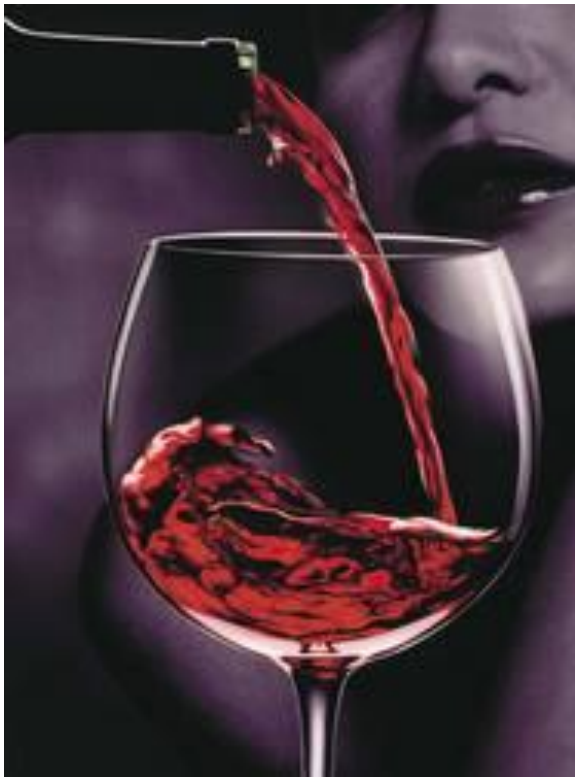

Sensory analysis as a tool to improve selection of new yeasts

"The Raboso Selection"

The new strain from a particular *terroir* in North Eastern Italy

Tiziana Nardi, PhD

Lallemand Italia

What's Raboso?

Raboso is a **native red grape** of **Doc Piave area** known for its **heavy tannins**, **high acidity** and **deep colour** that grows primarily in Veneto region.

The Raboso Piave

Raboso Piave, as for its name and for its origins, is strictly linked with the oenological production of the **entire valley of Piave river** where since several centuries ago is successfully cultivated on the both side of the river.

Raboso Piave is **a red strong and rustic vine variety** which **ripens late** and doesn't fear the drought and cold temperatures: for its unique character is **excellent for producing wines for ageing**.

From the **gravely soils** along the Piave river it gains elegance and fine flavours and from the **clayey vineyards** body and structure.

THE GRAPE

LALLEMAND

What's Raboso?

Raboso Piave is generally **intense ruby red** with garnet highlights that become more intense during the ageing period, it has an **high levels of tannins** and **acidity** when it is young and is ideal for *laying down for a long time*, after which it is an excellent full bodied wine.
The palate is **dry** and **austere**, with **very full flavours** and the aroma releases **wild violets**, **spices** and **tobacco**, with a definite fragrance of morello cherry.
The ideal vinification requires an appropriate maceration of skins and juices at the right temperature: after several months in **wooden barrels** (in general 24) it acquires a deepest colour and a wonderful body and bouquet. At full maturity Raboso Piave **is one of the great Italian red wines**.

Minimum Total Acidity 6,5 g/l

“Valorization and characterization of autoctonous grapevine Bianchetta Trevigiana and Raboso Piave ”

THE PARTNERS

UNIVERSITÀ DEGLI STUDI DI PADOVA

Sampling
Selection
Microvinification trials
Winery trials
Industrial production test

CONSORZIO TUTELA VINI DEL PIAVE D.O.C.

Sampling
Selection
Microvinification trials
Winery trials
Scale-up and production test

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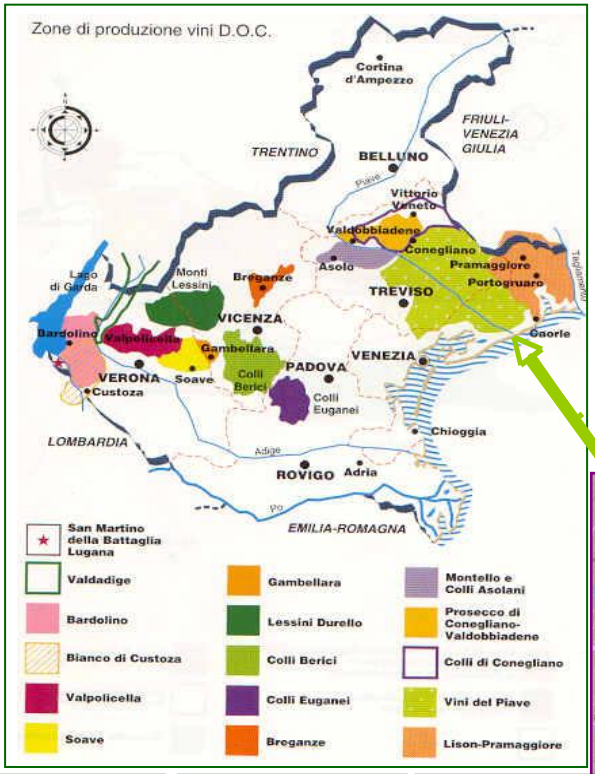
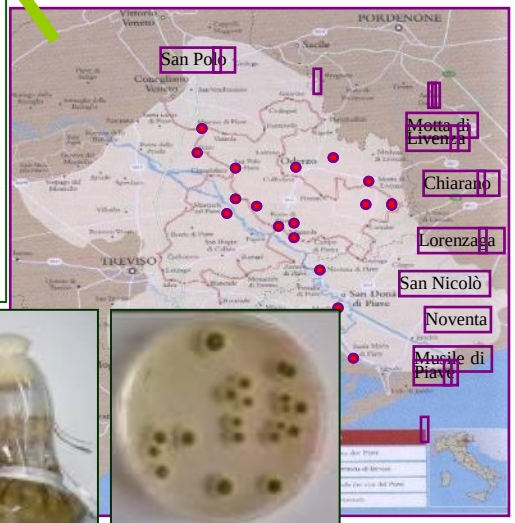
Sampling
Selection
Microvinification trials
Winery trials
Scale-up and production test

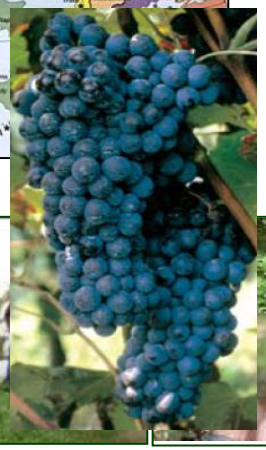
THE PROJECT

SELECTION PROJECTS
Sampling: DOC areas in Veneto



- Small area, but challenging must for yeasts (pH: 2.8-3.0, tannins and anthocyans)
- Winemaking interest in the resulting strain
- Sampling Years: 2005 and 2006





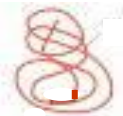
Example of selection project progress

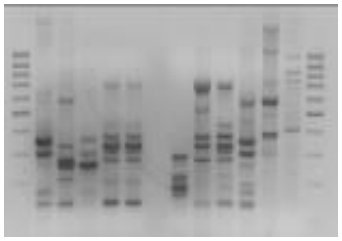


Sampling



Yeast colonies



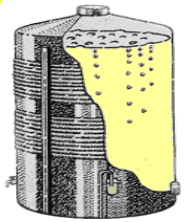
Genetic analyses



"Nanovinification"

