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几种包膜控释肥氮素释放特性的评价

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Evaluation of nutrients release feature of coated controlled-release fertilizer

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摘要

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摘要 采用水浸泡法和土培法,按照欧洲标准化委员会(CEN)推荐的控释肥料评价标准,对国内外8种包膜肥料的氮素释放特性进行了评价。水浸泡法测试结果表明,Compo-1、Compo-2的初期溶出率(η_{t1})超出该标准,其它6种包膜肥的 η_{t1} 在标准规定的范围内;8种包膜肥的微分溶出率($\eta_{\Delta t}$)均符合标准,氮素释放期(T)均达到缓/控释要求。8种包膜肥中除了Compo-1、Compo-2的 η_{t1} 以外,其它均符合CEN推荐的控释肥料标准,但因包膜材料和工艺的差异,表现出了各自不同的氮素释放特征。土壤条件下Compo系列、Cau系列、Osmocote和Au的释放期分别是水浸泡条件下的2~4、1.5、0.7和1.3倍,不同的包膜肥料有各自不同的估算系数,需要采用具体的校验试验确定。从盆栽试验中油菜、玉米第六周生物量来看,Compo-3、Cau-C17显著低于速效肥处理,Osmocote、Au油菜处理显著高于速效肥油菜处理,其它施肥处理与速效肥处理差异不显著。

关键词: 包膜肥 养分释放特性 初期溶出率 微分溶出率 养分释放期 包膜肥 养分释放特性 初期溶出率 微分溶出率 养分释放期

Abstract: The nutrient release character of coated fertilizer indicates the strength of controlled releasing and nutrient supply in specific time. At the same time, it can reflect the quality of coated materials and its processing techniques. In this experiment, the nutrition release characters of eight coated fertilizers was evaluated according to the standard recommend by Committee of European Normalization (CEN) using water extraction and soil incubation methods in order to guide the application of coated fertilizers. The test results using soil extraction method showed that there were discrepancies in nutrient release between eight coated controlled fertilizers due to the difference of coated materials and processing techniques. For Compo series, the preliminary solubility η_{t1} were 51.9%, 28.6% and 11.5%, respectively; differential solubility $\eta_{\Delta t}$ were 1.5%, 1.8%, and 1.4%, respectively; and nutrient release time (T) was ranged from 3 to 6 months. But for Cau series, η_{t1} were 3%, 7.4% and 5.7%, respectively; $\eta_{\Delta t}$ were 0.8%, 1.2% and 1.2%, respectively; and T was ranged from 2 to 3 months. η_{t1} , $\eta_{\Delta t}$ and T of Osmocote were 5.8%, 0.7% and two and a half months, while for Au were 0.9%, 2.1% and one and a half month. T of Compo series, Cau series, Osmocote and Au incubated by soil were 2-4, 1.5, 0.7 and 1.3 times of that tested using water extract. Different coated fertilizers were of their respective conversion coefficients, which should be ascertained by concrete calibration experiments. In term of the biomass of cole and corn at sixth week, Osmocote and Au treatments was significantly higher than that of readily available fertilizer, while the biomass of Compo-3 and Cau-C17 treatment were significantly lower. For the other treatments, the biomass didn't show a notable difference with that of readily available fertilizers.

Keywords:

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