

When results are analyzed in terms of saleable OFSP, the data vary and the average weight is sometimes more interesting at 105 days after planting, sometimes at 137 days. The varieties which provided the best results in term of saleable tubers are: Zapallo 420027, Japan 420009, CIP Breeding Line 1999062-1, Jewel Fada, Tainung 440125 n° 64 and Tainung 440212 n° 65.

Length and average diameter

These two parameters were measured only 137 days after planting and in the dry season. Of these two parameters, the diameter seemed to be the most interesting one. The diameters of tuberous roots vary from 3.36 to 8.45 Cm. The most significant diameters come from the following varieties: Tainung 440215 n° 65 (6.4 cm); Excel 440016 (6.38 cm); Tib-4 440060 (6.45 cm); Resisto 440001 (6.65 cm); CIP Breeding Line 199062-1 (8.45 cm).

The ratio diameter/length gives an idea of sweetpotato shape. The ratios approaching 0.50 make it possible to identify round potatoes, which are often appreciated. Five potato varieties met these criteria: Japan 420009 (0.53); Tib-4 440060 (0.45); Resisto 440001 (0.49); CIP Breeding Line 199062-1 (0.45); CIP Breeding Line 199034-1 (0.40).

Yield in fresh tubers

The results of the first harvest 105 days after planting in the rainy season are presented in table 1. During this first harvest, only 5 varieties yielded higher than 15 tons/ha. The best yields were obtained with the following varieties by decreasing order: Tib-4 440060 (31.2 t/ha); Jewel 566638 (24 t/ha); Tainung 440125 n°64 (16.4 t/ha); Saliboro 177017-1 (16 t/ha).

In the dry season, the results obtained 105 days after planting showed an improvement of the yields for most varieties. Ten sweetpotato varieties reached an output equal to or higher than 15 tons/ha. The 5 best varieties at 105 days in the dry season are: CIP Breeding Line 199062-1(33.13 t/ha); CIP Breeding Line 199004-2 (25.38 t/ha); Jewel 566638 (18.25 t/ha); Room Tiébélé-2 (18 t/ha); CIP Breeding Line 199004-2 (25.38 t/ha).

137 days after planting, the number of varieties with yields higher than 15 tons/ha increased to 16. The 5 best varieties at 137 days in the dry season were: CIP Breeding Line 199062-1 (32.25 t/ha); Jewel Fada (30.75 t/ha); CIP Breeding Line 199004-2 (29.88 t/ha); Tainung 440125 n°64 (27.63 t/ha); Jewel 566638 (24.38 t/ha).

Generally, at 105 days, yields were better in the dry season than in the rainy season except for 2 varieties (Tib-4 440060 and Jewel 566638). At 137 days in the dry season, all the outputs were improved except for Tib-4 440060 variety whose output was the best in the rainy season. These results make it possible to believe that most varieties have long cycles and that harvest happened too early in the rainy season. The tests in the rainy season will thus be made again in 2006 to allow the comparison of results and identification of the best-adapted varieties to the rainy season.

The content of dry matter

This parameter was measured only 137 days after plantation and in the dry season. The content of dry matter enormously varied from an OFSP variety to the other. The best varieties are as follows: Namenete 420005 (32.8 %); Kandee 440140 (32.38 %); SPK 004 (32.44 %); Comensal 187015-1 (35.51 %); Tib-4 440060 (31.56 %).

Conclusion of the first tests and prospects

Generally, the received OFSP varieties from Uganda adapt well to Burkina Faso climate. However, some did not provide for the expected yields. We hope that the resumption of the tests in the 2006 rainy season and over a longer period, will allow to better document the yield at that period and to facilitate the comparison with the dry season.

The tests with producers selected in 3 zones in Burkina Faso will also begin in the 2006 rainy season. These tests will allow following OFSP output in operational and various climatic conditions.

The agronomic test will also be supplemented by taste tests in order to have complementary criteria for the selection of the varieties to promote in Burkina Faso. Various preparation or transformation modes will have to be included in the taste tests.

