



APNI

AFRICAN
PLANT
NUTRITION
INSTITUTE

Welcome to the...

West African Forum on Precision Agriculture

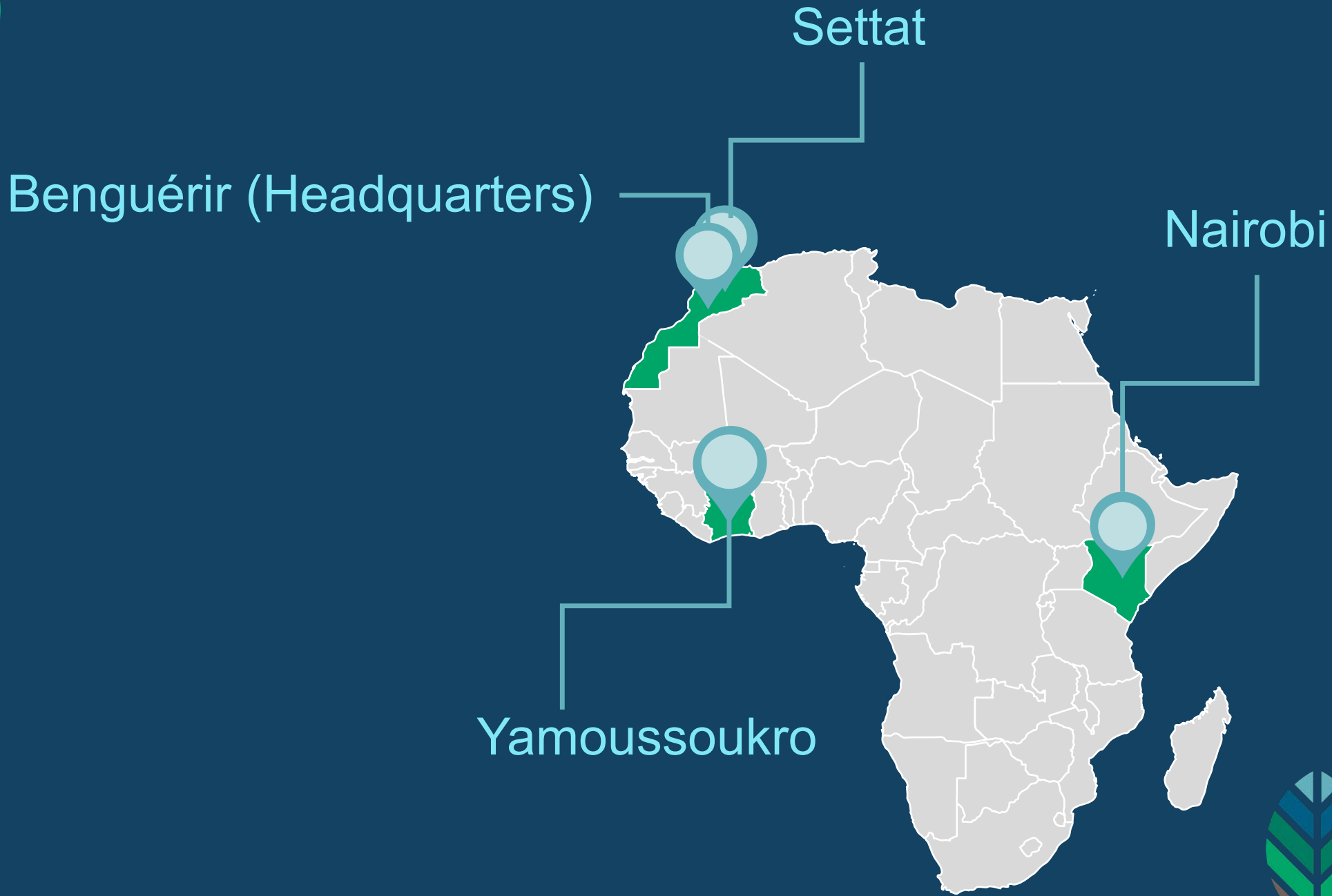


African Plant Nutrition Institute (APNI)

A not-for-profit scientific organization established in March 2019

“Innovate plant nutrition through evidence-based practices for a resilient and food secure Africa”