Technologic charachterization

Sensory evaluation

Micro & Pilot scale vinification

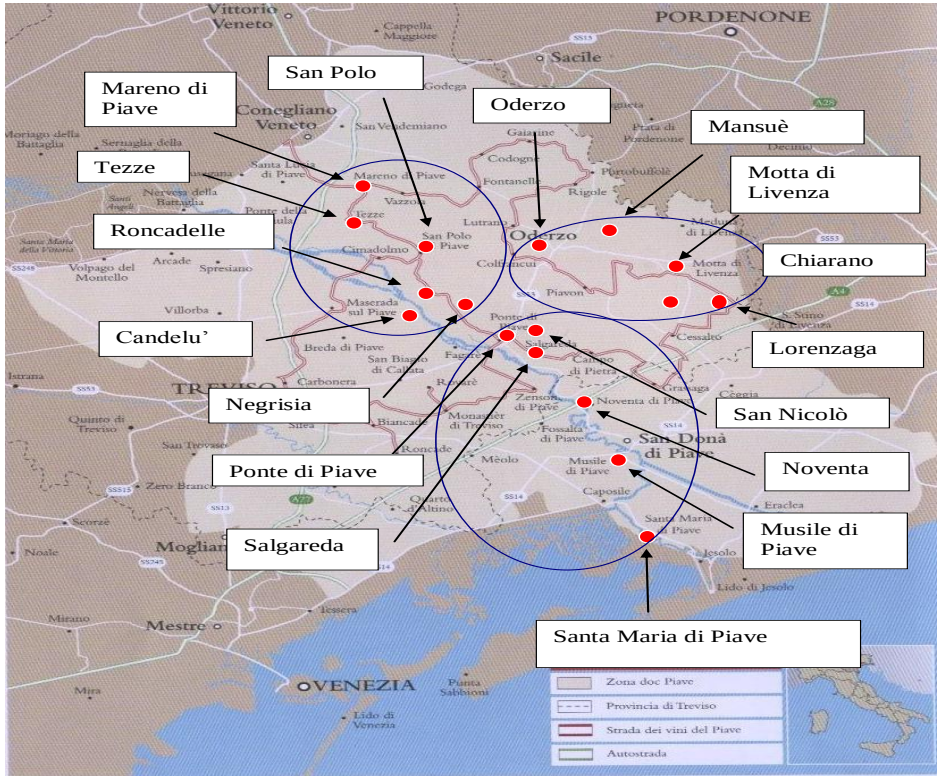
Technological validation

Sensory evaluation

THE SELECTION AREA

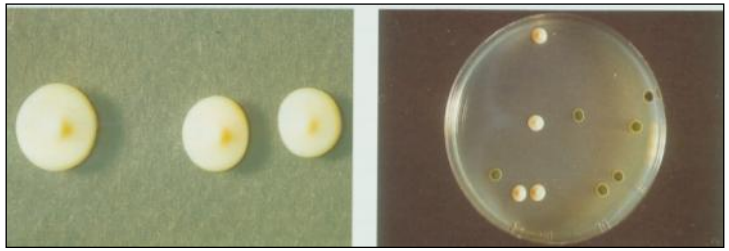
1° ISOLATION

Grape Sampling



FIRST FERMENTATION:

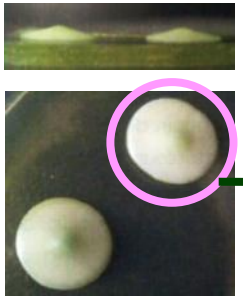
collected grape added with SUGAR & SO2



Pool of 760 isolates

2005-2006

Saccharomyces sensu stricto identification

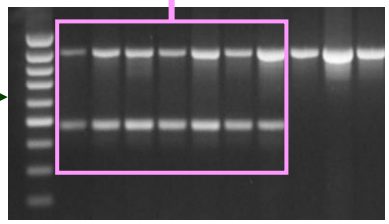


WL plates

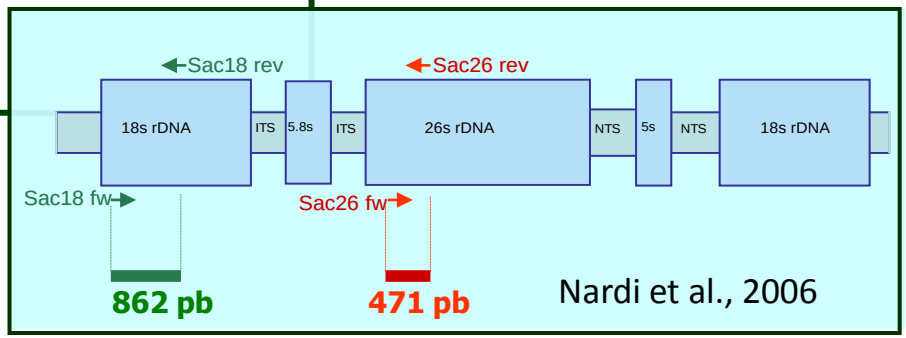
Yeast cells

PCR amplification

Saccharomyces sensu stricto



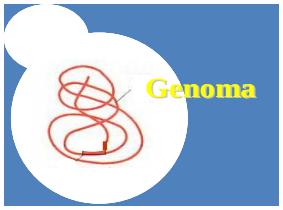
239 *Saccharomyces* isolates (760 colonies screened)



Nardi et al., 2006

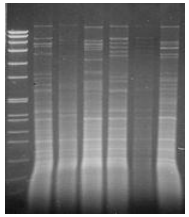
and strain redundancy determination

130 different strains (non-commercial)

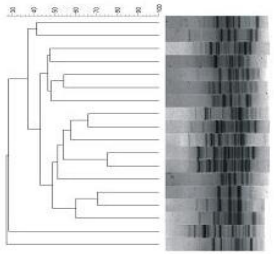


Isolates

Total DNA extraction



Restriction profiles (*Hin*fI)



Gel Compar II analysis

Querol et al., 1996; Nardi et al., 2006

1st SCREENING

SYNTHETIC MUST

pH 2,9, Malic acid 3,5 g/L, AF 24 °C

239 isolates

Genetic analyses

Fermentation *Performances*, H_2S-foam production, etc.

107 strains

2nd SCREENING

NATURAL Raboso MUST

pH 2,9, Malic acid 4.5 g/L, AF 24 °C

107 strains + VRB

Fermentation *Performances*, H_2S-foam production, etc.

