



HARVESTING PROGRAMME UPDATE

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Summary

This update reviews progress in the “Innovative Harvesting Solutions” programme up to Quarter 3 of the 2013/14 year. Significant progress during the quarter has seen the completion of the development projects for the ClimbMAX steep slope harvester, the CutoverCam hauler vision system, and the Alpine Grapple for improved grapple control. The HarvestNav on-board navigation software application was also released to the industry as a free download. Major progress has also been made in the teleoperation project and in the design of the Innovative Yarding System. The 2014/15 Research Plan has been completed and will be presented to the FFR Board for approval at their May meeting.

RESEARCH PROGRESS: 2013/14

FFR's Harvesting Programme has completed the third quarter of Year 4 of the six-year PGP Harvesting Programme. Progress in the 2013/14 programme was presented at the Technical Steering Team Meeting on 16th April, 2014.

Steep Slope Feller Buncher

The ClimbMAX Steep Slope Harvester was demonstrated in operation at John Burt Logging's operation in Maungitaniwha Forest in Hawkes Bay on 20th March 2014, with over 40 industry people attending. The ClimbMAX Steep Slope Harvester is now fully commercialised. The fourth ClimbMAX was delivered to a customer in Nelson and a fifth machine is under construction. For more information on the ClimbMAX Steep Slope Harvester go to the ClimbMAX Equipment Ltd website: <http://www.climbmax.co.nz>.

The HarvestNav on-board navigation application has been completed and released to the industry. This “app” provides the operator of any steep slope harvesting machine with information on harvest area terrain and is available from the Interpine Forestry website or click here to download: <http://www.interpine.co.nz>.

Assistance is also available in loading the software application on your Windows 8 tablet, installing digital terrain models and getting the system up and running. For more information or

to request assistance contact Hamish Marshall on 021 667 720. Further development of the HarvestNav application is planned in the 2014/15 year.

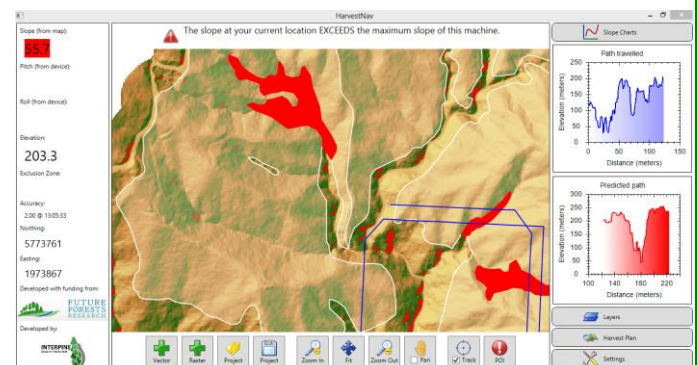


Figure 1: Screenshot of HarvestNav app

Teleoperated Felling Machine

Significant progress has been made in Task A of the teleoperation project in the development and installation of the teleoperation control system into a felling machine. A John Deere 909, owned by Ross Wood of Wood Contracting Nelson Limited, is the candidate machine for this installation. The Development Plan was approved in February and the installation of basic remote control functions is planned for June, 2014 (see Figure 2).

In Task B of the project, the development of the prototype “stick insect” robotic felling machine was completed in September, 2013. Current work is focussed on developing joystick control for the machine and addressing the scale-up



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issues prior to development of a larger “working model”.

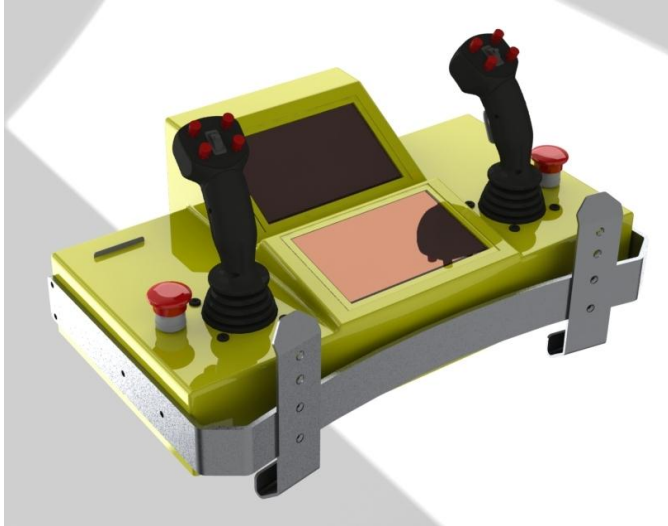


Figure 2: Prototype Design of Remote Control Unit

Advanced Hauler Vision System

Commercialisation of the CutoverCam camera system has been completed and the first commercial unit has been sold.



Figure 3: CutoverCam in action

The CutoverCam is available from Cutover Systems Limited in Rotorua. To contact click here: <http://cutoversystems.com>.

Improved Grapple Control

The commercial model of the lightweight hydraulically-powered Alpine grapple carriage, developed by Alpine Logging of South Africa was demonstrated in operation at a field day at Gillion Logging Ltd in Waimate Forest on 28th February.

The Alpine Grapple is now fully commercialised, and two units have been sold. It is marketed in New Zealand by Logpro Limited, to contact click here: <http://www.logpro.co.nz>.