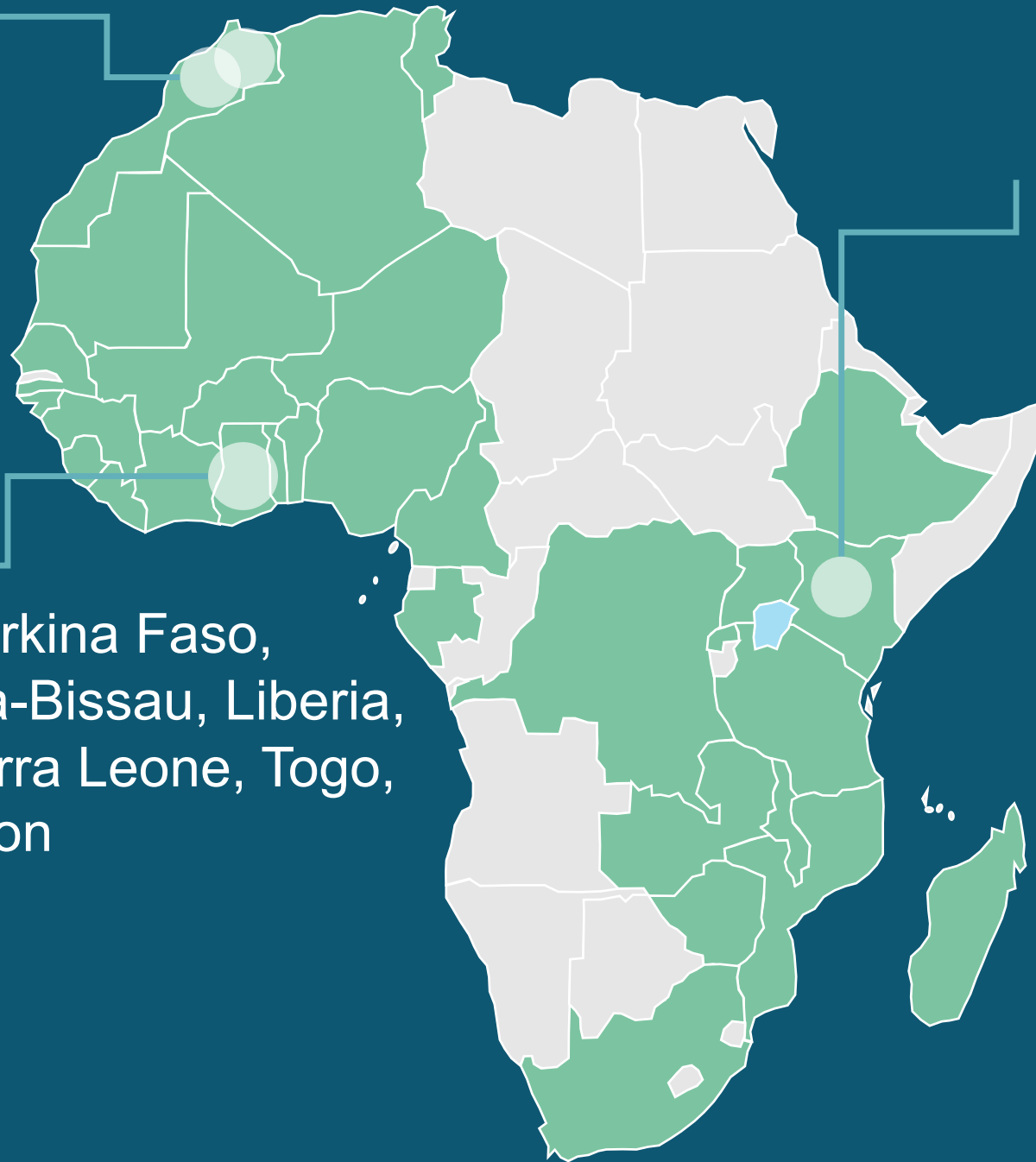


North Africa

Morocco, Algeria,
Tunisia, Senegal,
Mauritania

West Africa

Ivory Coast, Burkina Faso,
Guinea, Guinea-Bissau, Liberia,
Mali, Niger, Sierra Leone, Togo,
Benin, Cameroon



East & South Africa

Kenya, Ethiopia,
Uganda, Tanzania,
Rwanda, D.R.C., Gabon,
Zambia, Malawi,
Mozambique, Zimbabwe,
Madagascar, S. Africa



APNI Pathway to Impact

Guided by:

- Data & Diagnostics
- Value-Chain Needs

Identify Opportunities

Research Focus Areas

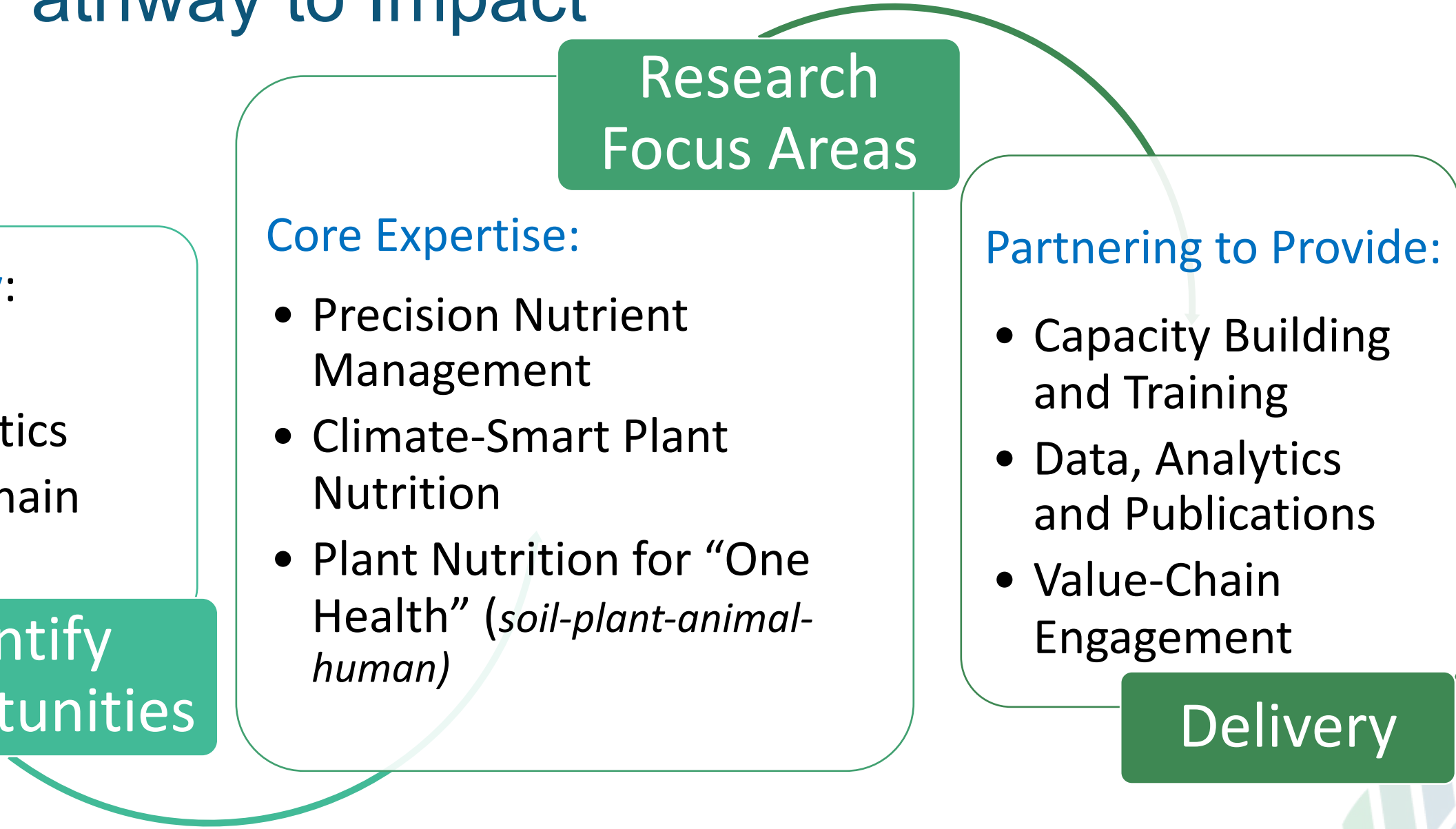
Core Expertise:

