

超级稻单茎秆切割力学性能试验 Experiment on Cutting Mechanical Property of Single Super Rice Stalk

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摘要: 在自制的切割试验台上对超级稻单茎秆切割力学特性进行了试验。根据测量获取的切割力连续变化曲线计算了6种超级稻样本的切割功耗,分析了切割速度、切割位置以及切割刀具组合对茎秆切割力和功耗的影响。结果表明:不同品种超级稻单茎秆峰值切割力达到24~32 N,随着切割位置的提高切割力有小幅下降趋势,峰值切割力和切割功耗随茎秆截面积的增大几乎呈线性增加,随着切割速度的增加而逐渐减小。A pendulum impact cutting test-rig and a cutting force measurement system composed of a cantilever weigh sensor and a high speed analog acquisition card were developed. Then cutting mechanical property experiments of super rice stalk were carried out. According to the measuring cutting force, the cutting power consumption of different super rice stalk were calculated, and the influence of cutting speed, cutting position and parting cutter on the cutting force and consumption were analyzed. The results indicated slight decreasing tendency of cutting force with the increasing of cutting position. The peak cutting force and the cutting power consumption nearly linear increased with the increasing of cutting sectional area, but both decreased gradually with the increasing of cutting speed. The peak cutting force of different single super rice stalks could reach 24~32 N.

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