



 Amylic

 Fresh fruitiness

 Oak

 Structure

 Ripe fruitiness

 Low SO₂

 BIO

Routing for fruity red wines

Red wines: a remarkable diversity of fruitiness... and challenges

For the first time in 2021, grape variety became more important than appellation as a determining factor when buying a bottle of wine. Cited by 25% of French consumers (Sowine – Dynata Study, December 2020), who want to discover the sensory identity and fruity expression of what they are purchasing. They have a real interest in experiencing the multi-faceted aromatic worlds embodied in various grape varieties. It is the wine-grower's role to see that this diversity is expressed.

However, red wine producers also need to face the challenges of climate change, which has a direct impact on the vine's growing cycle and differences can frequently be perceived between technological, phenolic and aromatic ripeness, with the former often outstripping the other two.

Consequently, the challenge is to unite these new product-aims and new production constraints. How is it possible to achieve a fruity red wine without astringency, from harvests concentrated in sugar but which have not yet reached their phenolic ripeness? How, on the other hand, can aromatic freshness be restored when grapes are too ripe?

So many questions, for which understanding how to use œnological tools is becoming imperative. The recent rise in energy costs means that we have to re-examine certain physical practices which, although very effective, are energy-intensive in terms of refrigeration and calories. Now is the time to adopt increasingly biosourced approaches.

Fortunately, it is possible to draw on recent progress in the science of fruity aromas in red wine. Today, there is a better understanding of the aromatic compounds associated with fruity ripeness, which makes it possible to implement vinification actions that enhance the contribution of such compounds in wines.



Plant-based fruitiness

Blackcurrant bud
Fruit tree leaf
Peppers
Bean

Methyl salicylate
Eucalyptol
Pyrazines
Thiol 3MH



Fresh fruitiness

Fresh blackcurrant
Acidulous red/black fruits

Amyl:
isoamyl acetate

Red fruits:
fatty acid esters C4C2
+ C6C2 + C8C2 + 3OHC4C2

Black fruits:
fatty acid esters C3C2
+ 2MeC3C2 + 2MeC4C2
+ 2OH4MeC5C2

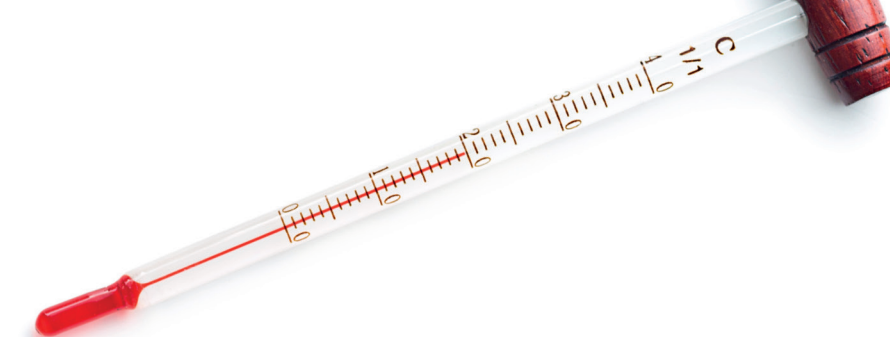
Enhancer:
DMS



Ripe fruitiness

Blackcurrant jam
Fig, spices
Violet, rose

Terpenols
Beta-damascenone
Benzyl acetate



Overripe fruitiness

Blackcurrant liqueur
Eau-de-vie fruit
Prune
Cocoa

MND



Degraded fruitiness

Oxidized blackcurrant liqueur
Crushed strawberry

Sotolon

Evolution in the ripeness of fruitiness in red wines and associated aromatic compounds.

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Technical routing for each aromatic profile, depending on grape ripeness

Offering an aromatic profile in line with consumer expectations, while at the same time taking climate, environmental, economic and societal constraints into account, is one of the ambitious aims which IOC has set itself.

The following pages outline different routing possibilities for the main profiles acclaimed in red wines. These routing processes do not pretend to offer solutions to all situations, nor be implemented in their entirety, but they do provide technical options which wine-growers can use as a springboard for their own processes and, in so doing, give them a distinctive edge.

Unless otherwise indicated, all of the solutions presented may be used in BIO EU and NOP.

