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HARVESTING THEME UPDATE

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Summary

It has been a busy quarter with the FFR Harvesting Theme Annual Meeting held in Nelson on 31st August, an Industry Executives Research Forum in Wellington on 28th July and the Q4 2009/10 review by the Technical Steering Team on 21st July in Rotorua. The following update highlights the commencement of the “Innovative Harvesting Solutions” PGP Harvesting Programme and summarises the completion of the 2009/10 Harvesting Research Plan.

ANNUAL MEMBER MEETING

On the 31st August the FFR Harvesting Theme Annual Meeting was held in Nelson. The objective of the meeting was two-fold: to present final results of the 2009/10 research year to members; and to preview the 2010/11 PGP Harvesting Programme and gain industry input to the 2010/11 Research Plan.

Feedback from the presentations has been good with 70% of participants rating the value gained from the meeting as very good or exceeding expectations. The breakout sessions in the afternoon where members had the opportunity to discuss specific projects in detail with the researchers were noted as most useful.

This update provides a brief summary of each project. If you were unable to make the meeting a set of presentation slides is available on the FFR website (under Member Meetings-Harvesting).

FFR FIELD TRIP

The field trip on Wednesday 1st September associated with the FFR Annual Meetings included a visit to Brightwater Engineering Ltd to take a close look at the new BE85 cable yarder. The BE 85 has an 26m telescoping tower, three working drums, and a 450hp engine coupled to a six speed powershift transmission. The yarder has a movable cab to eliminate blind spots when logging, and allows excellent visibility of the drum set. Reach is 680m of 28mm skyline and

main rope line speed at mid-drum is over 12m/sec. With good reach and fast line speeds, the BE85 is the largest model in Brightwater's range.

Recently Brightwater added the Madill range of swing yarders to their model range, and their next hauler to be manufactured will be a Madill 120 swing yarder. Discussions have been held with Brightwater inviting them to join the Harvesting Theme.

PRIMARY GROWTH PARTNERSHIP (PGP) PROGRAMME UPDATE

The Research Plan was presented to the Harvesting Theme Technical Steering Team Q4 review in July and endorsed by the Steering team subject to developing some more detail.

The opportunity was taken at the Annual Meeting in Nelson in August to present the PGP Programme to the members in terms of the objectives, benefits and outcomes of the “Innovative Harvesting Solutions” programme.

The meeting was then opened up to four breakout sessions to encourage wider discussion among members of the proposed 2010/11 projects in more detail. The detailed PGP Work Programme has been put into the FFR Harvesting Theme Research Plan, which has three main components:

- Mechanisation on Steep Terrain
- Increased Productivity of Cable Extraction
- Development of Operational Efficiencies



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The 2010/11 Research Plan details five projects for the year aimed at achieving a step-change improvement in steep country harvesting costs and productivity.

The issue of having to use NZFOA as the vehicle to forward the Programme to PGP due to concerns around FFR's shareholding was resolved by a decision by the Office of the Auditor General that FFR is not a subsidiary of Scion. The contract for the "Innovative Harvesting Solutions" Programme is still in negotiation with MAF's agents, the Foundation for Research, Science and Technology.

Mechanisation – Steep Slope Feller Buncher

Work on Task 1.1 has commenced with a baseline measurement of productivity of the Kelly Logging System. A Technical Note on the cable-assisted excavator feller buncher is in preparation.

Mechanisation – Teleoperated Felling Machine

A meeting was held with Professor XiaoQi Chen of the Mechatronics Programme at the University of Canterbury Engineering School in August, to discuss involvement of PhD students in this project.

The Mechatronics Programme has about 9 graduate students working on various teleoperation and robotic projects and Prof Chen expressed a lot of interest in getting involved in this project next year.

Cable Extraction – Hauler Vision System

This project is aimed at developing improve vision for the hauler operator to enable faster carriage positioning and reduced breakout times. Learnings from the project using state-of-the-art body cameras on tree fallers and breaker outs will be applied to this project.

