

Water budgeting in conservation agriculturebased subsurface drip irrigation in maize-wheat rotation using HYDRUS2D model for South Asia

Project Title: P1401 - Scaling CA based SI through enhanced capacity, knowledge, partnerships and policy engagement

Description of the innovation: In water scarce regions of South Asia, replacing rice with maize is advocated to make cereal-based systems sustainable. Adoption of innovative agronomic management practices, i.e. conservation agriculture (CA) and sub-surface drip irrigation (SSDI), are considered as key strategies and interventions to address the challenges of water scarcity under projected climate change. Benefits from CA and SSDI concerning water economy are well-established; now scientists established their complementarity in water budgeting in cereal-based systems.

New Innovation: Yes

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:

- Southern Asia

Description of Stage reached: Multi-year systematic research showed the complementarity of conservation agriculture and sub-surface drip irrigation, assessed through field experimentation and simulation modelling. Considering the future consequences of rapidly depleting groundwater, Governments (India, Punjab, Haryana) initiated a new policy to save water in agriculture. 'Science driven Policy' is needed for effective execution.

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:

- BISA - Borlaug Institute for South Asia
- ICAR - Indian Council of Agricultural Research

Milestones:

- Farmers in a further 2-3 WHEAT (irrigated) target regions, using most water-efficient cultivars and optimum agronomy and irrigation systems, achieve water use efficiency of ca 450 l/ kg grain can be achieved

Sub-IDs:

- 8 - More efficient use of inputs

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/s41598-021-93866-6>

Deliverables associated:

- D18040 - High impact research article on SI (<https://cgspace.cgiar.org/handle/10568/110078>)

Contributing CRPs/Platforms:

- CCAFS - Climate Change, Agriculture and Food Security
- Wheat - Wheat