- Sensorial Evaluation
- Analytical controls

5 strains

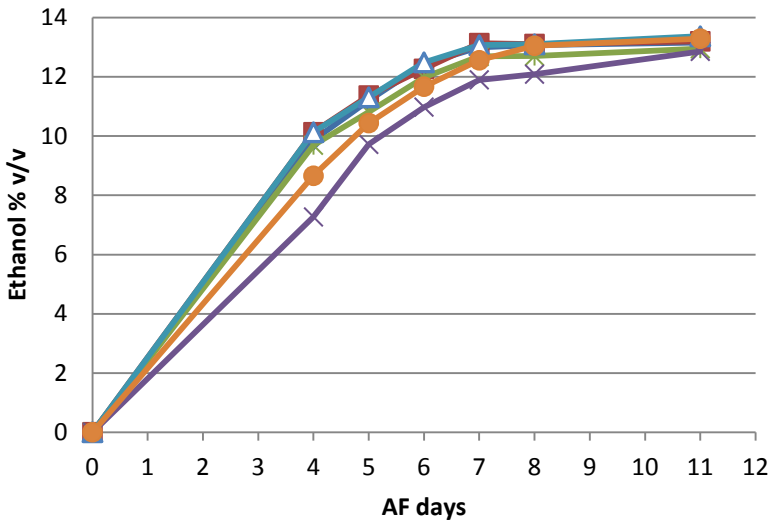
From E. Bartowsky

2005-2006

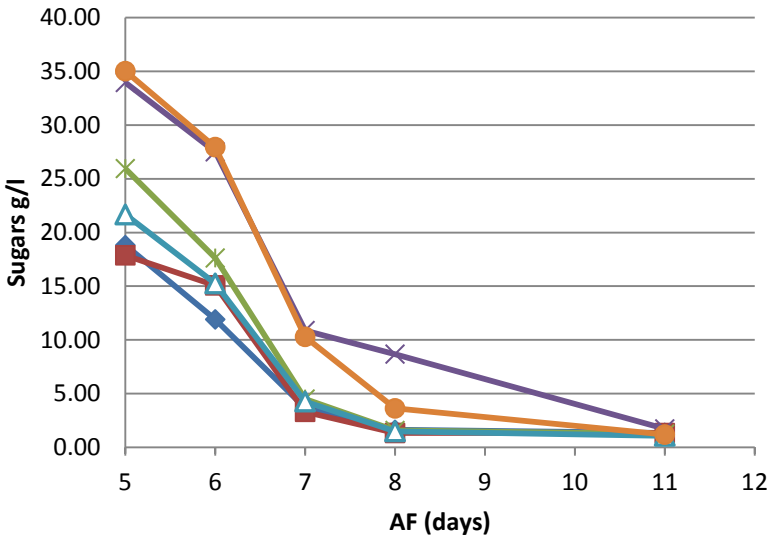
Yeast characterisation: technological traits

Fermentation performances in microvinification

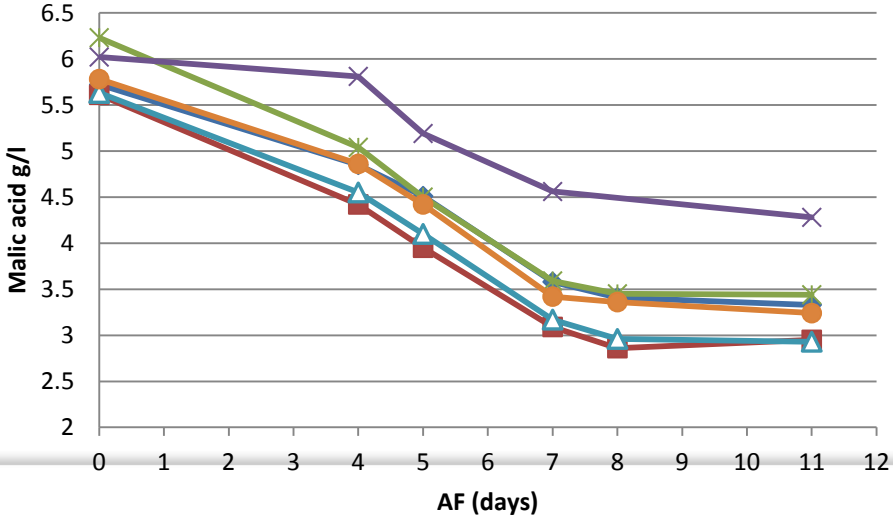
Alcoholic fermentation

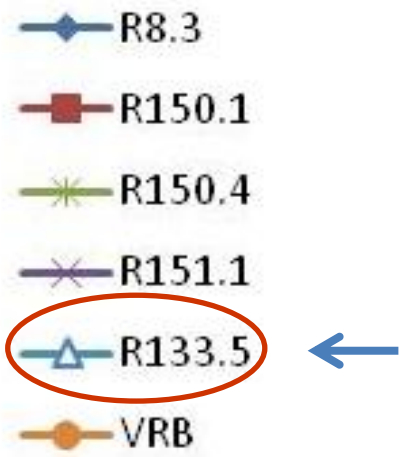


Finish of AF



Malic acid degradation





2007

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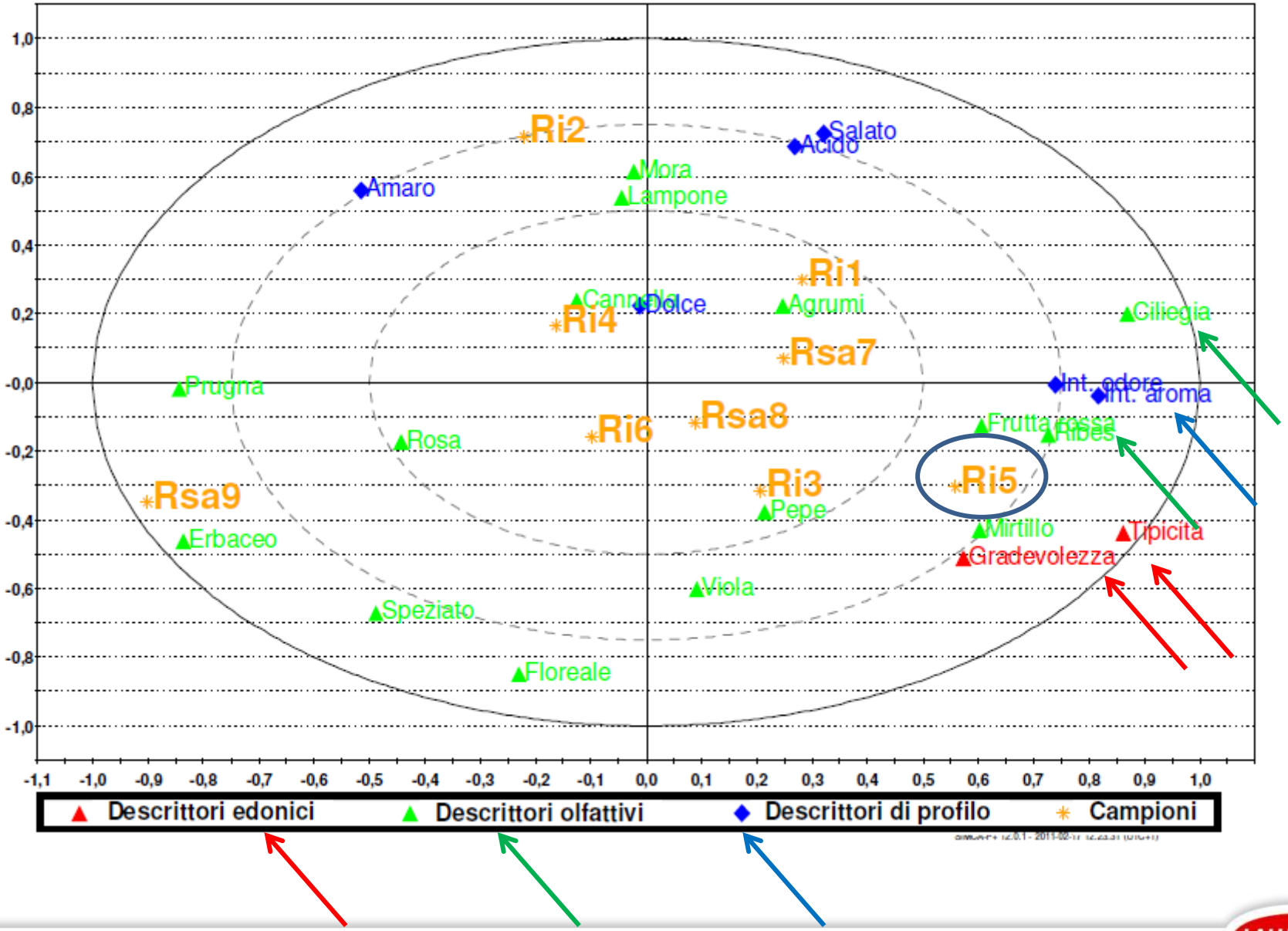
2007 WINE TASTING



