

Title Metagenomic approach to tracking microorganisms on apples - a case study
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Abstract

An understanding to the microflora species composition and frequency on apple trees is important in understanding the potential for biocontrol to succeed. Ultraviolet radiation (UV) is an environmental factor that limits microbial growth and SurroundTM particle film is highly reflective of UV radiation and may provide an effective 'umbrella' of protection. Leaf and fruit washings were made in July and September of 2007 and in August and September of 2008 of 'Empire' apple production systems. The systems were: 1) organic production based on Surround particle film for insect control and wettable sulfur for disease control, 2) conventional pesticide program, and 3) conventional pesticide program with the addition of Surround particle film. DNA was extracted from the washings and used as template for amplification of 16S rDNA (bacterial) and 18S rDNA (fungal). The amplicons were subjected to 454 sequence analysis using standard software for taxonomic identification. The results indicated that species diversity was increased by the presence of the Surround particle film with or without synthetic pesticides. These results demonstrate that sensitive tools are available to survey change in microbial populations and a metagenomic approach to microbial ecology has value in the agricultural setting.