INNOVATIVE DIGITAL DATA COLLECTION IN COLLABORATIVE COCOA FERTILIZER TRIALS

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CocoaSoils addresses a huge knowledge gap on soil fertility and mineral nutrition needs of the cocoa tree, as well as exploring impacts of climate change, the role of agroforestry, avoiding deforestation and ensuring a living income for cocoa farmers.

CocoaSoils is a public-private partnership between cocoa and fertilizer companies, CGIAR centers and other public research institutes. The consortium is co-led by IITA and Wageningen University & Research.
Trials set up

CORE TRIALS

11 Long-term nutrient response experiments
6 countries: Ghana, Nigeria, Cameroon, CdI, Indonesia and Ecuador.

SATELLITE TRIALS

393 Farmer-managed sites
4 countries: Ghana, Nigeria, Cameroon, and Ivory Coast
T1: C + I
T2: BMP + no F
T3: BMP + NF
T4: BMP + OF

Effects of:
- Multifactorial fertiliser combinations (N-P-K) as part of integrated soil fertility management
- BPM: Shading, pruning, weeding, pest control.

Aim: To evaluate the impact of optimized cocoa tree management and nutrient supply.
Collaboration in Research

Experts knowledge

- Development of protocols for data collection and management of the trials.
Barcode system

- S0 => stands for satellite trial
- CA => Country code
- 064 => Field ID
- 004 => Plot ID
- 24 => Tree ID
ODK Data Collection

Protocol → XLS → ODK forms → Data collection
Data Collection – Core trials

- **Trial Establishment**
  - Plot coordinates
  - Field soil sample

- **Maize Uniformity Crop**
  - Maize harvest per plot

- **Nursery**
  - Nursery and seedling information

- **Field preparation**

- **Planting cocoa**
  - Planting details, compost, fertiliser use, nutrient analysis.

- **Measurements**

- **Management**
  - Weeding, pruning, pest and disease.

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**Yearly assessment**

- Tree height
- Trunk circumference
- Crown depth and crown radius
- Leaf number
- Flushing, flowering, cherelle and pod presence
- Canopy cover
- Pod count per size class
- Pod and Bean yield
- Litter biomass
- Chupon removal

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**Nutrient response trial:**
6 countries – 11 CT

Per trial

* Fertilizer selection
* Tailor-made formulation,
* Design map of treatments,
* Identification tool using ODK
* Fertilizer preparation guidelines, and application.

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Data Collection – Satellite trials

127 partners’ technicians in Ghana, Cameroon, Nigeria and CdI.

Consecutive data collection since 2019.
Data storage and data publication

Field data collection

Data storage and processing

Data publication
Data sharing with CocoaSoils partners

Data accessibility
Our aim:

• To generate a set of integrated soil fertility management and a decision support system for intensifying cocoa production through judicious use of agricultural inputs.

• Documented evidence for understanding the physiological basis of cocoa nutrient uptake and use.

• Identification of recommendation domains and impact of sustainable intensification on forest pressure.

• Operational open knowledge and data sharing portal for the storage, management, and dissemination of cocoa intensification research results.
Conclusions

- Innovative data collection approaches are needed to improve data repositories and decision tools support.
- We have developed and operationalize an innovative digital data collection workflow, from field data collection and data processing to cocoa ontologies.
- Collaboration in cocoa research is key to improve productivity and farmers living income.
Acknowledgements

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- IITA Nigeria (Stefan Hauser)
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*Images representing logos for each entity.*
Thank you!

- Questions?