

inFRes



Four successful international supply chain demonstrations

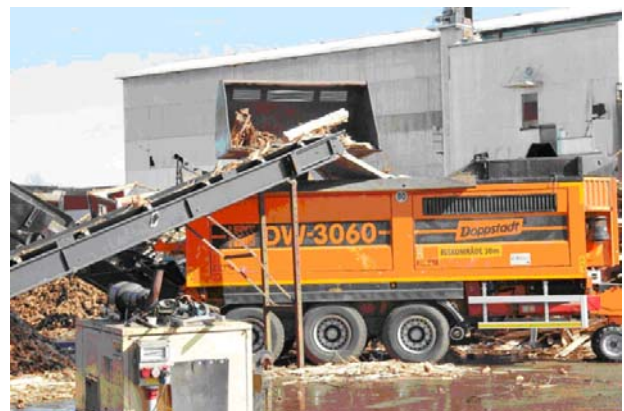
Newsletter 3 | 2013

INFRES has organized and conducted four successful demonstrations during first year of operation. The demonstrations have covered four distinctive biomass supply chains and have been conducted within the scope of a large cooperative effort. All demonstrations were international in character, with partners from more countries joining on the same demo sites, each with their own contributions to give.

First INFRES demo in Sweden

The first demonstration was held in Valbo, in Central Sweden, on 3 – 4 April in 2013. The demonstration was hosted by Valbo Entreprenad AB, a mid-sized contractor, who provided the site, the material and the machines. Skogforsk (Sweden) and VTT (Finland) jointly studied the machines and conducted the demonstration. The focus was on the recovery of forest residues and stumps. The demonstrated technology was two-stage grinding/crushing, where the residues were comminuted with a horizontal

grinder/crusher (Doppstad DW 3060 Buffel), sent through a trommel screen and eventually re-directed to the grinder if too coarse for making it through the screen.



The system performed well, achieving the fuel quality targets specified by the customer. Total diesel consumption was 2.2 litres per oven-dry ton, of which 20% was for the screen and 80% to the grinder/crusher.

Results of grinding demo in Sweden - classification according to EN ISO 17225-1 standard

| Property | Sawmill residues 1.2.1.4 | Recycled wood, 1.3.1 | Pre-crushed stumps 1.1.5.2 | Logging residues (brown) 1.1.4.2 | Stumps offcuts 1.1.5 | Logging residues (green), 1.1.4.2 |
|------------------------|-----------------------------|-------------------------|-------------------------------|-------------------------------------|-------------------------|--------------------------------------|
| Moisture, M, w-% | 16.7, M20 | 16.6, M20 | 51.8, M55 | 39.3, M40 | 48.2, M50 | 50.5, M55 |
| Ash content, A, dry % | 0.3, A0.5 | 0.5, A0.5 | 2.7, A3.0 | 2.9, A3.0 | 1.8, A2 | 2.5, A3.0 |
| Particle size class, P | P100, F05 | P45, F05 | P63, F05 | P63, F05 | P63, F05 | P100, F05 |
| <3.15 mm | 0.3 | 2.7 | 1.3 | 3.7 | 1.2 | 0.8 |
| 3.15-8 mm | 1.1 | 11.9 | 2.2 | 5.1 | 1.4 | 0.7 |
| 8-16 mm | 4.6 | 20.8 | 7.1 | 5.9 | 5.1 | 3.5 |
| 16-31.5 mm | 22.7 | 29.3 | 20.6 | 14.8 | 29.1 | 8.4 |
| 31.5-45 mm | 16.8 | 20.0 | 25.3 | 15.2 | 22.1 | 8.6 |
| 45-63 mm | 28.9 | 12.3 | 19.8 | 35.0 | 10.5 | 16.7 |
| 63-100 mm | 10.5 | 2.9 | 18.1 | 2.4 | 18.5 | 50.4 |
| >100 mm | 15.0 | 0 | 5.6 | 17.9 | 12.1 | 10.9 |

F= fines (< 3.15 mm)

The study identified further opportunities for improvement, including the installation of additional screens directly on the grinder, in order to reduce the production of oversized particles eventually returned to it. The study also suggested that additional benefits could be obtained by adjusting the position of the conveyor belts moving the chips to and from the trammel screen.



