

# Maple Syrup

Maple syrup is a profitable minor crop from Maine to Minnesota. It is valued at about \$40 million annually. Produced in late winter and early spring when the sugar maples are dormant, the sap is essentially a weak solution of table sugar plus trace amounts of flavor precursors. (It is these complex precursors, of course, that make maple syrup so uniquely delicious and valuable.)

For many years, the process for converting maple sap to syrup was relatively unchanged from that learned by early settlers from Indians. Research that began at the ERRC as early as 1948 resulted in modernization of every aspect of this farm industry, from collecting the sap to finishing the syrup. Lines of plastic tubing to central collection points replaced the unsanitary open metal spouts and buckets. Germicidal pellets controlled growth of microbes at the taphole, extending the sapflow season and producing larger yields. Processing was improved to produce a syrup free of caramel and other off-flavors, and precision instruments were introduced to control evaporation more carefully. Sanitation in steamy evaporator houses was improved.

In the early 1950's, ERRC researchers developed ways to intensify the natural flavor of maple syrup. The high-flavored syrup contained enough maple flavor and color to permit blending it with less expensive sugar syrup. This technique greatly expanded the maple syrup market.

Other industry improvements followed over the next few decades, including accurate analysis in 1975 of the 25 constituents of maple flavor. That same year, scientists solved the problem of so-called buddy off-flavors in maple syrup, caused by trace amounts of amino acids that form in the early spring, when leaf buds begin to swell. An inexpensive process removed the objectionable flavors. It has been in commercial use since 1977 in the United States and Canada.