SANITATION OF MAPLE TUBING SYSTEMS:
SECOND YEAR OF TESTING

Report on the Season 1999 Tests in the College D'Alfred Maple Bush

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HIGHLIGHTS OF THE RESULTS FOR THE SEASON 1999

Weather played a major role in Spring 1999 maple flows. Sap flows were interrupted several times and were often slow from March 15 to April 13, 1999. Because of this slow flow combined with high daytime temperatures, the sap heated rapidly in the black PVC collector tubes. Only about a third of the nights had freezing temperatures during the last two weeks of the maple season, and two thirds of the maximum temperature were above 10 degrees Centigrade. The 1999 Season demonstrated the great impact of the weather patterns on the microbial loads of maple sap collected through plastic tubing systems.

- Microbial loads of the sap was high in all lines during the season. About half of the 91 sap samples collected contained more than 10 million bacteria per millilitre (mL). The microbial contamination was continuously high because of sluggish sap flows and high daytime temperatures that heated the sap and promoted microbial growth.

- Despite high microbial loads, the four sanitation methods applied during the season had a distinct effect in reducing the microbial contamination of the maple sap. Although substantial, reductions of contamination levels were not as high as expected (i.e. 99.999% wipe-out), ranging from 53% to 98%.

- The four sanitation methods tested in 1999 are the air-water pressure wash, chlorine at 500 ppm[1], hydrogen peroxide at 1,000 ppm and a strong acid (Tub-O-Net®) at 4,000 ppm. These methods gave comparable results. Contrary to 1998, the air-water pressure wash with no chemicals added showed sanitation efficiency similar to the chemical products, probably because of the use of a dedicated washing system equipped with filters to insure the purity of the compressed air.

- Although the treatments applied during the season have a lasting effect of several days, they did not reduce the contamination loads to ideal low levels, i.e. below the 1,000 microbes per mL, ideal to produce the clearer syrups. However, good maple syrup without taste defaults can be produced with sap containing microbial loads as high as 10,000.000 per mL.

- A taphole closure survey was done in August on the four experimental lines. The tapholes in the air-water wash line appear to close slower than the tapholes in the three other lines treated with chemical sanitizers. It is speculated that the low concentration sanitizers helped sterilize the taphole wound and promote faster healing.

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[1]ppm: parts per million (10^{-6}).