- Precision Nutrient Management
- Climate-Smart Plant Nutrition
- Plant Nutrition for “One Health” (*soil-plant-animal-human*)

Partnering to Provide:

- Capacity Building and Training
- Data, Analytics and Publications
- Value-Chain Engagement

Delivery



Defining Precision Agriculture



Precision agriculture is a management strategy that gathers, processes, and analyzes temporal, spatial, and individual data



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Defining Precision Agriculture



Precision agriculture is a management strategy that gathers, processes, and analyzes temporal, spatial, and individual data and combines it with other information to support management decisions according to estimated variability **for improved resource use efficiency, productivity, quality, profitability, and sustainability of agricultural production.**

Is Precision Agriculture Relevant in Smallholder Systems?

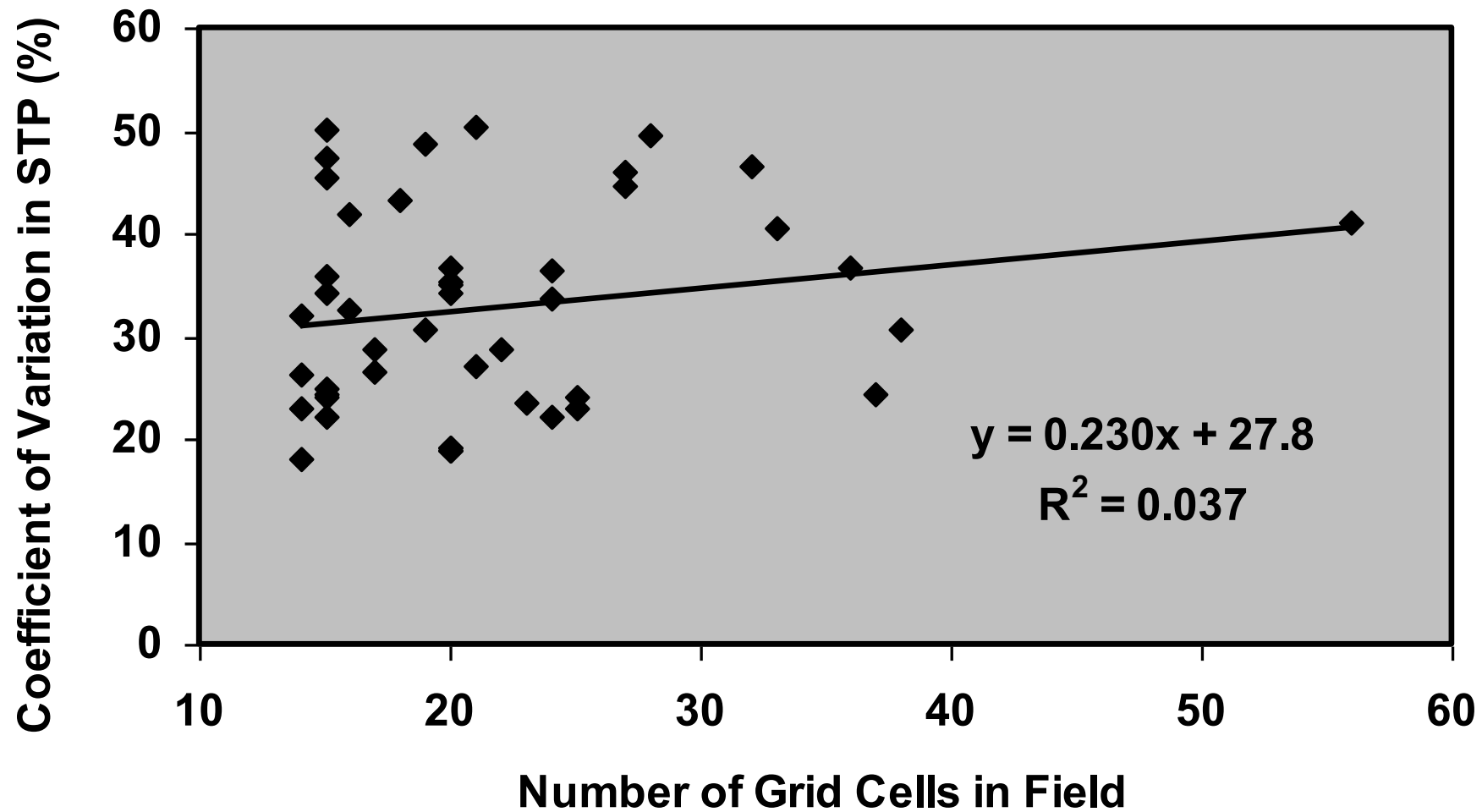
Cook et al., 2003

“We question this assertion [that PA is irrelevant to small holders] and postulate that the basic purpose of precision agriculture – to provide spatial information to reduce uncertainty – far from being a luxury, and could be viewed as essential to accelerate change in the developing world...”

“The need for [site-specific] information is actually greater [in the developing world], principally because of stronger imperative for change and lack of conventional support.”



Scale of Spatial Variability



Spatial Variability in Smallholder Farms



0.94 ha field in Togoville, Togo



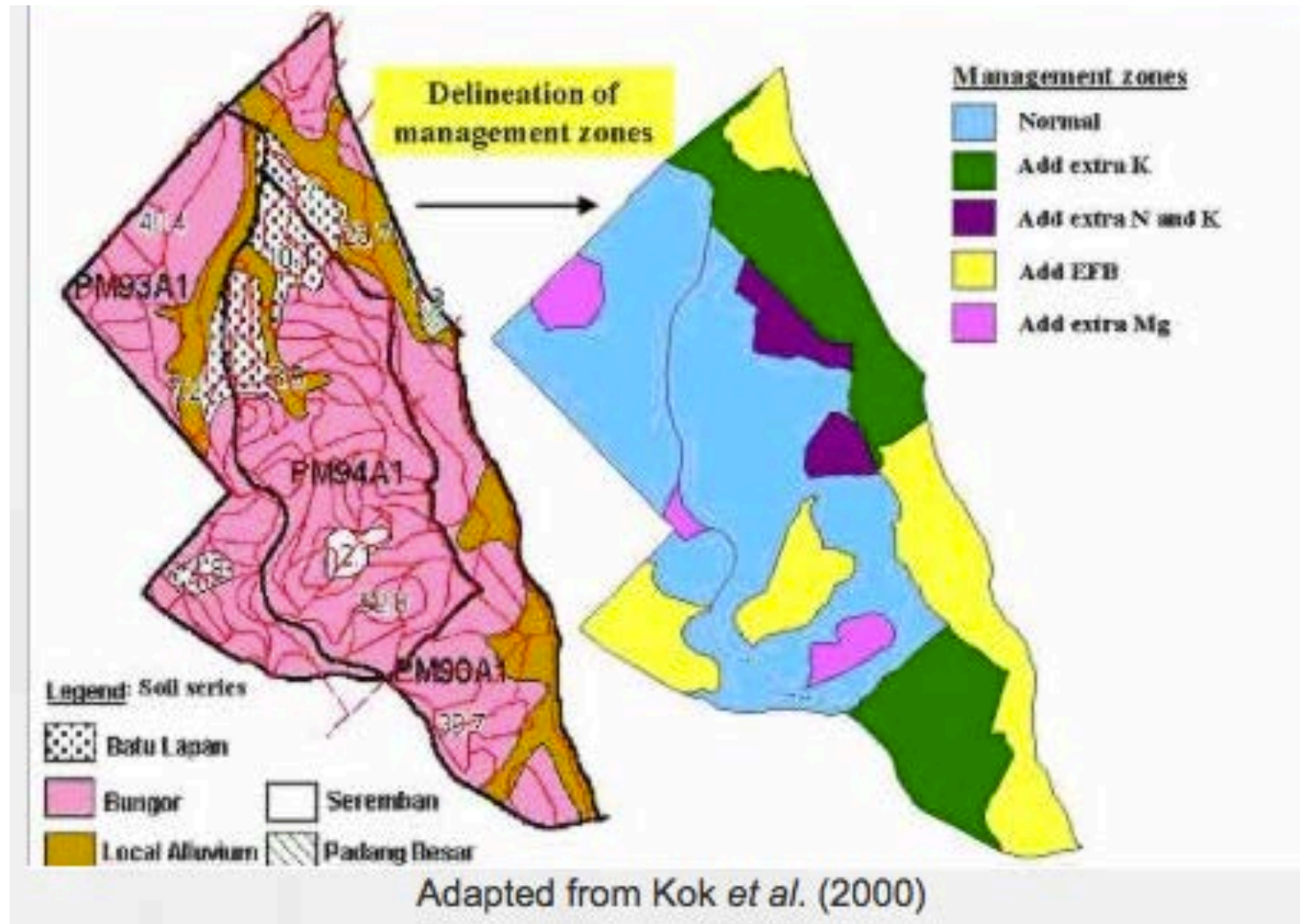
Management Zones...

