Sustainable fertilisation of the vineyard in Galicia (Spain)

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INTRODUCTION

Inadequate fertilization of the vineyards leads to nutritional imbalances, with negative repercussions for grape quality, economic profitability and the environment

OBJECTIVE

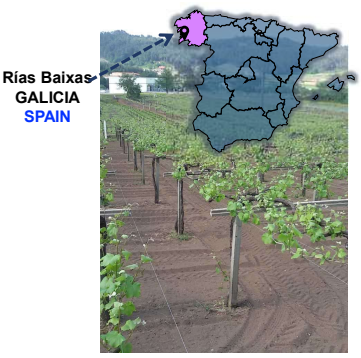
The establishement of an integrated management system aimed at a sustainable fertilization of the Albariño vineyards in the *Rías Baixas* Appellation of Origin (Galicia, Spain)

MATERIAL AND METHODS

- Thirty representative vineyards of the Albariño cultivar in the *Rías Baixas* Appellation of Origin.
- Three blocks of 20 vines marked in every vineyard for the collecting of soil and vegetal material samples.
- Measured parameters:

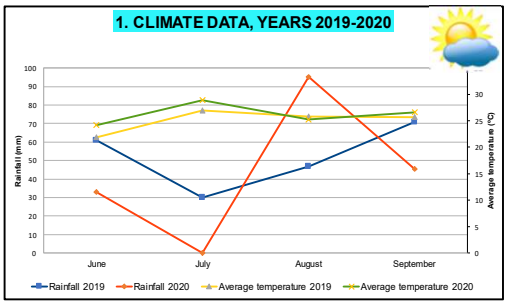
1. Soil parameters: pH, calcium, magnesium, sodium, potassium, aluminum, cation exchange capacity, phosphorous, carbon, organic matter, nitrogen, texture.
2. Petiole analysis: nitrogen, phosphorus, potassium, sodium, calcium, magnesium, iron, copper, manganese, zinc, boron
3. Agronomical data: berry yield/hectare, pruning wood weigth, crop load
4. Must analysis: Brix degree, total acidity, pH, tartaric and malic acids, total nitrogen, calcium, magnesium, potassium, copper, iron, aluminum, boron, phosphorous, manganese, sodium, zinc, amino and ammonia nitrogen

- Two vintages (2019-2020)



RESULTS

1. CLIMATE DATA, YEARS 2019-2020



2. ESTABLISHMENT OF QUALITY CATEGORIES FOR EACH PARAMETER, ACCORDING TO THE INTERESTS OF THE WINERY

Must parameters	Category 1	Category 2	Category 3	Category 4	Category 5
Total acidity (g/L tartaric acid)	9.3-9.8	9.8-10.5	<9.3	10.5-11.1	>11.1
Brix degree	21.3-22.0	22.0-22.7	20.8-21.3	<20.8	>22.7
Probable alcoholic degree (% v/v)	12.31-12.78	12.78-13.25	11.97-12.31	<11.97	>13.25
Probable alcoholic degree/total acidity	1.19-1.32	1.32-1.40	1.09-1.19	<1.09	>1.40
Total nitrogen (mg/L)	175.9-221.2	221.2-270.5	270.5-321.5	<175.9	>321.3
Malic acid (g/L)	<5.0	5.0-6.1	6.1-6.6	6.6-7.6	>7.6
Tartaric acid (g/L)	6.6-6.9	<6.6	6.9-7.1	7.1-7.4	>7.4
pH	>2.97	2.92-2.97	2.90-2.92	2.82-2.90	<2.82
Calcium (mg/L)	<46	46-52	52-58	58-69	>69
Magnesium (mg/L)	>64	60-64	56-60	52-56	<52
Potassium (mg/L)	<1,238	1,238-1,338	1,338-1,438	1,438-1,525	>1,525

3. CORRELATIONS BETWEEN MUST AND SOIL ANALYSIS (years 2019-2020)

SOIL	MUST			
	Calcium		Magnesium	
	2019	2020	2019	2020
pH (H2O)	0.253	0.622		
Calcium	0.232	0.568	-0.363	-0.259
Sodium			-0.227	-0.279
Ca/K ratio	0.253	0.563	-0.327	-0.246
Ca/Mg ratio	0.233	0.597	-0.342	-0.265
Aluminum	-0.215	-0.582		
Cation exchange capacity	0,227	0,557	-0.360	-0.259

4. LEVELS OF REFERENCE OF SOIL ANALYSIS FOR THE ALBARIÑO CULTIVAR

	Very low	Low	Medium (adequate)	High
pH (H_2O)	<6	6.0-6.5	6.5-7.0	>7.0
Organic matter (%)	<3.0	3.5-5.0	5.0-7.5	>7.5
C/N ratio	<10.5	10.5-12.5	12.6-14.0	>14.0
Nitrogen (%)	<0.2	0.2-0.25	0.25-0.4	>0.4
Phosphorous (ppm)	<10	10-20	20-35	>35
Potassium (cmol(+)/kg)	<0.25	0.25-0.4	0.4-0.7	>0.7
Magnesium (cmol(+)/kg)	<0.5	0.5-0.8	0.8-1.4	>1.4
Cation exchange capacity	<8	8-10	10-18	>18
Ca/Mg ratio	<8	8-10	10-15	>16
Ca/K ratio	<10	10-15	15-30	>30
K/Mg ratio	<0.2	0.2-0.4	0.4-0.8	>0.8

5. DESIGN OF AN EASY-TO-USE TIC APPLICATION FOR FERTILIZATION

http://amgeo.es/ferviña/

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