

## Annual Progress Report—Narrative for 4 August 2009–30 June 2010

### *Executive Summary*

The Sweetpotato Action for Security and Health in Africa (SASHA) is a five-year project that serves as the foundation for the Sweetpotato for Profit and Health Initiative (SPHI) launched on 26 October 2010. SPHI aims to reduce child malnutrition and improve smallholder crop incomes in 10 million African families by 2020 through the effective production and expanded use of sweetpotato. SASHA seeks to directly improve the food security of at least 155,000 SSA families by exploiting the untapped potential of sweetpotato and to create the conditions for going-to-scale. This requires (1) transforming sweetpotato breeding, (2) developing innovative seed systems, (3) strengthening partners' capacities, and (4) understanding how to link these components to market and food-based nutritional interventions while assuring gender equity. The project focuses on research supporting development outcomes coordinated through three sub-regional sweetpotato support platforms (SSP). Sweetpotato's image will be transformed from a poor person's crop to a healthy food preferred by all. The project comprises five program areas to achieve its objectives. In year 1, the basis of this report, all project-specific staff members have been recruited and all letters of agreement (LOA) with year 1 partners (except BeCA) have been signed. Of the 8 milestones due to be completed by 30<sup>th</sup> June 2010, 7 have been completely achieved and one 75% achieved. The remaining milestones are on track.

**Research Program 1 (RP1): Breeding and Varietal Improvement.** The overall objective of RP1 is to establish efficient population improvement programs at a sub-regional level in SSA linked with participatory varietal selection at the national level to enable short- and long-term production of new locally adapted varieties that significantly improve farmer incomes and deliver nutritional benefits to consumers, especially women and children. Developing varieties with traits desired by consumers is fundamental to the success of the SASHA project; therefore, RP1 is the largest of the five research programs. Activities are conducted in SSA by CIP breeders at three SSPs and by the global leader of sweetpotato breeding at CIP Headquarters (CIP-HQ) under six major activity areas, each with specific milestones. Progress within the four breeding efforts varies, depending on the status of the program prior to the initiation of the SASHA project. Population development is well established at CIP-HQ, and under SASHA, it is being initiated in the region. The new approach of accelerated breeding began in Mozambique in 2005, and it is now being introduced in Uganda and Ghana. The national breeding program in Uganda is well established, so addition of the population development program was simple. However, in Ghana, the CIP breeder had to be recruited and the program has to be built from scratch. Given the longer-term nature of breeding, no milestones were scheduled to be met during the year 1 of the project. Substantial progress has been made in standardizing data collection, entry, and analysis protocols among SSA breeders. Exciting preliminary findings are available from the study examining whether exploitable heterosis exists, and as this is new knowledge, the results are highlighted in the detailed narrative in Appendix D.

**Research Program 2 (RP2): Breeding Weevil-Resistant Sweetpotatoes.** RP2 aims at developing weevil-resistant (WR) varieties of sweetpotato by combining breeding and biotechnology. Producing a biotech variety with resistance against an insect is composed of five benchmarks: (1) identification of protein(s) active against weevils; (2) synthesis, transfer, and expression of insect resistance genes in the target tissue/organ; (3) demonstration of

efficacy; (4) regulatory dossier submission; and (5) deregulation that authorizes commercialization. The first benchmark was reached before the initiation of SASHA thanks to support from the Rockefeller Foundation, the Belgian Directorate General for Development Cooperation, and USAID. The second benchmark has been reached during the first year of SASHA. Out of the 25 events with a single WR gene, 23 have been analyzed for WR gene transcription and translation in sweetpotato leaves, and in a few cases, in storage roots. For each WR gene, we have identified high and low expressers of the transgene. Demonstrating that the WR genes introduced into sweetpotato are functional and produce detectable proteins with specific antibodies represents a major achievement.

**Research Program 3 (RP3): Sustainable Seed Systems.** RP3 capitalizes on investments in breeding by developing and testing strategies to scale up variety dissemination cost effectively, maintain and multiply quality planting material, and efficiently supply vines following dry periods. Options for large-scale dissemination of improved orange-fleshed varieties and “cleaned-up” local varieties are being tested in the Lake Zone area of Tanzania in a project named *Marando Bora* (“better vines” in Kiswahili), with a goal of reaching 150,000 households by March 2012. Research on protected seed beds in Uganda and Tanzania and use of low-cost netting to prevent virus infection in Western Kenya appear promising. A major achievement was the production of over 30,000 virus-indexed in vitro plantlets from seven varieties and their transfer by road and ferry from Nairobi to LZARDI-Maruku in Bukoba, Tanzania, where they were successfully hardened. Progress on developing a suite of novel diagnostic methods for sweetpotato-virus detection has also been made, and new viral nucleic acid sequence information has been generated using state-of-the-art, high-throughput sequencing techniques.

**Research Program 4 (RP4): Proof-of-Concept Projects (PoCP).** To cost effectively deliver benefits to the poor, RP4 examines (1) alternative institutional models to utilize OFSP to combat nutritional deficiencies and (2) alternative market interventions to expand market opportunities for sweetpotato and improve access to urban consumers. Under RP4, there are two PoCPs: the Kenya Health PoCP, which began in October 2009, and the Rwanda Value Chain PoCP due to begin in year 2; and two feasibility studies: one on sweetpotato as an animal feed, which began in September 2009, and a market study in Nigeria due to begin in year 2. The Kenya Health PoCP is a social innovation that links knowledge about and delivery of OFSP with health care for pregnant women. In December 2009, after conducting an assessment of consumer acceptance of OFSP varieties, we decided to initiate a one-year pilot phase before implementing the full-fledged program. Implementation of two pilot divisions began in May 2010. In year 1, a few preparatory research activities were undertaken by the Rwanda Value Chain PoCP researchers, who identified three sweetpotato products that are technically viable and of interest to the private sector partner. This is a prerequisite step for enabling the final design of the project in July 2010. The Animal Feed research program is on track in Kenya, with all on-farm trial sites identified and three students working on related research topics. The initiation of trials in Rwanda is three months behind schedule.

**Research Program 5 (RP5): Management and Support Platforms (SSP).** In addition to assuring good governance of the SPHI and SASHA, RP5 aims to develop platforms at the sub-regional level (Uganda, Mozambique, and Ghana) to support sweetpotato research and development and to build a vibrant community of practice. One major planning meeting with year 1 partners was held in October 2009, following by the SPHI/SASHA official launch attended by over 220 people at the site of the East Africa SSP, the National Crops Resources

Research Institute (NaCRRRI) in Namulonge, Uganda. Numerous planning meetings were held for each sub-program. Sixteen LOAs were signed with year 1 SASHA partners. The full project management team (PMT) was in place by 15 March 2010, the senior management team (SMT) met for the first time on 21 June 2010, and the executive steering committee (ESC) has been selected and will meet on 28–30 September 2010. The three sub-regional SSPs held their first meetings at host national programs in June and July 2010.