2007 – Winemaker panel

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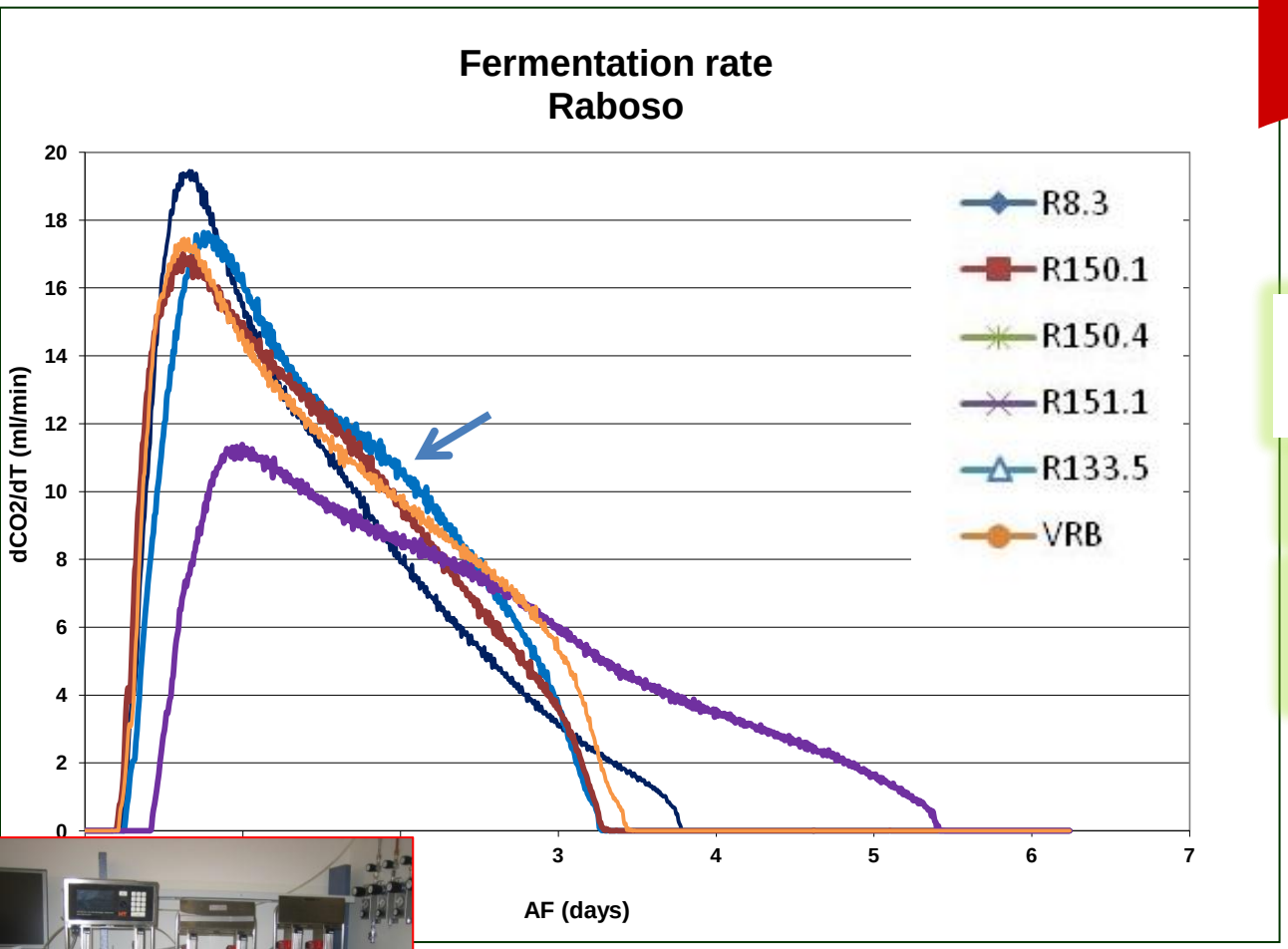
Yeast characterisation: technological traits

Fermentation dynamics

3rd SCREENING



5 strains + VRB

- Microvinification
  Sensorial Evaluation
- Analytical controls
- Fermentation dynamics

2 strains

2007

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MULTIPLE TRIALS IN RABOSO GRAPE

R8.3 R133.5 VRB Yseo
(commercial control)

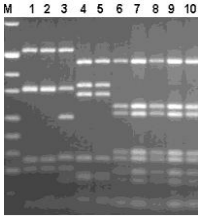
Microvinification Raboso classico	Microvinification Raboso passito (from dried grape)	Vinification Raboso classico

Analysis

Microbiological

Monitoring of microflora (CFU/ml)

- before inoculation
- after inoculation
- 5 days after inoculation



Genetics analysis (Dominance)

Chemical:

- Reducing sugar
- Total acidity
- pH
- Malic acid

2008

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MULTIPLE TRIALS IN RABOSO GRAPE

Must profiles

	pH	Acidità Totale (g/l)	Zuccheri (g/l)	Acido Malico (g/l)	Acido Tartarico (g/l)
Microvinificazione Raboso classico	2,91	10,47	217,29	3,77	6,98
Microvinificazione Raboso passito	2,97	8,8	265,22	3,53	4,92
Vinificazione Raboso Classico	2,9	9,6	223,4	4,56	4,96

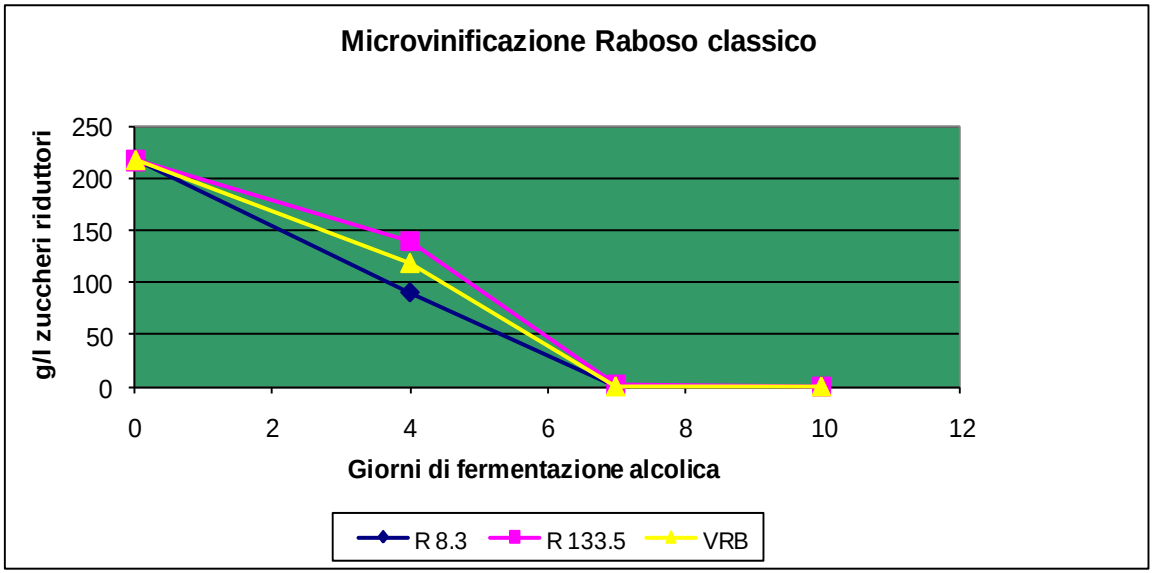
Caratteristiche chimiche del mosto Raboso di partenza usato nelle prove di microvinificazione