Fresh fruits red wine routing

The aim is to produce a gentle extraction of tannins and above all that of colour and aromatic precursors, as well as to bring out fatty acid esters, contributing to fresh notes of red or black fruits.












●

 Stages common to different types of harvests

●

 Specific stages linked to harvest ripeness



	☀️ GRAPES WITH A GOOD LEVEL OF RIPENESS		☀️ OVERRIPE GRAPES	
Harvesting and reception of harvests	BIOCONTROL OF GRAPES	BIOCONTROL AGAINST UNWANTED FLORA  IOC GAÏA™ 7 to 15 g/100 kg of harvest, according to health risk and timing		
Maceration - Limiting mechanical actions	I EXTRACT MY SKIN POTENTIAL SELECTIVELY: PRE-FERMENTATION COLD MACERATION (3-5 DAYS)	EXTRACTION AND BRINGING OUT PRECURSORS OF FRUITY AROMA (BETA-IONONE)  MYZYM RED FRUITS™ (1) 1 to 2 g/100 kg of harvests	SELECTIVE EXTRACTION OF COLOUR (ANTHOCYANES)  MYZYM MPF™ (1) or MYZYM ULTRA EXTRACT™ (1) 2 g/100 kg of harvest	
Upstream of fermentation	I RESTORE MY ACID BALANCE			PRODUCTION OF LACTIC ACID + FRUITINESS/FLORAL  IOC BOREAL™ 25 g/hL ≈ 48hrs
Yeasting: 20 g/hL	I SELECT THE AROMATIC POTENTIAL TO BE BROUGHT OUT	RESTORING AROMATIC FRESHNESS AND MAINTAINING MALIC ACID  IOC BE FRESH™ Zero SO ₂ , low H ₂ S	PROTECTION OF YEASTS AGAINST ETHANOL ACTIPROTECT+™ 30 g/hL when rehydrating yeasts	
Nutrition	I GUARANTEE GOOD AF KINETICS AND BRINGING-OUT OF POTENTIAL	ENHANCING YEAST WELLNESS ANTI OXIDATIVE STRESS BRINGING OUT FRUITY AROMAS  NATJJA™ 40 g/hL at beginning of AF	ALTERNATIVE: AROMACTIVIT 1™ 25 to 30 g/hL at beginning of AF & AROMACTIVIT 2™ 15 to 20 g/hL at 1/3 AF	
Oak infusion	I ENHANCE FRUITY NOTES			FRESHNESS OF NON-TOASTED OAK FRUITINESS ENHANCER  FEELWOOD SWEET & FRESH™ 1 to 2 g/ at beginning of AF
Beginning fermentation	I STABILISE THE COLOUR: INTENSITY & VIVIDNESS	SYNERGY TANNINS / YEAST POLYSACCHARIDES  FULLCOLOR™ 40 g/hL	OR ALTERNATIVE TO LEES VOLUME IN MOUTH OR FRESHNESS  EDIFYS RILIEVO™ 15 to 30 g/hL	
Malolactic fermentation	I PRESERVE & AMPLIFY MY FRUITY POTENTIAL	INTENSITY OF FRUITY NOTES (ESTERS) EXTRAFLORE CO-IN'™ In direct co-inoculation	PURITY & FRESHNESS OF FRUITY NOTES TOLERANCE TO WEAK MALIC ACIDS  EXTRAFLORE PURE FRUIT™ In direct sequential inoculation or co-inoculation	
End AF (2/3 AF)	I ENSURE SAFETY AT THE END OF FERMENTATION TO PROTECT AROMAS	ACCORDING TO TASTING: ENVISAGE EARLY DEVATting AT DENSITY OF 1010 OR AN END OF AF UNDER GRAPE POMACE		LATE NUTRITION + DETOXICATION (IN CASE OF DEFICIENCIES AND/OR STRONG ETHANOL) ACTIVIT SAFE™ 20 to 40 g/hL LIGHT POST-AF VATting (26°C MAXIMUM – 3 TO 5 DAYS)
Ageing	I REFINE MY PROFILE	FULL-BODIEDNESS BALANCE FRESH-TASTING  SPHERE EXPRESS™ 5 to 20 g/hL		

(1) Products unusable in BIO EU for the application in question.

Ripe fruits red wine routing

The aim is to limit the extraction of greenness. The aim is also to bring out terpenols, contributing to notes of ripe fruits and reducing plant-based notes. The harmful consequences of having too high a level of ethanol are reduced.

