

TECHNICAL NOTE NUMBER 176

FOREST PRODUCTS LABORATORY - U. S. FOREST SERVICE - MADISON, WISCONSIN

ETHYL ALCOHOL FROM WESTERN LARCH

Experimental fermentations of sugars obtained from western larch indicate that this wood is one of the most valuable sources of ethyl alcohol. By a careful regulation of temperature and acidity and by finding the proper yeast the Forest Products Laboratory of the U. S. Forest Service, Madison, Wisconsin, has succeeded in converting into alcohol not only the sugars obtained from a hydrolysis of the cellulose but also a large proportion of the galactose sugar obtained from the galactan in the wood.

The yeast used in the laboratory experiments was a pure strain culture of Hungarian beer yeast which has proved very efficient in the fermentation of sugars resulting from the hydrolysis of wood. In fermenting solutions containing galactose the temperature was held between 85° and 90° F., and care was taken that the initial acidity of the solution was under 5 degrees.

The galactose fermented better alone than when mixed with the other sugars, probably because the acid formed by the other sugars prohibited the yeast from fermenting the galactose. Even when the galactose and sugars obtained from the cellulose were fermented together, however, the total alcohol yield from western larch was found to be at least 33 gallons per ton of dry wood, or almost 10 gallons per ton greater than that of any other wood studied.

The production of ethyl alcohol from any source is of particular importance in view of the impending shortage of motor fuel; and the fact that western larch

is so productive a source of this material is of especial interest to the lumber industry since it affords a means of utilizing not only the waste but also the large quantities of butt logs of high galactan content now left in the woods. The paper industry should also be interested in the fact that galactose from larch can be fermented, for by extracting galactan from larch chips before pulping, a quantity of sugar easily converted into ethyl alcohol can be obtained.