Organic yeast: a tool for premium wine production

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Yeast

The natural or organic wine production has increased alongside rising consumer awareness and demand. The reasons leading wineries around the world have chosen to follow the organic route, whether they choose to promote this on the final product or not, extend beyond an ethical belief, through a conviction to produce a higher-quality product.

What role do organic yeasts play in this and what advantages do they offer?

Today, organic products do not merely belong to a 'niche market' but they are synonymous with quality in production and practices. Well-known international wineries from France, Italy, Germany, such as Domaine Chapoutier, Château Latour and Bassermann-Jordan, as well as many across the New World are looking for organic solutions as they no longer want to use synthetic fungicides and herbicides in the vineyard.

This extends to the use of organic solutions during winemaking, where these wineries also wish to omit the use of synthetic products. To satisfy this increasing demand, new organic yeast products are appearing on the market.

The launch of the new EU Law for biological wine production in 2012, and the adaption of this law in New Zealand (and soon in Australia), has accelerated the development of these products. The EU Bio Law no. 834/2008 stipulates very clearly how organic yeast products must be produced to be in accordance with this law.

ORGANIC YEAST IN DETAIL

The first question one might ask is what organic means in terms of yeast. The organism itself is of course of biological nature. So, where does the difference lie between conventionally-produced yeast and organic-certified yeast?

The first difference can be found in the raw materials used to grow or ferment the yeast. Conventional yeasts are grown on sugar beet or sugar cane molasses from conventional agriculture and with liquid ammonia derived from fossil fuels as the nitrogen source. A lot of additional substances, which are not from natural sources but of synthetic chemical origin, are also used. For example, some vitamins and minerals such as magnesium and zinc are used to enrich the mineral content of the media during the production.

Table 1: Production of conventional versus organic yeast – a comparison.

Organic and conventional yeast – a comparison		
Comparison of process	Conventional yeast	Organic/BIO yeast
Sugar source	Molasses, conventional but also GMO derived	Organic molasses
Nitrogen source	Ammonia of petro chemical origin	Organic cereals organic soy bean
pH regulation	Acid, e.g. SO2 Sodium hydroxide	Not necessary
Vitamines and minerals	Synthetic vitamines Anorganic salts	From organic corn or soy bean
Emulsifiers and preservatives	mono & diglycerides E471 Sorbitanmonostearat E491	Organic vegetable oil
Washing and disposal	2x Persistent and difficult to degrade	Raw material for further organic products

To facilitate the drying process of conventional yeast, and to increase their shelf life, synthetic emulsifiers and stabilisers are used. These substances, usually mono- and di-glyceride (E471) or sorbitanmonostearate (E491) – are required to be declared on the product packaging.

In contrast to this, for organic-certified yeasts and yeast products used for organic wine production only raw materials derived from organic agriculture are permitted. This means alternative sources of nitrogen, vitamins and trace elements had to be found. In addition to this during the drying process of organic yeast the use of emulsifiers and stabilisers is not allowed, therefore a new drying technique had to be developed, which prevented damage to the yeasts and their capacity to conduct fermentation. A positive side effect was this new method can also be used on yeast strains that were previously not accessible to conventional drying methods, which opened the door for certain wild-type strains of yeast. Due to the absence of emulsifiers and stabilisers, foam production during rehydration of the yeasts is significantly reduced which clearly facilitates a better handling of the yeast (Picture 1).

Picture 1: Comparison of foam production between a conventional (Lalvin EC1118) and an organic, emulsifier-free (ViniFerm Cool White) yeast strain.

Of course due to the special requirements – in terms of raw materials used, the absence of synthetic substances and the special gentle drying process – the production of organic yeast is more expensive than the production of conventional yeasts.

In the past organic products for wine production often had a negative reputation for not having the same functionality and reliability as conventional products. However, improved production techniques and extensive practical trials comparing conventional versus organic yeasts have shown that this is no

FERMENTATION

ViniFerm - YEAST STRAINS

Our indigenous "WILD TYPE" *Saccharomyces cerevisiae* yeast strains are the first active dry yeast strains in the world that combine the flavour diversity of *Non-Saccharomyces* with the fermentation security of *Saccharomyces* yeasts.

ViniFerm yeasts give a broad flavour spectrum and emphasize the varietal and terroir character in all wines.

Two strains available - **ViniFerm Cool White** & **ViniFerm Extra Red**

FermControl - YEAST NUTRITION

FermControl is a truly special, one of a kind yeast supplement for the support of the yeast metabolism. Due to its unique and unrivalled composition FermControl provides specific co-factors in order to secure an optimal, reliable and clean fermentation. The effect is a significantly improved sensory impression of the wine without any reductive or other undesired flavour characteristics.

FermControl BIO is certified organic to EC and USDA regulations. Suitable for all organic wines.