2.1.3. Promotion of OFSP production and consumption

During this first year, the promotion activities were limited to the East area of Komondjari province where three varieties (Taining, Jewel and Caromex) already introduced since 2002 into the province near Gourma, were distributed. These varieties were selected, within the framework of a pilot project of school gardening (HKI-Unicef) at the end of a process which lasted three years and which enabled to test on the various zones, several varieties adaptability brought from Niger and the South Center, to evaluate the productivity and profitability of those varieties, to measure their carotenoid contents and to finally disseminate them in schools and communities.

The step followed for this OFSP first introduction in Komondjari is as follows:

- 1) Sensitize schools and pupils' parents on the nutritional interest of this new crop and farming techniques
- 2) Supply schools and villages with OFSP cuttings
- 3) Follow-up the development of nurseries before the rainy season
- 4) Evaluate production at harvest period

The schools and villages of Komondjari where the OFSP was introduced host a school gardening integrated project and fight against trachoma, which makes the promotion of the school and community gardens by supporting the production of micronutrient-rich vegetables. The teachers, pupils and pupils' parents are thus sensitized on the importance of nutrition and food rich in vitamin A for their health. Sensitization sessions specific to OFSP were conducted in those villages because the sweetpotato is produced in a season different from that of other vegetables (apart from school year) and that its cultivation is unusual in the area. During these transfers, interest of orange-fleshed sweetpotato compared to white-fleshed sweetpotato was underlined and production techniques reviewed.

Following these sensitization campaigns, cuttings were distributed in schools to be put in nursery and then transplanted in the school garden and distributed to peasants at the beginning of the rainy season.

During the rainy season, most villages of Komondjari province are inaccessible, which does not enable to supervise transplanting. One had to await the end of the rainy season before reaching the villages and evaluating production.

Results of OFSP production evaluation in Komondjari

Of all the eleven (11) intervention schools, six (6) could in the long term lead this first production with a total of 46 mounds and a production estimated of tubers at 412 kg.

At the village community level, fifty-three (53) producers in ten (10) villages produced OFSP for a total of 240 mounds corresponding to 2342 kg of sweetpotato.

These results are satisfactory given the small quantity of cuttings sent and the completely new practice of sweetpotato farming for the majority of the new recipients. Indeed, before the project start-up, the peasants of Komondjari practiced little or no sweetpotato farming, even the white-fleshed one.

Moreover, this experiment shows that schools are a good opportunity for OFSP promotion. Though all the schools could not produce, at least they contributed to put at the disposal of the peasants potato seeds through the multiplication of cuttings in the school garden nurseries maintained by the pupils and teachers during part of the dry season.

Constraints related to potato production in schools and in peasant environment

- ✓ Departure of the teachers on holiday in some schools making it difficult to mound cuttings in those schools during the rainy season;
- ✓ Inaccessibility of the villages, which does not allow for a close follow-up in order to provide for technical assistance during mounding.
- ✓ Yield was limited due to insufficient rainfalls during mounding and seedlings transfer between July 15 and August 15.
- ✓ Producers came to take OFSP seeds at the school and with some producers without informing the teachers and owners, their production thus could not be followed and counted.
- ✓ Conservation difficulty of cuttings due to the significance of animals' rambling in the locality

2.1.4. Steps taken within structures of the ministry of agriculture in charge of agricultural production evaluation

Two meetings took place with the agricultural statistical services in order to introduce the current project and especially the interest for best follow-up of OFSP production. Discussions with the statisticians also allowed to better understand the statistical tools currently used within the Ministry for Agriculture. For the moment, reflections are underway in order to find a suitable strategy for OFSP evaluation.

Thereafter, DGPSA invited HKI to participate in a national consultation workshop of users and producers of the agricultural statistics held in Kaya on June 21-23, 2005. The overall objective of the workshop was to enable the Directorate-General of Forecasts and Agricultural Statistics (DGPSA) to elaborate a national plan for a medium-term agricultural statistics on a consensual and concerted basis. During that workshop, concerns were expressed on data acquisition on the production of orange-fleshed and white-fleshed sweetpotato varieties.

The Directorate-General of Forecasts and Agricultural Statistics (DGPSA) also took part in the exchange workshop on OFSP, which was held in September 2005 (See point 2.1.5). These various contacts with the DGPSA made it possible to establish closer relations between this structure and HKI and permanent exchanges are thus maintained.

