RIPENING CHARACTERIZATION AND MODELLING OF LISTAN NEGRO GRAPE IN SPAIN USING A REGRESSION ANALYSIS.

Autores: García Fernández, M.J.; González Mendoza, L.A. y Pomar García, M.

Departamento de Ingeniería Química y Tecnología Farmacéutica.

Facultad de Química. Universidad de La Laguna**.**

Avda. Astrofísico Francisco Sánchez, s/n.

Summary:

The professional winegrower usually selects the harvest date considering several elements, such as the vine stem and berry colour, the flavour, appearance and grain elasticity. Nowadays these elements have turned old fashioned.

Other professionals take into account the weather or even manpower availability, so it is mainly random which determines wine quality, as this depends on the raw material (quality) characteristics.

In order to palliate these practice posible negative effects, this work was based on the simple mathematical equation obtention which characterized the ripening of the most common grape variety at Tacoronte-Acentejo vineyard area to give both the winegrower and the oenologist a simple instrument to find out the best harvest date or to know the value of each traditional parameter according to the weather.

This work was done during the season from 1994 to 1998, in the period that starts with the verasion and ends with the ripening process. During this period samples were taken weekly. About ten grains by vine stem were taken from a whole of fifty, which were previously selected in vineyards grown in different parts of the wine region.

Once they were in the laboratory and after getting the sample ready to obtain the grape must, multiple physicochemical analyses were done, from which we stand out the following ones: one hundred berry weight, total sample weight, total volume, grape must yield, soluble solids, probable alcoholic rate, pH, total acidity, tartaric acid, malic acid, bound and free volatile compounds (free and potentially volatile monoterpene grape flavourings), sodium, potassium, copper, iron, colour indicator parameters, from which only three have been used in this experiment, the sugar content given as probable alcoholic rate, pH and total acidity analysed using the Standard Methods.

After the systematic observation of the ripening curve lines, similar evolutive tendencies are found in the three analysed parameters. This tendency has been studied by comparing the curved line behaviour to a straight line, using a computerized calculation programme obtaining like this the slope, the ordinate in the origin and the coefficient of correlation r^2 in each case. The equations found are of the type y=a+bx, were "y" represents the value of the physicochemical studied parameter and "x" the day from the verasion. The ordinate in the origin "a" will be the studied parameter value at the moment in which the first sample was taken, that is to say, in the verasion. Slope "b" indicates the studied parameter daily increase.

We have also found regression lines which allow the harvest date calculation for the probable alcoholic rate determined with 0,12 alcoholic / day slope for 500 m high vineyards areas or even higher. We have also established a linear pH relationship with the days up to the harvest, which depends on the vineyard height and a similar regression for the acidity has also been found.

Thus, knowing each parameter prediction equation, the winegrower will be able to know his harvest conditions. He will also be able to know the time left to obtain each analytical parameter wished value

and so, the best optimum harvest date with more than a 90% reliability.