Clearup - CORRECTIVE FINING AGENT

Clear Up is the first organic corrective fining agent based on yeast cell walls in the market. It can remove inhibitory substances such as fatty acids, pesticide residue and other toxins from the must or wine, including reducing or removing *Brettanomyces* taint and sulphur off-flavours.

MaloBacti - MLF BACTERIA

CN1 Flavour purity. Citric acid negative strain, MLF without diacetyl and VA.

HF2 Varietal character. Burgundian isolate, colour protective and cold tolerant.

AF3 Complex profile. Australian isolate, tolerant to extreme alcohols and high phenolic conditions.

MaloControl is a complete MLF supplement for difficult conditions. Certified organic.

For further information, please contact Kauri

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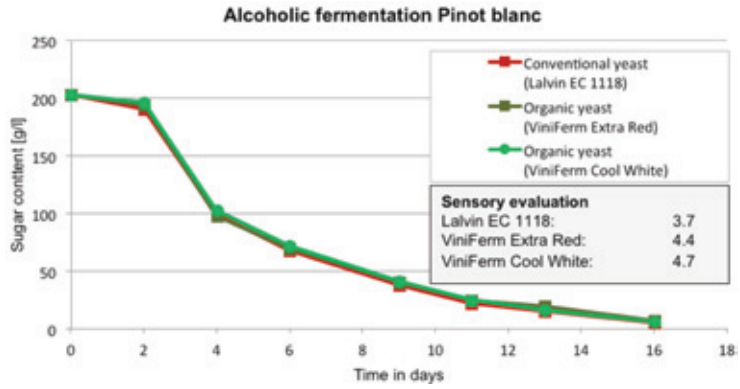
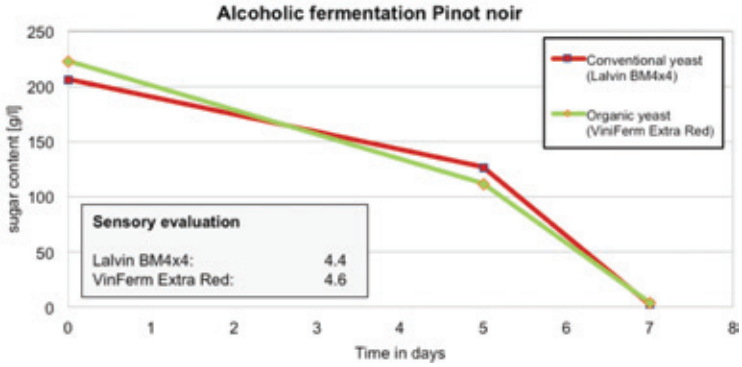
USDA ORGANIC



Graph 1: Fermentation curves and sensory evaluation of conventional and organic yeasts in a Pinot blanc (source: thesis of R. Federer, 2012, U. of Applied Sciences Villingen-Schwenningen, Germany). Sensory evaluation was conducted in a blind tasting (1= unpleasant, 6= excellent).



Graph 2: Fermentation curves and sensory evaluation of conventional and organic yeasts in a Pinot noir (source: Study at Badischer Winzerkeller, 2012, Germany). Sensory evaluation was conducted in a blind tasting (1= unpleasant, 6= excellent).

longer the case.

A thesis at University of Applied Sciences in Villingen-Schwenningen, Germany in cooperation with Badischer Winzerkeller in Germany supported this paradigm change. Different yeast strains (organic yeasts verses internationally well-known standard yeasts) were compared with regards to their fermentation dynamics and sensory characteristics. Further trials where performed during vintage 2012/2013 in Germany and South Africa.

Graph 1 shows the fermentation curves in a Pinot Blanc with 13.1% v/v and both fermentation curves run parallel, which indicates the fermentation dynamics and reliability of both yeast strains (ViniFerm Cool White and Lalvin EC1118) are comparable. A similar result (Graph 2) was shown for fermentation in a Pinot Noir wine at 13.8% v/v.

The sensory evaluation of these wines was conducted by six trained wine tasters early in the following year. In blind tastings both organic yeast strains were rated better than the standard yeast.

CONCLUSION

We can conclude the use of organic yeast today shows no disadvantages for wine production. Organic yeast is equal when it comes to fermentation dynamics and is often better in a sensory assessment. Because of the special production methods, organic yeast made in accordance with EU Bio Law no 834/2008 not only provides advantages to consumers, but also to winemakers in terms of marketing and positioning of their premium wines:

- Organic yeast is free of petro chemical and synthetic chemical substances;
- All raw materials are derived from controlled organic certified agriculture;
- The wines are free from allergens and contain no-hidden preservatives or emulsifiers; and
- As a result the wines show a very natural and competitive sensorial character.

It can therefore be concluded that the use of organic yeast for wine production is more and more becoming the gold standard for premium wines in Europe.

For more information on ViniFerm Yeast and other organic winemaking products contact Kauri Winemaking Innovation

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