3. Farmer's experience



- Previous management
- Familiarity with field
- Intuition
- Observations
- History of land use
- Tillage
- Pests and weeds

Management Zones in a 216-ha Oil Palm Field



Zones based on:

- Yield history
- Soil fertility
- Terrain
- Infrastructure (roads)

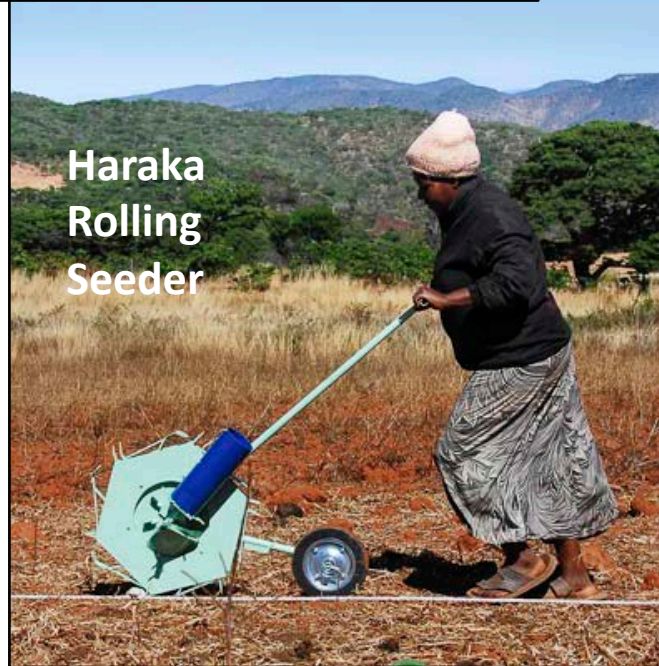


If single seeds would be planted 14 to 17-cm apart, production levels could easily increase 25%.



