

## PERFORMANCE OF INDUSTRIAL FIREWOOD PROCESSORS

Carolina Lombardini<sup>1</sup>, Gianni Picchi<sup>2</sup>

<sup>1</sup>CNR-IVALSA,  
Via Madonna del Piano 10  
I-50019 Sesto Fiorentino (FI) Italy  
lombardini@ivalsa.cnr.it

<sup>2</sup>CNR-IVALSA,  
Via Biasi 75 –  
I-38010 San Michele all'Adige (TN) Italy  
picchi@ivalsa.cnr.it

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**Abstract:** *The official production of firewood from Italian forests amounts to over 3 million m<sup>3</sup> year<sup>-1</sup>, and is at the base of a lively production sector, often industrial in character. Firewood is not only harvested by individual users, but also by small and medium-size companies, selling their products outside the regional borders. Commercial firewood harvesting often resorts to dedicated equipment, which has favoured the development of a specialised manufacturing sector. That is especially true for firewood processing: dedicated sawing and splitting machines are currently offered by dozens of Italian manufacturers and come in all sizes, from portable to truck-mounted. Some manufacturers have developed industrial firewood processor that integrate the most modern devices, including optical gates, on-board computers, log-making optimization software and automated multi-step processing. At the same time, Italian firewood processors need to be robust and versatile, because they are designed to process hard wood, often coming in very irregular pieces. The 3 million m<sup>3</sup> mentioned above are indeed almost exclusively hardwood - mostly beech, oaks and hornbeam derived from coppice forests. Stems and large branches are processed to a minimum diameter of 4 cm, so that Italian firewood processors must be able to deal alternately with large diameter (> 40 cm) heavy logs and bunched small logs. For this reason, Italian manufacturers have developed specific equipment, whose performance is relatively undocumented, despite its widespread commercial success. In 2009 CNR-IVALSA launched a research project aimed at developing productivity relationships for industrial firewood processors, operating with hardwood logs. Three machine models were identified, produced by 3 of the most successful manufacturers and representative of different technology solutions. The machines were studied during commercial operation, and CNR researchers recorded time consumption, volume output and log characteristics. Productivity standards were developed, addressing main problem areas and potential solutions for a further improvement of machine performance.*