- Stages common to different types of harvests
- Specific stages linked to harvest ripeness



	UNDERRIPE GRAPES	RIPES GRAPES
Harvesting and reception of harvests	BIOCONTROL OF GRAPES BIOCONTROL AGAINST UNWANTED FLORA  IOC GAÏA™ 10 to 20 g/100 kg of harvest, according to health risk and timing	
Maceration - Limiting mechanical actions	I EXTRACT MY SKIN POTENTIAL SELECTIVELY: PRE-FERMENTATION COLD MACERATION (3-5 DAYS) MASKING OF PLANT-BASED AROMAS (BRINGING OUT BETA-DAMASCENONE)  MYZYM RED FRUITS™ (1) 1 to 2 g/100 kg of harvests	SELECTIVE EXTRACTION OF COLOUR (ANTHOCYANINS)  MYZYM ULTRA EXTRACT™ (1) 2 g/100 kg of harvest
Upstream of fermentation	I RESTORE MY ACID BALANCE (IF NEEDS BE)	PRODUCTION OF LACTIC ACID + FRUITINESS/FLORAL  IOC BOREAL™ 25 g/hL ≈ 48hrs
Yeastng: 20 g/hL	I SELECT THE AROMATIC POTENTIAL TO BE BROUGHT OUT STABILISATION OF COLOUR & RIPE FRUITINESS  IOC RÉVÉLATION TERROIR™ BRINGING OUT RIPE FRUITINESS (TERPENOLS) TONING DOWN PLANT CHARACTER HIGH ROBUSTNESS  IOC R 9008™	PROTECTION OF YEASTS AGAINST ETHANOL  ACTIPROTECT+™ 30 g/hL when rehydrating yeasts ALCOHOL/BODY BALANCE  IOC R 9008™ OR SPICES/BLACK FRUITS  IOC R 9002™
Nutrition	I GUARANTEE GOOD AF KINETICS AND BRINGING-OUT OF POTENTIAL IMPROVING BIOMASS FOR BRINGING OUT AROMAS  AROMACTIVIT 1™ 25 to 30 g/hL at beginning of AF &  AROMACTIVIT 2™ 15 to 20 g/hL at 1/3 AF ALTERNATIVE:  NATJJA™ 40 g/hL at beginning of AF	
Oak infusion	I ENHANCE FRUITY NOTES SMOOTHNESS OF HEATED OAK WOODREDUCTION OF ALCOHOL SENSATIONS  FEELWOOD BALANCE & STRUCTURE™ 1 to 2 g/L at beginning of AF	
Beginning fermentation	I STABILISE THE COLOUR: & PROTECT THE FRUITINESS ALTERNATIVE TO LEES REDUCTION OF GREENNESS  EDIFYS INCISO™ 15 to 30 g/hL SACRIFICIAL TANNINS  TANIN SR TERROIR™ or VOLUTAN™ 5 to 15 g/hL	SYNERGIY TANNINS / YEAST POLYSACCHARIDES  FULLCOLOR™ 20 to 40 g/hL OR RED FRUIT TANNINS  BOUQUET R 36™ 10 to 20 g/hL
2/3 AF	I ENSURE SAFETY AT THE END OF FERMENTATION	LATE NUTRITION + DETOXICATION (IN CASE OF DEFICIENCIES AND/OR STRONG ETHANOL)  ACTIVIT SAFE™ 20 to 40 g/hL
Malolactic fermentation	I PRESERVE & AMPLIFY MY FRUITY POTENTIAL REDUCTION OF ASTRINGENCY AND BITTERNESS  MAXIFLORE SATINE™ In early or sequential inoculation OR RIPE FRUITS & SPICES COMPLEXITY & STRUCTURE  EXTRAFLORE COMPLEXITY™ In sequential or direct inoculation + RESISTANCE OF BACTERIA TO ETHANOL  NUTRIFLORE FML™ 20 g/hL 48hrs before	
Post AF	I WORK ON THE FINAL EXTRACTION LONG VATTING (28°C) +  MYZYM ELEVAGE™ (1) 1 to 3 g/hL	
Ageing	I REFINE MY PROFILE FULL-BODIEDNESS STRUCTURAL QUALITY AROMATIC RIPENESS  SPHERE ROUGE™ 5 to 20 g/hL	

(1) Products unusable in BIO EU for the application in question



Low SO₂

Low SO₂ Solutions red wine routing



All steps are taken to ensure the clarity, stability and quality of wines, where both microbial control and oxidative resistance are concerned. The aim is to limit any production of SO₂ or ethanal.

