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立式轴流大豆育种脱粒机参数优化

Parameters optimization of vertical axial flow thresher for soybean breeding

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中文摘要:

为寻求对立式轴流大豆育种专用脱粒机的脱粒、分离与清选性能影响的结构与工作参数最优组合，对其进行了参数优化试验。采用二次回归正交旋转中心组合优化试验方法，以滚筒线速度、脱粒间隙、喂入量和植株体积含水率为影响因素，含杂率、破碎率、未脱净率、夹带损失率、飞溅损失率和沉积率为目标函数，对影响该机脱粒性能的结构与工作参数进行优化试验研究。结果表明：当植株体积含水率14%～20%，滚筒线速度6.5～8.3 m/s，脱粒间隙为15 mm，喂入量为2.4 kg/min时，含杂率低于0.5%，破碎率低于1%，未脱净率低于2%，夹带损失率低于0.7%，飞溅损失率与沉积率为零。该研究可为立式轴流大豆育种专用脱粒机的产品定型设计提供依据。

英文摘要:

In order to find the optimal combination of the structure and working parameters of the vertical axial-flow soybean breeding thresher , and experiments were conducted to study the effect of the structure and working parameters for threshing, separating and cleaning. The structure and working principle were introduced. A central composite rotatable orthogonal experimental design of response surface methodology was employed for finding the optimum combination effecting on the working properties. The four parameters: linear velocity, concave clearance, feeding rate and moisture content were selected as input variables. Cracked grains, impurities, loss of entrapped grains, loss of unthreshed grains, spattered grains and residual grains were selected as response functions. Experimental results indicated that the most optimum combination region of the moisture content was 14-20%, the linear velocity was 6.5-8.3 m/s, the concave clearance was 15 mm, the feeding rate was 2.4 kg/min, the cracked grains were less than 1%, impurities were less than 0.5%, loss of unthreshed grains were less than 2% and loss of entrapped grains were less than 0.7%. Spattered grains and residual grains were zero.

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