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水稻植质钵育秧盘制备工艺及参数优化

Preparation technology and parameters optimization for seedling-growing bowl tray made of paddy straw

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中文摘要:

为实现适合中国国情的钵育栽植技术,该文以水稻秸秆为主要原料,配以热固性胶粘剂、固化剂和增强剂经热压制备水稻植质钵育秧盘,采用正交试验设计分析成型比(施胶量、固化剂量、增强剂量和混料量)和制备工艺(成型压力、模具温度和保压时间)对植质钵育秧盘性能影响。通过对试验结果分析得出制备植质钵育秧盘优化参数为:施胶量0.9 kg、固化剂量0.002 kg、增强剂量0.09 kg、混料量1.3 kg、成型压力30 MPa、模具温度120℃、保压时间300 s,优化后的工艺参数可满足实验室试要求(钵孔率99.46%,膨胀率1.12%),为进一步研究和植质钵育秧盘产业化生产提供技术借鉴与参考。

英文摘要:

The establishment of rice seedlings is most important in cold regions in order to promote the desired rice yield. Planting technology of the seedling-growing bowl tray made of paddy straw is an effective way to promote the desired rice yield in cold regions. The preparation process of the seedling-growing bowl tray made of paddy straw is the main tech for the seedling growing tray to improve the planting technology of the seedling-growing in china. Therefore, the study explored the preparation technique of the seedling-growir bowl tray, which was the combination of hot-setting glue, curing agent, and intensifier through hot pressing. The study analyzed the performance influence of several factors on seedling-growing bowl tray made of paddy straw, and confirms the major factors and the ranges of value with single factor experiments. This study also analyzed the performance influence of the forming ratio (the quantity of glue, the quantity of curing agent, the quantity of intensifier and the quantity of mixed materials) and the preparation process (the fo pressure, the forming temperature, and the holding time) to seedling-growing bowl tray with orthogonal experiments. The optimal parameters through the analysis of the results w found 0.9 kg glue, 0.002 kg curing agent, 0.09 kg intensifier, 1.3 kg mixed materials, and the forming pressure, the forming temperature and holding time were 30 MPa, 120℃ and 300 s respectively. The optimized parameters could support the findings of the laboratory research requirements (the percent of pass was and the expansion ratio was 99.46%, 1.12% respectively), and the industrialized production, which provides the technical findings for the further research and exactly permissive for the industrialization production. The preparation technique also provides a new ways for the high value-added use of paddy straw and significance to insure food security and to promote high quality of rice producti china.

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