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斗式提升机输送大豆的机械损伤特征与机理

Soybean mechanical damage characteristics and mechanism during transportation by bucket elevator

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英文关键词:Damage detection mechanism kinetic parameters soybean Mechanical damage Bucket elevator

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中文摘要:

为改进斗式提升机设计、减轻输送过程中对大豆的机械损伤，以辽豆15、辽豆18和黑农40大豆为对象，采用TD250型斗式提升机对大豆进行提升输送损伤试验，研究了斗式提升机在输送大豆过程中造成损伤的特征与机理。结果表明：大豆在斗式提升输送过程中的损伤率约为10%，种皮破损为主要损伤形式，约占7.5%，同时伴有破碎、两瓣、缺损等。损伤主要由装载时畚斗对大豆剪切、冲击及摩擦力造成的；卸载时大豆撞击机罩所产生冲击力的作用反力造成的。通过优化装卸载结构及运行参数，损伤率下降至6.7%。

英文摘要:

In order to improve the design of bucket elevator and reduce the damage in the transportation process, three soybean varieties (Liaodou 15, Liaodou 18 and Heinong 40) were used as the samples. TD250 bucket elevator was involved in the soybean injury test of the ascension delivery, and the soybean mechanical damage characteristics and mechanism were studied. The results showed that the mechanical damage rate of transportation process by soybean bucket elevator was about 10%. Damage characteristics mainly contained broken, two discs, defect and skin damaged. Damage rate of skin damaged was the most among the damage characteristics, about 7.5%. Mechanical damage was mainly caused by shear force, friction and impact pressure made by dust pan, and impact reaction force produced by soybean hitting the machine cover under unloading. Damage rate was reduced at 6.7% after loading and unloading structure and operating parameters optimization.

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