2008

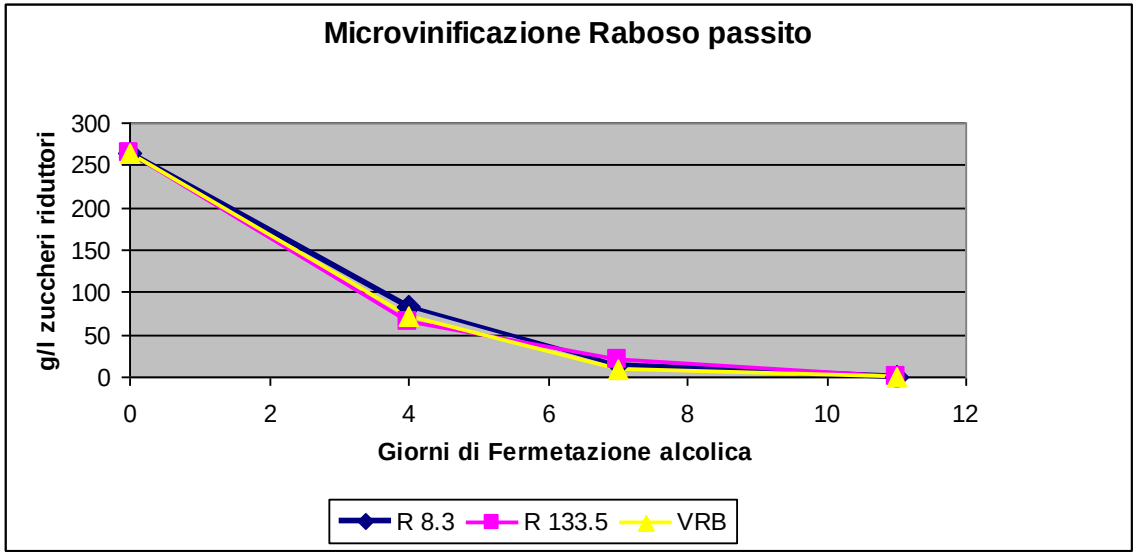
LALLEMAND

MICROVINIFICATION RABOSO GRAPE

Raboso classico



Raboso passito

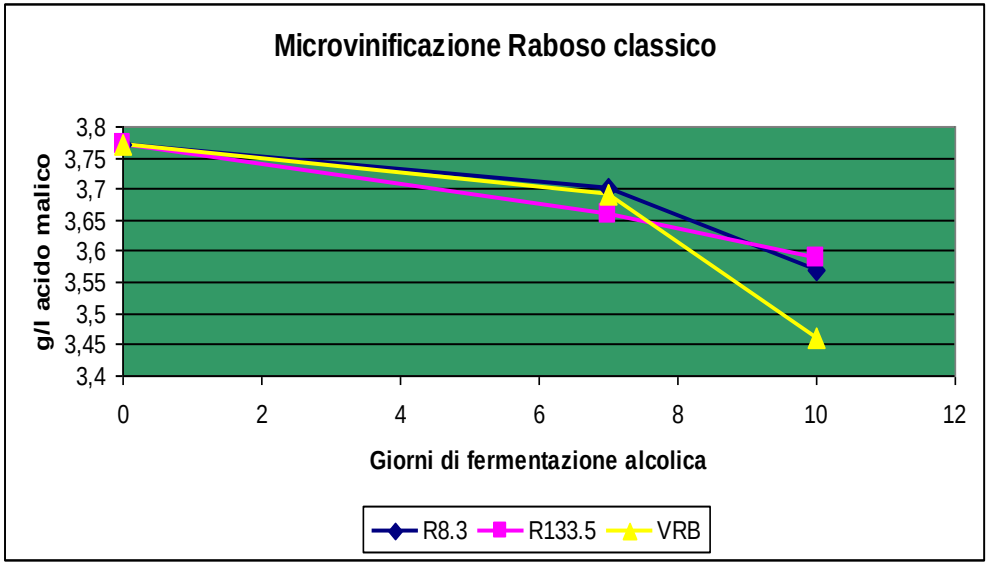


	Acido acetico (g/l)		
	R8.3	R133.5	VRB
Microvinificazione Raboso classico	0,09	0,16	0,12
Microvinificazione Raboso passito	0,45	0,44	0,48
Vinificazione pilota Raboso classico	0,55	0,44	0,48

MALIC ACID DEGRADATION -MICROVINIFICATION

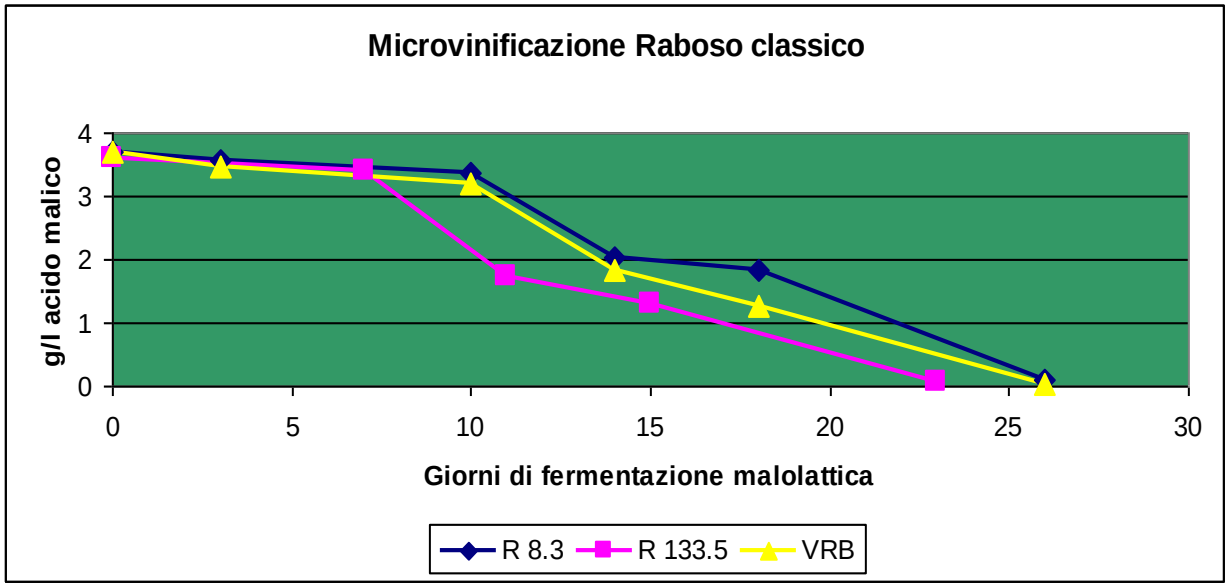
During Alcoholic Fermentation

Raboso classico



After bacteria inoculum

Inoculation bacteria Lalvin VP41 (end of AF)



