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## 水稻秸秆纤维地膜制造工艺参数优化

### Optimization of technical parameters for making mulch from rice straw fiber

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中文摘要:

为规模化生产与塑料地膜除草和保墒等同、价格相当的生物质基生物降解地膜提供技术支撑, 该文对用水稻秸秆纤维制取地膜的工艺进行了探讨。以水稻秸秆纤维为主要原料, 添加KP浆板(木材纤维)、湿强剂、松香以及矾土等环保助剂, 利用常规抄纸工艺, 采用五因素五水平1/2实施正交旋转中心组合试验设计的方法, 以打浆度、混合比、定量、湿强剂、调节剂为影响因素, 选取干抗张力、湿抗张力、施胶度为性能指标, 进行了试验研究。研究结果表明: 在定量90 g/m<sup>2</sup>, 调节剂0.2%, 湿强剂0.8%, 混合比低于68%, 打浆度大于45° SR的参数组合下, 水稻秸秆纤维地膜的干抗张力大于30 N, 湿抗张力大于10 N, 施胶度大于100 s。优化后的参数可满足地膜田间覆盖机械性能要求。

英文摘要:

The technique for producing a kind of bio-degraded mulch from the straw fiber was studied. It is an alternative to plastic mulch with the same price and weed control, reducing evaporation functions. Rice straw fiber was the main material, and KP (wood fiber) as well as environment-friendly additives such as wet strength agent, rosin and bauxite were added. A central composite rotary orthogonal experimental design of RSM, with five factors and five levels for each factor was employed. Conventional paper producing technology was adopted, and pulp degree, mixture ratio, grammage, wet strength agent and conditioning agents were the input variables, dry tension strength, wet tension strength, sizing value were the response functions. The optimal technical parameters were obtained, the grammage value, conditioning agents content, wet strength agent content, mixture ratio and pulp degree were 90 g/m<sup>2</sup>, 0.2%, 0.8%, less than 68% and more than 45° SR respectively. Under the condition, dry tension strength of the sample mulch was higher than 30 N, the wet tension stress was higher than 10 N, and the sizing value was higher than 100 s. The sample of mulch made from rice straw fiber could meet the need of mechanical performance for laying field.

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