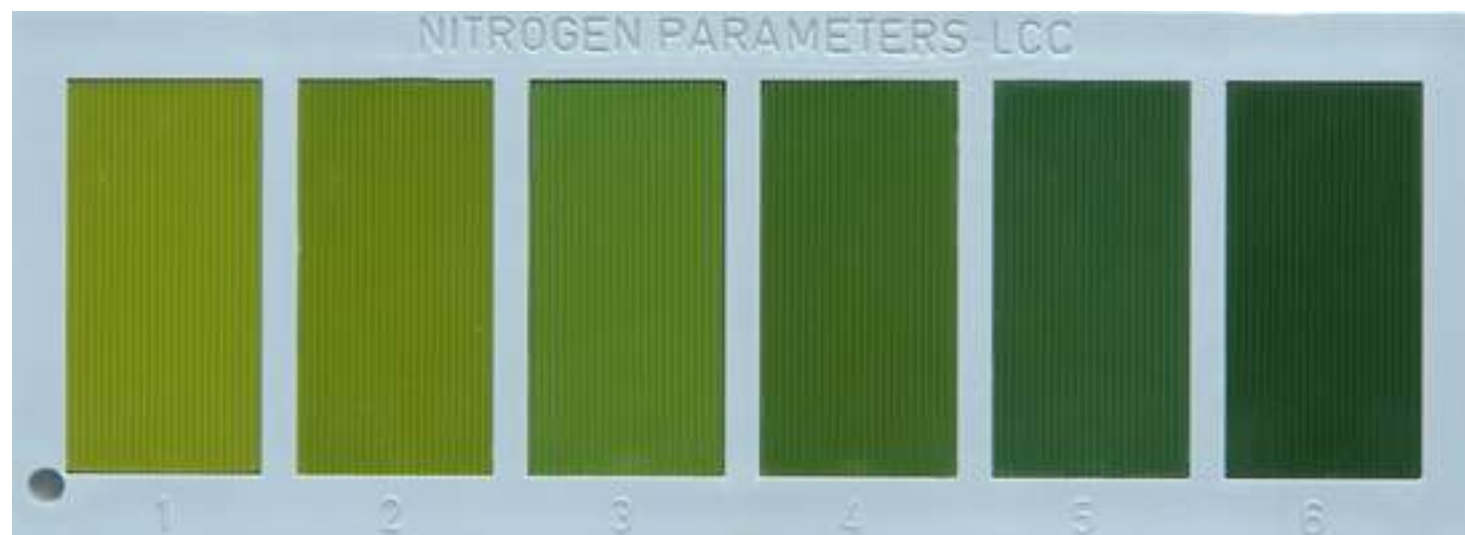


Precision Hand-Planting Tools



Precision Farming Tools for Smallholder Systems





Apply high N dose



Apply baseline N dose

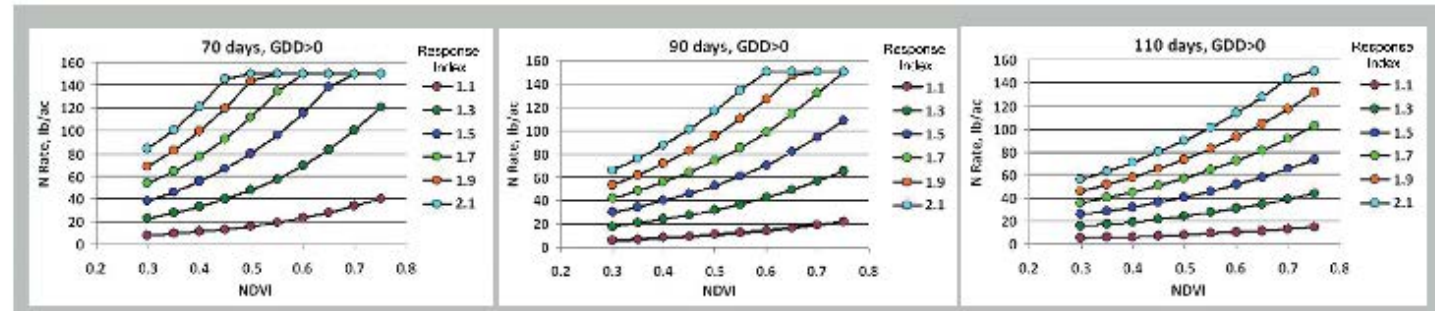
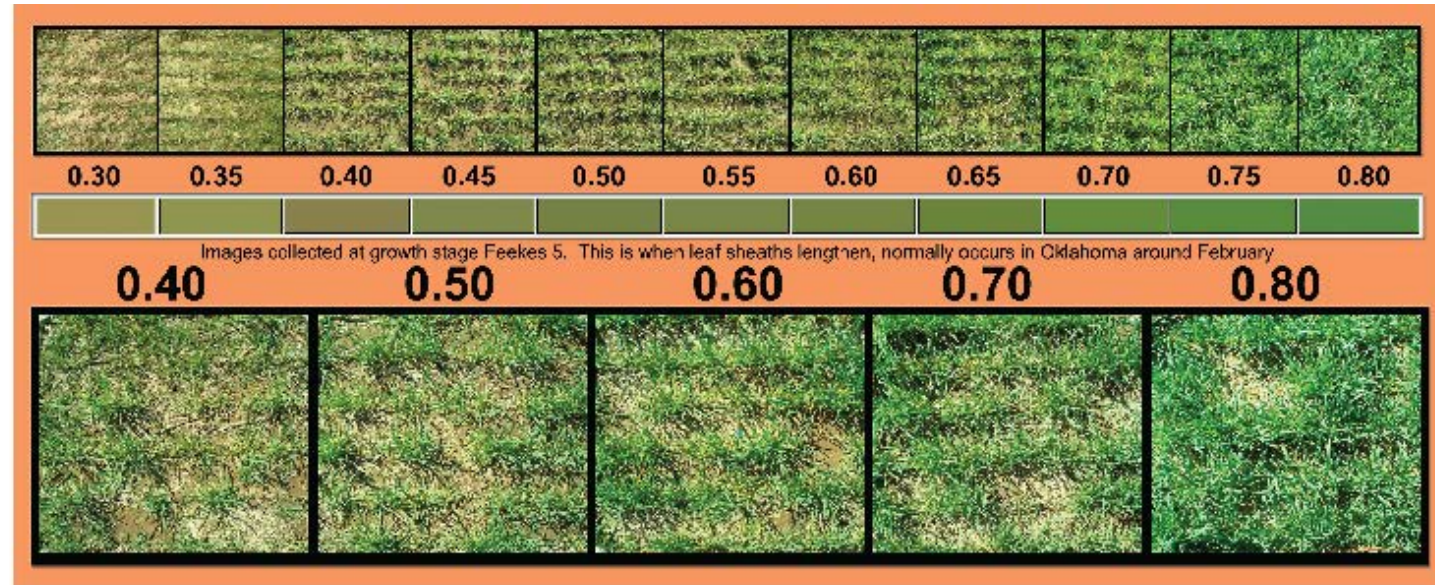


