

Title Effects of crop-machine variables on paddy grain damage during handling with an inclined screw auger

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Abstract

The effects of product moisture content (MC), conveyor inclination and rotational speed on paddy grain damage during handling with an adjustable screw auger were evaluated. The experiments were conducted at three levels of MCs, namely 8, 11, and 14% w.b., three conveying inclinations (CIs) (10, 20 and 30° included angle), and five levels of rotational speed (100, 200, 300, 400 and 500 rpm). Paddy grains damage was determined in terms of broken grains (BGs), husked grains (HGs), husked–cracked grains (HCG) and cracked grains (CGs). The results revealed that the values of damaged grains significantly increased with increasing the rotational speed of the screw auger. It was concluded that increasing the MC of the grains significantly reduced the values of BGs, HGs and CGs. Although the effect of conveyor inclination was significant on the value of HGs, inclination did not significantly affect the other characteristics evaluated. The highest values of broken, husked, husk-cracked and CGs were obtained at a MC of 8% w.b., a rotational speed of 500 rpm and an inclination angle of 30°; whilst the lowest values were acquired at the MC of 14% w.b., a rotational speed of 100 rpm and an inclination angle of 10°.