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**NON DESTRUCTIVE `DELICIOUS' APPLE FRUIT ASSESSMENTS FOR WATERCORE USING DA METER IN RESPONSE TO HARVEST DATE, AND HARVISTA AND RETAIN APPLICATIONS**

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A new harvest tool available to researchers and industry is the DA meter, which can be used to assess chlorophyll concentrations in the fruit skin. The meter uses visible/Near Infra Red spectroscopy (vis/NIR) signals to determine chlorophyll and provides an Absorbance Difference index ($I_{AD}$).   Low values represent low chlorophyll concentrations. Internal ethylene concentrations (IECs) remain standard indication of apple fruit physiology and our studies and that of others show good relationships between IEC and $I_{AD}$ values, suggesting that the DA meter may be a useful for assessing harvest maturity. However, many apple industries use the plant growth regulators (PGRs), Harvista (1-methylcyclopropene; 1-MCP) and ReTain (aminoethoxyvinylglycine; AVG); inhibitors of ethylene production and perception, respectively, to reduce fruit drop and manage harvest and further better fruit storage. `Red Delicious'is susceptible to water core development during maturation and ripening on the tree. Difference of absorbance ($I_{AD}$) values, which reflect chlorophyll concentrations in the skin, the starch pattern index (SPI) and IEC of fruit, and the incidence and severity of watercore at the time of harvest and during cold storage.In this study we investigated the effects of pre-harvest 1-methylcyclopropene (1-MCP; Harvista) and aminoethoxyvinylglycine (AVG; ReTain) applications on the relationship between IEC and $I_{AD}$ values and watercore incidence. Freshly harvested fruit were sorted into $I_{AD}$ values of 0.2 to 1.8 in 0.2 unit increments and then stored in air at $0.5^{o}$C and 85% RH for 28 weeks. PGR applications resulted in lower watercore incidence and severity at harvest relative to untreated fruit, and showed good correlations with IECs up to week 10 of storage. Fruit without PGR treatment harvested one week earlier had lower IECs than either treated or non-treated fruit harvested a week later, but with the same degree of watercore disappearance after 28 weeks of cold storage. The DA meter may be useful for predicting fruit maturity and possible watercore severity at the time of fruit harvest, but not for predicting disorder disappearance in long-term cold storage.