Apply little or no N

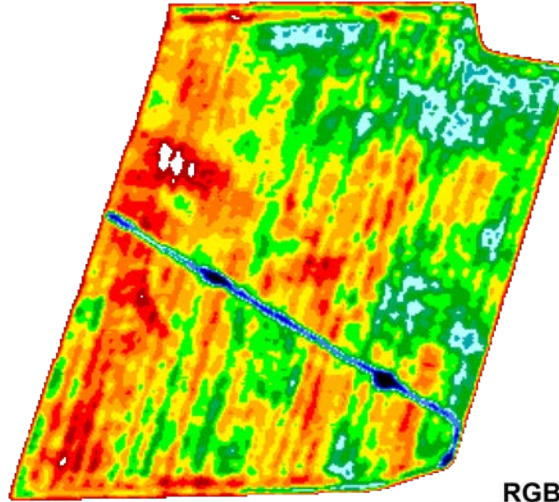




Sensor-Based NDVI Chart

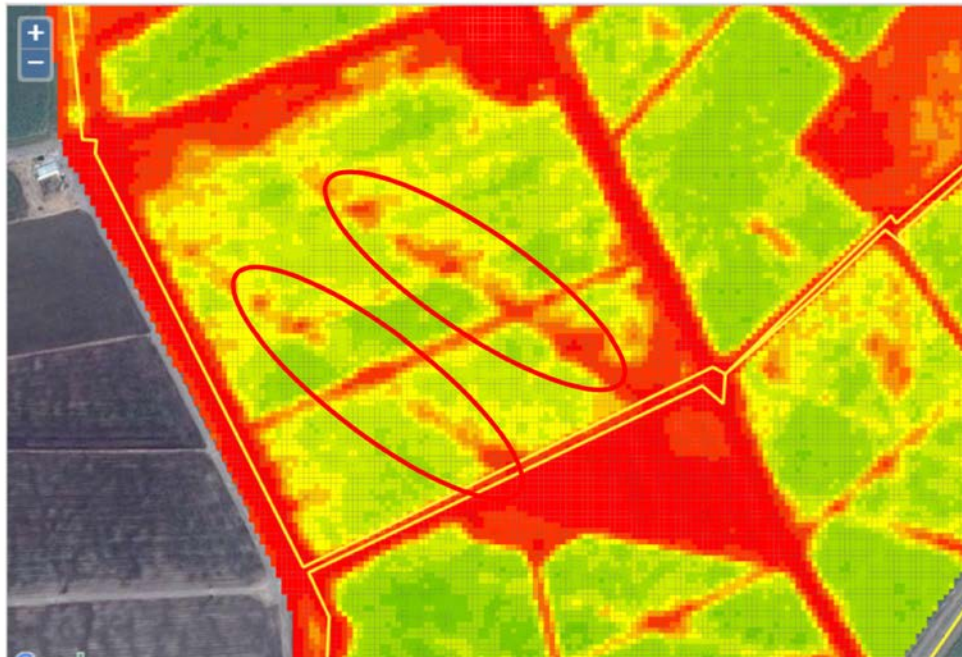


Remote Sensing and In-Season Imagery

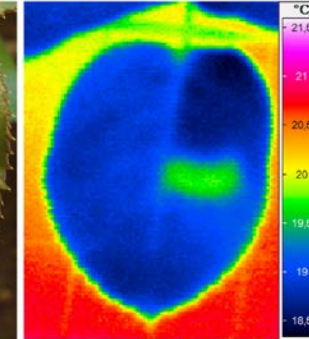


