Innovation in Maine’s Logging Industry

Forest Resources Association Fall Board Meeting
Bangor, Maine
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Outline

• What is innovation?
• Innovation Theory Applied to the Logging Industry
• Examples of Innovation in Practice Today
• Traits of Innovative and Successful Logging Contractors
What is innovation?
### What is *innovation*?

<table>
<thead>
<tr>
<th>Definition</th>
<th>Author/ Publication</th>
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<tbody>
<tr>
<td>A discontinuously occurring implementation of new combinations of means of production</td>
<td>Schumpeter 1934</td>
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<td>A non-trivial change in products and processes in the lack of previous experiences</td>
<td>Nelson and Winters 1977</td>
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<td>An idea, practice, or object that is perceived as new by an individual or other unit of adoption</td>
<td>Rogers 2003</td>
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<tr>
<td>The intentional discontinuous change of inputs, processes, or outputs</td>
<td>Rametsteiner and Weiss 2006</td>
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<td>An <em>innovation</em> is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations</td>
<td>Oslo Manual (OECD and Eurostat 2005)</td>
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Innovation Theory

- **Innovation Types**

<table>
<thead>
<tr>
<th>Innovation Type</th>
<th>Definition (based on Oslo Manual)</th>
<th>Logging Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Introduction of a new or significantly improved good or service</td>
<td>biomass or road work</td>
</tr>
<tr>
<td>Process</td>
<td>Implementation or development of a new or significantly improved production system</td>
<td>new harvest method or equipment configurations</td>
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<tr>
<td>Organizational</td>
<td>The implementation of a new organizational method in the firm’s business practices, workplace organization, or external relations</td>
<td>new production tracking system or change in office management</td>
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<tr>
<td>Marketing</td>
<td>Implementing a new marketing method that involves significant changes in product design, placement, promotion, pricing, or other strategies</td>
<td>promotion of special services</td>
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Innovation Theory

- Linear Adoption Process
  - (Redrawn from Rogers (2003), Stone et al. 2011b)
Innovation Theory

- Innovation System
Application of Theory

• For example……..
  – Mechanization in Maine’s logging industry
Application of Theory

- A wide array of logging equipment has been developed and adopted in the last 100 years. As shown below in the figure by Stone et al. (2011b), Maine still has tremendous diversity in equipment actively used.

<table>
<thead>
<tr>
<th>Machine</th>
<th>Timeperiod</th>
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<tbody>
<tr>
<td></td>
<td>30's</td>
</tr>
<tr>
<td>Lightweight Chainsaw</td>
<td></td>
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<tr>
<td>Cable Skidder</td>
<td></td>
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<tr>
<td>Grapple Skidder</td>
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<tr>
<td>Slasher</td>
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<tr>
<td>Feller-Buncher</td>
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<tr>
<td>Stroke Delimber-Roadside</td>
<td></td>
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<tr>
<td>Stroke Delimber-In Woods</td>
<td></td>
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<tr>
<td>Forwarder</td>
<td></td>
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<tr>
<td>Processor</td>
<td></td>
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<tr>
<td>Dual Machines/Harwarders</td>
<td></td>
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<tr>
<td>Slash Bundlers</td>
<td></td>
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</tbody>
</table>

Legend

- Development
- Phase In
- Adoption
- Phase Out

Based on volume!!
Application of Theory

- The range in equipment leads to a divergent pattern of harvest system use.
Application of Theory

- Even though the technology was available to build forest roads and transport with log trucks, it still took decades for this to become the dominant mode of transportation.
Application of Theory

- Change does not come easy in forestry!
Examples of Innovation in Logging

- Dean Young of Franklin, ME uses a tracked grapple skidder by CAT to deliver wood on wet ground to main trails for larger rubber tired grapple skidders.
The Effects: Site Disturbance (SC)

6-8 psi = 20-40% Reduction over GS

Ground pressure (kPa, kN/m²)
Examples of Innovation in Logging

- Trade-off is lower production with tracked machines, but he can still operate when other contractors are shut down for wet conditions.
Examples of Innovation in Logging

• Custom-built, mobile chipper designed by Pat Gagne of Gagne & Sons Logging in New Hampshire in response to an increase in demand for energy wood.

• Summarized by Benjamin and Berthiaume 2010
  – FRA Tech Release 10-R-23
Examples of Innovation in Logging

• This machine can follow a CTL operation, or swap the grapple for a harvesting head and complete the entire operation at once.
  – 1997 Timbco F
  – 170 hp Tornado Morbark drum chipper
  – 7-9
Examples of Innovation in Logging

- On-board computers for tracking production in CTL systems
- Critical systems for process improvement

For example, John Deere’s TimberMatic System for CTL machines
Examples of Innovation in Logging

- Over 100 logging contractors in the NE Region are certified as Master Loggers.
- Third-party certification of loggers to high environmental standards began over 10 years ago.
- Refer to:
  Beth Ollivier, Executive Director
  Trust to Conserve Northeast Forestlands
  eollivier@tcnf.org  688-8195
Outline

- What is innovation?
- Innovation Theory Applied to the Logging Industry
- Examples of Innovation in Practice Today
- Traits of Innovative and Successful Logging Contractors
Traits of the Innovative & Successful Ones

- 18 Contractors Selected
  - 5 Maine
  - 5 New Hampshire
  - 6 New York
  - 2 Vermont
- Detailed on-site interviews
  - ~2-3 hours each
- Summary of themes by research team
Contractor Profiles

• Years in business
  – 60s & 70s (34%), 80s (44%), 90s+ (23%)

• Size of companies
  – # employees (avg 15, max 40, “outlier” 100)

• Background
  – ~50% family history, 25% advanced forestry training

• Harvest Systems
  – 78% WT (75% biomass)

• Land Type
  – >50% industrial, mix of small private, state and federal
“Top 10 List” – Summary

- Many ways to run a successful logging business.
- Diversity participants lends credibility to the similarities in themes and traits observed.
- Commitment to continuous improvement is key.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Trait</th>
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<tbody>
<tr>
<td>Forest Operations Management</td>
<td>- Maintain Equipment to Avoid Lost Productivity</td>
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<tr>
<td></td>
<td>- Have Pride in Work and Confidence in Abilities</td>
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<tr>
<td>General Business Practices</td>
<td>- Understand Key Financial Indicators</td>
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<tr>
<td></td>
<td>- Commitment to Continuous Improvement</td>
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<tr>
<td></td>
<td>- Understand the Importance of Diversification</td>
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<tr>
<td>Working with People</td>
<td>- Identify, Hire, and Reward Good People</td>
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<td></td>
<td>- Develop Long Lasting Business Relationships</td>
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<tr>
<td></td>
<td>- Manage Stress and Responsibilities</td>
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<tr>
<td>Outreach and Service</td>
<td>- Engage in Industry and Community</td>
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<tr>
<td></td>
<td>- Value Family</td>
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</table>
Your Role in Fostering Innovation

1. Communicate upcoming resources needs
2. Provide “longer-term” support if specialized equipment is required
References


Acknowledgements

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• Cooperative Forestry Research Unit
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