Harvester Adjustment for Corn Silage

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Proper adjustment and maintenance of harvester cutterhead and crop processor ensures high quality corn silage. Adjust cutterhead and feedroll system for desired theoretical length of cut (TLC) to meet the animal needs for feed particle length and the forage storage system feed removal. Adjust processor so that more than 90% of kernels are broken and no circular cob pieces remain.

The cutterhead and feedroll adjustment determine TLC produced (length of material moved into the cutterhead between the passage of successive knives). Adjust TLC by changing the speed of the feedrolls, done by gears, sprockets or other means. Additional TLC's can be obtained by removing knives from the cutterhead.

Actual forage particle length will be less than the TLC due to crop orientation while entering feedrolls and some shattering. Dull knives and excessive knife-shearbar clearance will lead to longer particle length and higher fuel consumption. Shearbar (stationary cutting edge) maintenance is often overlooked. Many harvesters have rectangular cross section shearbars with more than one functional edge. The shearbar can be removed, turned over and reinstalled resulting in a new cutting edge (refer to manual).

For harvesters without crop processors, TLC is usually adjusted near 3/8". For harvesters with crop processors, TLC should be 5/8"-3/4". Many producers adjust TLC to 1" or more leading to more rapid processor roll wear and increased risk of plugging.
The crop processor should be set from 1/8"-3/16" roll spacing to ensure proper cob/kernel breakage. Small roll clearance will increase the power requirement and reduce harvester capacity making the operator reluctant to maintain such a small clearance. By increasing TLC, the power requirement is reduced and capacity increased. Thus, 3/4" TLC is recommended.

In Wisconsin studies where the clearance was just over 3/16" and a TLC of 3/4", 88% of kernels were broken which is low. Therefore, roll spacing of less than 3/16" is recommended. For a TLC of 3/8" and no processing rolls, the kernel breakage was 67% which is unacceptable.

In the Wisconsin studies where power requirement was evaluated, there was little difference between the 3/8" cut with no processor and the 3/4" cut with a processor roll clearance of just over 3/16" (2.69 vs. 2.70 horsepower-hours/ton). The power requirement increased about 2% when the roll clearance was reduced to 1/8" (2.76 horsepower-hours/ton).

In closing, the processing roll clearance should be maintained at 1/8" to obtain sufficient kernel breakage. Very little power will be sacrificed when TLC is increased to 3/4" and roll clearance is maintained at 1/8". Proper maintenance will lead to better machine performance with respect to power consumption and particle length.