Entry No. IRRC-0022

Category	: International Rice Research Conference
Select Theme	: Climate change and environmental sustainability
Endorsement email	:
Keyword 1	: Mitigation of climate change
Keyword 2	: Carbon and nitrogen cycles
Keyword 3	: Adaptation to climate change
Title of Entry	: Impact of nitrogen management on crop performance, agronomic nitrogen use efficiency, soil health and greenhouse gas emissions in direct seeded rice of central Vietnam
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Growing rice by direct seeding is getting popularity in many parts of Asia and challenged by low nitrogen use efficiency subjected to greenhouse gas emissions (GHGs). Projected food production with burgeoning population needs sustainable rice production to reduce trade off between water scarcity and irrigated rice production. Impact of nitrogen rates (0, 40, 80, 120 kg ha-1) and fertilizer types (urea, ammonium chloride and calcium nitrate) was assessed on crop performance, dry matter production, CH4 and N2O emissions and economic efficiency including water productivity for rice grown in spring and summer seasons in comparison to continuous flooding (CF) of central Vietnam. Application of 120 kg N ha-1 using urea and ammonium chloride produced highest productive tillers, dry matter and grain yield in both growing seasons with no significant difference for 80 kg N ha-1 for grain yield followed by Calcium nitrate. Highest grain yield for 80 kg N ha-1 was associated with increased panicle numbers, filled spikelets and 1000-seed weight. Economic efficiency and soil health in terms of organic matter, nitrogen contents and available phosphorus also improved for 80 or 120 kg N ha-1 for each of the source. Mean CH4 and N2O emissions decreased by 33% and 20% for urea than ammonium chloride at 120 kg N ha-1 in summer and spring seasons. Highest agronomic N use efficiencies ranged 20.8 to 22.5 kg grain yield kg N-1 for urea applied at 80 kg N ha-1 in summer and spring growing seasons, followed by ammonium chloride. These gases emissions reduced significantly using 80 kg N ha-1 urea following ammonium chloride. Thus, optimizing N fertilizer using 80 kg N ha-1 urea can be economically viable to improve the agronomic nitrogen use efficiency, grain yield, soil health and mitigate CH4 and N2O emissions under water saving paddy cultivation in Central Vietnam.

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