Harvesting and reception of harvests	<div>BIOCONTROL OF GRAPES</div>	<div>BIOCONTROL AGAINST UNWANTED FLORA</div> <div><div>IOC GAÏA™ 10 to 20 g/100 kg of harvest, according to health risk & timing</div></div> <div>ANTI-OXIDANT BONDS</div> <div><div>FULLPROTECT™ 30 g/hL</div></div> <div>SACRIFICIAL TANNINS AND ANTI-LACCASE</div> <div><div>ESSENTIAL ANTIOXIDANT™ 5 to 10 g/hL</div></div>
Maceration - Limiting mechanical actions	<div>I EXTRACT MY SKIN POTENTIAL SELECTIVELY</div>	<div>MASKING OF PLANT-BASED AROMAS (BRINGING OUT BETA-DAMASCENONE) RAPID EXTRACTION OF ANTHOCYANINS</div> <div><div>MYZYM RED FRUITS™ (1) 1 to 2 g/100 kg of harvest</div></div>
Upstream of fermentation	<div>I RESTORE MY ACID BALANCE (IT NEEDS TO BE)</div>	<div>PRODUCTION OF LACTIC ACID + FRUITINESS/FLORAL</div> <div><div>IOC BOREAL™ 25 g/hL ≈ 48hrs</div></div>
Yeasting: 20 g/hL	<div>I ENHANCE MY FERMENTATION, WITHOUT PRODUCING SO₂</div>	<div>PROTECTING YEASTS AGAINST ETHANOL</div> <div><div>ACTIPROTECT+™ 30 g/hL when rehydrating yeasts</div></div> <div>RESTORING AROMATIC FRESHNESS AND MAINTAINING MALIC ACID</div> <div><div>IOC BE FRESH™ Zero SO₂, low ethanal and very low H₂S</div></div>
Beginning AF	<div>I ENRICH MY WINE WITH ANTI-OXIDANTS</div>	<div>PRODUCTION OF GLUTATHION IN FERMENTATION</div> <div><div>GLUTAROM EXTRA™ (1) 20 g/hL</div></div>
Nutrition	<div>I GUARANTEE GOOD AF KINETICS AND BRINGING-OUT OF POTENTIAL</div>	<div>ENHANCING YEAST WELLNESS ANTI OXIDATIVE STRESS BRINGING OUT FRUITY AROMAS</div> <div><div>NATJJA™ 40 g/hL at beginning of FA</div></div> <div>OR</div> <div>IMPROVING BIOMASS FOR BRINGING OUT AROMAS</div> <div><div>AROMACTIVIT 1™ 25 to 30 g/hL of beginning of AF</div><div>AND</div><div>AROMACTIVIT 2™ 15 to 20 g/hL at 1/3 FA</div></div>
Oak infusion	<div>I ENHANCE FRUITY NOTES</div>	<div>FRESHNESS OF NON-TOASTED OAK FRUITINESS ENHANCER</div> <div><div>FEELWOOD SWEET & FRESH™ 1 to 2 g/L at beginning of AF</div></div> <div>OR</div> <div>SMOOTHNESS OF HEATED OAK REDUCTION IN ALCOHOL SENSATIONS</div> <div><div>FEELWOOD BALANCE & STRUCTURE™ 1 to 2 g/L at beginning of AF</div></div>
Beginning fermentation	<div>I STABILISE THE COLOUR AND PROTECT FRUITINESS</div>	<div>SACRIFICIAL TANNINS</div> <div><div>TANIN SR TERROIR™ or VOLUTAN™ 5 to 15 g/hL</div><div>AND/OR</div><div>SYNERGY TANNINS / YEAST POLYSACCHARIDES</div><div><div>FULLCOLOR™ 20 to 40 g/hL</div><div>AND/OR</div><div>ALTERNATIVE TO LEES VOLUME IN MOUTH OR REDUCTION OF GREENNESS</div><div><div>EDIFYS : RILIEVO™ or INCISO™ 20 to 40 g/hL</div></div></div></div>
Malolactic fermentation	<div>I BIOCONTROL MY POTENTIAL</div>	<div>BACTERIAL BIOCONTROL AGAINST <i>BRETTANOMYCES</i> + ETHANAL CONSUMPTION</div> <div><div>EXTRAFLORE CO-IN™ or EXTRAFLORE PURE FRUIT™ or MAXIFLORE SATINE™ In co-inoculation</div></div>
2/3 AF	<div>I ENSURE SAFETY AT THE END OF FERMENTATION</div>	<div>LATE NUTRITION + DETOXICATION (IN CASE OF DEFICIENCIES AND/OR STRONG ETHANOL)</div> <div><div>ACTIVIT SAFE™ 20 to 40 g/hL</div></div>
Ageing & storage	<div>I PROTECT MY WINE FOR STORAGE</div>	<div>ANTI-OXIDANT BONDS</div> <div><div>ULTIMA JUMP™ 10 to 20 g/hL</div></div> <div>COMBATting LACTIC BACTERIA</div> <div><div>ACIDE FUMARIQUE (1,2) 30 to 60 g/hL</div></div>

