Forest Research

Operational Aspects of Woodfuel Production

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Forestry Commission
Technical Development

- Operational Aspects of Woodfuel Production
- Woodlands increase in value if managed to give a good quality crop.
- Management – underpinned by planning and clear objectives!
- Thinning; following establishment = most powerful tool to manipulate stand development and the quality and quantity of the final crop.

  Thinning economics – can be improved by woodfuel markets.
- Harvesting may be exclusively for woodfuel or (more likely) part of a wider product mix.

- Effective Harvesting
- Four factors determine selection of an effective harvesting operation:
- i. Woodland and product type;
- ii. Site and management objectives/constraints;
- iii. Choice of harvesting system (shortwood, pole-length);
- iv. Choice of extraction machinery.

- Effective Harvesting
- i. Woodland type and products
  - Opportunities for WF harvesting are varied, of particular benefit to ‘undermanaged’ woodlands.
  - Products: wide range of products: including crownwood - branchwood and tops (<7cm), woody shrubs and...stumps?!



- Effective Harvesting
- ii. Site and management constraints
- Costs (capital costs, fixed, variable, labour, products, marketing)
- Environment (using appropriate machinery and methods)
- Terrain (Firmness, Roughness, Slope)
- Access and logistics
- Health and safety (AFAG)
- Windthrow risk

- Effective Harvesting
- iii. Choice of harvesting system

  (felling, processing and extraction, with each involving different methods and equipment)

- Tree or pole-length
- Part pole length
- Shortwood
- Whole-tree harvesting
- Terrain chipping
- (Co-products, brash, stumps)

- Effective Harvesting
- iv. Choice of extraction machinery
- Forwarding (produce carried off the ground)
- Skidding (produce dragged in contact with the ground)
- Others (cable systems, terrain chipper, portable winches, log chute)

- General operational comments:
- Financial viability of a harvesting operation depends on:
  - Product value (including value added);
  - Site, access;
  - Distance to roadside;
  - Harvesting method (especially extraction);
  - Scale (economics at different scales - consider placement cost).

- General operational comments (cont.):

- Forwarding tends to be more cost effective than skidding (forwarding typically costs half the price of skidding per m^3).

- BUT: capital costs of skidding are lower.

- AND: forwarding and skidding have specific benefits, useful for different circumstances (forwarder crane also has varied uses for handling).

- Site disturbance varies considerably with extraction method.

- Generally harvesting costs increase when:
- Slope increases;
- Uphill extraction is used;
- Lower volume and product densities are harvested;
- Smaller product volumes or sizes are harvested;
- Poor tree and product form are worked;
- Access is poor or difficult;
- Extraction distance increases.

- Concluding Comments

- Thinning economics can be improved through woodfuel markets.
- Consider carefully management objectives and planning.
- Woodfuel markets offer potential for ‘undermanaged’ or ‘unmanaged’ woodlands to be brought into management.
- Minimise costs through careful planning and maximise value adding.
- Markets, existing and emerging.
- Consider whole supply chain. Upstream and downstream and what their requirements are.

Thank you.

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www.biomassenergycentre.org
www.usewoodfuel.co.uk