POSTER SESSION

FERTILIZING PREHARVEST LODGEPOLE PINE IN ALBERTA:

COSTS, REVENUES, AND RETURNS

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Fertilization trials in 70-year-old lodgepole pine stands on Coalspur and Mercoal, two prominent soil types in western-central Alberta, were initiated near Hinton, Alberta, in 1971. Fertilization increased 10-year average diameter at breast height (DBH) increments from 0.3 to 0.8 cm on Coalspur and 0.4 to 1.2 cm on Mercoal. Ten-year merchantable volume increments ranged from 3.6 to 33.3 m^3/ha on Coalspur and 4.7 to 28.6 m^3/ha on Mercoal. Nitrogen (N) was the nutrient in greatest demand for pine growth on these two luvisols. An addition of at least 188 kg/ha of N was needed for significant response. On Coalspur soils, an application of phosphorus (P) in the range of 38-94 kg/ha, in addition to the required N, improved tree growth. Sulphur (S) improved tree growth more on Mercoal than on Coalspur soils. Our results suggest that growth response to fertilizer treatment is soil-specific. This means that treatment for each soil type must be individually prescribed for maximum growth response.

Total cost of fertilization in 1982 dollars ranged from $117/ha for low rate to $403/ha for high rate applications. The cost included fertilizer purchase ($84-$329/ha), transport of fertilizer to field by truck ($92/tonne) and aerial application (fixed-wing aircraft, $21-$58/ha, based on fertilizer blocks of 2000 ha or larger). Total fertilization benefits ranged from $168/ha to $939/ha for Coalspur stands, and $134/ha to $996/ha for Mercoal stands.

The highest real internal rates of return (IRR) from market value of the increased wood yield and reduced logging cost due to harvesting of larger trees were 11.7% on Coalspur soils using 76 kg N, 150 kg P and 90 kg S/ha and 16.3% on Mercoal soils using 76 kg N, 38 kg P and 23 kg S/ha. The IRR for [illegible] treatments on Mercoal and some on Coalspur exceeded a 6% discount rate, making such [illegible]ents an attractive investment. Present net worth (PNW) at 6% was highest on Coalspur [illegible]0/ha using 300 kg N, 38 kg P and 23 kg S/ha; and on Mercoal at $267/ha using 188 kg [illegible]4 kg P and 113 kg S/ha.

Fertilizing preharvest lodgepole pine provides three main benefits: increased wood yield, increased revenue, and reduced logging costs per cubic metre. Large-scale fertilization operations to increase stand productivity may not be urgent in Alberta because of the abundant softwood supply, but the need for larger-size timber may still make fertilization desirable. This may be especially true in older stands near mills, where reduced transportation costs wold make such treatments even more profitable.

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