A TIME TRIAL OF A REMOTE CONTROLLED WINCH MOUNTED ON A CABLE SKIDDER- A CASE STUDY
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Background:
In the spring of 2001, the University Forests Office at the University of Maine was contacted by Helmut Meier, principal of HMRadio. Mr. Meier offered to install a remote control for the winch on the University’s 1984 Timberjack Model 208E cable skidder. In return, Mr. Meier asked the University Forests Office staff to use the device in conjunction with its annual harvesting operations, and make comments and evaluations as to the device’s performance. The control was installed in the summer of 2001, and University Forests staff performed a time trial in February of 2002.

Objective of the Time Trial:
The University Forests Office staff chose to look at some very specific activities associated with skidding tree-length wood that might likely be affected by using a remote controlled winch, versus the normal winch control on the machine. Four specific things were looked at:
- The time required to hook up a “hitch” of wood using the remote control versus the regular control
- The time required to unhook a “hitch” at the roadside landing area using the remote control versus the regular control
- The number of times the operator got on and off the skidder while hooking using the remote control versus the regular control
- The number of times the operator got on and off the skidder while unhooking at the roadside landing area using the remote control versus the regular control.

Along with these observations, the total round trip time per hitch was measured, as well as the number of trees taken per hitch. This information was used to evaluate the effect on production of using the remote control versus the regular control on the skidding process of the harvesting operation.

Study Layout:
Trees were felled and limbed in advance of the time trial. Time was measured from when the operator left the skidder to hook up until he got back on the skidder to head to the landing. Time was measured from when the operator left the machine at the landing to unhook until he had unhooked, bucked and sorted the load and got back onto the skidder. Total round trip time was also measured, along with the number of times the operator got on and off the machine while both hooking up and unhooking the hitch. The number of stems skidded per trip was also measured to determine production figures. A total of fifteen (15) trips using the regular winch control were measured, and fourteen (14) trips using the remote control.

The Skidder:
The skidder used was a 1984 Timberjack Model 208 E equipped with sixty-five feet (65”) of 5/8” mainline cable and eight, seven-foot long cable chokers.
The Pre-harvest Stand:
The stand harvested was a six-acre spruce plantation planted in 1936. Pre-harvest volume was 3,838 cubic-feet/acre with a basal area of 144 square-feet/acre. Stand composition was 75% white and Norway spruce and 25% white pine. There were 153 trees per acre.

Harvest Removals:
Fifty-six square feet per acre was removed in the harvest. That amounted to 1,814 cubic-feet/acre or 20.15 cords/acre. Only spruce was harvested, with a total of 60 trees per acre removed.

Results of the Study:
Using the remote control on the winch in this study reduced hook-up time by 38.3%, and unhook time by 25.6%. The average time per round trip was reduced by 22.6%. In addition, the operator got on and off the machine 51.6% and 56.7% during hook-up and unhook respectively.

The average total trip time using the regular control was 30.32 minutes. Using the remote control reduced the average total trip time by 6.84 minutes. Assuming the operator could make 12 trips/day using the regular control, he could make 15 trips/day using the remote control. With the average volume of wood per trip at 2.18 cords, the remote control could increase daily production by 6.54 cords.

Economic Impacts of the Remote Control:
The initial cost to purchase and install the remote control is estimated at $2,500-$4,000 depending on the type of skidder. The potential increased production indicated from this study is 32.7 cords per week. At a nominal rate of $15.00/cord, revenue would increase by $490.50/week. At that rate, payback for this system would be between 6-9 weeks.

Other Factors That Could Affect Results:
Numerous other factors could affect the results of using a remote controlled winch versus a winch with regular controls. These include, but aren’t limited to:
- Length of mainline cable
- Number of chokers
- Terrain or adverse walking conditions
- Prefelling versus fell as you skid
- Number of product sorts
- Size of trees
- Size of skidder
- Skidding distance
- Others??

Conclusions:
This case study indicated favorable results using the remote controlled winch versus the winch with regular controls. It should be noted that only a limited number of trips were measured and no statistical evaluation was made of the results. There is a need for further study of this system, including measuring a variety of other factors which could affect productivity. And finally, the safety aspects of such a system need to be evaluated. There is some question as to whether this winch control system is legal under current safety regulations in the U.S.

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Thank you.
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