

## Analysis of the Shape of Feed Speed and Cutting Speed of Korean and Japanese Combines with High-Speed Camera

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**ABSTRACT:** *Cutting performance of 5 row Daedong industry combines cutting knife and 5 row Kubota combines cutting blade was evaluated using straw as the cutting material. Cutting position was left and right from the center 68cm. The cutting performance was measured at three places. The feed rates were 0.6 m/s, 1.1 m/s, 1.6 m/s, and the cutting speeds were 600 RPM, 990 RPM, 1,380 RPM. Each of the speed-specific cutting shapes were measured three times by repeating the procedure. The straw shape, angle, number of the non-cuts and biting were quantified. The difference between the smallest straw size and the largest straw size was measured. The distance between the largest straw and the smallest straw was calculated to obtain the angle. The number of truncated and broken straw was measured to quantify the cutting shape. The feed rate and the cutting speed of Korean and Japanese combines were identified according to the cut shape, by using high-speed camera. If the feed rate and cutting speed were increased, number of cutting was lower, load was less on the cutting blade between the blade and the cutting target, and the cutting shape was not clean. However, when the feed rate and the cutting speed were lower, the cutting shape was clean, but high cutting force was exerted and a high power was consumed, which was a burden on the combine.*

**Keywords:** *Combines, cutting speed, feed rate, rice straw*

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