A process is currently underway in order to improve the indicators of the permanent agricultural investigation (the investigation collects production data 3 times a year) so that it can include a food quality index and food safety index as well. These indices will allow following in the long run the impact of OFSP promotion and other gardening activities on food diversity at the national level.

3. Organization of exchange workshop with teams of researchers, producers and NGOs specialized in research and promotion on OFSP varieties in East Africa

An exchange workshop on OFSP was held on September 27-29, 2005 in Ouagadougou. There were twenty four (24) participants from Uganda (1), Senegal (1), 12 NGOs (one participant per NGO), the confederation of Burkina producers (1), FAO (1), the French Co-operation (1), the Ministry for agriculture (4), the Health Ministry (2) and the Ministry Secondary, Higher Education and Scientific Research (1). An expert in OFSP came from Uganda to support the teamwork in Burkina Faso.

Workshop objectives

The objectives of the workshop were:

- Involve more actors in the promotion of OFSP production and consumption as a strategy of controlling vitamin A deficiency at the national level.
- Share the best practices of the promotion programs of orange-fleshed sweetpotato.
- Present and discuss "VitA Burkina " project
- Work out a national action plan for OFSP production, dissemination and promotion.

Work flow

As a whole, work was carried out according to plans. Ann Tarini, Resident Representative of HKI-Burkina and Dr. Mohamed Ag Bendeck of the Regional office of HKI facilitated the workshop. A simultaneous French-English translation was provided.

Seven (7) presentations were made at plenary sessions on the topics mentioned below and work group on the development of a national action plan for OFSP promotion took place:

Presentation 1: Introduction on vitamin A deficiency

Presentation 2: National strategies for food diversification to control vitamin A deficiency

Presentation 3: Presentation of the policies and strategies concerning research on tubers and place of potato

Presentation 4: Experience of HKI in OFSP gardening and promotion

Presentation 5: Presentation of the CCRP

Presentation 6: Experience of the implementation of orange-fleshed sweetpotato (OFSP) project in East Africa

Presentation 7: Presentation of OFSP promotion Project called "VitA Burkina"

Four groups worked for the development of the various components of a national action plan.

These components are:

Group 1: Selection, production, multiplication and varietal dissemination of OFSP

Group 2: Conservation and transformation of OFSP

Group 3: Nutrition and OFSP

Group 4: Communication strategy and social marketing of OFSP

Conclusions and recommendations

This workshop was a great success for participants. All of them showed great enthusiasm and actively contributed. An action plan was proposed for the 4 years of the project implementation, very interesting suggestions were made and the next stages were defined as follows:

- Preparation of the baseline survey
- Continuation of seeds multiplication
- Hold a stand to present orange-fleshed sweetpotato at and during an exhibition which will take place in November (to be seen with FIAB)

- Documentation of conservation methods and census of the local orange-fleshed sweetpotato varieties.
- Choice of the intervention villages (before undertaking the baseline survey)

Preparation of a press article

After the workshop, a press article on the project was written and submitted to HKI headquarters in NY for its review by Shawn Baker and Rebecca Nelson. After its completion, it was posted on HKI Web site (www.hki.org)

3.1.1. Advocacy at the national, regional and local levels for the promotion of OFSP production and consumption

During the project first year, the advocacy activities that were undertaken are the following:

- Partnership with INERA allowed to the latter as a research structure to be interested in OFSP.
- Organization of exchange workshop on OFSP that got several partners interested in OFSP and to create a demand.
- All the meetings with the ministry for agriculture services were used as a framework to talk about OFSP project.
- 53 producers, pupils, teachers and pupils' parents of Komondjari province were sensitized on the OFSP advantages in order to persuade them to engage in its production.

4. Unimplemented activity

The only unimplemented activity is the project baseline survey which was envisioned during the first year but which was finally deferred to the second year because of a light shift in launching activities thus not enabling implementation of the survey during the usual time of harvest and consumption of sweetpotato.

