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Afla**STOP**:

Drying and Storage for Aflatoxin Prevention

Annual Report, March 2012- October 2013



PROJECT SUMMARY: AflaSTOP aims to develop and commercialize technologies for post-harvest storage and drying of staple grains to help prevent and control the incidence of aflatoxin. The project will identify and market existing, commercially viable, small-scale storage and develop new low cost drying technology that will either be affordable to the farmer as an investment or as a service. The drying technologies will help to reduce aflatoxin contamination at the farm level, improving crop handling and management practices. Such technology will also reduce post-harvest losses, increasing the nutritional values of crops consumed by smallholders, as well as the volume available for consumption and sale. AflaSTOP will then promote the scaling-up of proven technologies across Sub-Saharan Africa by synthesizing and distributing lessons learned to different countries.

COMPARISON OF ACTUAL ACCOMPLISHMENTS WITH GOALS AND OBJECTIVES

Several Key activities were identified and outlined in the *Work Plan: AflaSTOP* which was updated September 6, 2012. For each of these key activities (goals) we've outline progress to date and provided an explanation when goals were not met.

Key Activity 1: *Identify commercially viable small scale storage technology that prevents further aflatoxin contamination.*

Assessments: AflaSTOP aimed to undertake a number of assessments to better understand how farmers prepare grain for storage; how storage is used; the value placed on storage; the actual moisture levels at which farmers store their grain; how long they store it; why they stop storing; and the economic costs of storage choices. AflaSTOP completed several major studies on aflatoxin storage and drying. These include:

- **North Rift and Eastern Province Storage Surveys:** AflaSTOP interviewed 50 smallholder farmers in North Rift to establish practice and attitude towards storage of main commodities. AflaSTOP also helped prepare the same survey with IFPRI in Eastern Province. The surveys are available at <http://merid.org/en/AflaSTOP/Documents.aspx>
- **Kenyan Storage Practice Survey:** AflaSTOP completed the Kenyan Storage Practice Survey which compared storage practices in the North Rift, Meru, Makueni, and Eastern Province. The survey identified types of existing storage, common pests, insecticide use, and mold prevalence. A full summary of the survey will be available at a later date.

Off and On-farm Testing: Other activities included in Key Activity 1 include testing storage technology off farm at 12 testing sites, followed by on farm testing. AflaSTOP made good progress towards these tests between March and November 2012, when the project was directed to stop activities (see below). In preparation for storage testing, AflaSTOP rented 6 stores in Makueni, Eastern Province for the off farm testing which met the minimum requirements and equipped with the identified storage devices (small metal silo, small plastic silo, 1 mt bulk Grain Pro bag, PICS bag, GrainPro bag, PP bag). AflaSTOP investigated various options for mixing all grain that would be used in testing to allow for a

homogeneous mixture with similar conditions in all storage devices. AflaSTOP also explored multiple options for sourcing grain.

The project had already identified and procured 11 metric tons of maize when the project was put on hold (see below) and is using Grain Pro's cocoons to store this grain. This stored grain is being periodically tested for aflatoxin, taking advantage of the opportunity created by the delayed project and need to store grain. To date, the project has learned important lessons about sampling methodology from these stores and will utilize these lessons in the storage tests, once resumed.

Key Activity Area 2: *Identify commercially viable drying technology suitable for smallholder farmers*

Assessment: As outlined in the workplan, the project aimed to conduct desk research to compile information on drying designs, materials used, effectiveness and investment costs.

- **North Rift Drying Survey:** AflaSTOP commissioned a survey to investigate maize drying practices in Rift Valley Province (North Rift) among 48 farmers in January 2013. The *North Rift Drying Survey* was carried out after the long rains harvest in November/December 2012. Information from the survey will help inform the contractor working on developing appropriate drying technology for smallholder farmers. Pan African Research Services (PARS) undertook the field work and AflaSTOP analyzed the data collected. The survey is available at <http://merid.org/en/AflaSTOP/Documents.aspx>
- **Eastern Drying Survey (delayed):** While the original intention was to carry out a drying survey in both North Rift and Eastern Provinces, Catapult Design (see below in Testing and drying technology section) has recommended that delaying the drying survey in Eastern Province until after the prototypes have been developed. This would allow the project to add questions to the survey asking the farmers about willingness to invest in the identified technologies.

