Geophysical Research Abstracts
Vol. 19, EGU2017-18760, 2017
EGU General Assembly 2017

Effects of different nitrogen reduction modes on yield of spring maize and nitrate - N residue in soils of the southern Loess Plateau

Tinghui Dang and Qiang Dong

Insititute of soil and water conservation, Northwest A&F University Yangling Shaanxi China (dangth@ms.iswc.ac.cn)

[U+3010]Objectives[U+3011]Excessive fertilization in farmland caused nitrate leaching and accumulation in soil, which not only reduced the fertilizer utilization rate, but also had potential environmental problems. The effects of different nitrogen reduction modes on yield of spring maize and soil NO_3−-N in the southern Loess Plateau were discussed, and scientific fertilization suggestions were put forward, which were of great significance to instruct local maize fertilization and protect environment safety. [U+3010]Methods[U+3011]A field experiment was conducted in the south of the Loess Plateau for three years. Spring maize was planted with half plastic film mulching in one crop per annum[U+FF0E]The experiment consisted of 5 N fertilization treatments: control treatment (CK),conventional N fertilization rate (Con), optimal N fertilization[U+2160](Opt[U+2160]), optimal N fertilization[U+2161] (Opt [U+2161]) and optimal N fertilization [U+2162](Opt [U+2162]), The changes of yield of maize, nitrogen uptake and soil NO_3−-N were measured.[U+3010]Results[U+3011]The results showed that, compared with the conventional fertilization, the grain yield and N uptake of maize had no significant change under the three optimal N fertilization application models, the rate of the grain yield's change is 100∼300kg/hm2. Compared with the conventional fertilization, agronomic efficiency of fertilizer-nitrogen and N partial fertilizer productivity were increased by 20.2%∼23.2% and 21.9%∼23.7%, respectively. The accumulation of nitrate nitrogen in profile (0[U+FF0D]200 cm) decreased by 90.7 kg / hm2, 97.3 kg / hm2, 100.7 kg / hm2 ,respectively, with the decreases of 44.7%, 47.9% and 49.6% respectively.[U+3010]Conclusions[U+3011]The optimum nitrogen fertilization pattern did not affect spring maize yield and N uptake, and could improve agronomic efficiency of fertilizer-nitrogen and N partial fertilizer productivity. Under the same nitrogen application rate, the effects of adding nitrification inhibitor or slow-release fertilizer on nitrate-N residue were not obvious. The amount of nitrogen applied, the mode and type of fertilization had a certain effect on the migration of nitrate nitrogen. Optimized N - application model could significantly reduce the NO_3—N residue in soil profile. It is suggested to reduce the amount of nitrogen fertilizer by 20% on the basis of the traditional nitrogen fertilizer when the spring maize is planted with half plastic film mulching, which can guarantee the yield and protect the environment.