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“Filling gaps and removing traps
for sustainable resource management”

A Researcher Friendly Digital Sample Tracker for Cost Effective Sample Processing

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Abstract

Collecting plant and soil samples is an integral part of agricultural research. Large scale research projects collect soil and plant samples from a large number of trials to be processed in different ways, analysed at different laboratories which may result in loss of entire samples or losing track of samples eventually causing data gaps. The African Cassava Agronomy Initiative (ACAI) is introducing an efficient sample tracker system that records a bar code based digital link between samples, plots, and trials, thus is crucial for success of the project. ACAI is developing decision support tools (DST) at scale with its partners in Nigeria and Tanzania and has been collecting thousands of soil and plant samples over the last three years. The integrated sample tracker system creates a digital identity for samples and keeps record of the associated plot and trial metadata. This is facilitated by a barcoding system, which tags each trial, plot, plant and sample with linked bar codes to provide every sample with a unique identifier. The sample tracker consists of 2 web-based forms hosted by ONA. The first an enketo web-form, is designed to i) log in all new samples by composing sample batches containing a group of similar samples; ii) log and record the fate of each sample during its life cycle in the project: reception as part of a batch from partner stations, selection of samples from a batch for processing. The second web-based form is a shinyapp (an interactive web app built from R) in which the decision is made to discard, store or process for analysis. These decisions are based on relevant information about the sample from the project database: trial type, location, sampling dates, validity of trials, sample quality, etc. Thus, this sample tracker tool enables researchers to know where the sample is located and at which stage of processing or analysis the samples are, at any moment. As such the system helps the project to save on handling and processing labour, time and costs by limiting all processing and analyses to only those samples relevant to creating the decision support tools.

Keywords: African Cassava Agronomy Initiative (ACAI), barcoding, database, decision support tools, enketo webform, identifier, metadata, shinyapp