# Improved Tools for Breeders: CloneSelector & AccuDataLog

SASHA

Sweetpotato Action for Security and Health in Africa

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# Introduction

- CloneSelector is a tool developed to help plant breeders carry out field trials, analyze the results and make selection decisions.
- Open source
- Based on MS excel & R statistical package

# Features

- Design field trials – single and multiple location
- Generate a field book for each experiment
- Register metadata for each experiment – critical with Open Access
- Data collection in field and post-harvest
- Calculate derived variables (yield/ha etc)

# Features

- Offer some options for statistical analysis
- CloneSelector now offers strong data management options for both breeding and non-breeding trials for clonally propagated crops

# Highlights

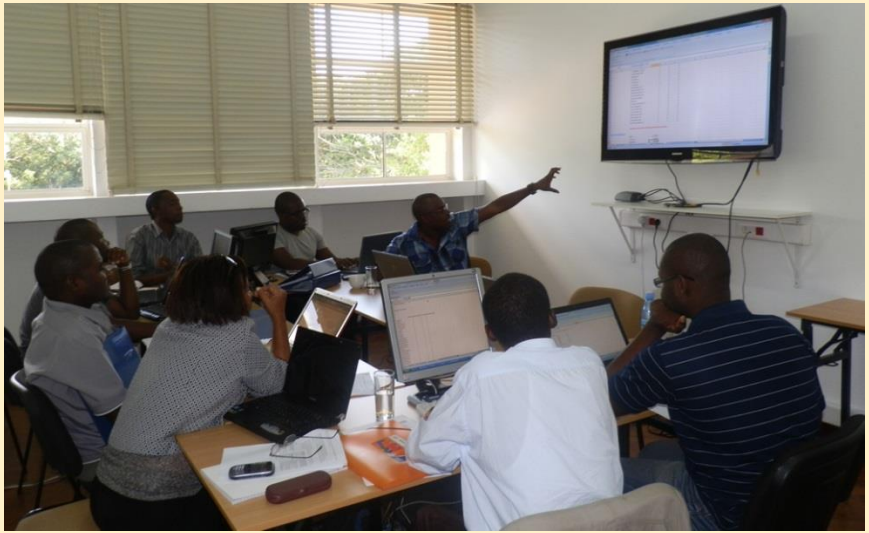
- CloneSelector1.0 released in 2010
  - RCBD trial design and management
- CloneSelector2.0 released June 2011
  - MET analysis
- CloneSelector3.0 released August 2012
  - 2 more statistical designs to accommodate trials with large number of genotypes

# Highlights

- CloneSelector3.0 released August 2012
  - Automatic import of NIR's data
- Training offered to SP breeders during annual meetings 2010-2012

# Highlights

- Intensive in-country trainings in 2013
  - Over 10 countries



# Highlights

- Work ongoing on integration of Elston and Pesek Baker Index into CloneSelector
  - Raul Eyzaguirre conducted a training on both indices in June during this year's breeders meeting
- AccuDataLog, a mobile Fieldbook app. with integrated Zebra Barcoding technology.

# About AccuDataLog

- A mobile application for entering trial data into the CloneSelector Fieldbook while in the field
- Available on Windows and Android platforms

# Main Features

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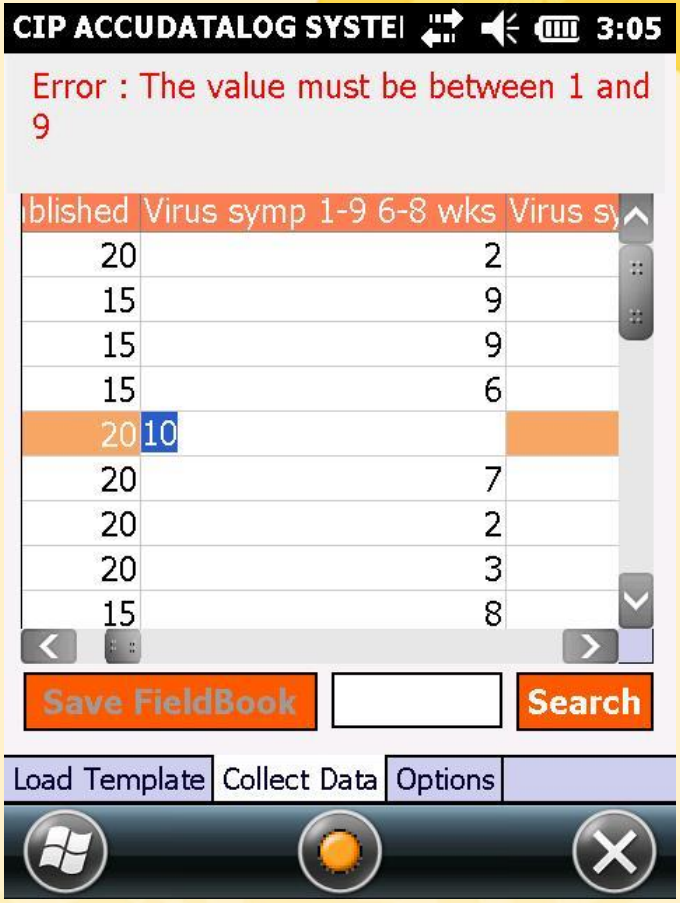
- Automatic Import of CloneSelector Fieldbooks into mobile device
- Field based data entry


