Must clarification tests with ATI flotation machine, vintages 2004 / 2005

Introduction

Must clarification before fermentation is a basic operation as to obtain wines with the best sensory features. The removal of solid parts from musts limits the production of superior alcohols during fermentation, and increases the presence of esters, with consequent exaltation of flavours and general improvement of wines.

There are several well-known must clarification methods: the mostly used is at present the cold static decantation, which allows to obtain a satisfactory degree of clearness. With this practice it is possible to add pectolytic enzymes to increase decantation effectiveness and to remove some pectics. In some cases, in order to increase the removal of colloids, they are used clarifiers such as bentonite, gelatine, silica gel, casein and activated carbon. Everybody knows that all these substances electrically alloy to colloids, and, therefore, they are able to make them precipitate.

These methods require long operation times and waste of considerable quantities of energy to suitably cool the must mass. Furthermore, the addition of adjuvants affects significantly the must composition, by reducing the concentration of components supporting the yeast growth. For instance, the addition of silica gel tends to reduce the presence of ammoniacal nitrogen. Besides impoverishing the must of substances necessary to the yeast metabolism, the excessive use of adjuvants can cause an excessive removal of complex molecules: among these there are the glycosides, named also flavour precursors, whose reduction causes a loss of the aromatic potential of the wine.

In order to carry out a process of clarification of practical use and with low impact on flavour precursors, we have employed ATI flotation machine, that we have tested and tried during vintages 2004 and 2005.

Principles of operation and way of working

The technique of flotation, which has been well-known also in oenology for a long time, is carried out by diffusing gas micro-bubbles in the lower side of the mass to clarify. The so-diffused gas will tend to surface, dragging during its ascent the particles of lees in the must.

The machine is made of a compact tracked unit, carrying a must circulation pump, a compressed air (or gas) filtering unit, a gas microdiffusion system, and must and gas pressure regulating tools. A system of automatic gelatine suction completes the machine. The installation has not required any special work, as it was sufficient to connect this machine to the must tank by means of standard cellar pipelines.

Trials have concerned musts obtained from “Bianchello del Metauro” grapes in good state of soundness and harvested during vintages 2004 and 2005.

After destemming, grapes have been pressed in a membrane press and the so-obtained musts have been divided into three equal parts, and have undergone different processes, such as:

A) Static decantation for 18 hours at 12°C with the addition of pectolytic enzymes.

B) Clarification with the addition of pectolytic enzymes, 80g/hl of bentonite, 60gr/hl of potassium caseinate, 30gr/hl of gelatine and 10gr/hl of silica gel.

C) Clarification by ATI machine, with the addition of pectolytic enzymes and 5 gr/hl of gelatine.

Clarification C) has been made on a tank of 50 hl, with recirculation from bottom, by sucking the must from the tank, letting it pass through the machine, and sending it back to the reservoir.
This operation is automatically carried out by the system in use. The machine has run for about 1 hour, proportioning 3 liters per minute of compressed air, (one can indifferently use nitrogen) and 5 gr/hl of gelatine. After this treatment, we waited for the stratification of lees to be accomplished, that took 1 hour on average.
Clarifications A) and B) have been normally carried out.
After clarifications, musts have been separated from lees and analysed to determine:

- percentage of produced dregs,
- turbidity

Afterwards, we inoculated in the three ones 25-gr/hl yeasts samples. The fermentation temperature has been controlled at 17°C.
On the obtained wines, we proceeded to determine the amount of total glycosides of the volatile substances (G-GPF).
The analytic results obtained on musts and wines were almost identical during the two vintages, and their average is shown in the following table:

	NTU	**G-GPF**	**% Dregs**
A	43	800	15
B	3,5	78	11
C	1,9	780	4

Notes to the results
The obtained data show that the treatment with ATI machine brings a good clarification of the must, better than the one obtained by the cold static clarification, in a short time and with a user-friendly technique.
Compared to the cold static clarification, no particular differences in glycoside contents have been revealed.
The clarification with adjuvants produces a good clarification, but reduces the presence in glycosides.
The trials have proved that the treatment with the flotation machine gives qualitative results same as those obtained by the cold static clarification, improving however the operational and economic aspects thanks to the non-use of cold and to the speed with which the clarification is obtained.
The percentage of the produced clarification dregs is extremely low with ATI's machine.
Dregs appear compact and easy to sever from the liquid part: this separation takes place by simple tapping the clear liquid from the tank bottom, rather than from its top as in the case of cold static clarification or clarification with adjuvants
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