



# **XIV AGRICULTURAL SCIENCE CONGRESS**

## **Innovations for Agricultural Transformation**



**ABSTRACTS**

**Poster Presentations**

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**National Academy of Agricultural Sciences, New Delhi**  
**ICAR-Indian Agricultural Research Institute, New Delhi**

# Contents

## Day-1

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1. Plant Sciences (Field Crops)	1-111
2. Plant Sciences (Horticultural Crops)	112-155
3. Natural Resource Management	156-234
4. Plant Protection	235-293
5. Food Science & Value Addition	294-311
6. Animal Sciences-Livestock, Dairy & Poultry	312-340
7. Fisheries	341-361
8. Engineering & IT	362-377
9. Social Sciences	378-422
10. Agricultural Education	423-429

## Day-2

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1. Plant Sciences (Field Crops)	430-544
2. Plant Sciences (Horticultural Crops)	545-590
3. Natural Resource Management	591-683
4. Plant Protection	684-749
5. Food Science & Value Addition	750-767
6. Animal Sciences-Livestock, Dairy & Poultry	768-797
7. Fisheries	798-815
8. Engineering & IT	816-830
9. Social Sciences	831-876
10. Agricultural Education	877-883



**Abstract No. 1686****Role of nitrogen and carbon supplementation on N assimilatory enzymes and photosynthetic efficiency amongst low pH tolerant *Nostoc* strains**

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The study focused on the influence of nitrogen as  $\text{NaNO}_3$  and carbon as sucrose supplementation on the activity of N assimilatory enzymes (nitrogenase, nitrate reductase, nitrite reductase, glutamine synthetase) and photosynthetic parameters (intracellular sucrose, photosynthetic oxygen evolution and photochemical efficiency of PSII) amongst low pH tolerant *Nostoc* strains grown under control pH (7.0) and low pH (4.5) medium. Influence of carbon supplementation was more significant than nitrogen supplementation under two conditions of growing medium. Effect of nitrogen supplementation was more on nitrate reductase as well as photochemical efficiency of *Nostoc* strains whereas, the effect of carbon supplementation was more on nitrogenase activity and intracellular sucrose. These conditions exhibited differential response in terms of nitrite reductase, glutamine synthetase and photosynthetic oxygen evolution rate. Statistical analysis showed significant interactive effect of nutrient supplementation, strain, treatment (Nutrient supplementation x strain, nutrient supplementation x treatment, strain x treatment and nutrient supplementation x strain x treatment) on intracellular sucrose, photosynthetic oxygen evolution and N assimilatory enzymes (nitrogenase, nitrate reductase, nitrite reductase, and glutamine synthetase) under the treatment of no nitrogen or carbon supplementation or with N or C supplementation in the growing medium. The effect of treatment on photochemical efficiency of PSII ( $F_v/F_m$ ) was non-significant, whereas, the effect of others on this parameter was significant. Nitrogen or carbon supplementation in the growing medium may have a role in low pH tolerance mechanism amongst selected *Nostoc* strains and these strains can have a potential in development of effective bioinoculant for rice growing acidic soils of India.

**Abstract No. 1688****Conservation agriculture: Can be an option for sustainable crop production in India**

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Non remarkable response in crop productivity, degrading soil structures, scarcity of production resources such as water, energy and labour along with changing climate provides a pace towards adoption of maize based cropping systems along with conservation agriculture(CA) based best bet crop management practices in rice-wheat dominated agro-ecologies of north-western IGP. With this a higher productivity, better response from applied inputs, saving of water, energy along with lower environmental impact can be expected, thus maize being a  $C_4$  crop having adaptability to climate change and CA being a

environment friendly approach. Maize based cropping systems under CA-based management practices have immense potential to feed the future population in the era of climate change. In a long term study of CA-based management practices, we have evaluated the performance of CA-based management practices [zero tilled permanent bed (PB) and zero tillage flat (ZT)] and conventional till flat (CT) in main plots in four diversified maize based systems [maize-wheat-mungbean (MWMb), maize-chickpea-*Sesbania* green manure (MCS), maize-mustard-mungbean (MMuMb) and maize-maize-*Sesbania* (MMS)] in sub plots. The experimental design was split-plot with three replications. Significant ( $P < 0.05$ ) interactions between tillage, crop establishment methods and cropping system were observed for system productivity and soil carbon dynamics. Performance of all the crops (except wheat) with respect to agronomic traits was superior in ZT plots, however wheat performed better in PB. CA-based crop management practices have significant ( $P < 0.05$ ) impact on soil organic carbon (SOC) content and its stock than to CT system as compared to initial value.

### Abstract No. 1689

## Feasibility and economic sustainability of mechanization in sugarcane planting under western plane zone of Uttar Pradesh India

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The feasibility and its economic viability of 2- row sugarcane automatic cutter planter were studied at farmers' field. The labour intensive and time exhaustive operation are common problems associated to conventional sowing of sugarcane. Tractor drawn commercially available ICAR-Indian Institute for Sugarcane Research, Lucknow designed and manufactured two - row sugarcane automatic cutter planter was tested and evaluated at farmers' field. Performance indicators of the planter viz., field capacity and efficiency were calculated by using the observed data in the field. An average field capacity of 0.18 ha/h was obtained for continuous operation of planter with average speed of 1.62 km/h. The field efficiency varied from 63.49 to 70.81 per cent in different field conditions. The cutting sett length was found on average 33.75 cm with 2 to 3 bud eyes of each sett and planted with overlapping 34.44 mm which is recommended range of 30 to 50 mm. The average depth of placement of setts in 10 observations of farmer's field was measured 116.0 mm. The operating cost of planter was found to be Rs 906/h and Rs 4975/ha, however, in conventional method of sugarcane sowing (rider and furrower followed by dropping of setts in furrow manually), the cost was analyzed to be Rs 4049/h and Rs 10172/ha. The cost benefits in machine planting was calculated Rs 5197/ha over the conventional method. Extent of adoptability and suitability of machine in region, it has very cost effectiveness, timeliness operation, good quality of work & safety of work, reduction in drudgery.