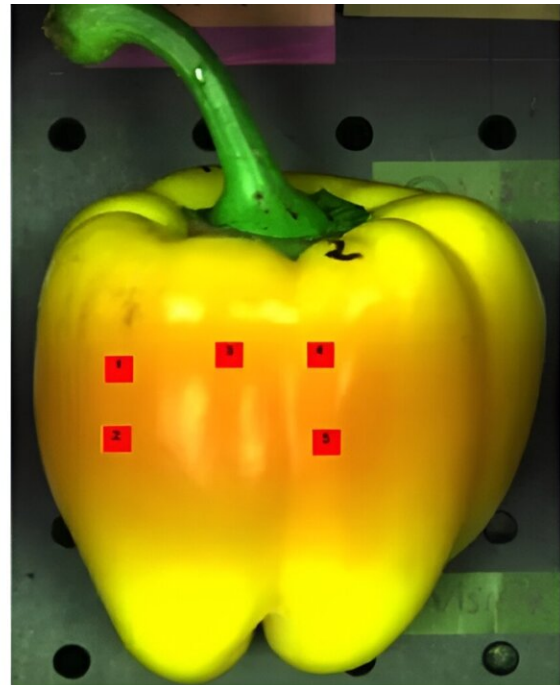


# A method for classifying the ripeness of peppers using hyperspectral imaging

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Credit: University of Granada

A UGR research team has developed a method for classifying the ripeness of peppers using hyperspectral imaging, which is a non-invasive technique, and machine learning.

Developed using the California-type pepper, which is typically blocky in shape and has thick flesh, the project makes it possible to determine the

firmness of the pepper—a quality linked to its ripeness that is key to its success on the market.

To prevent the packaging of overripe peppers, the research team from the UGR's Color Imaging Lab, in [collaboration](#) with the Department of Analytical Chemistry and the Hortofrutícola Mabe cooperative in Almería, has developed a new method for measuring the ripeness of these products.

The team employed [hyperspectral imaging](#), a non-invasive technique that is used to identify, classify and visualize the quality attributes of fruit and vegetables and ensure they are safe to consume.

The scientists analyzed spectral reflectance in the visible and near-infrared range to determine the ripeness of peppers from three different crops, identifying the spectral bands that provide the best classification rates for gauging ripeness.

The project has constructed a realistic scenario, simulating a conveyor belt system, in which the peppers are assessed using four classification algorithms to predict their ripeness.

The algorithm used for this classification process achieved success rates of more than 90%, thanks to a system that improves the shelf-life estimation of the peppers and ensures better product quality for customers.

This system offers an effective and practical solution for classifying the ripeness of peppers, enabling fruit and vegetable growers to improve crop management and reduce losses owing to overripe products.

The flexibility of the system allows companies to choose the number of spectral bands to suit their budget and the type of product they wish to

analyze.

Provided by University of Granada

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