

Mense V-TEC harvester head feed rollers

GENTLE BITE

An important part of the harvester head is the grip of the feed rollers on the wood. Maximum grip cannot be exerted, however, unless the wood surface becomes damaged making it unsuitable for sawing. Mense Oy has now launched a new feed wheel model, the V-Tec.

■ Tommi Hakala

Mense Oy is a long-term forestry machine manufacturer. Harvester feed rollers have been manufactured since 1996, now also for the initial installations of the harvester manufacturers. Besides these, various feed rolls for sawmills and various rubber products are also manufactured.

Considering direct working equipment, the cutting clearing head series is important, too. For the feed roller there are also available weld-in ribs and knobs for feed rollers to be affixed by customers modifying the rollers themselves.



↑ In V-Tec the diagonal ribs always follow in the same direction, i.e. the left and the right roller are identical. Thanks to this design, the reverse direction also has the same grip as the forward feeding. The V-Tec range covers the commonest three- and four-roller cutting head models.



The harvester head feed rollers perform a tough task. Even the heaviest bodies must be able to be run efficiently through the harvester head without surface damage. Mense Oy has developed the new V-Tec feed rollers with an emphasis on grip and self-cleaning. Simultaneously damage to the wood has been reduced.

→ Because the teeth line is oblique, for the thickest wood bodies, the teeth form a rim as circle-shaped as possible. It reduces the "digging" of the roller. Again, for thinner woods the sparseness of the ribs reduces the number of touching points of the teeth, which crushes the lure of the tree at fewer points and breakage of the tree is reduced.



Mense manufacturers both full-steel and rubber-damped feed roller versions. In the latter, the frame-saving structure of the cutting head has been achieved with the rubber damping. The vulcanized rubber between the steel frames reduces vibration. There are several versions of the full-steel rollers, from very aggressive sparse versions to dense, low-spike versions.

The grip of the feed rollers in the cutting heads is always a compromise between a grip which pulls and a grip which breaks the wood. Excessive surface pressure and the penetration of the gripping studs will damage the most valuable part of the log, that is, the non-branched surface strip. And in the case of plywood logs, even a slight increase in thickness reduces surface yield very quickly. When the same rollers have to process pines with heavy tree based bark and birches covered only with thin birchbark, the challenge is considerable.

Sparse but gently biting V-Tec

Mense's latest feed roller version is a combination of two different roller types. Koneviesti reviewed the new V-Tec feed rollers and their operation in Hyrynsalmi, on a site belonging to Motoharvennus J. Antman. The rollers were installed on a John Deere H414 harvester head

With its sparseness, V-Tec is much like the open rib rollers designed for mass processing applications. This space reduces roll blocking, which, in a worst scenario may cause the spruce bark to adhere to the roller. At the same time grip is reduced and the roller digging damages the wood. But when the roller is set more sparsely, its rolling becomes more uneven and simultaneously run-time vibrations increase.



↑ In many harvester head models the moving feed rollers are interlaced into the position for the smallest possible log. In V-Tec, the design of the end of the teeth appears to be successful, as the interlaced parts of the teeth did not wear much in three weeks of use. The reason for this is probably the very small splitting of the teeth, the splitting



↑ There are flat, load-bearing points between the teeth giving grip. They limit the excessive penetration of the teeth into the wood. The vertical points adjacent to these recesses in turn reduce the sideways slip of the wood, thus improving the rigidity of a heavy log between the rollers. Diagonal forms and a very open structure allow the rollers to self-clean effectively.



← ↑ ↑ Because the teeth bite into the bark in-between each other, the bark does not break into pieces and is not shed so easily. The wide tooth also equalizes the surface pressure at the points where the cutter blades have removed the bark. The difference between the traditional stud teeth is significant, a curved stud leaves a sharp mark. Also the sparser teething of the measuring wheel digs into the surface of the wood.

If, however, the rib spacing is denser, problems will arise in harvesting heads with three or four rollers, where the rollers must overlap in places where the log is thin. For these reasons, V-Tec is a successful solution for grip and sparseness. The rollers do not remove bark and they run smoothly with thick logs.

When this novelty is viewed from the direction of the shaft, the chisel-like grip teeth at the ends of its sloping ribs are found to form a more-or-less complete circle, a denser one than on conventional studs rollers. The inclination of the ribs staggers the teeth at four different positions on the rim. Thanks to this, for the thicker parts of a log three teeth stick to the log almost at the same time, leaving interlaced marks. The thinner the log to be fed becomes, the smaller the part of the teeth that bite the log, and simultaneously grip improves. This is especially emphasized in thickly knotted pine tops.

Limited penetration

On a sparsely-paired feeding wheel it is difficult to limit the penetration of the chisel-like teeth. Steel rims and fitting the teeth more densely have been proposed as various solutions. On both methods blockage has become a problem. For V-Tec adjustment of penetration has been done with platforms between the chisel teeth. Because the platform is diagonally positioned, between interlacing chisel teeth, no continuous length of bark will adhere to it.

At the edges of the platforms the sides of the chisel teeth are vertical. This creates a tree-supporting angle that improves log retention in the harvester head, i.e., the lateral clamping of the rolls improves when compared to a uniform grid.

The advantage of lower chisel-like tooth penetration is also a reduction in tooth penetration. A disadvantage of the commonly used circular-shaped stud teeth is the difference in velocity between the tip and the edge,

which causes the stud to knock off a piece of wood like a chisel. At the same time, the tip presses into the tree causing damage, which may appear on the planar panels made from the surface strip.

Light and inexpensive universal rollers

According to reviews, the new Mense rollers are an interesting combination of different rollers. They have good grip, but penetration of the wood is suitably limited. As a bonus, these rollers also are very competitively priced: they are even cheaper than similar non-absorbent stud rollers. ■