Testing drying technology: AflaSTOP aims to develop and test three possible technologies suitable for smallholder farmers to invest in as an on farm asset or buy in as a service from someone moving the technology from farm to farm. AflaSTOP issued a request for proposals (RFP) to identify a consultant Research, Design and Development (RD&D) team to support the project in identifying commercially viable drying technology. The project received proposals from the following companies and individuals: UC Davis D Lab, Nkundu, Purdue University, and Catapult Design. The project team put together criteria to consider the cost effectiveness and the technical content of each bid and all proposals were reviewed by two teams. Catapult Design was identified as the best potential service provider to deliver commercially oriented drying technology for smallholder farmers. Catapult Design, upon further discussion with ASI and Meridian Institute, will include a "go to market" strategy that will explore the potential for commercialization; input from interested Kenyan-based manufacturers; and associated costs.

Other Activities: In addition to the Key activities outlined in the workplan, several additional activities have been completed which contribute to the goals of identifying and commercializing low-cost storage and drying technology. These include:

- **Partnership with University of Leeds on cotton-based storage bag tests:** Representatives from the University of Leeds contacted the AflaSTOP Project Manager after the April 2013 PACA Strategy Workshop to express interest in including cotton-based storage bag in the storage survey. AflaSTOP and University of Leeds are exploring the feasibility of including this in the testing phase.
- **Policy Brief:** AflaSTOP has contributed to a collection of policy briefs on *Aflatoxins: Finding Market and Technology Solutions to Improve Food Safety* for IFPRI and its 2020 Vision Initiative. The brief on *Aflatoxin in Kenya: Farmers' Perceptions, Strategies, and Implications for Intervention* is based on findings in the storage and drying surveys.
- **Facilitation of AFRICOM's pilot project:** at the request of USAID, AflaSTOP hired Dr. Erastus Kang'ethe to investigate the current regulations governing the handling of aflatoxin contaminated grains as well as establishing which agencies are involved. This was submitted to USAID and AFRICOM on 26 October 2012.
- **Attending PACA and other aflatoxin events:** AflaSTOP staff attended the PACA Launch in October/November 2012 and the Strategy Workshop in April 2013. Both events were an opportunity to share information on the project and develop valuable connections and linkages to other entities working to address aflatoxin in Africa.
- **Develop and maintain connections with others working on storage, drying and aflatoxin control in Africa:** These include Diagnostics for All, IFPRI, FAO Agribusiness, Kentainers, Cimbria, University of Nairobi, among others.

Key Activities 3-5: The other key activities, commercialization of project identified technology, synthesize and distribute lessons learned, and expanding technology to different countries, will be completed in subsequent years, as originally planned. These tasks are informed on the outcomes from the first two key activities.

EXPLANATION OF WHY GOALS WERE NOT MET:

During discussions in November, the AflaSTOP Global Development Alliance (GDA) Partners agreed to delay the testing of storage technologies until August 2013 in order to amend the Initial Environmental Evaluation and conduct consultations with key Kenyan stakeholders. In January 2013 the GDA Partners further agreed to modify the approach to off-farm testing of low-cost storage devices. The Partners agreed to purchase contaminated grain in the Kenyan market for use in the off-farm storage test and, if necessary, incubate fungus, instead of using inoculation, to ensure aflatoxin contamination levels are sufficient to conduct a scientifically rigorous test. The IEE Amendment documentation was modified to

reflect this new approach. The IEE documentation was completed and submitted to USAID who approved the document on the 23 March 2013.

Subsequently, it was established that the Kenyan National Environment Management Agency (NEMA) needs to license the project. The project issued an RFP to solicit proposals and select a Kenyan consultant to complete a NEMA Project Report and terms of reference (TOR) for a full Environmental Impact Assessment (EIA). Four bids were received and through careful analysis, EcoServ Consultants was identified as best suited to develop the Project Report. The Project Report was submitted to NEMA on 10 September 2013. NEMA provided a letter requesting an Environmental Impact Assessment Study on 1 October 2013.

While waiting for NEMA approval, AflaSTOP will continue activities that are not dependent on harvest seasons in Kenya, including:

- Begin drying technology research design and development (RD&D),
- Procure equipment and technology for drying technology testing, and
- Conduct drying technology testing.

In 2014, Meridian Institute and our sub-contractor ACDI/VOCA, hope that we can continue the storage testing.

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