RGB Image

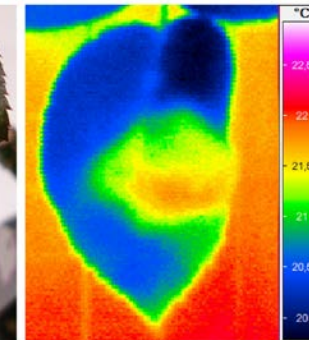
Thermogram



5 dai



7 dai

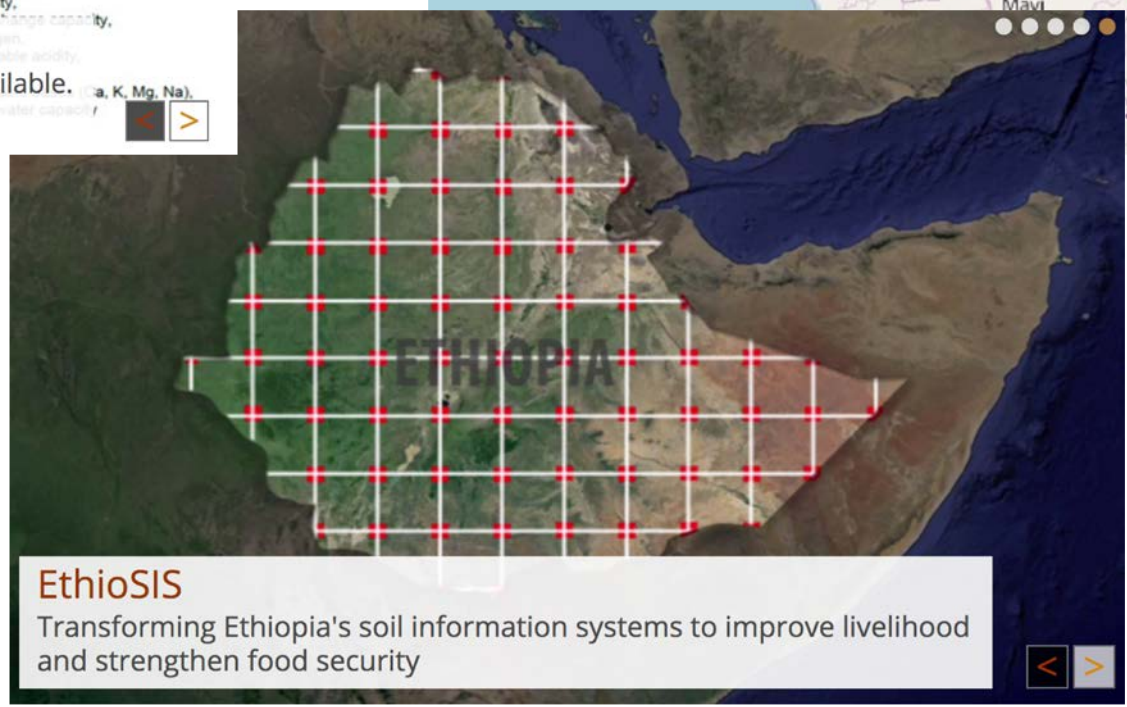
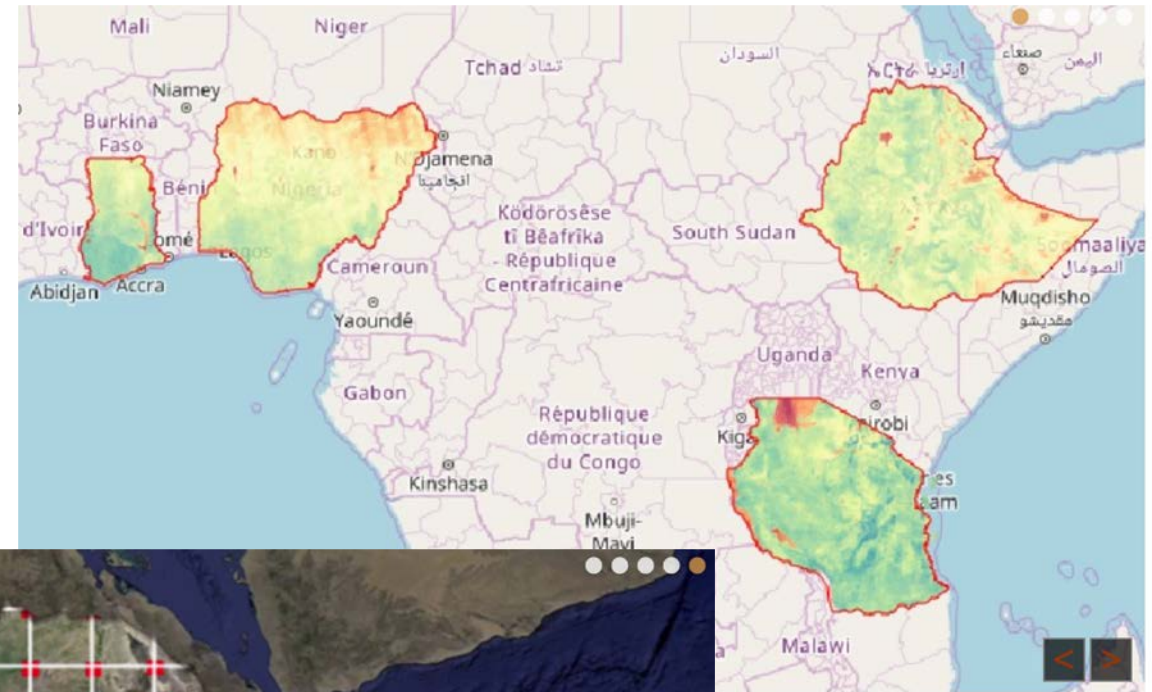
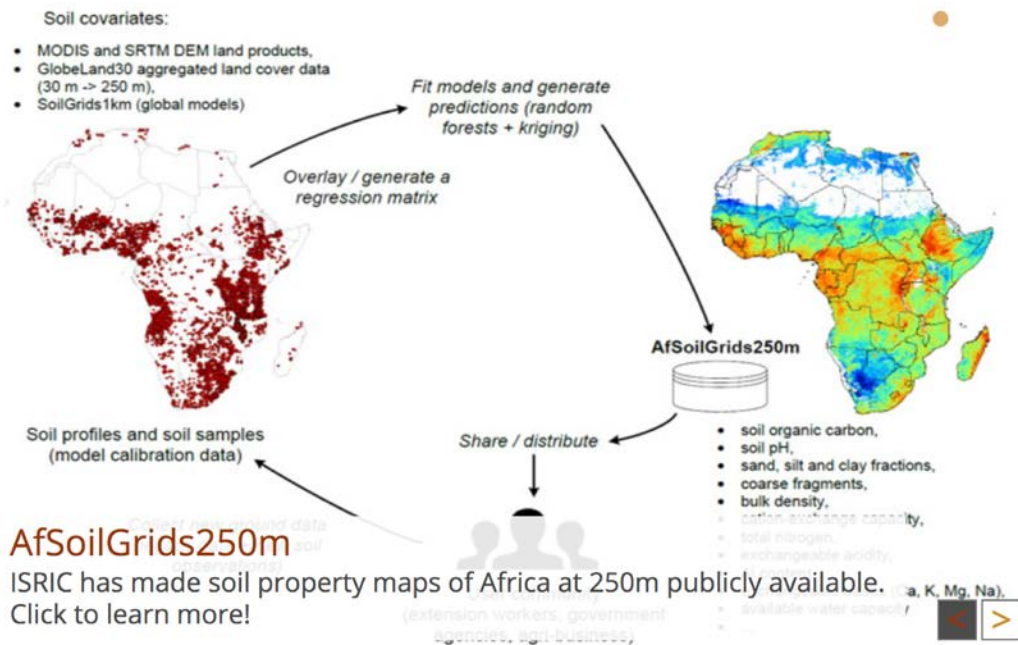




