

A “Sticky” Issue: No More Vermont Maple Syrup?

By Susan Bellerose

Wednesday, April 11, 2007

Much has been written about climate change caused by the build up of carbon dioxide and other “greenhouse” gases that are the by-products of burning fossil fuels such as oil and coal. Many of us have read about the melting of the polar ice caps, and the increasing incidence of insect-borne diseases and extreme weather-related events such as droughts, floods, fires and hurricanes that have been attributed to global warming. A less well known but important local by-product of global warming is the reduction in maple syrup production in New England due to the northern migration of forests.

Over the next thirty to fifty years, the optimal growing range for many tree species is expected to migrate northward by as much as 100 to 300 miles to higher altitudes in response to the predicted doubling of greenhouse gases. Trees can “migrate” to cooler, more tolerable growing climates when their seeds are spread by the wind or by animals. Trees that have seeds that are spread by birds, such as oak trees, are able to migrate northward at a faster rate than those trees whose seeds are spread by the wind, such as maples. Some tree species will have difficulty thriving in their current environment but may not be able to migrate quickly enough to survive, which will result in a reduction in biodiversity of both plants and animals.

In the Northeast, warmer, drier winters combined with other factors such as air pollution and pest infestations are putting stress on the sugar maple. The sugar maple is not able to migrate quickly to adapt to the warmer climate because its seeds are spread by the wind. Some scientists are hypothesizing that sugar maples may nearly die out in New England over the next century. This will not only affect the brilliant colors that we see on the mountains in northern New England in the Fall, but will also have consequences for one of America’s favorite foods: maple syrup.

We are already seeing the effects of global warming on maple syrup production. In the 1950’s, the U.S. produced 80% of the world’s maple syrup, and Canada produced the remaining 20%. Due to climate warming combined with technological changes in how syrup is collected, this ratio has reversed. Now Canada produces 80% of the world’s maple syrup, and the U.S., primarily New England and New York, produces only 20%. Vermont in particular has been affected, as it has a sizeable seasonal workforce devoted to syrup production and relies on the income from sales of syrup and related products.

An explanation of how maple syrup is produced helps to understand how climate change is affecting the syrup business here in the U.S. Maple syrup flows best when the temperature is below 25 degrees Fahrenheit at night, and above 40 degrees Fahrenheit during the day. As air temperatures drop below freezing, the sugar maple pulls sap out of its branches and into the roots. When temperatures move above freezing, the cycle is reversed, and sap flows out of the roots back into the branches,

and out of any “wound” in the tree, such as the tap hole cut for syrup production. In order for the tree to convert stored starch to sugar in the sap, there needs to be an extended period of below freezing temperatures. As the climate in the Northeast has continued to warm, this has reduced the number of freeze-thaw cycles that are needed for sap to flow. When the transition from winter to spring is accelerated with early spring warming, this causes the sugar maple buds to open early, resulting in bitter sap, and less syrup production overall due to a shorter sugaring season.

It will be a pity if the sugar maples in New England die out because they are unable to adapt quickly enough to the warming climate. Hopefully the next time we pour syrup over our pancakes or waffles, we will be reminded of how easily climate change can affect our everyday lives and the “sweet” pleasures in life that we take for granted!

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