RAFFAELE GUZZON[1], MAURO PAOLINI[1], TIZIANA NARDIN[1], TOMAS ROMAN[1], ROBERTO LARCHER[1], PAOLA VAGNOLI[2], SIBYLLE KRIEGER-WEBER[2]

[1]Fondazione Edmund Mach. Via Mach 1. 38010 San Michele all'Adige (TN) raffaele.guzzon@fmach.it

[2]Lallemand inc.

MODULATION OF WINE SENSORY PROFILE BY LACTIC BACTERIAL ACTIVITY IN A GLOBAL WARMING SCENARIO BY DIFFERENT MALOLACTIC FERMENTATION STRATEGIES

AIM OF STUDY

Incoming global warming imposing strategies to adapt wine chemical profile at an unknown scenario.
In this sense malolactic fermentation (MLF), the biological deacidification of wines, must become a conscious choice to optimize the content in organic acids and the sensory profile of the wine.
The effect of different strategies of bacterial inoculum and correction of acidity with organic acids allowed by the International Organization of Vine and Wine (OIV) were considered in terms of MLF kinetic, bacterial viability and compositional profile of obtained wines.

METHOD Usually, MLF is performed after alcoholic fermentation, because the absence of sugars in wine avoid spoilage metabolism of heterolactic bacteria, such as *O. oeni*. However, using selected strains of lactic bacteria, the range of strategies of management of MLF is wider. Simultaneous fermentation (**SF**) is an alternative strategy for managing MLF, which involves the inoculation of lactic bacteria into the grape must, instead into the wine at the end of alcoholic fermentation as traditionally practiced in winemaking (**TW**). This approach has been tested in southern red wines with a high ethanol potential, white and aromatic wines or sparkling-base wines. Furthermore, on a population of strains of *O. oeni* we verified the effect of the correction of grape must/wine acidity by different organic acids, in terms of MLF kinetics, cell viability and diacetyl production.

TRADITIONAL MLF

ALCHOOLIC FERMENTATION

RACKING

MALOLACTIC FERMENTATION

EFFECTS & PROBLEMS
Delay in winemaking process.
Spoilage phenomena (*Brettanomyces* spp.) during MHL lag-phase.
No risk of heterolactic fermentation.
Increasing of wine complexity due to citrate metabolism (Diacetyl).

SIMULTANEOUS AF & MLF

INOCOLUM OF YEAST IN GRAPE MUST

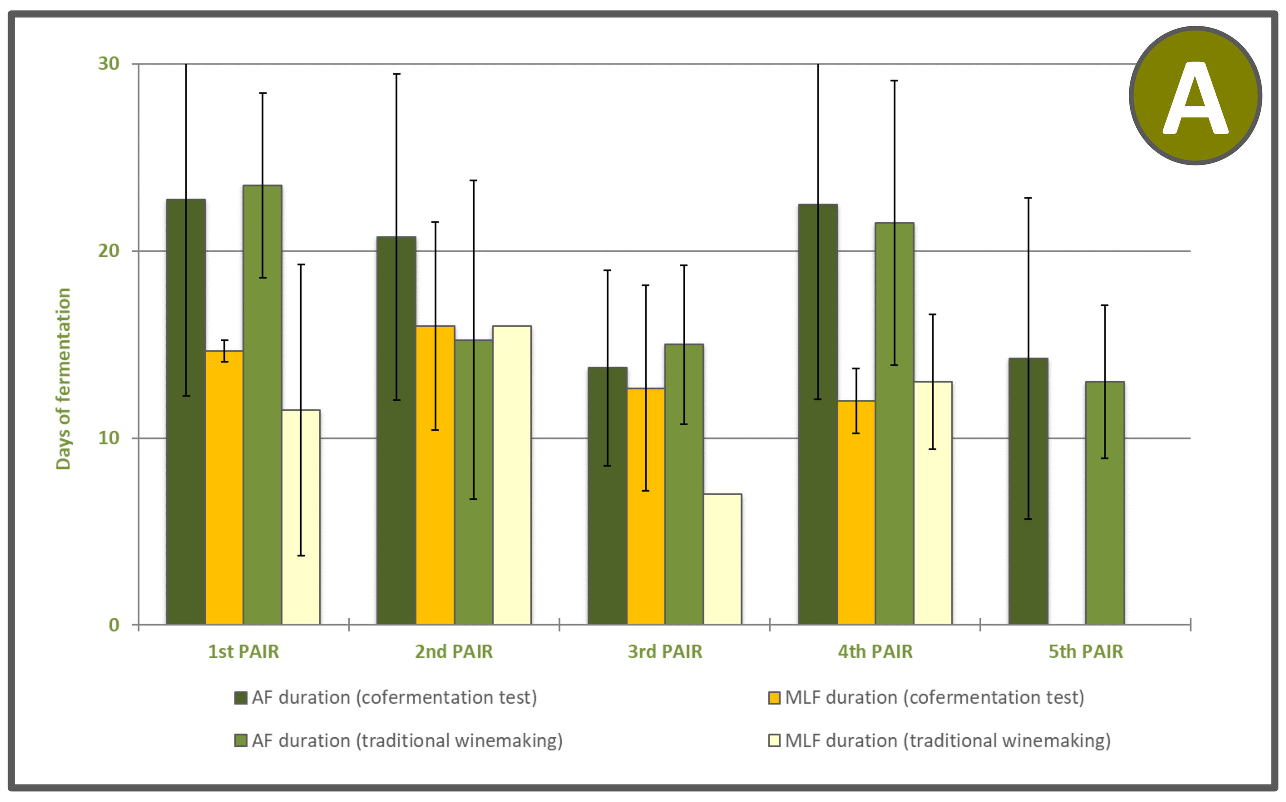
AFTER 24 - 48h INOCOLUM OF LACTIC BACTERIA

