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### 控制排水和施氮量对旱地土壤氮素运移转化的影响

## Effects of controlled drainage and nitrogen fertilizer application on nitrogen migration and transformation in dryland

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中文关键词: [氮](#), [灌溉](#), [土壤](#), [控制水位](#), [NO<sub>3</sub>-N含量](#), [NH<sub>4</sub><sup>+</sup>-N含量](#), [氮素稳定性](#)

英文关键词: [nitrogen](#) [irrigation](#) [soils](#) [controlled water table](#) [nitrate content](#) [ammonia content](#) [nitrogen stability](#)

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中文摘要:

为了研究控制排水和氮肥共同作用对旱地土壤氮素运移转化的影响,在湖北荆州羊角排灌试验站进行微区对照试验,以控制水位水平(30、50、100 cm)和3个施氮水平(H:68.25/145.6 kg/hm<sup>2</sup>; C:52.5/112 kg/hm<sup>2</sup>, L:36.75/78.4 kg/hm<sup>2</sup>,前面数值是施磷酸二铵量,后面为施硫酸钾复合肥量)为试验变量,组合成H30、H50、H100、C30、C50、C100、L30、L50、L100等9个处理测定了土壤剖面分层NO<sub>3</sub><sup>-</sup>-N、NH<sub>4</sub><sup>+</sup>-N含量。对观测结果进行分析表明,常规施氮水平下,自由排水处理各土层NO<sub>3</sub><sup>-</sup>-N含量最高、50处理各土层NO<sub>3</sub><sup>-</sup>-N含量最低;低施氮水平下30处理NH<sub>4</sub><sup>+</sup>-N含量最高;同一水位处理高施氮水平NH<sub>4</sub><sup>+</sup>-N含量最低。同一施氮水平下,控制水位30 cm的NH<sub>4</sub><sup>+</sup>-N含量大于50 cm的NH<sub>4</sub><sup>+</sup>-N含量大于100 cm的NH<sub>4</sub><sup>+</sup>-N含量。同一施氮水平下实行控制排水可以增加氮素稳定性;实行控制水位处理时,不需增加或减少施氮量、常规施氮条件下氮素稳定性保持最高;而在自由排水时,减少施氮量,能够增加耕层土壤氮素稳定性。

英文摘要:

In order to study the effect of combination of controlled drainage and nitrogen application on nitrogen migration and transformation in dryland, a compared test-pit experiment was conducted in Yajiao Drainage and Irrigation Station in Hubei province. Nine treatments, named H30, H50, H100, C30, C50, C100, L30, L50 and L100 were studied with two factors, controlled drainage water table with three levels 30, 50 and 100 cm, and nitrogen application with three levels, high, conventional and low level. Nitrate and ammonia contents in the soil layers were measured. Results showed that under the conventional nitrogen application level, nitrate content was highest in the treatment C100, and lowest in the treatment C50. Under the low nitrogen application level, ammonia content was highest in the treatment L30. When the water table was same, ammonia content was lowest in the treatment H30, H50 and H100. When the nitrogen application level was same, ammonia content sorted by controlled water table was 30>50>100 cm. Under the same nitrogen application level, controlled drainage can improve the stability of the nitrogen. Under the controlled drainage condition, there was no need to increase or decrease the nitrogen application while the nitrogen stability was high. Under the conventional drainage condition, reducing the nitrogen application can promote the nitrogen stability.

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