

**Title** Non-destructive index to characterize the maturity of 'Williams' pears grown in Argentina

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### **Abstract**

Determining the maturity at harvest is crucial for storage and marketing of pears. In recent years non-destructive techniques were evaluated. In this study we used spectroscopy in the Vis-NIR range, and established the AD index (absorbance difference) as the difference between the average value of absorbance between two points near the peak of chlorophyll absorption: 677 and 722 nm. Fruits were harvested between 93 and 131 days after full bloom (DAFB) and ethylene production, traditional maturity indexes and the AD index were determined on each date. Four significantly different maturity groups were characterized by their ethylene production pattern: immature (<99 DAFB), transition (102-105 DAFB), intermediate (107-124 DAFB) and late (>126 DAFB). AD values decreased with advanced harvest and had a high correlation with ethylene production. AD could better discriminate the 'late' harvest group than other traditional indexes such as flesh firmness. During shelf life, AD evolution showed a high correlation with the different stages of ethylene production of climacteric fruit: pre-climacteric, rising phase and climacteric. Preliminarily, it was established that AD values between 1.45 and 0.85 correspond to the pre-climacteric, between 0.85 and 0.50 to the rising phase, and values below 0.5 for climacteric. We conclude that AD index can be useful to identify the physiological changes that occur during 'Williams' ripening, with the advantage of being an instant and non-destructive determination.