ABSTRAK

Jefri Suranta Purba   : Desain Alat Uji Pemotongan (*Cutting Test Apparatust*) Bahan Pertanian Berbasis *Strain Gage*. **Tugas Akhir**. Fakultas Teknik Universitas Negeri Medan. 2021

Pemotongan merupakan salah satu kegiatan dalam pemanenan bahan pertanian, misalnya : untuk tanaman padi, jagung, kedelai, tebu, dan kelapa sawit. Untuk merancang alat/mesin pemanen tanaman di atas, perlu diketahui tahanan potongnya. Penelitian ini dilakukan untuk merancang alat uji pemotongan berbasis sensor *strain gages*. Penelitian ini dilakuakn untuk mengetahui tahanan potong bahan pertanian. Alat uji pemotongan dapat bekerja dengan baik dengan variasi putaran (92 Rpm, 61 Rpm, 46 Rpm, 36 Rpm), variasi kecepatan potong/*feeding* (4.6 mm/detik, 3.07 mm/detik, 2.30 mm/detik, 1.84 mm/detik), jenis mata pisau (rata, berserat, bergerigi) dan sudut mata pisau (0°, 20°, 30°, 40°). Sensor strain gage dapat berfungsi sangat presisi dengan persamaan kalibrasi : $y = 1.417x - 1.970$ dan $R^2 = 0.980$. Hasil rancangan alat uji pemotongan dapat digunakan untuk melakukan uji tahanan potong bahan pertanian dengan presisi.

Kata Kunci : Desain, Pemotongan, *Cutting, Strain Gauge*, Apparatus

ABSTRACT

Jefri Suranta Purba : Design of Cutting Test Apparatus for Agricultural Materials Based on Strain Gage. Thesis. Faculty of Engineering, State University of Medan. 2021

Cutting is one of the activities in harvesting materials, for example: for rice, corn, soybeans, sugar cane, and oil palm. To design the above plant harvesting tool/machine, it is necessary to know the cutting resistance. This research was conducted to design a cutting test tool based on the strain gages sensor. This research was conducted to determine the cutting resistance of agricultural materials. Cutting test equipment can work well with variations in rotation (92 Rpm, 61 Rpm, 46 Rpm, 36 Rpm), variations in cutting/feeding speed (4.6 mm/second, 3.07 mm/second, 2.30 mm/second , 1.84 mm/sec) , blade type (flat, fibrous, serrated) and blade angle (0°, 20°, 30°, 40°). The strain gage sensor can work very precisely with the calibration equation: $y = 1.417x - 1.970$ and $R^2 = 0.980$. The results of the cutting test design can be used to conduct trials of cutting agricultural materials with precision.

Keywords: Design, Cutting, Strain Gages, Apparatus