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玉米果穗螺旋摩擦输送装置的输送性能试验

Performance experiment of friction conveying device for maize ears

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中文关键词：收获机,螺旋输送,效率,玉米果穗,损伤

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中文摘要:

为解决小型玉米联合收获机上难于配置果穗输送装置的问题，该文利用自制玉米果穗输送试验台，试验研究了玉米果穗螺旋摩擦输送搅龙的叶片高度、导向侧板倾角、导向侧板位置角、搅龙升运角和搅龙转速等对玉米果穗输送性能的影响，验证了玉米果穗输送装置对不同状态果穗的适应性。果穗处于下降侧输送、螺旋叶片高度20 mm、转速300 r/min、侧板位置角70°、侧板倾角75°的情况下，可以较好的完成玉米果穗的输送，有效避免了传统螺旋输送装置输送过程中引起的果穗损伤。

英文摘要:

Abstract: At present, chain-rake grain conveying devices are widely used in corn united harvest machines. They are reliable with stable performance, but their structures are complicated. Screw conveying devices have the advantages of being simple in structure; they are also applied in corn united harvest machines, but since they use a helical blade space to transport corn, the structures are huge and difficult to configure in small corn united harvest machines. Therefore, it is necessary to develop a new conveying device. The blades of the new maize ears helical blade friction conveying devices are lower, so the grains during the course of transmission are on the top of the blades at all times. Thus, the conveyer structure can be smaller in size, with less grain injuries in the conveying process.By using a self-made conveying device for maize ears, the research focused on the laws of effects on maize ears conveying performance caused by the new-type transmission auger's blade height, guide side panel's inclining angle, guide side panel position angle, auger lift-and-convey angle, and the rotational speed of the auger. Performances of maize ear conveying devices mainly displays in three aspects: the damage degree of maize ears, the quantity of shattering, and the transport capacity. In the paper, maize ears were first be divided into four states according to the average length, diameter and differences of moisture content. The first state was chosen in the test. Maize ears of the first state are different from the ones of state two, three, and four, respectively, in diameter, length, and moisture content. The state classification was used to study the adaptability of the conveyor as the single characteristic of the material changes. It helps to compare the test results more directly and clearly. Analysis of variance was used in the test to calculate the test results.The test verified that the maize ear conveying device is adapted to many causes, including different maize ear sizes and moisture content. With a blade height of 20 mm, an auger rotational speed of 300 r/min, side panel position angle of 70° and side panel inclination angle of 75°, the novel conveying device can convey maize ears better and effectively avoid the injury by traditional helical conveying devices.

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