Application Advice ClearUp BIO - Part I: Polar Substances

Protocol for the secure removal of polar charged components in juice and wine such as undesired phenolics and fatty acids

Background

The market offers various fining additives for the removal of undesired components in juice and wine. There are basically two binding principles for standard fining products. Fining additives such as PVPP and active carbon adsorb molecules in a large range of molecular weight and size, but the binding is not very selective. The consequence is that besides the undesired components, desired flavours will also partially be removed. In addition, all protein based fining products like egg white, casein or isinglass are not very selective and potentially highly allergenic.

For undesired polar charged components such as all phenolics and negatively charged mid-chain fatty acids, the positively charged head of the phosphor- and glycol lipids in ClearUp BIO will attach and therefore bind to those negatively charged components. It creates a relatively stable connection between the opposite charged compartments of the undesired, negatively charged substances and the positively charged ClearUp BIO and by creating large heavy particles those attached components will be settled out efficiently.

General

ClearUp BIO is a fully organic and allergen free fining tool based on a special preparation of yeast cell walls. The technical difference to standard yeast cell walls is the production method. Due to the new method the cell walls contain up to 14% of total lipids, where standard cell walls only have a content of 1-2% of total lipids. The lipids have the ability to chemically bind the undesired components and precipitate them in the sediment. This polar binding mechanism is relatively stable and can rest in the sediment (lees) for up to one week. However, we recommend separating the ClearUp BIO 48 hours after addition.

Practical Application

- ClearUp BIO can be applied in all kinds of juices and wines. Please dissolve the ClearUp BIO in a small quantity (1:10) of juice or wine, adding while stirring to make sure it's well dissolved and homogenously suspended.
- The best timing of the application is right after press or while cold settling prior to fermentation. The polar mechanism of the positively charged ClearUp BIO removes negatively charged undesired phenols and mid-chain fatty acids very selectively and efficiently. We recommend an average dose rate of 20g/hL of juice.
- Allow a **minimum contact time of 30 minutes** before settling, and rack after 24 hours from the sediment. Due to the stable binding of the undesired components with ClearUp BIO it can also rest in the sediment for up to one week prior to racking. The temperature of the wine should be higher than 10°C; optimal temperature is 18°C.

  If winemakers intend to use flotation, it's recommended to add ClearUp BIO right after press to achieve a contact time of **min. 30 minutes** before flotation. ClearUp BIO can be used in conjunction with all enzymes and other fining additives but it should always be added last.
- For all applications in wine we recommend to filter latest after **one week** by coarse filtration to remove the ClearUp BIO. This will give the best sensory results.
- All fermentations tend to run faster after fining with ClearUp BIO because inhibitory substances for the fermentation will be removed.

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Application Advice ClearUp BIO - PART II: Non-Polar Substances

Protocol for the secure removal of non-polar substances in juice and wine such as spray residues, heavy metals, fatty acids, *brettanomyces* and smoke taint

Background

The market offers various fining additives for the removal of undesired components in juice and wine.

There are basically two binding principles for standard fining products; Fining additives such as PVPP and active carbon adsorb molecules in a large range of molecular weight and size, but the binding is not very selective. The consequence is that besides the undesired components also desired flavours will partially be removed. All protein based fining products like egg white, casein or isinglass are not very selective and potentially highly allergenic.

For undesired non-polar components such as smoke taint, spray residues, heavy metals, TCA, TBA or volatile phenols, additives are not very efficient because they are not specific. Non-polar components can occur by external impact in all stages of vinifcation or even after bottling. ClearUp BIO is a new organic yeast cell wall preparation with a very high content of lipids. The lipids provide a selective binding mechanism to non-polar substances in wine by so called hydrophobic interaction; meaning encapsulation (micellization).

General

ClearUp BIO is a fully organic and allergen free fining tool based on a special preparation of yeast cell walls. The technical difference to standard yeast cells is the production method. Due to the new method the cell walls contain up to 14% of total lipids, where standard cell walls only have a content of 1-2% of total lipids. The lipids have the ability to encapsulate the undesired components and precipitate them in the sediment. This non-polar binding has a limited stability time, therefore it's highly recommended to remove the cell walls with the encapsulated components after 48 hours by coarse filtration, 1.5 µm is enough. Don't use centrifuge!

Practical Application

- The application timing for white and rosé wines is the addition of ClearUp BIO to the juice prior to cold settling. Dissolve the ClearUp BIO in a small quantity (1:10) of juice, adding while stirring to make sure it's well dissolved and homogenously suspended.
- We recommend a minimum dose rate of 20g/hL of juice. If the smoke, TCA or volatile phenol taint is very intense you can go up to 40g/hL. You can use ClearUp BIO in conjunction with all other clarification or fining products but it is important to respect the correct order of additions to achieve the best efficiency.
- If desired add clarification enzymes first (except for removal of volatile phenols such as smoke taint or brettanomyces), then add ClearUp BIO. Allow a reaction time of **min. 2 hours in full suspension**, this is important for a complete encapsulation (micellization), then settle it out with or without bentonite. The temperature of the wine should be higher than 10°C, optimal is 18°C.

  For winemakers intending to use flotation, it is recommended to add ClearUp BIO right after pressing to achieve a contact time of **min. 2 hours before** flotation.
- For red wines we recommend an average dose rate of 20g/hL to the fermentation and another dose after pressing for the settling of the gross lees. Determine the correct dose rate in a lab scale trial in order to make sure that there is no taint left prior to MLF and ageing. For all applications in wine it's important to filter **after 48 hours** by coarse filtration to remove the ClearUp BIO together with the encapsulated substances. Otherwise after this time these encapsulated substances will be slowly released back into the wine. Do not filter together with the ClearUp BIO in full suspension, let it settle for 48 hours and then filter it off.
- There is no negative impact on yeast or bacteria, it's rather the opposite. All fermentations tend to run faster after ClearUp BIO fining because inhibitory toxins for the fermentation such as spray residues, heavy metals and mycotoxins will be removed.

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