



Timber Talks



Department of Fisheries and Forestry

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SLASH BURNING AND SEEDLING GROWTH

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One reason for the disposal of logging debris by burning is to facilitate re-stocking of harvested areas with acceptable tree species. Sites favorable for seedling establishment can be created, competitive vegetation removed or decreased and obstructions that impede planting reduced. As changes effected in the nutrient status of the soil from burning and the resultant influence on seedling growth is less well understood, the nutrient status and growth of seedlings on burned and unburned soil was investigated.

Cedar-hemlock logging slash was burned on a degraded acid brown wooded soil near Vernon, B. C. Soil cores were collected from some areas that were unburned, and others where the surface organic layer had been wholly or partially consumed by the fire. One newly germinated Douglas-fir seedling was planted on each core and maintained under controlled conditions of temperature, light and humidity for eight months. At the termination of the growing period, the seedlings were measured and analyzed for their total nitrogen, phosphorus, potassium and sulphur content.

Fire increased the pH of the surface soil from about 4.0 to 8.0. After 8 months differences still persisted, although less pronounced. High soil pH values were reflected in poor seedling development and best height and diameter growth was attained when the pH of the soil was about 4.0.

Seedlings grown on soil burned 2-4 years previously, had a slightly increased concentration of nitrogen and much increased concentration of phosphorus, potassium and sulphur. Burning did not affect the relative concentration of N in seedling roots and tops; the increase in concentration of P and K was most pronounced in the tops and of S in the roots.

All seedlings had a deficiency in nitrogen. Those grown on burned soil had a higher concentration of essential nutrients but were smaller than those on unburned soil. This suggests a nutrient imbalance and that optimum growth is dependent not only upon the availability and concentration of essential nutrients but also on their relative proportions. To fully evaluate the effects of prescribed burning on soil properties and seedling growth, consideration must be given to modifications of physical and biological characteristics.