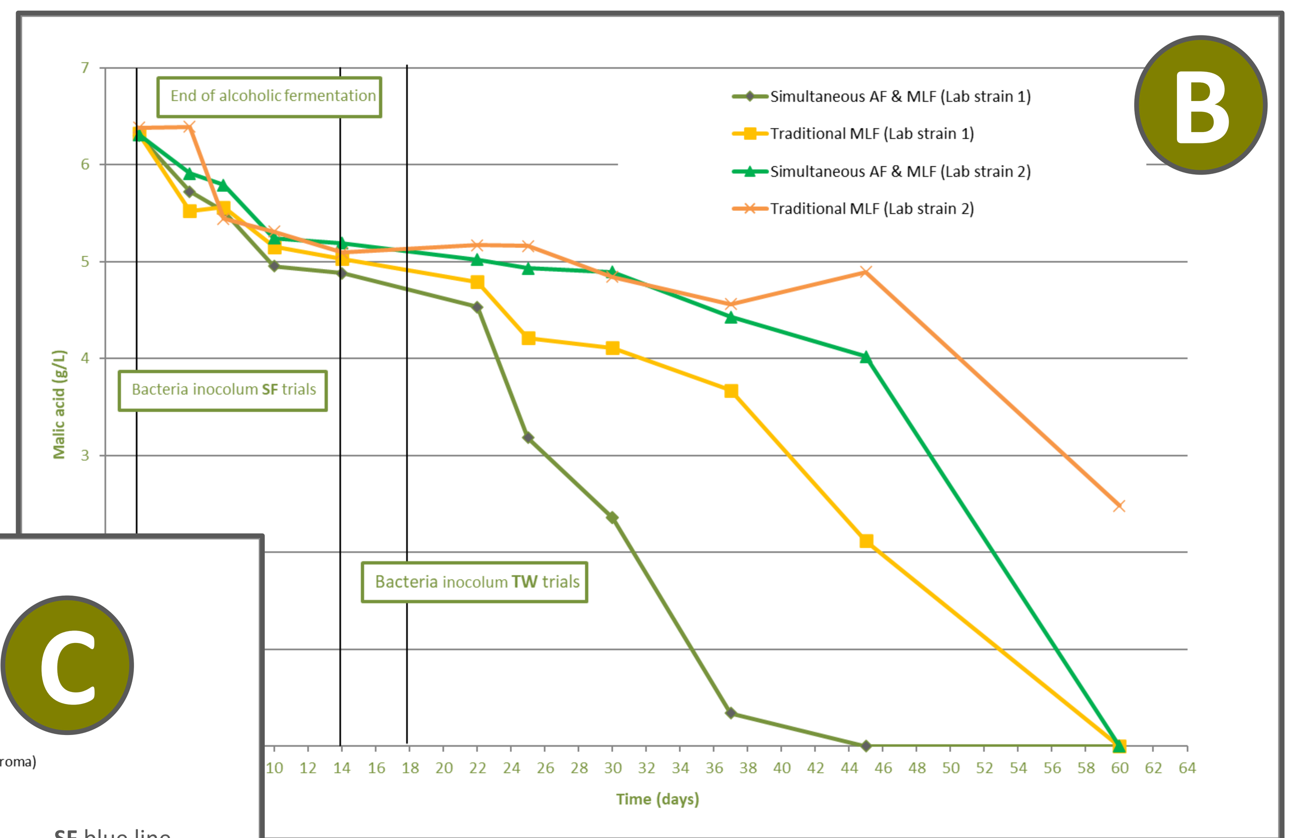
SIMULTANEOUS ALCHOLIC & MALOLACTIC FERMENTATIONS

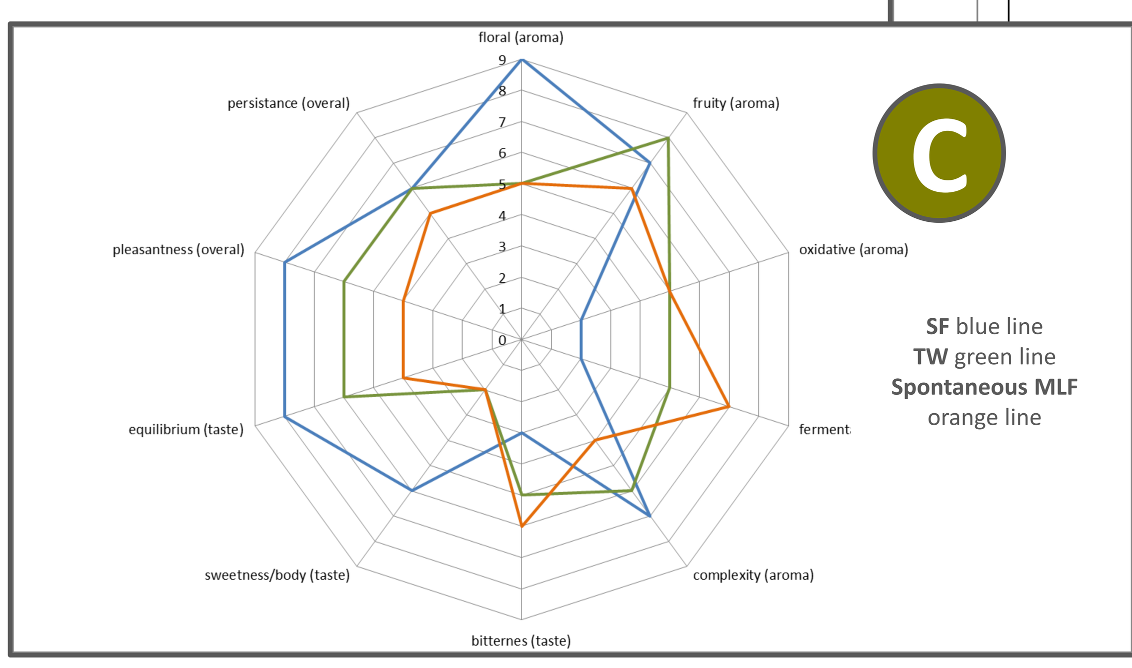
EFFECTS & PROBLEMS
Faster winemaking.
Rapid wine stabilization from microbiological point of view.
Reduction of citrate metabolism, prevalence in wine of aromas made from varietal precursors and yeast metabolism.

