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Vine and wine residues management: practices and new routes of valorisation in the French Languedoc Roussillon region

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INTRODUCTION

In the vine and wine production sector, huge amounts of waste and by-products are generated each year in France: 1.6 million tons of wood pruning, 850 000 tons of grape marc, 1.5 million hectolitres of wine lees and wastewater.

Since one century, French distilleries valorised the wine by-products.

Since the French decree n° 2014-903 winemakers are authorized to valorise by themselves their by-products through methanization or spreading.

The Languedoc Roussillon region is the most important French area for the vine and wine industry as regards of volume produced.
RESEARCH OBJECTIVES

This study aims to:

- Provide a clear picture of the current situation as regard the nature of wastes generating by the vine and wine sector and collecting all relevant information to understand why a waste management system is preferred among all the other existing valorization routes

- Evaluate the new technologies acceptance and potential development
METHODOLOGY

Different stakeholders have been interviewed through face-to-face interviews in July and August 2018

Two focuses:

1/ Interviews of 12 winemakers with semi-directive discussion, transcribed and analysed with a thematic analysis

2/ Surveys of 6 winemakers, 2 distilleries and 3 public decision-makers, analysed with NoAWVote

Typology and repartition of interviewees in the Languedoc Roussillon
RESULTS

Mulched and spread in vineyard or burnt
vine shoots
vine roots
grape stalks

Vineyard

Vineyard

Winery

Winery

grape pomace
grape stalks
wine lees

De-oiling
Grape seed oil
Grape pulp

Methanization
Biogas
Digestate

Distillery

Distillery

Potable alcohol
Industrial alcohol

Tartric acid
Tannins, anthocyanins and polyphenols
1- Current valorisation routes

Current prefered valorisation routes: **distilleries and fertilization**

Choice criteria ranked by wineries:
   1. Low economic-cost
   2. Low environmental impact
   3. Ease of use / convenience

For the policy-makers the main criteria is the low environmental impact.
2- Management of wine by-products

Collection logistics of grape pomace and wine lees is organised by distilleries.

Globally satisfied of this long term commercial relationship

Advantages mentioned:
- Compliance with legal requirements
- Low cost of the valorisation pathway

Constraints mentioned:
- Producers of small quantity have to organise the transportation
- Grape pomace separation

Almost no use of the oenological products made by distilleries.
3- Management of wastewater and vine by-products

There is no specific collection and post-treatment proposed to vine growers.

Three type of vine by-products:

- **Vine shoots**: crushed and left in the vineyard, or burnt
- **Vine roots**: firewood or wood barbecue
- **Grape stalks**: spread in the vineyard

Different options are possible for wastewater treatment but none of these seems to satisfy them because of the cost, labour time and administrative complexity.
4- Preferences of stakeholders as regard new valorisation routes

![Preferred NoAW routes-Vine & Winery wastes](image)

- **Biofertilizers**: Borda Rank - Other stakeholders (1), Borda rank - Wineries & converters (2)
- **Biomaterials**: Borda Rank - Other stakeholders (2), Borda rank - Wineries & converters (3)
- **Bioenergy**: Borda Rank - Other stakeholders (3), Borda rank - Wineries & converters (4)
- **Biorefinery**: Borda Rank - Other stakeholders (3), Borda rank - Wineries & converters (4)
- **Other**: Borda Rank - Other stakeholders (3), Borda rank - Wineries & converters (5)
5- Expected benefits and potential obstacles

**Expected Benefits - Vine/Winery Waste**

- Low environmental impact: 1
- Low economic cost: 2
- Ease of use: 3
- None of the above reasons: 4
- Valorization routes near the structure: 5
- Government tax benefits: 6
- Respect for tradition: 7
- Need for heat/energy on-site: 2
- CRS benefits: 6

**Potential Obstacles - Vine/Winery Wastes**

- Cost: 1
- Authorisations difficulty: 2
- Other: 3
- Too low amount of waste: 4
- High maintenance costs: 5
- Sorting: 5
- Too bad quality of the...: 1
- Difficulties to get founds: 4
- Collection: 4
- No qualified operators: 3
- Missing infrastructure: 2
- No market: 6
- High depreciation costs: 6
DISCUSSION AND CONCLUSION

The results of this study not only highlight the crucial role of distillery in the wine by-products management and for the circularity of the wine sector, but also enhance:

1. The winemakers disempowering and lack of information regarding the environmental impact of winemaking
2. The distillery vulnerability because of their business model based on public subsidies (decrease of processing aid)
3. The challenge to attain a critical size motivated by the economic performance but which implied a lower environmental performance due to transport and logistics.