Figure 4: Alpine Grapple at Gillion Logging Ltd

Further work in the Cable Rigging Efficiency project on measuring the efficiency of different rigging configurations has continued with Hunter Harrill of the University of Canterbury, School of Forestry. Field trials of 8 different operations, measuring the skyline tensions and productivity, have been completed.

Further development work has continued on the alpha prototype Scorpion Grapple. The dual-arm grapple, carriage and control system has been built. Scion will provide documentation of the initial development of this grapple carriage, and when the alpha prototype is completed a series of field trials will be undertaken in 2014/15.

A new felling wedge is under development to improve directional felling of manually-felled trees and reduce the impact of stem breakage during felling. The alpha prototype of this felling



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wedge was developed by loggers in Northland, and has had some initial trials. Further development will continue in the 2014/15 year.

Innovative Yarding System

This project aims to design an alternative new extraction system that has the potential to provide a 30% productivity improvement over current systems. The first part of this project involved the design of a new mobility platform for cable yarding – The Hill Country Harvester.

The expert panel guiding direction in this project did not support further development of the Hill Country Harvester in its present design due to its complexity and high cost. A new design for a hydraulically-powered yarder will provide a low cost alternative to existing cable yarders capable of synchronised control of three innovative cable yarding carriages (a mobile tail hold carriage, a lateral yarding carriage and a new grapple carriage).

A revised Development Plan for this Innovative Yarding System has been approved by the Technical Steering Team. This plan involves development of the three new carriages and the control system as part of the yarder design.

The Research Plan budget for the Innovative Yarding System in 2013/14 has been revised to \$388,341 down from \$462,753 due to proposed changes in the Development Plan. Concept design work for the Innovative Yarding System has been completed and a demonstration of a simulation model was made to the TST in February. The next stage of the project is the construction of 1/8 scale working models of the low cost yarder and the carriages.

New Hauler Technology and International Monitoring

Collection of 2013 data for the Benchmarking of Harvesting Cost and Productivity project has been completed. Over 200 data entries have been received and analysis of the data is underway.

In the Precision Forestry project looking at the application of GPS and geospatial information to mechanised harvesting, data collection has commenced.

The project evaluating the Cable Hauler Planning System (CHPS) outputs in comparison to other cable analysis software has been completed.

The forest engineering field trip to Austria organised by Dr Rien Visser of the School of Forestry, University of Canterbury from 19th – 24th October, 2014 is still open to members and interested contractors. This trip is aimed at modern European steep terrain harvesting operations, visiting cable yarding manufacturers, and includes a one-day professional training course at the Ossiach Forest Education and Training Center in Austria. For more information or to register your interest, please contact Dr Rien Visser at (03) 364 2127 or email rien.visser@canterbury.ac.nz.

UPDATE ON FFR STRUCTURE

The FFR Harvesting Programme now has 34 industry members comprising 16 forestry companies, 12 associate members and six forestry consultant firms contributing a total of \$477,000 of research cash funding in 2014/15. All Harvesting Programme members have confirmed their on-going financial support for the continuation of the research programme, outside of the Forest Growing Levy.

The on-going management of the FFR PGP programme has been finalised. The existing FFR company structure will be retained for the steep land harvesting programme under a new Board and the programme will be managed under a management agreement with NZ Forest Owners Association (NZFOA), with Russell Dale as R&D Manager. Project management will be maintained by Keith Raymond, FFR Programme Manager. Disclosure and reporting to the NZFOA Research Advisory Committee will be limited to high level oversight of the programme.



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2014/15 RESEARCH PLAN

Funding for the 2014/15 Research Plan for the “Innovative Harvesting Solutions” programme is \$1,155,646. This is made up of industry cash funding of \$477,823 plus in-kind contribution of \$100,000, matched by PGP funding of \$577,823 from the Ministry for Primary Industries.

The Research Plan for 2014/15 (including in-kind costs and project management) is split into three intermediate outcomes:

- Mechanisation on Steep Terrain: \$463,286 (42%)
- Increased Productivity of Cable Extraction: \$385,480 273 (35%)
- Development of Operational Efficiencies: \$242,452 (22%)

Including the NZFOA overhead component of \$64,429 for management of research plan outcomes and governance of the Programme, total expenditure is \$1,155,646.

The 2014/15 Research Plan to 30 June 2015 covers five objectives:

- Objective 1.1 Steep Slope Feller Buncher: Further development of the HarvestNav on-board navigation system; \$25,195.
- Objective 1.2 Teleoperated Felling Machine: Installation of the teleoperation control system to a harvesting machine (Task A) and development of the robotic felling machine to prototype stage (Task B); \$438,091.
- Objective 2.2 Improved Grapple Control System: Completion of the Cable Rigging Efficiency project, and development of the Scorpion Grapple and Improved Felling Wedge; 76,215.
- Objective 2.3 Innovative Yarding System: Construction of the prototype innovative

carriages and low cost yarder to alpha prototype stage and co-investment to take to commercialisation stage; \$309,265.

- Objective 3.2 New Hauler Technology and International Monitoring: Continuation of the Harvesting Technology Watch programme and on-going development of the Benchmarking Harvesting Cost and Productivity database; \$242,452.

The 2014/15 Research Plan will be presented to the FFR Board for approval at their May meeting, and once approved will be circulated to FFR members.

If you have any questions or comments regarding the annual research plan or any of these projects please contact Keith Raymond at keith.raymond@ffr.co.nz or phone 027 4385233.