RESULTS

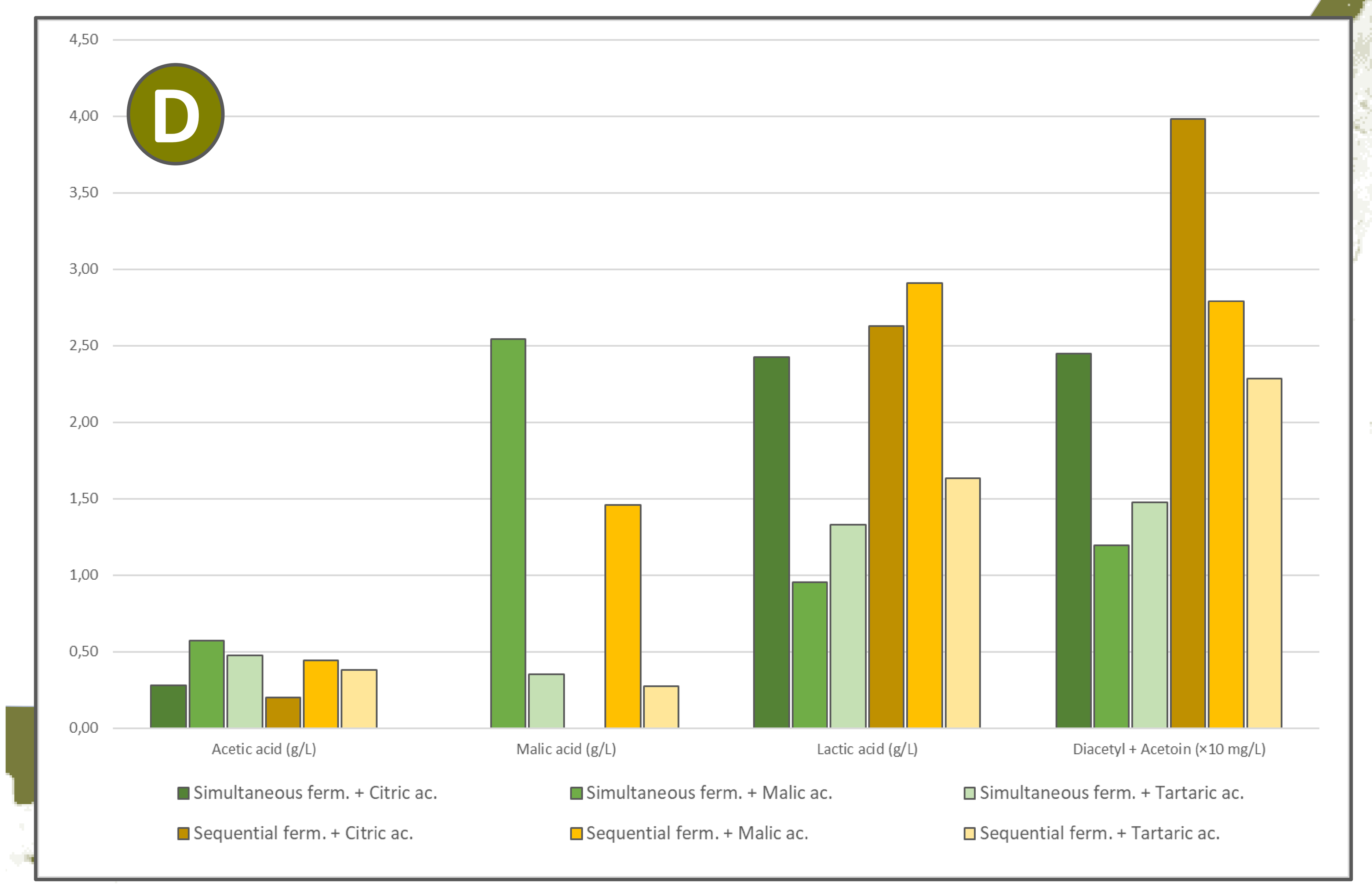
Simultaneous inoculum of bacteria and yeast in grape must seems to achieve different goals.
In southern, high ethanol and low acidity wines (**Figure A**) the bacteria resulted more active respect to that observed tests performed by traditional post-alcoholic inoculum, accomplishing MLF without spoilage effects, such as volatile acidity increase. This results was achieved considering 5 different pair of yeast-bacteria strains.
In white wine with high acidity (pH < 3.20) SF ensured fast MLF respect to that performed in traditional winemaking (**Figure B**).
In the tests performed during the production of in sparkling-base wines the SF gave wines with floral and complex aroma, more equilibrated and generally more appreciated by testers (**Figure C**).







Tartaric, malic, and citric acid were tested in the correction of the low acidity of grape must/wine, before MLF. Addiction of malic acid over 2.5 g/L affected evolution of MLF, while at the same concentration the addiction of citric acid stimulated bacterial activity and diacetyl production. The addition of tartaric acid resulted counterproductive at the higher value. Wine obtained after supplementation of grape must by different organic acids (Malic, Citric and Tartaric) lead to a different composition of wines in terms of organic acid prfile diacetyl/acetoin (Butter/spicy aroma) **Figure D.**



MORE INFORMATIONS

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