

Remote sensing-based tool to assess nitrogen levels in farmers fields, to support farmers' stover+fertilizer use/management

Project Title: P1965 - Africa RISING: Sustainable intensification of low-input farming systems

Description of the innovation: Proper nitrogen management is crucial to conservation agriculture. Significant yield (GY) increases are achieved when combining residues with N fertilizer application. Quantifying the optimal quantity of stover to incorporate as residue cover will provide greater yield and economically benefit farmers. MAIZE researchers demonstrated the potential of remote sensing tools at leaf and canopy scale to predict grain yield and assess leaf nitrogen content, to help adjust N fertilizer inputs for optimizing grain yield.

New Innovation: No

Stage of innovation: Stage 1: discovery/proof of concept (PC - end of research phase)

Innovation type: Production systems and Management practices

Geographic Scope: Regional

Number of individual improved lines/varieties: <Not Applicable>

Region:

- Sub-Saharan Africa

Description of Stage reached: Initial comparison between ground- and aerial-based tools made. Further multi-location validation required. As low-cost tool in comparison to the more specialized leaf-clip sensors, digital photography is promising approach for precision agriculture crop management. Ground and aerial platform-based measurements performed similarly in terms of assessing leaf N content and GY.

Name of lead organization/entity to take innovation to this stage: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo / International Maize and Wheat Improvement Center

Names of top five contributing organizations/entities to this stage:

- IITA - International Institute of Tropical Agriculture

Milestones:

- Strengthened ability to synthesize and apply available knowledge related to SI oriented research methodologies (multi-criteria assessments), management practices, technologies, machinery, in 10-15 partner orgs

Sub-IDOs:

- 10 - Closed yield gaps through improved agronomic and animal husbandry practices

Contributing Centers/PPA partners:

- CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo / International Maize and Wheat Improvement Center

Evidence link:

- <https://doi.org/10.1038/s41598-020-73110-3>

Deliverables associated: <Not Defined>

Contributing CRPs/Platforms:

- Maize - Maize
- Wheat - Wheat