Internal Project Information Notes 11/08 & 25/06 - Extended summary

Evaluation of Methods for Drying Woodchips & Woodfuel Drying and Storage

Methods of drying and storing woodfuel in Great Britain (GB) were investigated, based on questionnaires sent to woodfuel producers and followed by interviews, and on a number of case studies. Reducing moisture content (MC) in woodfuel has several benefits:

- it increases the calorific value, and therefore the potential monetary value, of the fuel
- as the material is lighter, it reduces transport costs
- in woodchips, it limits the risk of microbial activity and therefore the amount of harmful airborne spores released during handling, as well as the risk of self ignition and loss of biomass

Woodfuel was procured from a wide variety of sources including arboricultural arisings, sawmill residues, clean reclaimed wood, short rotation coppice and small round wood.

The main reported method of reducing MC was to stack roundwood or slabwood in the open until the target MC had been achieved. Best practice was not always followed; it is generally recommend to:

- choose a well exposed and aerated location
- stack material on bearers to limit contamination and aid air circulation
- cover the material to prevent rewetting while still allowing good air circulation

The target MC for most of the suppliers was between 25% and 35%, and was generally reached within a 12-24 months period. For woodchip production the material was then chipped and stored either in a barn or under covering material to prevent rewetting.

Fuelwood stacked on bearers for drying

The surveys also showed that although different methods of assessing MC were used, ranging from drying of round wood discs and samples of wood chips in industrial ovens to using various moisture meters and 'feeling' the chips, there was little knowledge of and even less reference to the CEN standards.

Air-drying was generally the preferred method for most suppliers, however where time or weather conditions made air-drying impossible or insufficient to meet demand, some suppliers were artificially drying the woodchips:

- Grain aeration spears were used to control hot spots to reduce the risk of microbial activity and self-ignition in stored woodchips. Because of their very local effect, it is thought that this type of system is probably better suited for health and safety purposes rather than to significantly reduce the MC of large amounts of chips.

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- Large quantities of wood chips were dried by storing them on floors heated by either hot air or hot water circulation.

In all these cases, although MC was reported to be significantly reduced (up to 20% +) in a matter of days (c. 2 to 10 days), the information available was generally insufficient, in terms of MC measurement, energy input and costs, to establish with certainty the cost and energy balance of the drying processes.

Because of economical and energy balance considerations, it is recommended that low cost and energy input methods be always considered first to reduce the MC. Only where this cannot be achieved, or cannot be achieved to meet demand, should energy input be used.

If a need is identified to better assess the cost and energy balance of different artificial drying methods, this will require detailed case studies for collection of accurate data on initial and final moisture content, energy used and potential capital costs associated with such systems.

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Other related work

The work summarised here is part of an ongoing programme of research funded by the Forestry Commission aimed at improving the efficiency with which fuel is harvested and processed from sustainably managed forests in the UK. Work has also been carried out on the chipping of fuelwood (IPIN 0605 and 0208 -Small scale chippers, IPIN 1906 – Large chippers) and calorific value of timber relating to species age (IPIN 1407 and 2508).

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