

[Home](#) » [Volume 12 / 2008](#) »

Performance of a Modified Cylinder Cleaner, Part I

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Inclined cylinder cleaners are used primarily for cleaning upland seed cotton. Previous studies have shown that these cleaners are generally less aggressive than saw-type lint cleaners when used for cleaning lint. The objective of this study was to evaluate the seed cotton and lint cleaning performances of a modified cylinder cleaner equipped with grid bars in the shape of chisel blades. The cleaner's seed cotton and lint cleaning performances were evaluated in two tests, three different cleaner configurations, and two cultivars (smooth- and hairy-leaf). The three cleaner configurations studied included: a baseline saw-type lint cleaner, and two cleaner configurations based on a modified cylinder cleaner with narrowly (6.4 mm) or widely spaced (9.5mm) sharp cutting grid bars, respectively. Ginned lint cleaned by the modified cylinder cleaner was also cleaned by a special saw-type lint cleaner with only one cleaning grid bar. In comparison to the performance of the saw-type lint cleaner, ginned lint cleaned by the modified cylinder cleaner with narrowly spaced grid bars could potentially gain a maximum of 6.4 kg/bale of fiber without compromising color and other fiber properties. Both cylinder cleaners generated more neps in the bale than the standard saw-type lint cleaner. There was no significant interaction between seed-cotton and lint cleaner treatments on fiber properties and other performance measures. The grid bars with a sharp cutting edge cleaned seed cotton more efficiently than the flat-square grid bars.

In comparison to the hairy-leaf cultivar, the smooth-leaf cultivar had higher fiber strength, reflectance, neps and short fiber content. It produced lower seed-coat neps, fiber length, fineness and maturity ratio. The smooth-leaf cultivar was generally easier to clean and insensitive to cleaner treatments.