

# Sampo HR46x harvester

IN these islands the four-wheeled harvester seems to have fallen out of fashion. Many in the forestry industry probably remember them as a cut-price – usually second-hand – option for the upgrade from motor-manual to mechanised harvesting. It is true that for climbing the hills and clearfelling the plantations established on peatlands, bogies and bandtracks have become an essential part of the harvesting system.

Bogies and bandtracks, on the other hand, do not only pile the weight onto the harvester, they also considerably bunk up the cost. Oakleaf Forestry has been searching for a lightweight, affordable harvester with the ability to achieve good production rates in young crops but with the power and speed to make it competitive in stands of larger timber. The Northern Ireland-based business believes it has found the ideal candidate in the form of the Sampo Rosenlew HR46x.

Joe Litter (Oakleaf Forestry) and Teijo Kuusisto (Sampo Rosenlew) set the HR46x harvester to work in the woods of the English East Midlands in early October. The first task for the Sampo harvester was to undertake a second thinning in a mixed plantation established on the Northamptonshire ironstone soils. Three rows of Corsican pine alternated with three rows of ash.

Both species were well suited to the site; they would be able to thrive even when the roots reached through the clay to the more alkaline subsoils beneath. Mechanical harvesting of the middle row of pines had already been carried out and the Sampo harvester was to start its UK trial on a selective thinning of both the conifers and hardwoods.

The pines are susceptible to red band needle blight and the ashes at risk of ash dieback. The estate forester had taken the opportunity to open the canopy; a procedure that some experts believe may inhibit the spread of these infections. Tonnage production from the operation was not going to be large. According to Teijo Kuusisto, this was not a problem. The harvester had been designed to provide a cost-effective harvesting solution in even the earliest and lightest-intensity thinnings.

Harvester operator Ashley Rolfe, of East Midlands-based Even Forestry, had been drafted in to take the controls of the machine. He soon adapted to the feel of the joysticks and was able to direct the Kesla harvesting head quickly and accurately through the stand to pick out even the slenderest hardwood selected for removal.

Some of the Corsican pines ringed by the marker had acquired fairly bulky crowns and one or two took a firm hold in those of their neighbours. Bringing the 'hang-ups' down in thinning operations is the task that really makes the demands on a machine's hydraulic system. The HR46x coped extremely well. In such a mixture there is always the danger of excessive damage to the less sturdy species in the crop – in this case the ashes.

Ashley Rolfe was well aware of the problem and when



the forester arrived to inspect the worked section he would be pleased to see very little damage to his hardwoods. Nevertheless, the brief was to maximise the production of the machine and by way of the harvester's Technion computer system Ashley could communicate his progress to Joe and Teijo.

Officially providing technical support for Sampo Rosenlew forest machines, Teijo Kuusisto spends much of his time training machine operators and taking the controls during the research and development stage. Although it was only his second visit to the UK, he was well aware of the standards of performance exhibited by the Sampo Rosenlew machines not only in the Scandinavian forests, but also those of Canada, Japan and Central Europe.

"The HR46x has been designed to make the harvesting of small trees a commercially viable proposition," commented Teijo. "Fuel consumption is very low and the price of the machine is very reasonable compared with larger harvesters available. This significantly reduces the

Top: Sampo Rosenlew's latest timber harvester, the HR46x, retains the design advantages of its predecessor the HR46. Advances in diesel engine technology have provided the 'extra-power' of the new machine. The driving power transmission is fully hydrostatic. The operator can opt for electrical or automatic gear shifting.

Left: A steering angle of 50° and a turning radius of 4.02 m gives the machine unrivalled manoeuvrability for its size, both amongst the trees and at the forest edge. Ground clearance is 607 mm and the large wheels spread the machine weight (8,000 – 9,500 kg) evenly whilst travelling.



Left to right: Ashley Rolfe (Even Forestry), Joe Litter (Oakleaf Forestry), Teijo Kuusisto (Sampo Rosenlew).