Second INFRES demo in Germany

The second demonstration was conducted at three different sites near Offenburg, South-western Germany, between 16 – 18 April 16 in 2013. The demonstration was a joint effort supported by the University of Freiburg –FELIS (Germany), Fallert Holzenergie (SME-Germany), CNR IVALSA (Italy) and Pezzolato SpA (SME-Italy). The demonstration illustrated an innovative supply chain for the recovery of forest residues. This was based on a new chipper-truck (Pezzolato PTH 1200/820), characterized by high power and compact design. The machine was fitted with a new disposable knife system and a swing-away counter-knife to minimize damage in the presence of contaminants. The occurrence of metal and stone contaminants is relatively frequent in logging residues. The performance of the new system was compared with that of a conventional system, based on the extraction of loose residues to a landing accessible to standard truck-mounted chippers, deprived of the mobility advantage of the new chipper-truck. On a chain basis, the innovative system allowed a 13% saving on operational cost and a 35% saving on fuel cost.

Third INFRES demo in Sweden



The third demonstration took place in Hestra, in Southern Sweden, on 10 – 11 June 10 in 2013. The demonstration was organized by Skogforsk (Sweden) and CNR IVASA (Italy) with the support of Sveaskog (Sweden) and Pezzolato SpA (SME-Italy). Again, the demonstration concerned an innovative supply chain for the recovery of forest residues, based on the new PTH 1200/820 chipper-truck.

This time, the machine was used to process stored spruce tops and discharge the chips into roll-on containers. Working directly into containers allowed a drastic reduction of interaction delays, and especially waiting for trucks, which is a very common cause for downtime in conventional chipping operations. As a result, machine utilization increased to almost 90%, from a benchmark around 70%.

Productivity was high, despite the relatively small chip size, which is known to detract from productive potential. In fact, the chipper was designed for the production of small-size chips to be used in residential small-scale boilers. The chipper was also equipped with a prototype moisture content gauge, which may represent a valuable addition to the machine. The gauge is being currently calibrated, and once operational it will offer a good opportunity for increased product quality control and precision delivery.

Fourth INFRES demo in Catalonia, Spain

The fourth demonstration was held in Calders and in Avinyò, in Central Catalonia on 15 June 2013. The demonstration was organized by CTFC (Spain) and hosted by the Gavarressa-Moianès Forest Owners Association (Spain) and Germans Miralda SL (SME-Spain). The demonstration guest was PentinPaja Oy (SME from Finland) with their multi-tree felling head Naarva Grip EH28, which was installed for the purpose on a light excavator. This time, the forest energy supply chain targeted small trees from thinnings and was meant to achieve the double goal of increased energy independence and reduced fire risk in a typically fire-prone Mediterranean environment. The demonstration was conducted on a young Aleppo pine plantation, needing its first thinning. Trees were felled and bunched with the multi-tree head and extracted whole using a conventional forwarder. The multi-tree feller-buncher aroused much interest among the people attending the demonstration.



Many of them offered ideas for improvement and suggested further possibilities for increasing machine manoeuvrability. In general, the new machine looked very promising and it worked effectively also with Mediterranean tree wood, generally harder than the wood of Nordic species. This was the first demonstration of multi-tree felling head in Catalonia representing the transfer of innovative energy wood technologies between INFRES countries.

Contacts for demos

Raffaele Spinelli
CNR IVALSA
Tel: +39 055 5225641
Email: spinelli@ivalsa.cnr.it

INFRES Newsletter 3 | 2013 September, 2013



The research of the INFRES project has received funding from the European Union Seventh Framework Programme (FP7/2012-2015) under grant agreement n°311881. The sole responsibility for the content of this flyer lies with the authors. It does not necessarily reflect the opinion of the European Communities. The European Commission is not responsible for any use that maybe made of the information contained therein.