

同位素示踪 · 资源环境 · 动植物生理

### 三种核素对植物烂种烂芽的影响

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摘要:

为探讨核素及其浓度与植物烂种烂芽的关系,用Sr(NO<sub>3</sub>)<sub>2</sub>、CsNO<sub>3</sub>和UO<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O,配制成0, 0.1, 0.5, 1.0, 2.5, 5.0, 7.5和10.0mmol·L<sup>-1</sup>的溶液,研究Sr、Cs和U在发芽试验中对向日葵、大豆、玉米、黄瓜和油菜种子烂种烂芽的影响。结果表明:核素、核素浓度和植物对烂种烂芽的影响极显著,互作效应也非常显著。U处理的烂种烂芽率极显著地高于Sr或Cs处理,Sr或Cs处理之间差异不显著。不同Sr<sup>2+</sup>或Cs<sup>+</sup>浓度处理间没有显著差异。2.5mmol·L<sup>-1</sup>及以上U<sup>6+</sup>处理极显著地增加植物烂种烂芽率。植物之间对核素的反应差异较大,向日葵敏感,黄瓜不敏感,油菜、大豆和玉米介于二者之间。因此,不同核素对植物种子烂种烂芽的影响不同,U的影响大于Sr或Cs的影响,中高浓度U离子易致植物种子和幼芽死亡,不同植物烂种烂芽率对不同种类和不同浓度的核素反应不同。

关键词: 锶 铯 铀 植物种子 烂种烂芽

### Influence of Three Nuclides upon Seed and Bud Mortality of Plants

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Abstract:

In the present study, in order to understand the relationships between nuclides and seed and bud mortality of plants, five plant seeds of sunflower, soybean, corn, cucumber and rape were applied to investigate effects of Sr(NO<sub>3</sub>)<sub>2</sub>, CsNO<sub>3</sub> and UO<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O on their seed and bud mortality in a germination test. Results showed that types of nuclide, nuclide concentrations and plant species all had very significant effects on the seed and bud mortality, and their interaction effects were also very significant. The seed and bud mortality with U treatment was significantly higher than those treated with Sr or Cs. Effects between Sr and Cs treatments had no significant differences. Concentration effects between Sr<sup>2+</sup> or Cs<sup>+</sup> were not significantly different. The U<sup>6+</sup> concentration of 2.5mmol L<sup>-1</sup> and higher significantly increased seed and bud mortality. The response of the seed and bud mortality between plants to nuclides were quite different. Sunflower was the most sensitive one and cucumber the least sensitive one. The effects of different nuclides on seed and bud mortality of plants are different, following the order of U > Sr or Cs. Medium-high concentration of U ions is prone to increase plant seed and bud mortality. Seed and bud mortality of different plants respond differently to different nuclides and their concentrations.

Keywords: Strontium Cesium Uranium Plant seed Seed and bud mortality

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