# Main Features

- Integrated barcode technology, 1D or 2D

# Main Features

- Realtime data entry validation: numeric, date, string length, lower limits, upper limits, etc
  - User customizable



# Main Features

- Print on demand (POD) of labels via mobile printing
  - Labeling of samples during harvest
  - Label regeneration

# Main Features

- Easy transfer of data from PDA back to CloneSelector Fieldbook for analysis

# SSP WA Case Study

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- Trial: PT
- Genotypes: 31, Reps:2, Locations: 4
- Team consists CIP and CSIR-CRI colleagues

# Planting

- Planting labels printed
  - white V-Max polyolefin 7.5 mil tag that provides tear strength and outdoor use up to 1-2 years.  Offers good durability and chemical resistance

# Data Collection

- Fieldbook uploaded on PDA's in readiness for field data collection
  - SSP-WA has 5 PDA's so far
  - Same Fieldbook uploaded on multiple PDA's as each technician will collect data of a unique trait
  - Data collected over breeding season and regularly backed up.
  - Previously data entered on printed copies of the Fieldbook

# Harvesting

- Field data entry
  - Root count, foliage, etc
  - Complimentary paper data capture for backup

# Harvesting

- NIR's samples labels printed in the field

# NIR's Lab

- Fresh weight data entry into Fieldbook

# Transfer back to CloneSelector

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Trial: PT3-2013 Site: Fumesua Country: Ghana Planting: 22/08/2013
PlotSize: 3 Harvest: 22/12/2013 Collaborator: Dr. Asafu-Agyei Institution: CSIR-CRI/CIP

