

Category	: International Rice Research Conference
Select Theme	: Sustainable and equitable farming systems
Endorsement email	:
Keyword 1	: Water management
Keyword 2	: Sustainable management practices
Keyword 3	:
Title of Entry	: Portfolio of sub-surface micro-irrigation and conservation agriculture: A game changer for enhancing crop and water productivity of rice-wheat system in India
Presenting author	: Dr PC Sharma
Presenting author email	: psharma.knl@gmail.com
Co author 1	: Dr. HS Jat
Co author 2	: Dr. ML Jat
Affiliation presenting author	: Director, ICAR-CSSRI, Karnal, India
Affiliation 1	: Hub Manager, CIMMYT, India
Affiliation 2	: Principal Scientist, CIMMYT, India
Select only one type of presentation	: 15 minute oral presentation

Abstract : Rice-wheat (RW) system in north-west India has been central to food security in South Asia. However, indiscriminate use production resources have led to severe stress on natural resources. In RW system, repeated tillage, residue burning and over-pumping of ground water are the major causes of concern for soil health deterioration, serious water deficits and environmental pollution; the key indicators for sustainability. Rice consumes about 50% of total irrigation water in Asia and accounts for about 24-30% of the withdrawal of world total freshwater. The scenario is alike in India and is evident that during 2008-2012, the total fresh water withdrawals was about 761 billion m³ of which about 90% was for agriculture. To address these issues in RW system, conservation Agriculture (CA) based management practice have been developed, deployed and advocated. However, realizing potential benefits of CA would need synchronizing water and nitrogen (N) for altered management practices. With this background, in a long-term production-scale research platform established in 2009 at CSSRI (29°70'N, 76°96'E), Karnal, India; a new set of treatments on sub-surface drip fertigation were imposed during monsoon 2016. Four scenarios: i) conventional-till (CT) rice-CT wheat (Scenario I; farmers' practice; FP); ii) CT rice-zero till (ZT) wheat, flood irrigation (Scenario II; partial CA); iii) ZT rice-ZT wheat with flood irrigation (Scenario III; full CA) and iv) ZT rice-ZT wheat with subsurface drip irrigation (SSDI) (Scenario IV; full CA+SSDI) were evaluated during 2016-2018 for their effect on crop and water productivity. On a 2-year mean basis; full CA+SSDI recorded 18% higher system productivity, saved 57% (133 cm/yr) of irrigation water and increased WPI by 176% compared to FP. Scenario III recorded 14 and 44% higher system productivity and WPI, respectively and saved only 21% irrigation water compared to FP. Partial CA based system recorded yields similar to FP but with 13% less irrigation water. Layering of sub-surface drip irrigation/fertigation with CA based RW system is a potential game changing technology for sustaining the RW system in north-west India while conserving natural resources and ensuring food security under the emerging climate change scenario.

[Read more»](#)

Uploaded Files »

No files found.