5. CONSTRAINTS AND DIFFICULTIES ENCOUNTERED

Except the late arrival of cuttings from Uganda and consequently the late start-up of tests, one of the major constraints of the project is that it started at a time when UNICEF gardening project ended in 2004 and yet it was supposed to be integrated and to allow for cost sharing and resource integration. That gave rise to difficulties in financing and implementing some activities.

6. MAIN ACTIVITIES OF THE SECOND YEAR

The prospects are summarized in the action plan of the second year (April 2006 to March 2007) whose general objective is to increase the production and consumption of OFSP with high-yield and high dry matter content in Burkina Faso. The main activities planned are as follows:

- Continue the selection of OFSP varieties on the two experimental sites in order to start the process of participatory varietal selection in the two target regions.
- Work with producers to set up village nurseries in order to produce planting material and then disseminate planting materials to producers in the three provinces (Léo, Fada and Koupéla).
- Undertake a collection of samples to study the importance of viral attacks on different varieties of OFSP selected on-site and among producers.
- Identify and test the various OFSP conservation techniques. These tests will be carried out in Gourma in collaboration with the Association for Rural Support and Promotion of Gulmu (APRG)
- Carry out the baseline survey, which could not be carried out during the first year.
- Continue OFSP promotion in Komondjari province

- Hold a stand to present orange-fleshed sweetpotato at and during an exhibition which will take place in November (to be seen with FIAB)
- Prepare a draft article, to be submitted to a scientific review, on the results of the farming tests
- Accommodate one or two trainees on the project sites.

7. CONCLUSION

Despite delay in the reception of the cuttings from Uganda and their very limited number, which required a preliminary multiplication phase, most activities planned for the first year of the project were carried out.

The tests in controlled environment enabled to have a good idea of the yield in the cold dry season and preliminary data for the rainy season. The next stage will focus on the selection and propose ten varieties for multi-local tests in operational conditions for producers and primary schools of the project intervention zone. However, another longer test during the 2006 rainy season is necessary to confirm or correct the results obtained during the first test in 2005.

OFSP promotion through Komondjari schools experienced rather positive beginnings and will continue in 2006 in the same 11 schools and villages and extend to 11 new schools.

Discussions on the development of a specific and adapted evaluation methodology of OFSP production are still ongoing but there is no satisfactory and inexpensive methodology that was elaborated.

The exchange workshop on OFSP was an effective advocacy means and allowed to equip the project with a detailed and ambitious four-year action plan.

Implicitly, the various activities undertaken during this first year were used as an advocacy opportunity to make the project visible and OFSP in particular at the national, regional and local levels.

The few unimplemented activities will be a priority during the second year of the project.

ANNEXES

Table 1 : Preliminary results of the production of sweetpotato nursery plant observed in the Kamboinsé station (rainy season, 2005)

	Genotypes	Number of Tuber/Stand	Yield (tha ⁻¹)	Average Tuber weight (g)	Tuber length (cm)	Tuber diameter (cm)	Diameter/Length	Dominant color	
								Skin	Flesh
1	Zapallo420027	1,2	10	500	17,3	9	0,52	white	yellow
2	Saliboro187017-1	1	16	666	24,6	3,4	0,14	yellow	orange
3	Tainung440215 n°65	2	3,6	112	10,0	4	0,40	red	orange
4	Nemanete420005	5	3,2	27	38,2	1,6	0,04	red	yellow
5	Kandee440140	2	2,4	75	19,6	9,3	0,47	light-red	orange
6	Centenial440112	5	14,8	160	31,0	3,4	0,11	red	orange
7	Excel 440016 (White Tuber)	3	27,47	455	24	10,7	0,45	white	creamy
8	Japon420009	3	6,4	100	13,3	4,7	0,35	pink	yellow
9	Tib-4 440060	4	31,2	458	21,0	8,9	0,42	red	orange
10	Jewel 566638	5	24	240	23,6	8,5	0,36	red	orange
11	SPK 004	3	0,4	6	16,6	8	0,48	pink	yellow
12	Tainung440125 n°64	5	16,4	157	28,3	4,2	0,15	white	orange
13	Resisto440001	6	8,2	66	16,3	7,4	0,45	red	orange
14	Comensal187015-1	5	8,2	78	21,9	5,1	0,23	red	creamy
15	CIP 199004-2	5	10	100	14,6	5,3	0,36	red	creamy
16	CIP 199034-1	3	5,5	110	13,3	4	0,30	red	yellow
17	CIP 199062-1	4	9,6	133	14,6	8,3	0,57	light-red	orange
18	Local Tiébélé-1	4	9,86	125	22,3	6,1	0,27	red	orange
19	Local Tiébélé-2	3	6,09	116	19,0	4	0,21	red	orange
20	Caromex (Fada)	6	4,79	41	18,6	3,3	0,18	red	orange
21	Jewel (Fada)	4	11,02	146	18,3	6,5	0,36	red	creamy
22	Tainung (Fada)	3	8,99	172	21,3	6,3	0,30	red	Light-yellow
23	Excel -440016 (Red Tuber)	6	24	200	22,4	3,5	0,16	red	orange