| | Rep | Bloc | Plot | Entry | Name | Pedigree | # plants Harvested | # plants w. Roots | # Roots Marketable | # Roots NonMarket | Weight Root Marketable | Weight Root NonMarket | Vine Weight kg | Skin Color 1-9 | Flesh Color | Root Size 1-9 | Root Form 1-9 | Root Defects 1-9 | Weevil Damage 1-9 | Alcidodes 1-9 | Millipede 1-9 | Trait6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LowerLimit | | | | | | | 0 | 0 | 0 | | | | | 1 | | 1 | 1 | 1 | 1 | | | |
| UpperLimit | | | | | | | | | | | | | | 9 | | 9 | 9 | 9 | 9 | | | |
| | 1 | 1 | 1 | 1 | UW11906-79 | | 9 | 9 | 6 | 23 | 1.5 | 4.0 | 2.5 | | | 6 | 5 | 1 | 7 | 3.0 | 3.0 | |
| | 1 | 1 | 2 | 2 | Kemb10 | | 10 | 8 | 4 | 12 | 2.0 | 2.0 | 3.1 | | | 5 | 5 | 1 | 7 | 6.0 | 3.0 | |
| | 1 | 1 | 3 | 3 | Ningshu1 | | 10 | 5 | 0 | 9 | 0.0 | 0.5 | 3.3 | | | 3 | 3 | 1 | 1 | 2.0 | 1.0 | |
| | 1 | 1 | 4 | 4 | Mugande | | 10 | 10 | 6 | 30 | 2.0 | 2.5 | 3.0 | | | 3 | 3 | 1 | 2 | 2.0 | 1.0 | |
| | 1 | 1 | 5 | 5 | SPK004/616 | | 10 | 8 | 4 | 10 | 2.0 | 1.5 | 2.0 | | | 2 | 2 | 1 | 2 | 1.0 | 1.0 | |
| | 1 | 1 | 6 | 6 | Apomuden | | 10 | 10 | 11 | 24 | 0.2 | 1.5 | 0.7 | | | 4 | 4 | 1 | 5 | 3.0 | 2.0 | |
| | 1 | 1 | 7 | 7 | 199062 | | 8 | 8 | 21 | 32 | 2.5 | 1.5 | 2.1 | | | 5 | 5 | 1 | 6 | 1.0 | 2.0 | |
| | 1 | 1 | 8 | 8 | Mohc | | 10 | 9 | 14 | 15 | 3.0 | 1.5 | 1.1 | | | 7 | 6 | 1 | 1 | 1.0 | 1.0 | |
| | 1 | 1 | 9 | 9 | Ejumula | | 10 | 10 | 11 | 20 | 2.5 | 1.0 | 2.1 | | | 5 | 4 | 1 | 5 | 2.0 | 3.0 | |
| | 1 | 1 | 10 | 10 | Uww11906.289 | | 7 | 5 | 9 | 11 | 1.0 | 0.5 | 3.1 | | | 5 | 6 | 1 | 3 | 1.0 | 1.0 | |
| | 1 | 1 | 11 | 11 | Kemb37 | | 10 | 10 | 11 | 24 | 2.0 | 1.0 | 1.7 | | | 5 | 5 | 1 | 4 | 2.0 | 2.0 | |
| | 1 | 1 | 12 | 12 | Cemsa78-326 | | 10 | 8 | 8 | 4 | 2.5 | 0.1 | 1.0 | | | 5 | 4 | 2 | 4 | 3.0 | 2.0 | |
| | 1 | 1 | 13 | 13 | Mapthutha-1 | | 10 | 10 | 16 | 23 | 1.5 | 0.1 | 0.5 | | | 4 | 6 | 1 | 6 | 2.0 | 1.0 | |
| | 1 | 1 | 14 | 14 | Mugamba | | 10 | 10 | 30 | 15 | 4.5 | 0.5 | 1.1 | | | 6 | 5 | 2 | 4 | 2.0 | 2.0 | |
| | 1 | 1 | 15 | 15 | Zapallo | | 8 | 6 | 6 | 6 | 0.5 | 0.1 | 4.2 | | | 4 | 4 | 1 | 2 | 2.0 | 1.0 | |
| | 1 | 1 | 16 | 16 | Kamala Sundari | | 10 | 10 | 24 | 19 | 3.5 | 0.5 | 1.3 | | | 6 | 5 | 1 | 3 | 2.0 | 3.0 | |
| | 1 | 1 | 17 | 17 | UW119-15 | | 10 | 10 | 20 | 14 | 5.5 | 0.5 | 2.3 | | | 6 | 5 | 1 | 3 | 3.0 | 2.0 | |
| | 1 | 1 | 18 | 18 | Ogyefo | | 10 | 10 | 11 | 30 | 2.5 | 1.5 | 3.0 | | | 5 | 5 | 1 | 3 | 3.0 | 1.0 | |
| | 1 | 1 | 19 | 19 | UW11906-175 | | 10 | 9 | 11 | 21 | 2.5 | 1.0 | 1.3 | | | 5 | 5 | 1 | 5 | 2.0 | 1.0 | |
| | 1 | 1 | 20 | 20 | MUSG0616-18 | | 10 | 9 | 11 | 26 | 1.5 | 1.0 | 1.1 | | | 4 | 4 | 1 | 7 | 1.0 | 2.0 | |
| | 1 | 1 | 21 | 21 | Jewll | | 10 | 10 | 16 | 18 | 3.0 | 0.5 | 1.1 | | | 5 | 4 | 1 | 8 | 3.0 | 3.0 | |
| | 1 | 1 | 22 | 22 | Ejumula25 | | 10 | 10 | 13 | 24 | 3.5 | 1.5 | 1.6 | | | 7 | 5 | 1 | 6 | 3.0 | 3.0 | |
| | 1 | 1 | 23 | 23 | Tacna2 | | 10 | 10 | 17 | 13 | 3.5 | 0.5 | 3.9 | | | 7 | 5 | 1 | 5 | 1.0 | 2.0 | |
| | 1 | 1 | 24 | 24 | Baauregard | | 10 | 9 | 22 | 18 | 4.0 | 1.0 | 11.7 | | | 5 | 4 | 2 | 5 | 2.0 | 1.0 | |
| | 1 | 1 | 25 | 25 | Jonathan | | 9 | 9 | 7 | 26 | 1.0 | 1.0 | 2.4 | | | 3 | 4 | 1 | 2 | 1.0 | 2.0 | |
| | 1 | 1 | 26 | 26 | Cemsa74-228 | | 10 | 10 | 19 | 5 | 8.5 | 0.5 | 4.6 | | | 8 | 5 | 1 | 7 | 6.0 | 4.0 | |
| | 1 | 1 | 27 | 27 | Tamale Orange | | 10 | 10 | 11 | 8 | 2.5 | 0.5 | 0.6 | | | 5 | 5 | 1 | 6 | 3.0 | 2.0 | |
| | 1 | 1 | 28 | 28 | LO323-1 | | 10 | 10 | 15 | 16 | 4.0 | 1.5 | 3.0 | | | 6 | 4 | 2 | 6 | 3.0 | 5.0 | |

