

# TEXAS FORESTERS STUDY SAVINGS OF UTILITY CLEARANCE RESIDUES

By W.K. Murphey, J.G. Massey, and A. Sumrall, Professor, Assistant Professor, and Forester, Texas A&M University



**Large stumps and branches** as well as chips made in the field are rechipped to achieve the right size particle for energy use.

The rising cost of energy has prompted a Houston-based utility line clearance corporation to join with Forest Department staff at Texas A & M University to evaluate disposal methods for tons of wood chips it produces daily.

Trees, Inc. had been disposing of the residues from its power line clearance and maintenance in a landfill that it owned and operated. As this landfill became filled the company searched for alternatives to dumping the approximately 113 tons of residues to be disposed of daily. To this end, conversations were held with researchers from the Forest Science Department of Texas A & M University. Several options were explored and a feasibility study was funded by the Center for Energy and Mineral Resources at Texas A & M. The study was to determine if chipping the residue and selling it for fuel was both economically feasible and energy efficient. This paper reports the results of that study.

Trees, Inc. has been in the business of total tree care for 27 years and is the largest utility line clearance company in the southwest, employing more than 650 people including six graduate foresters. In Houston alone, there are 110 crews involved in utility line clearance and residential and commercial tree work. It is the material generated by these crews that was to be considered by the project. C. L. Benge, president of Trees, Inc., and Al Sumrall, forester, were instrumental in encouraging and developing the innovation that brought about this study and the successful completion of turning thousands of tons of wood waste into a marketable product. The product, in turn, potentially saved gallons of oil formerly used as fuel.

The options explored in the study were to:

- 1.) Chip all of the residue to an acceptable size for use as a fuel chip.
- 2.) Continue to landfill.
- 3.) Explore use of this residue for other products.

The data was collected assuming the existing landfill site would be the concentration site for material to be processed for each of the three options. These data, shown in Table 1, represent averages obtained over several months. The mileage rates to the new landfill represented initial runs prior to the development of option two. The landfill option was not exercised, nor was the search continued for other possible products from the residue.

The costs of material in dollars includes the money expended in wages, fuel and equipment pro-rated to one day. Approximately 113 tons of green wood are delivered to the concentration site each day by crews working throughout the city. There is energy expended to cut, chip and deliver that wood residue plus the energy represented by the wood itself. This energy is assumed to be 4,000 Btu's per pound of green wood. The money obtained by the contract operation was not considered since regardless of option these funds



## with Banvel® 4S & Banvel®+2, 4D

HERBICIDES

**The broadleaf weed 'specialists'  
designed for professional turf programs.**

Here's why BANVEL® herbicides are the professionals' choice for weed control:

- Used as directed Banvel will not harm trees, ornamentals or turf—it just eliminates weeds.
- No season restrictions. Lay down Banvel from early spring to late fall—all through the growing season.
- Rain will not affect Banvel. It keeps on working because it translocates—penetrates leaves and is absorbed through roots to attack every part of the weed.
- No special spraying equipment necessary. It is easy to clean out of equipment after use.
- Mixes readily with hard or soft water.
- Easily stored through winter months without losing potency.

**Banvel herbicides—products  
for professional turf men**



# Velsicol

VELSICOL CHEMICAL CORPORATION  
341 East Ohio Street  
Chicago, Illinois 60611

©Velsicol Chemical Corporation, 1976

Write 126 on free information card

## Residues from page 32

would be the same. The calculation of the funds expended to remove the material to the concentration site was considered only to provide a base cost per unit of energy. The dollars include the labor, fuel, and equipment costs while the energy is that expended in cutting, running mobile chipper and transporting residue to the chipping-concentration site.

The additional dollars and energy expended in the landfill includes that associated with a 20 mile haul in 20 ton trucks, plus the fee for dumping. The total lost energy amounts to 925 million Btu's if we include the energy expended each day, plus that energy potential being buried. This energy is recovered minus that expended when the residue is rechipped for the fuel chip. The rechipping is necessary because logs and some other vegetation are not chipped at the mobile site. The cost of the chipper is recovered as shown by the total dollars expended in the landfill operation, \$12,475, versus the fuel chip operation, \$12,448.

Of interest is the value of this energy recovered. A barrel of residual fuel oil contains 6.286 million Btu's for a 42 gallon barrel. The fuel chip operation then produced the equivalent of 138 barrels of oil a day. The firing efficiencies of oil versus wood depends on the moisture content of the wood, but may average about a ratio of 1.25 in favor of oil. Hence, when firing efficiencies are accounted for we have an equivalent of 110 barrels of oil per day. As the cost of oil increases, the landfilling of wood residues becomes less and less attractive from a national energy perspective in addition to the costs of the landfilling operation.

The Trees, Inc., operation will be monitored further and as additional information becomes available we shall update this report. **WTT**

**Table 1. Costs in Dollars & Energy per Day for Two Options of Residue Disposal**

Material Costs — Concentration Site			
Dollars		\$12,064.00	
Energy (mm Btu)		15,386 <sup>a</sup>	
Material Costs — Landfill Operation			
Dollars	\$ 411.21		Total \$12,475.21
Expended Energy (mm Btu)	6,208 <sup>b</sup>		21,594
Buried Energy (mm Btu)			904.0 <sup>c</sup>
Material Costs — Fuel Chip Operation			
Dollars	284.00 <sup>d</sup>		
Expended Energy (mm Btu)			35,893
Recovered Energy			868,107 <sup>e</sup>

(a) Includes transportation 69,450 Btu/ton, Mobile Chippers 51,250 Btu/ton and chain saws 15,800 Btu/ton.

(b) Energy expended: Transportation 4,618 mm Btu/day and handling 1,590 mm Btu/day.

(c) 4000 Btu/lb x 2000 lb/ton x 113 ton/day = Btu's/day.

(d) Includes: Costs of handling, chipper operation and depreciation minus price for chips sold @ \$1.25 per ton FOB site.

(e) Recovered Energy = Total energy from chips minus the energy expended from residue generation, transportation, handling and chipping.