

Vegetative Cover For Capping a Landfill at Closure 1990 Growing Season Report

**Prepared for
Lakeside Reclamation Landfill**

**by
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ABSTRACT

The Lakeside Reclamation Landfill (LRL), Beaverton, OR. planted 7,455 poplar trees in a 0.6 acre plot to cap and close a completed cell. This agroforestry capping technique was designed to remove water at rates greater than precipitation while growing a marketable crop. This prototype plot was designed to provide the data required to close the entire landfill using this revegetation technique. The Lakeside Reclamation Landfill is required to cover all landfilled waste according to its operating permit issued by Oregon Department of Environmental Quality (DEQ) under Condition 3 of Schedule C, Solid Waste Permit #214.

The prototype cap was planted April 18-19, 1990. The tree cutting survival exceeded 90% for 4 of 5 subplots. The average tree height for 60 sampled trees was 6 ft 8 in; the average tree base cross sectional area approximates 2.24 cm² (the size of a dime). The soil moisture data collected under the tree canopy indicated 'dry' soils at the 3 ft depth during the entire 1990 growing season.

These data collected at Lakeside Reclamation Landfill will be combined with results from an ongoing research program conducted at the University of Iowa, Iowa City, IA. to predict the future woody crop yield and future water uptake by tree roots for this capping system. The 1991 vegetative closure cap installation design will be based on the 1990 growing season experience. The management of LRL, with the technical support of CH2M Hill and Dr. Louis Licht, propose to expand the planted area by 2 acres requiring 14,000 to 16,000 trees.

INTRODUCTION

The conceptual idea for this agroforestry capping technique was based on a tree buffer design currently being used in Iowa to remove non-point source agricultural chemicals from drainage water leaving row-cropped land.

Essentially, this buffer was designed to grow a marketable crop that also helps stabilize environments 'at risk'. In the farm situation, deep-rooted poplar trees were planted in riparian soils (between cropped fields and streams) to remove nitrates from water supplies, develop wildlife habitat, and reduce erosion while growing a renewable woody crop.

Populus spp. (poplar) are able to grow roots from preformed root initials (similar to buds) located beneath the bark of stems, offering a way to place perennial roots deeper in the soil profile. This physiological ability is uncommon for woody plants. These root initials enable root sprouting from the entire planted stem's buried length. Figure 1 shows the planting technique used to purposefully grow roots 150 cm (5 ft) deep in the soil profile.

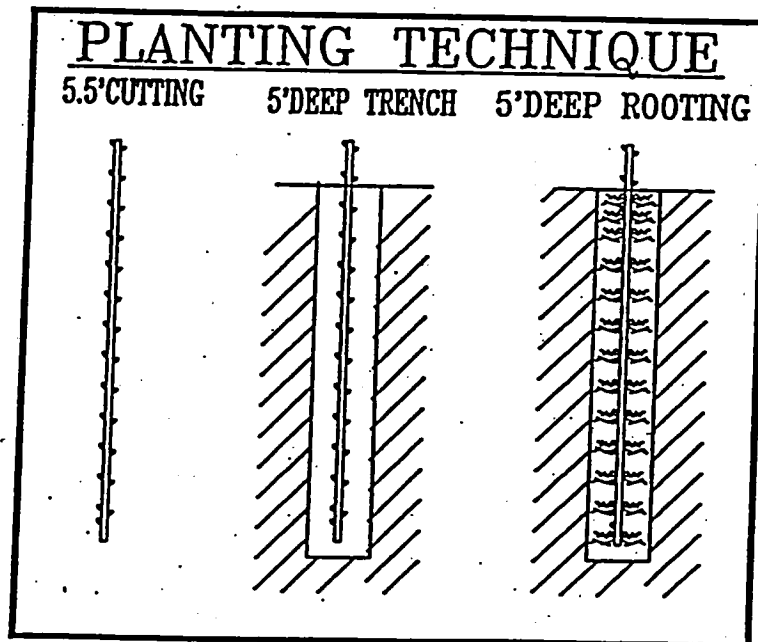


Figure 1: Technique for Growing Roots 150 cm (5 ft) Deep in the Soil Profile