Fieldbook | Results | General | Installation | Field | Weather_data | Master | Crop_management | cData

Ready

- The rest of the NIR’s data is imported back into CloneSelector via the CloneSelector routine for importing NIR’s data
- On the first day of use data for 13 different harvest traits for a total of 62 genotypes in the PYT was entered into the Fieldbook in the field.

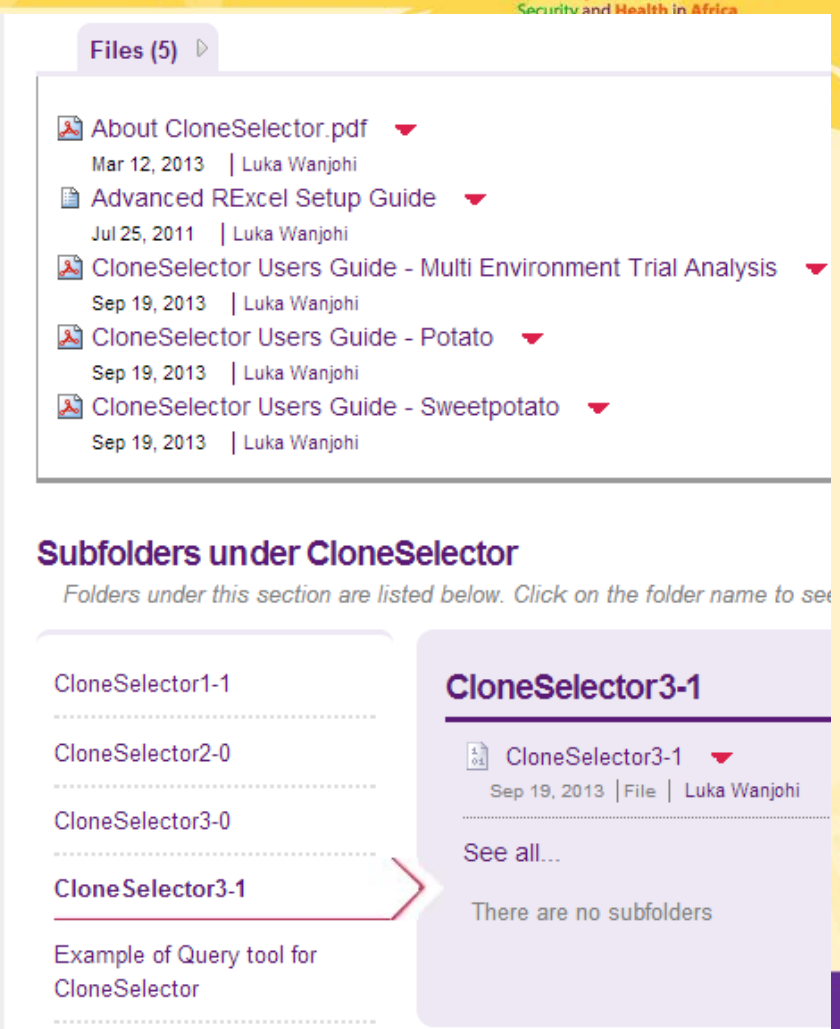
# Challenges

- Limited informatics support in SSA
  - User support always key in success of any information systems

# Getting Started

http://sweetpotatoknowledge.org/germplasm/research-methods/cloneselector

AccuDataLog: https://research.cip.cgiar.org/confluence/display/GIMS/CIP+AccuDataLog



# Acknowledgements

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