Table 2: Effect of harvest date on the number of tuber per stand, tuber length, tuber diameter, and the ratio of diameter over length of the tuber

Genotypes	Number of tubers/stand					Tuber length (cm)	Tuber diameter (cm)	Diameter/L ength	Dominant color			
	Total			Sellable					Skin	Flesh		
	105 Dap	105 Dap	137 Dap	105 Dap	137 Dap					105 Dap	137 Dap	105 Dap
Zapallo420027	1,2	2	2	1	2	18.94	4.72	0.26	white	white	yellow	yellow
Saliboro187017-1	1	4	5	1	1	18.85	5.61	0.30	yellow	yellow	orange	orange
Tainung440215 n°65	2	6	5	2	3	17.25	6.40	0.37	red	red	orange	orange
Nemanete420005	5	6	4	0	3	19.11	3.36	0.19	red	red	yellow	yellow
Kandee440140	2	5	5	2	3	17.45	5.70	0.33	light-red	light-red	orange	orange
Centenial440112	5	8	6	2	3	18.60	5.90	0.32	red	red	orange	orange
Excel n°1 440016	6	5	4	2	2	19.23	6.38	0.33	white	white	creamy	creamy
Japon420009	3	4	4	2	2	14.58	7.32	0.53	pink	pink	yellow	yellow
Tib-4 440060	4	6	5	2	3	14.65	6.45	0.45	red	red	orange	orange
Jewel 566638	5	8	8	1	5	18.75	6.0	0.32	red	red	orange	orange
SPK 004	3	4	4	2	2	19.55	5.10	0.26	pink	pink	yellow	yellow
Tainung440125 n°64	5	8	7	2	3	20.95	5.95	0.29	white	white	orange	orange
Resisto440001	6	7	6	1	5	13.80	6.65	0.49	red	red	orange	orange
Comensal187015-1	5	6	6	1	2	17.15	5.40	0.32	red	red	creamy	creamy
CIP Breeding line 199004-2	5	8	6	2	4	19.25	5.20	0.27	red	red	creamy	creamy
CIP Breeding line 199034-1	3	5	4	2	2	14.40	5.75	0.40	red	red	yellow	yellow
CIP Breeding line 199062-1	4	9	6	2	5	18.85	8.45	0.45	light-red	light-red	orange	orange
Local Tiébélé-1	4	5	6	2	3	17.55	5.70	0.33	red	red	orange	orange
Local Tiébélé-2	3	7	5	2	4	14.70	5.20	0.36	red	red	orange	orange
Caromex (Fada)	6	7	7	2	5	17.35	5.00	0.30	red	red	orange	orange
Jewel (Fada)	4	4	5	2	3	20.25	6.05	0.30	red	red	creamy	yellow
Tainung (Fada)	3	6	4	2	3	17.05	5.95	0.35	red	red	yellow	orange

