

农学—研究报告

He-Ne、Nd:YAG 激光对水稻种子萌发的生物效应

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摘要:

此实验主要研究激光辐照水稻种子后对其发芽的影响,利用不同剂量(4.8 J/cm²~36 J/cm²)的He-Ne、Nd:YAG激光辐照3种水稻种子的生物学效应,测定了M1代的发芽率、发芽势。结果表明发芽率和发芽势随辐照剂量的增加呈现先升后降的变化。此实验中He-Ne激光对3种种子的最适剂量分别为12 J/cm²、14.4 J/cm²、21.6 J/cm²。Nd:YAG激光的最适剂量分别为14.4 J/cm²、21.6 J/cm²。实验证明,适合的辐照剂量可有效提高水稻种子的发芽率和发芽势,不同品种的种子对激光的敏感性不相同。因此,激光辐照种子可引起有益的生物学效应。这能为激光辐射育种提供理论及实验依据。

关键词: 生物效应

The Biological Effects of He-Ne and Nd:YAG Laser on Rice Seeds at Germinating Stage

Abstract:

This experiment study on the germination stage of rice seeds that have been treated with Laser irradiation. Three different varieties of rice seeds were irradiated with different doses (4.8 J/cm²~36 J/cm²) of the He-Ne and Nd: YAG laser. The germination rate and germination energy of M1 generation were detected. Results indicated that the germination energy and germination rate increased with radiation dose to a degree, then decreased. The optimal dose of He-Ne laser of each kind of seed was 12 J/cm², 14.4 J/cm² and 21.6 J/cm². The optimal dose of Nd:YAG laser was 14.4 J/cm² and 21.6 J/cm². Experimental results showed that the appropriate dose of laser can improve germination energy and germination rate. The sensitivity of the laser is different between different kinds of seed. It indicates that it may be feasible for bringing about good biological effect for seed irradiated by laser. It would provide theoretical and experimental basis for breeding irradiated by laser.

Keywords: biological effect

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