

## 双氰胺在农业生态系统中的应用效果及其影响因素

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## Effects and influence factors of dicyandiamide (DCD) application in agricultural ecosystem.

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摘要

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摘要

农业生态系统中较低的氮肥利用率造成了一定的经济损失和环境污染.双氰胺(DCD)是一种高效并且专性抑制土壤硝化活性的化合物,可以通过抑制土壤氨氧化微生物的丰度和活性来显著减少土壤中硝态氮的淋失及温室气体N<sub>2</sub>O的排放,而对其他土壤微生物没有显著影响.影响DCD应用效果的主要因素包括土壤温度、pH值、质地、有机质含量及水分含量等.近些年随着分子生物学技术在农业生态系统中的应用,微生物介导的DCD硝化抑制机理取得了一系列重要研究成果.本文主要对DCD的酶学作用机理、应用效果及其影响因素等方面进行综述,并对今后的研究方向作一展望.

关键词: 硝化抑制剂 双氰胺 作用机理 抑制效果 氮肥利用率

Abstract:

The low utilization efficiency of nitrogen fertilizer in agricultural ecosystem has caused serious economic and environmental issues. Dicyandiamide (DCD) is a widely used nitrification inhibitor, which can inhibit nitrification via affecting ammonia oxidizing microorganisms with minimal influence on other soil microorganisms, thereby reducing the leaching of nitrate and emission of greenhouse gases. The factors influencing the efficiency of DCD in soil include soil temperature, pH, texture, organic matter, moisture, *etc*. Recently, the application of molecular methods in agricultural systems has shed new light on the microbial mechanism underlying nitrification inhibition by DCD. In this review, the enzymatic inhibition mechanism, the application effects and their influence factors of DCD were summarized, and the prospects of its application were discussed as well.

Key words: nitrification inhibitor dicyandiamide (DCD) inhibition mechanism inhibition effect nitrogen fertilizer efficiency.

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