

System for Checking Grape Quality Using Machine Vision

Background

The project is being run by Vitivinícola do Ribeiro, S.C.G. in partnership with the Laboratorio Oficial de Metroloxía de Galicia (LOMG) and the Centro Tecnolóxico de la Carne (CTC). It was developed in response to the problems experienced with the existing processes used for the control of grape quality which are i) based upon a subjective visual evaluation carried out by a human operator and ii) prone to various errors depending on the technique used, environmental conditions, lighting etc.

Objective

This project is intended to automate the process of evaluating grapes received by the Vitivinícola do Ribeiro winery. The primary objective is to incorporate machine vision technology into the quality control of harvested grapes – thereby both automating a complex process and reducing subjectivity and human error.

Additional objectives relate to the streamlining of process supervision; developing a robust set of criteria for grape classification, and; then applying these criteria to enable different grape qualities to be processed separately. In the long-term it is intended to provide a reliable and objective tool for the community of wine growers associated with the Co-operative.

Main Activities

The main activities as part of the project are:

- Implementing a semi-automatic system to take photographs at the collection centres of the co-operative;
- generating a database of grape photographs from the produce delivered during the 2008/2009 grape harvests at the collection centres of the co-operative;
- generating a database of evaluations made by co-operative inspectors;
- generating a database of the rapid metabolite analysis undertaken;
- obtaining samples of grape must from the products photographed;
- designing and implementing image recognition algorithms to enable the classification and evaluation of different varieties of grape correlated with the analyses of harvested produce;
- Undertaking a comparative study between the results obtained using conventional inspection techniques and machine vision techniques.



At a glance:

Theme:

Competitiveness of Agriculture and Forestry

Sub-theme:

Restructuring and developing physical potential and promoting innovation

Keywords:

Wine
Added value
Agri-food industry
Co-operation
Technology transfer

Country/Region:

Spain/Galicia

Beneficiary Type:

Producer groups
Individual farmers

Project Cost:

€100,000 - €500,000

RDP Measure:

124 – Cooperation for development of new products, processes and technologies in the agriculture and food sector and in the forestry sector

Duration:

Start date: May 2008
End date: November 2010

Last updated:

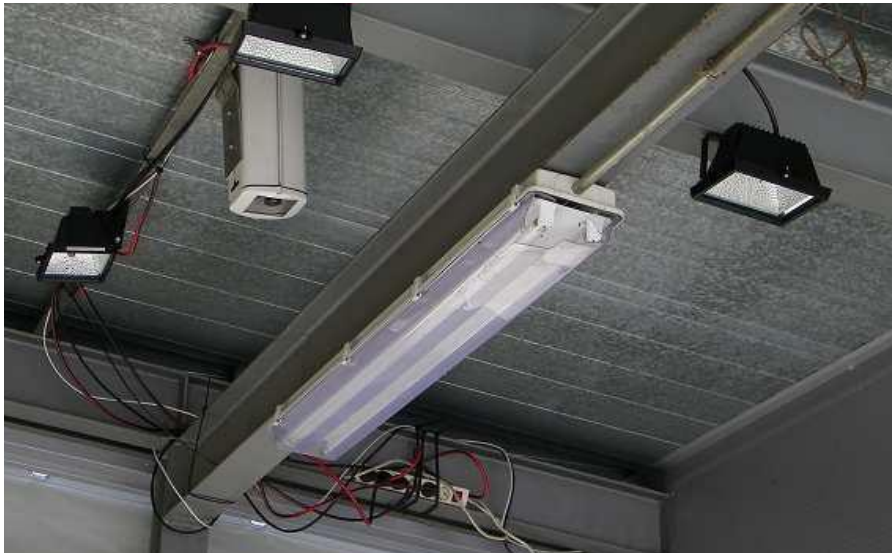
30 November 2010

Results and Benefits

The system developed as part of this project will provide a series of improvements to the existing grape classification process used in the collection centres of the winemaker Vitivinícola do Ribeiro, S.C.G.

In particular:

- It will provide a more reliable system for classifying different categories of grapes collected;
- It will provide winegrowers with an objective and fair tool for determining the price set for grape lots;
- A machine vision system and related algorithms for evaluating grapes will be developed and fine-tuned;
- As a consequence of the aforementioned results, the following positive effects are likely:
 1. The quality of wines made using grapes classified using this system will improve.
 2. Levels of satisfaction among winegrowers will increase as they will have an objective and fair valuation of their grape lots.
 3. The machine vision system and related algorithms developed for this project will be sufficiently generic to enable them to be applied by any wine grower.



Lessons Learnt

The application of advances in science and technology when applied to the modernisation of farm production can greatly increase the added value of end products.

Project Cost

EUR 189,252

Contact Information

Project website: n/a

Spanish NRN website:

<http://www.mapa.es/es/desarrollo/pags/RedRuralNacional/Presentacion/presentacion.htm>

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