2009 WINE TASTING AND GAS CHROMATOGRAPHY

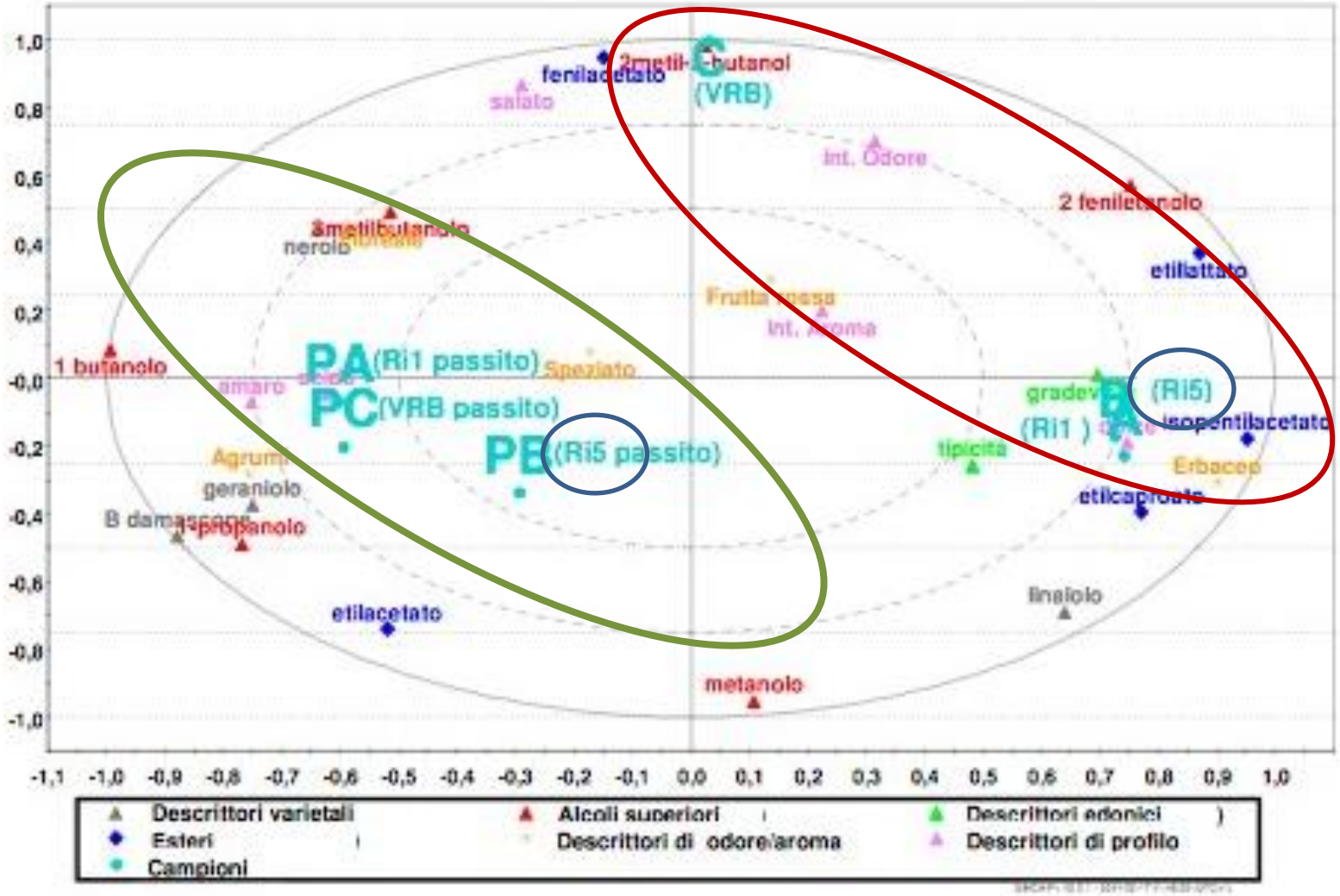


Fig. 11. Analisi delle componenti principali (PCA) dei descrittori sensoriali e dei composti aromatici relativi ai vini degustati.

2008-2009

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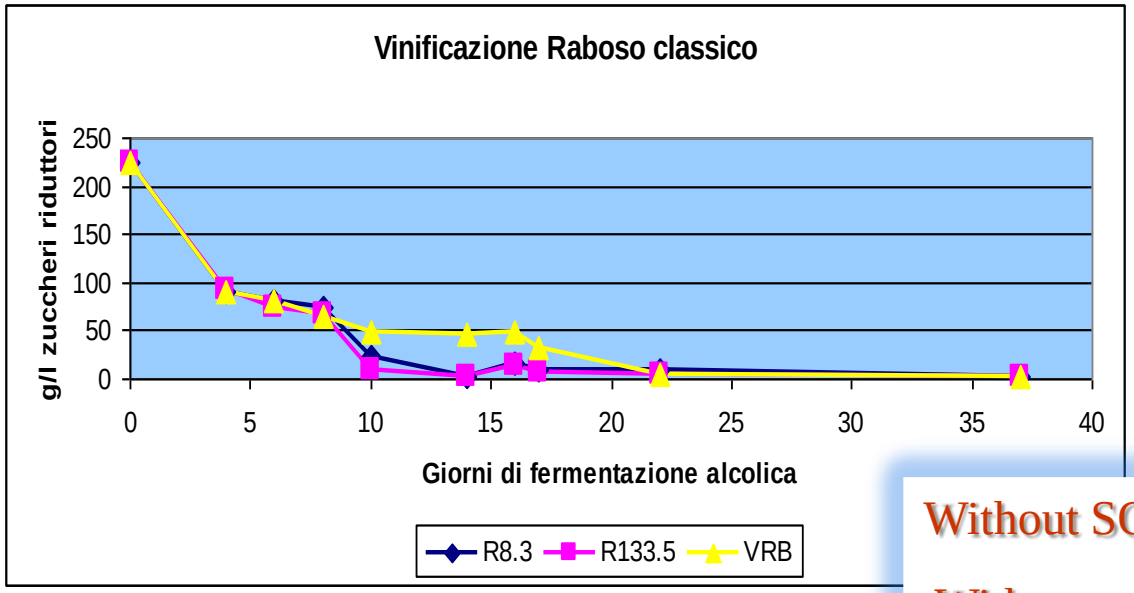
CELLAR RABOSO CLASSICO



Without SO2

Without temperature control

Without any yeast nutrition ….

