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Abstract	: Impacts of urea deep placement with intermittent irrigation on nitrous oxide and nitric oxide emissions and nitrogen use efficiency from lowland rice cultivation Theme:Climate change and environmental sustainability S.M. Mofijul Islam1,*, Yam Kanta Gaihre2, Upendra Singh3, Jatish Chandra Biswas1, Md. Nayeem Ahmed1, Joaquin Sanabria3, Bjoern Ole Sande4, M.A. Saleque5 1 Bangladesh Rice Research Institute, Soil Science Division, Gazipur, Bangladesh 2 International Fertilizer Development Center, Dhaka, Bangladesh 3 International Fertilizer Development Center, Muscle Shoals, Alabama, USA 4International Rice Research Institute, Los Baños, Laguna, Philippines 5 International Rice Research Institute, Dhaka, Bangladesh *Presenting Author S.M. Mofijul Islam Senior Scientific Officer Soil Science Division Bangladesh Rice Research Institute (BRRI) Gazipur, Bangladesh Telephone: +88-01718160966 Email: mislambrri@gmail.com Abstract Urea deep placement (UDP) and alternate wetting and drying (AWD) irrigation method are two promising rice production technologies. However, studies on the impacts of UDP under AWD irrigation on nitrous oxide (N2O) nitric oxide (NO) emissions are still limited. We investigated the effects of UDP on N2O and NO emissions, nitrogen use efficiency (NUE) and rice yields compared with conventional broadcast application of prilled urea (PU) under AWD irrigation. Emissions were measured from three fertilizer treatments — no N, UDP and PU using an automated gas sampling and analysis system continuously for two consecutive Boro (dry) rice seasons in Bangladesh. For UDP, urea briquettes were placed in 7-10 cm below soil surface between four hills of rice at each alternate row after ten days of transplanting, while PU was applied as broadcast in three equal splits. Treatments were arranged in a randomized complete block designwith three replications and

emissions were measured at every three-hour interval. N2O emissions were irregular and event specific. Fertilizer induced emission peaks were observed after broadcast application of PU, but they were not observed in UDP. However, emissions peaks during dry period were more prominent in UDP compared to PU. Nevertheless, seasonal cumulative N2O emissions were similar between UDP and PU treatments. Across the season, UDP and PU showed yield-scaled N2O emission 96.3 and 88.7 g t–1 grain and emission factors were 0.49 and 0.23%, respectively In contrast to N2O emission, NO fluxes

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