and butane respectively are 59% and 93% by weight, and that the cost of producing butane from industrial alcohol is about three times the cost of production from butane.

If all feasible Canadian rubber requirements were made from a wheat base it would probably utilize no more than 20,000,000 bushels at most: Canadian wheat in storage as of March 31, 1943, the last estimate, was 798,000,000 bushels. The estimated Canadian production of alcohol in 1943 is 14,000,000 gallons, which would require about 7,000,000 bushels if the total were made from wheat. It is doubtful whether chemurgic developments will ever take up more than a fraction of the Canadian wheat crop.

Scientific Development

Scientists of the applied biology branch of the National Research Council, working in conjunction with their colleagues in the United States, have pioneered the way in the production of butylene glycol from wheat which can be converted to butadiene more efficiently than alcohol. Two processes have been developed by which glycol may be produced from wheat. In the first, the starch in the wheat is changed into sugar, either by malting or by treating with acid, known as acid hydrolysis. The sugar is then fermented with "Aerobacter", a bacteria obtained from the soil, producing meso-glycol, a liquid with a freezing temperature of about 60 degrees Fahrenheit.

The second method involves cooking the wheat and fermenting it by another type of soil organism known as "Aerobacillus", which works directly on the starch in the wheat and produces a product known as laevo-glycol. While both types of glycol have the same structure and are equally suitable for conversion to butadiene, the latter can be utilized as an antifreeze, which in proper mixtures with water has a freezing point of about 40 degrees below zero, Fahrenheit. The first method, however, produces greater quantities of glycol and contains less alcohol than the second. When glycol has been attained butadiene may easily be made, and through the addition of styrene in the polymerization process, compounded into Buna-S rubber.