* **Dap:** Day after Planting

Table 3: Classification of varieties according to yield of fresh tubers

Classification of varieties according to yield	Classes			
	1	2	3	4
	Yield < 10t/ha	10t/ha≤Yield<15t/ha	15t/ha≤Yield<20t/ha	Yield ≥20t
105 Dap	Zapalo 420027 Nemanete 420005 Saliboro187017-1 Japon 420009 SPK004	Kandee 440140 Excell 440016 Resisto440001 CIP199034-1 Jewel (Fada) Tainung (Fada) Comensal 187015-1	Tainung440215n°65 Centenial440112 TIB4-440060 Jewel566638 Caromex (Fada) Tainung440125n°64 Tiébélé-1 Tiébélé-2	CIP199062-1 CIP199004-2
137 Dap	Nemanete 420005 Comensal 187015-1	Zapalo 420027 Saliboro187017-1 SPK004 Resisto440001	Kandee 440140 Excel 440016 CIP199034-1 Centenial 440112	Tainung440215n°65 Japon420009 TIB-4 440060 Jewel566638 Tainung440125n°64 CIP199004-2 CIP199062-1 Tiébélé-1 Tiébélé-2 Caromex 5Fqada) Jewel (Fada) Tainung (Fada)

Table 4 : Effect of harvest date on yield of orange-fleshed sweet potato

no	Genotypes	Average tuber weight (g)					Yield (tha ⁻¹)					% Dry matter
		Rainy season	Dry season				Rainy season	Dry season				
			Total		Sellable			Total		Sellable		
		106*	105	137	105	137	106	105	137	105	137	
1	Zapallo420027	500	139.92	304.12	443.58	384.10	10	5.89	12.56	3.45	10.63	15.58
2	Saliboro187017-1	666	109.07	153.6	258.35	342.5	16	7.50	14.38	3.58	9.00	23.33
3	Tainung440215 n°65	112	156.17	236.9	314.96	315.73	3,6		20.25	11.50	16.25	21.82
4	Nemanete420005	27	43.26	84.53	0.00	294.72	3,2	5.38	6.50	0.00	17.03	32.80
5	Kandee440140	75	167.14	208.93	285.39	225.48	2,4	14.75	18.38	12.00	16.75	32.38
6	Centenial440112	160	106.93	192.32	268.73	208.80	14,8	16.00	19.88	8.63	14.13	27.07
7	Excel n°1 440016	200	108.63	189.02	245.66	334.27	24	10.25	15.75	6.95	12.88	21.43
8	Japon420009	100	108.11	292.88	360.14	425.00	6,4	8.13	21.63	6.92	19.63	23.80
9	Tib-4 440060	458	157.29	205.2	264.55	283.38	31,2	17.00	21.13	10.75	18.50	31.56
10	Jewel 566638	240	114.95	162.92	223.21	206.55	24	18.25	24.38	10.26	20.25	22.91
11	SPK 004	6	89.32	133.5	272.12	272.00	0,4	6.84	11.38	3.93	11.01	32.44
12	Tainung440125 n°64	157	125.83	197.25	329.17	313.33	16,4	17.88	27.63	8.13	18.25	24.15
13	Resisto440001	66	81.94	114.5	156.14	140.20	8,2	10.50	14.25	2.71	12.63	26.61
14	Comensal187015-1	78	97.33	114.0	306.43	275.75	8,2	11.63	9.63	7.88	9.01	35.51
15	CIP Breeding line 199004-2	100	154.23	280.75	216.43	318.75	10	25.38	29.88	11.75	24.63	23.29
16	CIP Breeding line 199034-1	110	135.40	180.95	260.12	258.83	5,5	12.25	15.25	10.63	12.00	29.22
17	CIP Breeding line 199062-1	133	193.79	280.65	320.01	342.52	9,6	33.13	35.25	24.13	32.88	23.20
18	Local Tiébélé-1	125	143.97	184.6	327.67	275.72	9,86	15.00	20.63	11.71	16.25	23.26
19	Local Tiébélé-2	116	122.14	238.52	284.23	295.35	6,09	18.00	24.00	9.75	21.25	26.88
20	Caromex (Fada)	41	120.33	153.52	193.99	162.18	4,79	16.88	20.25	8.75	14.88	23.87
21	Jewel (Fada)	146	348.11	305.95	239.16	504.17	11,02	12.75	30.75	10.25	29.25	22.94
22	Tainung (Fada)	172	120.45	240.55	200.89	304.45	8,99	13.00	20.63	8.13	17.63	28.51

* Days after planting