Mobile Devices – Agricultural Apps



Soil Grid-Based Decision Support Tools



The Nutrient Expert[®] Decision Support Tool

Nutrient Expert is a computer/mobile device-based decision support tool for crop advisers.

Nutrient Expert aims to supply a crop's nutrient requirements tailored to a specific field or growing environment.

accounts for **indigenous nutrient sources** and **farmer resource availability**

recommends fertilizer at **optimal rates** and at **critical growth stages**



Nutrient Expert[®] for Hybrid Maize Settings About Help Exit
South Asia (Version 1.1.1, June 2013)

First time user? Working in a new location? Make sure to have the 'Settings' right!

Nutrient Expert for Hybrid Maize helps you to:

- develop an optimal planting density for your location
- evaluate current nutrient management practices
- determine a meaningful yield goal based on attainable yield
- estimate fertilizer NPK rates required for the selected yield goal
- translate fertilizer NPK rates into fertilizer sources
- develop an application strategy for fertilizers (right source, right rate, right time, right place), and
- compare the expected or actual benefit of current and improved practices.

To start, click a button

Current NPK Practice → Planting Density → SSNM Rates → Sources & Splitting → Profit Analysis

Nutrient Expert[™] for Wheat Settings About Help Exit
South Asia (Version 1.1.1, March 2013)

First time user? Working in a new location? Make sure to have the 'Settings' right!

Nutrient Expert for Wheat is a decision support tool for developing farmer-specific fertilizer recommendations. It helps you to:

- evaluate current nutrient management practices
- determine a meaningful yield goal based on attainable yield
- estimate fertilizer NPK rates required for the selected yield goal
- translate fertilizer NPK rates into fertilizer sources
- develop an application strategy for fertilizers (right source, right rate, right time, right place), and
- compare the expected or actual benefit of current and improved practices.

To start, click a button

Current FFP & Yield → SSNM Rates → Sources & Splitting → Profit Analysis

Global Food Security

- A study by the International Food Policy Research Institute (IFPRI) estimated that stacking agricultural technologies could increase global crop yields as much as 67% and cut food prices nearly in half by 2050.
- Key areas for prioritized investments:
 - Conservation agriculture
 - Integrated soil fertility
 - Improved crop protection
 - Improved irrigation
 - Precision agriculture





Thank You

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