ESTIMATING COTTON STRIPPER POWER REQUIREMENTS

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Abstract

Cotton strippers are used primarily in the Southern High Plains due to the specific varieties grown. Typically cotton strippers cost about 2/3 the price of a cotton picker and range from ½ to ¼ the horsepower. A cotton stripper also has a higher field and harvesting efficiency than a cotton picker under low yield conditions. ASABE D497.7 indicates that the rotary power requirement for a cotton stripper is a function of width only. The objective of this study was to estimate fuel use and the total power requirements for a cotton stripper. Cotton was harvested near Lubbock, TX in 2013 (4 row header) and 2015 (4 and 8 row headers). Data were collected with the harvester stationary while different components were operating, while the harvester was moving and not harvesting, and while harvesting at different speeds. Data collected included fuel consumption, engine speed, ground speed, hydraulic and header drive power, other machine parameters, and crop flow. The collected data does not include engine horsepower. Static testing revealed that engaging the fan significantly increased fuel use. Fuel use during harvesting was a function of ground speed, the number of rows and whether the field cleaner was engaged. Mass flow rate of cotton in the harvested did not affect fuel consumption. Drive power was highly correlation with ground speed. While the data collected may not support the addition of a flow component for the rotary power requirement equation for a cotton stripper in ASAE D497.7, it does support the addition of an intercept and adjustment of the width coefficient.