	Microvinificazione	R8.3	R133.5	VRB
Microvinificazione Raboso classico	A	100%	-	-
	B	-	100%	-
	C	-	-	100%
Vinificazione Raboso Classico	A	100%	-	-
	B	-	100%	-
	C	-	-	100%
Microvinificazione Raboso passito	A	100%	-	-
	B	-	100%	-
	C	-	-	100%

Tabella 3.1 Risultati del test della dominanza

Strain Dominance

2008 ALCOHOLIC FERMENTATION

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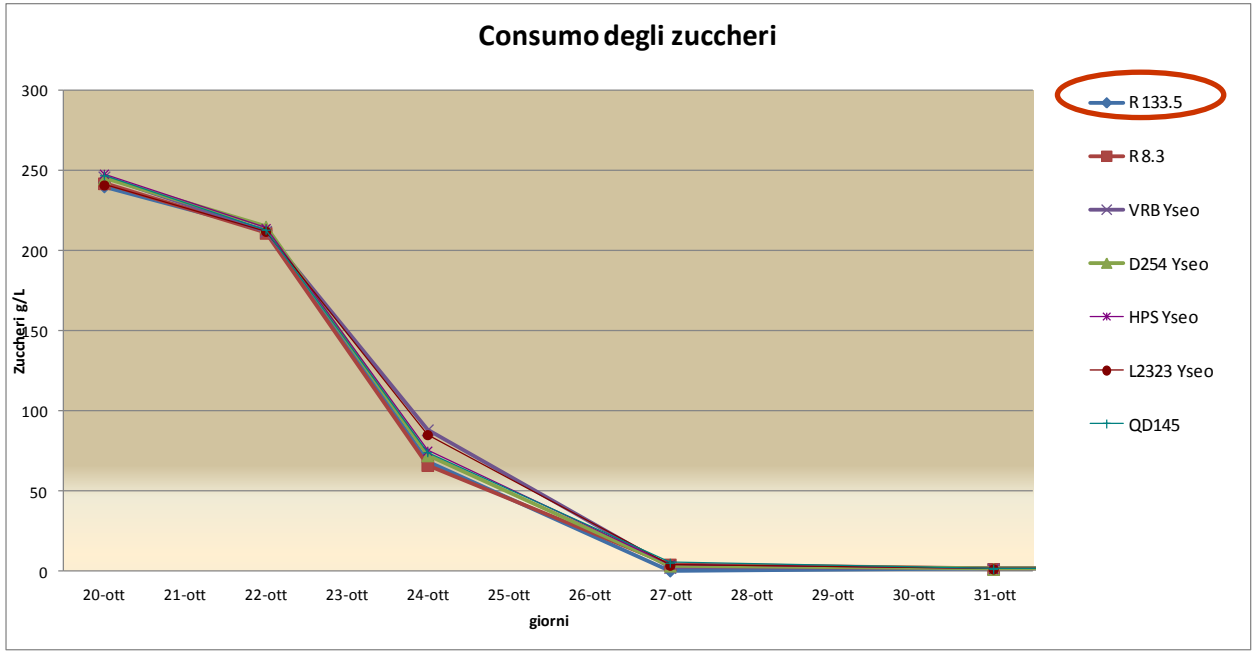
R 133.5 & R8.3 vs 7 " top red strains"

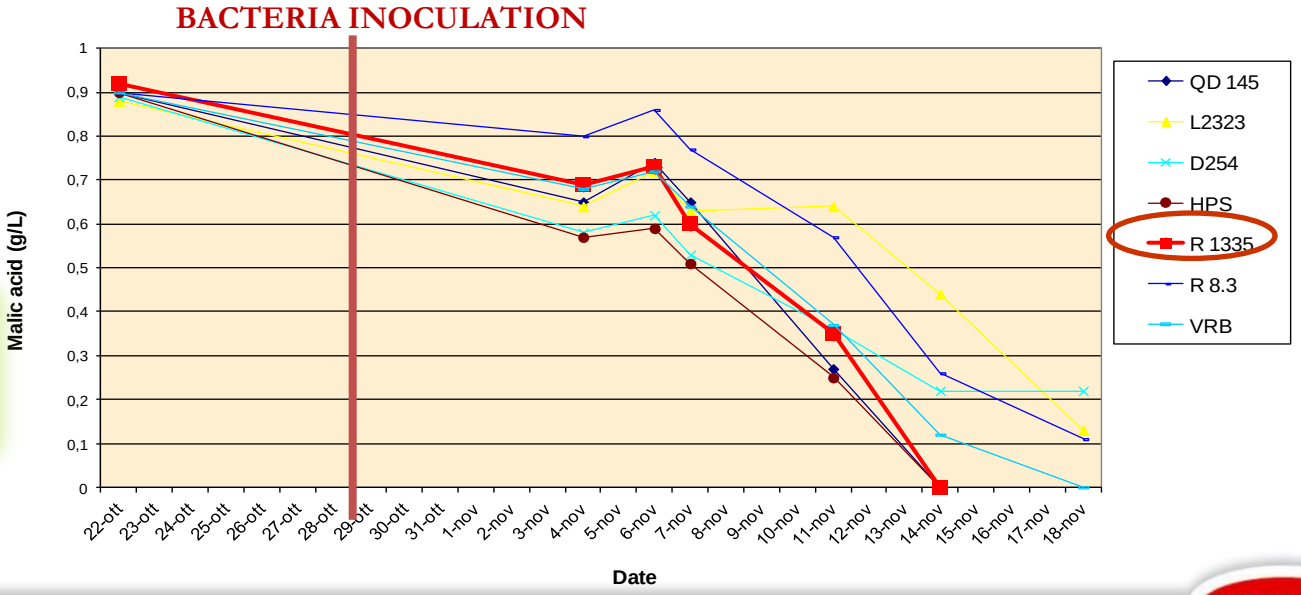
- High maturity **Sangiovese** grapes (machinery harvest)
- **Alcohol potential** close to 15%v/v
- **Inoculation dosage:** 25 g/hl
- **GoFerm Protect** in rehydration 30 g/hl
- **Fermaid** at the beginning and 1/3 of FA (2 x 20g/hl)
- **Temperature**: max 28 °C under cap
- 7 days maceration 2 pumping over per day, one delastage at third day
- MLF in all tanks with **Lalvin VP41 MBR** **after AF**

2009 COMPARATION WITH RED STRAINS

Alcoholic Fermentation



Malic degradation



ISVEA

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R 133.5 vs “ top red strains”

Wine @ the end of AF

D	D254 YSEO	R133.5
Alcohol %	14,75	14,75
Residual sugars g/l	1.0	1.0
Total acidity	5.58	6.06
pH	3.54	3.51
Volatile acidity	0.40	0.38
Free SO2	3	3
Total SO2	25	28
Malic acid	0.62	0.73
Total polyphenols	2397	2202
Color intensity	10.630	9.801
Color hue	0.548	0.566

R 133.5 *vs* 71B yseo

LALVIN 71B			FERMENTACIÓN			RABOSO R133.5
OBSERVACIONES	TEMP ºC	DEN S.	FECHA	DEN S.	TEMP ºC	OBSERVACIONES
GOFERM PROTECT: 20 G/HL	13,00	1110	**26/09/2009**	1110	16,00	GOFERM PROTECT: 20 G/HL
	13,00	1110	**27/09/2009**	1100	16,00	OPTIRED: 20 G/HL
OPTIRED: 20 G/HL	16,60	1100	**28/09/2009**	1078	24,20	NUTRIENT VIT: 15 G/HL
NUTRIENT VIT: 15 G/HL	24,60	1070	**29/09/2009**	1036	21,40	NUTRIENT VIT: 15 G/HL
NUTRIENT VIT: 15 G/HL	24,90	1020	**30/09/2009**	1010	24,90	
	22,10	997	**01/10/2009**	997	23,00	

