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切纵流联合收获机小麦夹带损失检测试验与分析

Test and analysis of wheat entrainment loss for tangential-longitudinal-axial combine harvester

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英文关键词: [harvesters](#) [losses](#) [testing](#) [sensors](#) [threshing-separating](#)

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中文摘要:

为及时获知切纵流联合收获机在田间收获时的夹带损失情况,该文将切纵流联合收获机上的刀形齿切流滚筒、辅助喂入轮和钉齿纵轴流滚筒在实验室内建成切纵流脱粒分离试验台,在7 kg/s小麦喂入量时进行脱粒分离性能试验,测定脱出混合物中各成分的含量和纵向分布规律,建立脱出混合物脱分系数矩阵,求解出切纵流联合收获机上脱粒分离装置的脱分矩阵方程。利用阵列式聚偏氟乙烯PVDF压电薄膜传感器测量切纵流联合收获机田间收获时钉齿纵轴流滚筒下第11接料盒位置分离出的籽粒量,运用脱分矩阵方程计算出夹带损失质量并与人工实测值进行比较。结果表明,田间收获时运用PVDF压电薄膜传感器预测的夹带损失质量与人工实测值的误差为-4.82%~-5.87%。该研究可以对田间收获的籽粒夹带损失进行实时监控。

英文摘要:

In order to timely acquire the situation of entrainment losses of the tangential-longitudinal-axial combine harvester when it harvest in a field, an tangential-longitudinal-axial threshing-separating test bed was built in the laboratory, which was made up of a knife-type teeth tangential-axial drum, assistant feeding wheel and spike teeth longitudinal-axial drum of the tangential-longitudinal-axial combine harvester. The threshing-separating performance test was conducted with the test bed at the wheat feeding rate of 7 kg/s, the components and the distribution regularity of the threshed mixture were measured, the threshing-separating coefficient matrix was established and then threshing-separating matrix equation of threshing-separating device on the tangential-longitudinal-axial combine harvester was solved. The array PVDF (Polyvinylidene Fluoride) piezoelectric-film sensor was applied to measure the grain number of the 11th materials boxes location under spike-tooth longitudinal-axial drum of the tangential-longitudinal-axial combine harvester, the measured results were compared with the entrainment losses which was calculated by the threshing-separating matrix equation. The result showed that the their difference between the measured entrainment losses in the field and calculated values was -4.82%-5.87%.It has real-time monitor for grain entrainment losses in the field.

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