(1) Products unusable in BIO EU for the application in question. (2) Products unusable in NOP.

Our key IOC solutions for your red wines



IOC GAÏA™

Globally-acclaimed pre-fermentation biocontrol

- Selected by the Institut Français de la Vigne et du Vin de Beaune (Burgundy).
- *Metschnikowia fructicola* yeast without fermentation ability.
- Efficient in combatting pre-fermentation contaminant flora (*Hanseniaspora uvarum*, acetic bacteria, *Brettanomyces*).
- Limits deviations (volatile acidity...).
- Reduces the risk of triggering alcoholic fermentation too early.
- A major microbial biocontrol tool during transport or in cold pre-fermentation maceration.
- Essential when not using sulphiting or when complementing SO₂ action.
- New, validated application: biosanitation of harvesting and reception equipment (machines, grape-carriers, conveyors...).



MYZYM RED FRUITS™

The best maceration extraction to bring out fruitiness

- Selective extraction of interesting compounds: pigments + polysaccharides + aroma precursors.
- Brings out beta-damascenone which amplifies fruity aromas and represses plant-based notes.
- Contributes to richness and full-bodiedness.
- In classic or cold pre-fermentation maceration.



IOC BE FRESH™ AND IOC R 9008™

Two yeasts which perfectly complement each other to position the freshness cursor

IOC R 9008™:

- Fosters fruity ripeness: brings out terpenols.
- The world benchmark for full-bodiedness: early release of polysaccharides linked with polyphenols.
- High ethanol resistance.

IOC BE FRESH™:

- Brings out fresh and complex notes of red or black fruits (fatty acid esters).
- Cutting-edge innovation from IOC BE™: produces no SO₂ and limits sulphurous odours.



EDIFYS™ RANGE: RILIEVO™ AND INCISO™

Shaping the tactile dimension of red wines

EDIFYS RILIEVO™:

- Alternative to lees which sculpts the attack and the mid-palate.
- Reinforces the sensation of volume in mouth.
- Contributes to the sensation of freshness.

EDIFYS INCISO™:

- Alternative to lees which builds the finish.
- Reduction of bitterness and astringency.
- Bringing out the ripeness.



FULLCOLOR™

Synergizing colour and structure

- Red wine colour = the first sign of its quality.
- Complementary actions of ellagic tannins, proanthocyanidins and yeast polysaccharides.
- Stabilises colour intensity in fermentation.
- Enhances structure and full-bodiedness.
- Cost-effective, quality tannin.



VOLUTAN™

The acclaimed tool for more balanced and more lasting wines

- 100% grape tannin.
- Contributes structure, body and suppleness.
- Enhances aptitude to ageing in oxidising conditions.



EXTRAFLORE PURE FRUIT™

Purity and freshness of fruity notes as a result of MLF

- Bacteria selected for red wines in collaboration with the Microbiology Laboratory of Direction Qualité et Développement Durable du CIVC.
- High tolerance to ethanol and low amounts in malic acid (normally restrictive).
- Very low production of diacetyl: no mask on fruity aromas caused by buttery notes.

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**IOC**

Révétons votre différence