- Variety Cencibel (Tempranillo)
- No remarkable difference on fermentation kinetics

2009 SPANISH TRIAL

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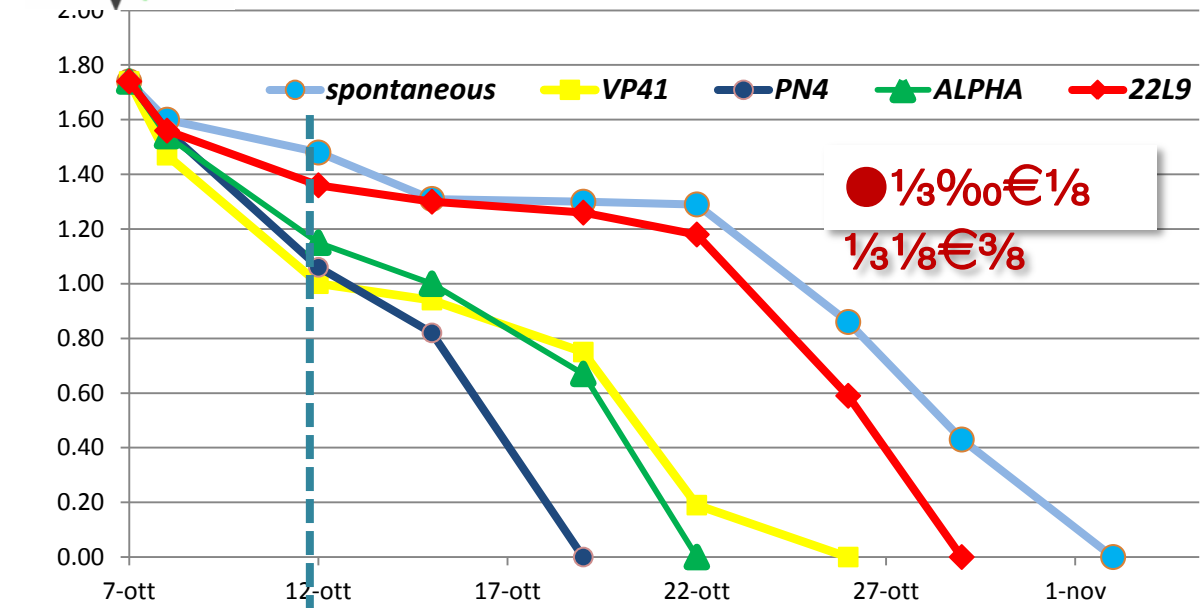
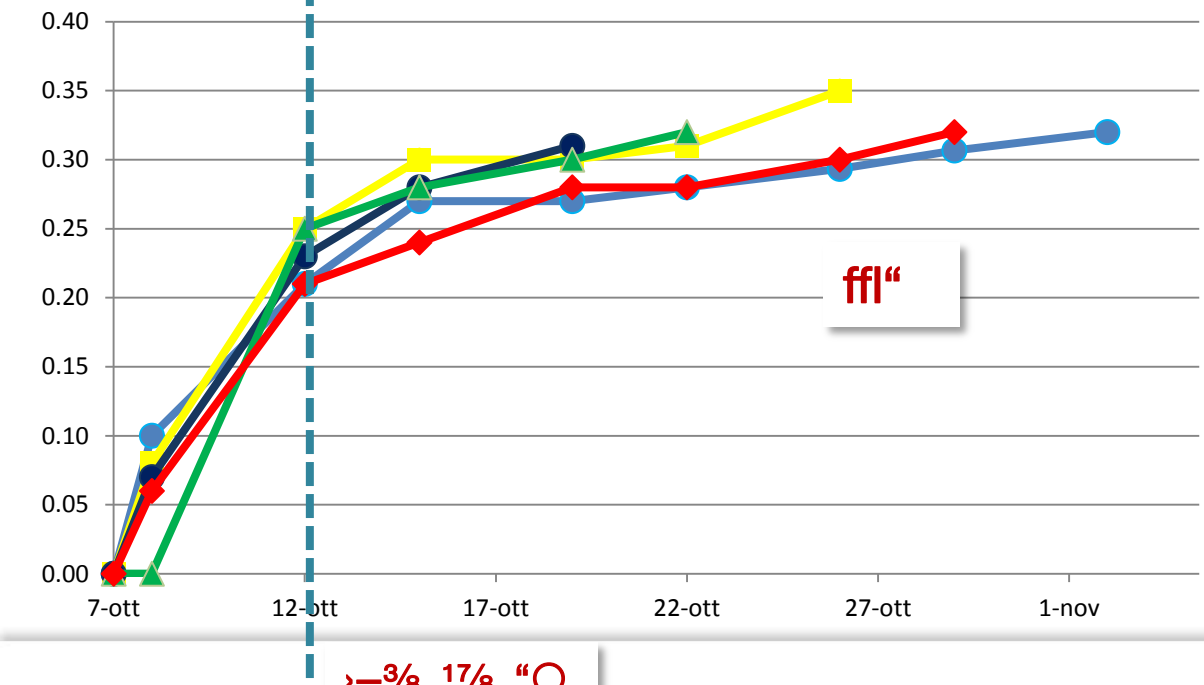
R 133.5 *vs* 71B yseo

After AF, the wine fermented with Lalvin 71B YSEO showed its characteristic profile, with amylic aromas and ample and silky mouth. **Raboso strain** presented **aromas of ripe fruit and more structure in the mouth.**

ANÁLISIS VINO		
VARIEDAD	RABOSO	LALVIN 71B YSEO
FECHA	20/11/2009	20/11/2009
AT (g/l)	6,38	4,87
AV (g/l)	0,63	0,50
Láctico (g/l)	2,04	1,89
Málico (g/l)	< 0,1	< 0,1
Az. Red. (g/l)	1,20	1,20
IC	13,13	12,43
% vol. Alc.	14,11	14,48
IPT	61,30	62,20
SO_2 LIBRE	15,00	25,00
SO_2 TOTAL	35,00	37,00

R 133.5 & 4 MLB





COINOCULO 24 h.

- pH 3.22
- Tot SO2 45
- Malic A. 1.74
- Fru 116
- Glu 108
- TA 6.92
- Yeast <1.0e+06
- Bacteria <1.0e+02

2010 YEAST-BACTERIA COMPATIBILITY

LALVIN RBS 133

- Rapid growth, also in high microflora contamination (no SO2) it completely dominated in all fermentation checked
- Regular speed and reliable fermentation even without temperature control
- Good fermentative performance tested up to 15,5 % alcohol (Raboso passito)
- Low volatile acidity
- Good synergy with malolactic bacteria
- Low Nitrogen needs

CHARACTERISTICS

LALVIN RBS 133

YSEO™ PROCESS

- In red complex aromas: violet, cherry , spices…
- Reduce the sensation of acidity and astringency
- Red wines with high tannic structure
- Red wines with high acidity
- “Passito “red
- Intense fresh fruity bouquet/flavours
- Balanced acidity
- Rosè wines

APPLICATIONS

LALLEMAND

The LANDSCAPE

LALLEMAND

La Confraternita del Raboso

ACKNOWLEDGEMENTS

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VENETO AGRICOLTURA
Azienda Regionale per i settori Agricolo, Forestale e Agro-Alimentare

THE PROJECT

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THANKS FOR THE ATTENTION