Cable Extraction – Improved Grapple Control System

This project aims to develop an improved control system where the grapple/carriage can be controlled by the bunching machine. Discussions have commenced with EMS Ltd in Rotorua regarding this project.

Operational Efficiencies – Benchmarking

Rien Visser at the School of Forestry, University of Canterbury has commenced preliminary analysis of 2010 harvest area production data.

There are now over 160 harvest areas in the Benchmarking database covering 2009 and 2010 data. We would like to get 100 harvest areas of 2010 data in the database (currently 78) before we publish the 2010 Annual Benchmarking report.

Additional analyses have been undertaken plotting logging rate against average slope of ground-based and hauler systems. This showed the lower slope limit of cable systems at 26% slope, and the upper limit of ground-based systems at 27%, but the intercept of the two systems (in terms of logging rate against slope) was 44%. This indicates significant potential for extending ground-based machines on to steeper terrain before the logging rate meets that of cable logging. This justifies continued work in the programme in extending ground-based machinery, such as the Kelly Logging System, onto steep terrain, from an economic perspective.

Look out for the November edition of the Journal of Forestry which will focus on Harvesting, and feature a summary of the FFR harvesting projects.

RESEARCH OUTPUTS FROM Q4 2009/10

The following reports were published during Quarter 4 2009/10:



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- Technical Note Vol. 2 No. 11: Integration of Technology for Productivity Monitoring.
- Technical Note Vol. 2 No. 12: Performance Data from Wearable Devices.
- Harvesting Technology Watch Number 5 July 2010.

That brings the total Technical Notes published for the 2009/10 year to twelve. Thanks to cooperation with the Cooperative Research Centre for Forestry in Australia, 8 CRC for Forestry harvesting and log transportation reports have also been made available. All these reports are available to members on the FFR Harvesting website now.

Better Monitoring Systems

A Technical Note on integration of tools such as MultiDAT, PDU and machine systems was published during the quarter. Further work with the improved Production Data Unit (PDU) in terms of drum rotation sensors to measure haul distance is on hold while we consider options for further development.

A Technical Note on using the GPS to monitor machine productivity, comparing the use of the GPS with an on-board monitoring system (e.g. Komatsu's machine tracking information system, MATRIS), has been completed.

Mechanisation of Steep Slope Harvesting

The project on analysis of harvest planning data to determine potential for bunching based on terrain, piece size and hauler payload over a sample of New Zealand cable logging conditions has been completed.

A study of a Valmet self-levelling feller-buncher on steep slopes in Forests NSW, Australia was also undertaken in collaboration with the CRC for Forestry, and a report is in preparation.

The potential in New Zealand harvesting for the "walking excavators" now common in Europe was investigated by literature search. This was followed by a study of a Kaiser Spyder in

operation in the Waikato. A report is in preparation.

Best Practice and Training for Cable Operations

Field work for this project, aimed at identifying elements of best practice for breaking out on steep slopes, has been completed using the state-of-the-art body cameras on the breaker outs to record work methods, retreat distances and communications used during the work task. A Technical Note on using videos for breaking out training is in preparation.

Optimising Work Organisation for Maximum Performance

This project focused on work organisation of harvesting, and was aimed at identifying the barriers, bottlenecks and factors influencing effective work organisation and scheduling within logging operations. A Technical Report has been written exploring the organisational and scheduling factors that contribute to physical and psychological workload and fatigue. FFR acknowledges the financial support of ACC in this project.

Crew Best Practice – Costs and Productivity

This study used data from the Benchmarking database to identify four "best performing" contractors. The study then examined the characteristics of these individual high performing operations to identify what factors contributed towards their high performance.

Application of Harvesting Technology

Arising from the Technology Watch undertaken over the last year, an initial study investigating fuel consumption in logging operations has been undertaken. A report is in preparation.