Below: Low yield per hectare is one of the constraints that limits profitability in thinning operations. Sampo Rosenlew's design teams included everything that was necessary in the HR46x harvester; and excluded everything that was not. The result is a machine with low capital and running costs but still with the power to be very competitive in production terms.

harvesting cost per cubic metre. The low weight of the harvester also lowers the ground impact on the forest floor."

The Finnish research institutes VTT and Metsäteho Oy have developed a calculation model for forest machine ground pressure and 'trail depth' – the latter being the technical term for rutting of the machine routes. The light weight and large wheels give the HR46x a considerably lighter footprint than bogie-equipped systems on all but the poorest load-bearing soils.

The harvester's stablemate, the FR28 forwarder, is equipped with bogies. Regular travel along the extraction routes with a 10-tonne payload does require the lift and traction bogies provide. Early operations in plantations will normally see the forwarder following in the footsteps of the harvester along the racks. In subsequent selective cuts, the compact dimensions and manoeuvrability of the HR46x allow the harvester to work through the crop between the dedicated extraction routes.

Produce from the harvester needs only to be presented within reach of the forwarder's grapple, so distance between the extraction routes can be increased or more easily varied to avoid difficult terrain constraints. While the forwarder's crane may be stretching a little further than normal, the higher concentration of timber alongside should redress the balance for the forwarder operator.

Sampo Rosenlew have been producing timber

"THESE HARVESTERS PUNCH WELL ABOVE THEIR WEIGHT WHEN IT COMES TO SIZE/PRODUCTION RATIO"



# MACHINERY DEMO

harvesters since 1997. While compact dimensions and agility in the forest have remained a hallmark of the forest machines, the introduction of the HR46 in 2013 was a considerable step forward in design terms. The sharing of components with the company's agricultural machines was discontinued and the new BlackBruinn hydraulic motors were designed 'in house' exclusively for the harvesters.

The 'x-power' variant was introduced in 2016 to take maximum advantage of the success of the HR46. A more powerful main pump has been fitted. The Rexroth A10V0 has a displacement of 140 cc and can provide a flow of 294 l/min @ 2100 rpm. The AGCO Power unit has been upgraded to the 49AWF model, producing 124 kW @ 2100 rpm. These changes, according to the manufacturer, have led to an increase in power whilst reducing fuel consumption.

The name of the engine may still sound a little unfamiliar to some. The global agricultural products AGCO Corp had taken control of the SisuDiesel manufacturing plant – formerly Valmet Diesel – in 2003, but the products retained the familiar names for some while. The new AGCO plant range of engines are the direct descendants of the power plants that powered Massey Ferguson and Challenger tractors in the fields and Logset, Logman and Komatsu machines in the forest. Equipped with engines from the same manufacturer, the Finnish Valtra tractors worked in both sectors.

The Kesla 671H parallel crane is ideally suited to the operation of the HR46x harvester. The 7.1 m reach is ample for removing small trees in early thinning operations. The ability to work through the standing crop in later selective fellings, as previously mentioned, allows the operator to deliver produce to within the range of the forwarder crane's envelope of operation.

