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# The fate of fertilizer-derived nitrogen in a rice field of Qingtongxia irrigation area

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The nitrogen cycling in the natural environments has been seriously disturbed due to fertilizer overused or misused. Some nitrogen oxides in the imbalanced process of nitrogen cycling are the main contributors for major environmental problems like water eutrophication. Nitrate leaching from agricultural lands during the growing season and its threat against water quality is one of the important global environmental issues. Field experiments were carried out at a rice field in Ningxia Hui Autonomous Region, northwestern China to provide information on the fate of FDN in the Qingwenxia irrigation area of the upper Yellow River basin, by using the technique of stable isotope 15N-traced nitrogen fertilizer. The fertilization levels in this study were 0, 240 and 300 kg N/ hm2, respectively. We estimated recovery of FDN in root, stover and grain of rice and profile distribution of fertilizer nitrogen residual in soil. The result showed that uptake of FDN in grain was increased by higher N rate. At a high level of fertilization (300 kgN/hm2), nitrogen uptake from fertilizer by the rice plant at harvest is 45.93%, percentage of in the plant tissue derived from the soil is 52.63%, recover by rice is 27.90%, soil residual is 23.31 %, the recovery of rice-soil is 51.21%, and the loss rate of nitrogen fertilizer is 48.79%. Based on the statistical data, the use amount of nitrogen fertilizer is 500 million kg in Ningxia Hui Autonomous Region, its loss from rice field at one growing season is 27.81 million kg. To produce rice of 1000 kg, the nitrogen loss is 20.17 kg. Soil residual of nitrogen fertilizer was also measured even in the soil depth of 60-90 cm, indicating that nitrogen fertilizer leaching would be a pollution source for underground water.