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ENARTIS NEWS

THE EFFECTS OF WATER STRESS ON GRAPE QUALITY AND WINEMAKING

The biological cycle of the vine repeats itself year after year. As grapes are slowly ripening, winemakers begin a journey marked by anticipation. Initial harvest forecasts can change at the last minute due to weather conditions, which can lead to disease during harvest, bringing a unique set of challenges for winemakers.
These challenges can be summarized as unbalanced grape ripening, pH, and acidity, as well as increased potential risk of microbial contamination, oxidation, and poor wine quality due to reduced concentration of aromas and lack of color extraction.

DROUGHT CONDITION CHALLENGES

The effects of climate change continue to impact the industry. High temperatures and drought can cause water stress to grapevines, which results in the interruption of photosynthesis, grape dehydration and shriveling. This leads to a significant quantitative and qualitative degradation (less intensity and aromatic complexity, appearance of green characters, unpleasant tannins, etc.).
Dehydrated grapes cause sugar accumulation, skin tends to thicken for self-defense and to regulate the dehydration, must is characterized by a high solids content, and unfavorable conditions for successful alcoholic fermentation and many other winemaking challenges are formed:

- *Increased risk of stuck or sluggish fermentation* due to low levels of nitrogen compounds and high alcohol potential.
- *Increased sensitivity to oxidation* due to high content of oxidative substrates (hydroxycinnamic acids and catechins).
- *Higher pH* leading to *increased risk of microbial spoilage*.
- *Lower acidity* due to malic acid degradation, which affects acid balance.
- Appearance of *jammy and cooked fruit characters*.

CHALLENGES	GOAL	ACTIONS	ENARTIS SOLUTIONS
Must Clarification	Increase yield and grape compound extraction (varietal aromas and anthocyanins).	Remove oxidation catalyst metals, such as copper and iron.	• White and rosé wines: **EnartisZym AROM MP** • Red and rosé wines: **EnartisZym COLOR PLUS**
Alcoholic Fermentation (AF)	Avoid sluggish or stuck fermentation.	Select a strong yeast with high alcohol tolerance to ensure stable and complete fermentations. Consider co-inoculation with malolactic bacteria in red wines.	• Easy tech **EnartisFerm WS** • In the case of co-inoculation: **EnartisFerm Q7** yeast + **EnartisML SILVER** malolactic bacteria
		The Importance of Balanced Nutrition.	• Easy tech At yeast inoculation: **NUTRIFERM AROM PLUS** to enhance aromas **NUTRIFERM ULTRA** to respect varietal aromas • At 1/3 AF: **NUTRIFERM SPECIAL** to maintain the vital activity of yeast • At 1/2 AF: **NUTRIFERM NO STOP** to regenerate yeast cell membranes

CHALLENGES	GOAL	ACTIONS	ENARTIS SOLUTIONS
Oxidation	Prevent aroma and color oxidation.	Antioxidant and antioxidasic protection.	• Reduce potentially oxidable polyphenols: **CLARIL AF, CLARIL OX** • Heavy metal reduction: **CLARIL HM** • Antioxidant tannins that work in synergy with selective fining agents: **HIDEKI, EnartisTan SLI**
Microbial Spoilage	Control microbe development.	Microbial protection from a wide range of microorganisms, even in wines with favorable contamination conditions (e.g., high pH).	• Effective alternative to SO_2: **EnartisStab MICRO M** • Treatments to combine for synergistic effects: **EnartisStab MICRO M + HIDEKI**
Lack of Aromas & Presence of Green Characters	Promote secondary aromas during alcoholic fermentation.	Select the proper yeast with specific enzymatic activities in combination with the right tannin or/and polysaccharide. Use polysaccharides during fermentation to reduce aroma loss.	• White and rosé wines: Yeast: **EnartisFerm ES181, EnartisFerm AROMA WHITE** Tannins and/or polysaccharides: **EnartisTan AROM, EnartisPro BLANCO, INCANTO NC WHITE** • Red and rosé wines: Yeast: **EnartisFerm ES488, EnartisFerm D20** Tannins and/or polysaccharides: **EnartisTan RED FRUIT, EnartisPro TINTO, INCANTO NC CHERRY**
Unripe Tannins	Soften harsh tannins.	Perform selective fining to remove astringency and bitterness, in combination with using yeast derivatives to balance the wine.	• Selective fining agents: **CLARIL AF** • Yeast derivatives in ageing: **SURLÌ VELVET, INCANTO NC DARK CHOCOLATE, INCANTO NC CHERRY** • Gums during bottling: **CITROGUM, MAXIGUM F** • Tannins: **EnartisTan MAX NATURE**
Jammy Characters	Freshen wine aromas.	Select the right yeast and polysaccharide to produce and/or protect fruity and spicy aromas to mask overripe and jammy characters.	• Yeast: **EnartisFerm Q7** • Yeast derivatives: **INCANTO NC CHERRY**

WET CONDITION CHALLENGES

During a cold, wet season, fungi and molds such as *Botrytis* and Powdery Mildew affect fruit quality: reduced sugar, acidity, and polyphenol levels are common. In wine, this translates into increased risk of microbial instability, oxidation due to laccase activity, moldy off-flavors, stuck fermentations, and clarification and filterability issues. In this situation, it is necessary to adjust the winemaking process to minimize wine defects:

- Hand picking and discarding as many contaminated grapes as possible in the vineyard.
- Use appropriate antioxidant and antioxidasic protection to limit browning, color loss, and aroma oxidation.
- Reduce skin contact to limit extraction of off-flavors.
- Control any spoilage microbes as early as possible.
- Promote rapid clarification and settling to reduce off-flavors and toxins that can alter fermentation.
- Supplement must with amino acids and ammonia to ensure complete, healthy fermentations.
- Select a robust yeast strain with low nutrient requirements.
- Remove heavy metals to reduce oxidation potential. Late application of certain fungicides can increase elemental sulfur and metal content (Cu).

CHALLENGES	GOAL	ACTIONS	ENARTIS SOLUTIONS
Oxidation	Limit laccase activity.	Select highly reactive tannins with strong antioxidant and antioxidasic effects. Specific activated chitosan can also inhibit oxidative enzyme actions.	• Tannin: **EnartisTan ANTIBOTRYTIS** • Activated chitosan: **EnartisStab MICRO M**
	Reduce heavy metal concentration.	Remove oxidation catalyst metals, such as copper and iron.	Selective fining agent: **CLARIL HM**
Microbial Contamination	Antimicrobial protection.	Microbial protection, even in wines with conditions favorable to contamination (e.g., high pH).	Synergistic effect: **EnartisStab MICRO M + HIDEKI**
Must Clarification	Promote fast clarification and settling. Remove undesirable compounds that can alter fermentation.	Choose selective plant-based fining agents to accelerate the process. Their activation with chitosan and the use of other clarifying agents makes them more effective.	**PLANTIS AF-Q** **CLARIL AF** **CLARIL OX**
Improve Filtration	Break glucan chains that cause turbidity and filterability problems in wine.	Add an efficient enzymatic preparation that contains β-glucanase activity.	**EnartisZym EZFILTER**
Off-flavors	Eliminate defects caused by spoilage microorganisms, mold, or other origins.	Use selective fining agents containing activated carbon, plant protein, and chitosan.	• Selective fining agents: **CLARIL SMK** • Activated chitosan: **EnartisStab MICRO M**

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