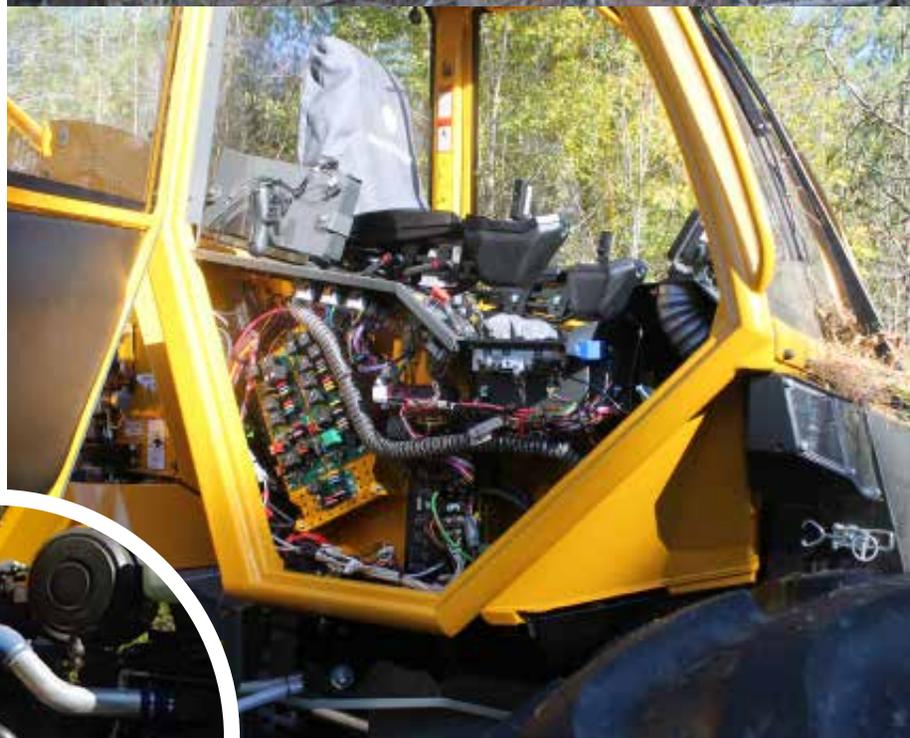
The 18RH-II harvesting head is not the lightest in the Kesla range, but coupled with the 671H crane it is able to cut timber up to 50 cm in diameter even when the crane boom is pushed out to maximum extension. The hydraulic pressure and flow furnished by the AGCO engine unit and the Rexroth pump are able to keep cutting and processing operations running smooth and fast.

An alternative well-proven harvester head option for the HR46x is the Keto 51 Eco Supreme. The chain drive of the Keto heads is more demanding on the hydraulic system and, consequently, the maximum cutting diameter of the head's saw is reduced. Nevertheless, contractors in the cold northern climes, especially in Finland, are very loyal to the Ketos. The long chain drive, many claim, allows a very positive contact with snow-covered or ice-coated stems.

For Joe Litter, Oakleaf Forestry's experience of Kesla forestry attachments was a key influence in forging the association with the Sampo Rosenlew forest machines. "Low-impact timber harvesting is the direction taken by Oakleaf," said Joe.

"We have been looking for a machine light and nimble enough to get around the wood but with the power to achieve good production rates. We would like to see a production of 12–15 m<sup>3</sup> per

The capacity of the fuel tank in the rear frame has been increased to 180 l. In normal work conditions the hourly consumption of the AGCO Power 49AWF engine is in the region of 7 litres. The operator can be confident, therefore, that he will be able to complete two long shifts between visits to the fuel storage area.



hour from this machine."

As if on cue, Teijo Kuusisto arrived to report on the last hour's production. The latest readout from the harvester's computer showed they were within the target area. It was admitted that Ashley, in this instance, was harvesting only one specification; 3 m lengths for biomass fuelwood. The Kesla harvesting head and Technion computer system were quite able to be programmed to select lengths and diameters of selected species; production rates may be reduced but the value of the timber could be substantially enhanced.

Joe Litter continued: "This machine is not a huge step up in terms of cost but it presents a massive move forward in terms of production. The Sampo Rosenlew harvesters are not 'niche' machines. They punch well above their weight when it comes to size/production ratio."

The last word should be left to machine operator Ashley Rolfe, who had agreed to leave his trusty JD 1270 in other hands for a week. "I am enjoying driving this machine; it felt good and powerful straight off. The speed of the head and how it works is unreal!"

H C Burke

Top: The Kesla 18RH-II harvesting head weighs only 490 kg but can cut stems up to 50 cm in diameter. The new more spacious design has seen allowed an upgrade in both the feed force and the speed of the twin roller drive system. Fuel consumption characteristics have also been improved.

Above: Filter and lubrication points have been located in easy-to-reach positions, as have as many as possible of the electrical components. A pair of 145 Ah 24 V batteries ensure efficient cold-starting and have ample reserves for accessory operation.