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# Effects of Environmental Factors And Vineyard practices in Flora Dynamic In Vineyard

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# Context

- ❖ International and European politics have to protect environmental resources, i.e. biodiversity
- ❖ As a consequence, French policy developed funding program ECOPHYTO to reduce inputs in agriculture, and in particular pesticides in viticulture
- ❖ In Alsace, PEPSVI program deals with re-designing, experimentation and assessment of new vinegrowing systems
- ❖ **The point of this presentation is results of assessment of flora diversity according to outstanding factors**

# General objectives of the PEPSVI project

❖ **Re-designed** systems for high quality wines in Alsace, France

❖ **Experiment** the re-designed systems in “real” conditions:

fields and Protected Designation of Origin products (PDO)

(Metral *et al.*, 2012; Grignon & Thiollet-Scholtus, RO-2015)

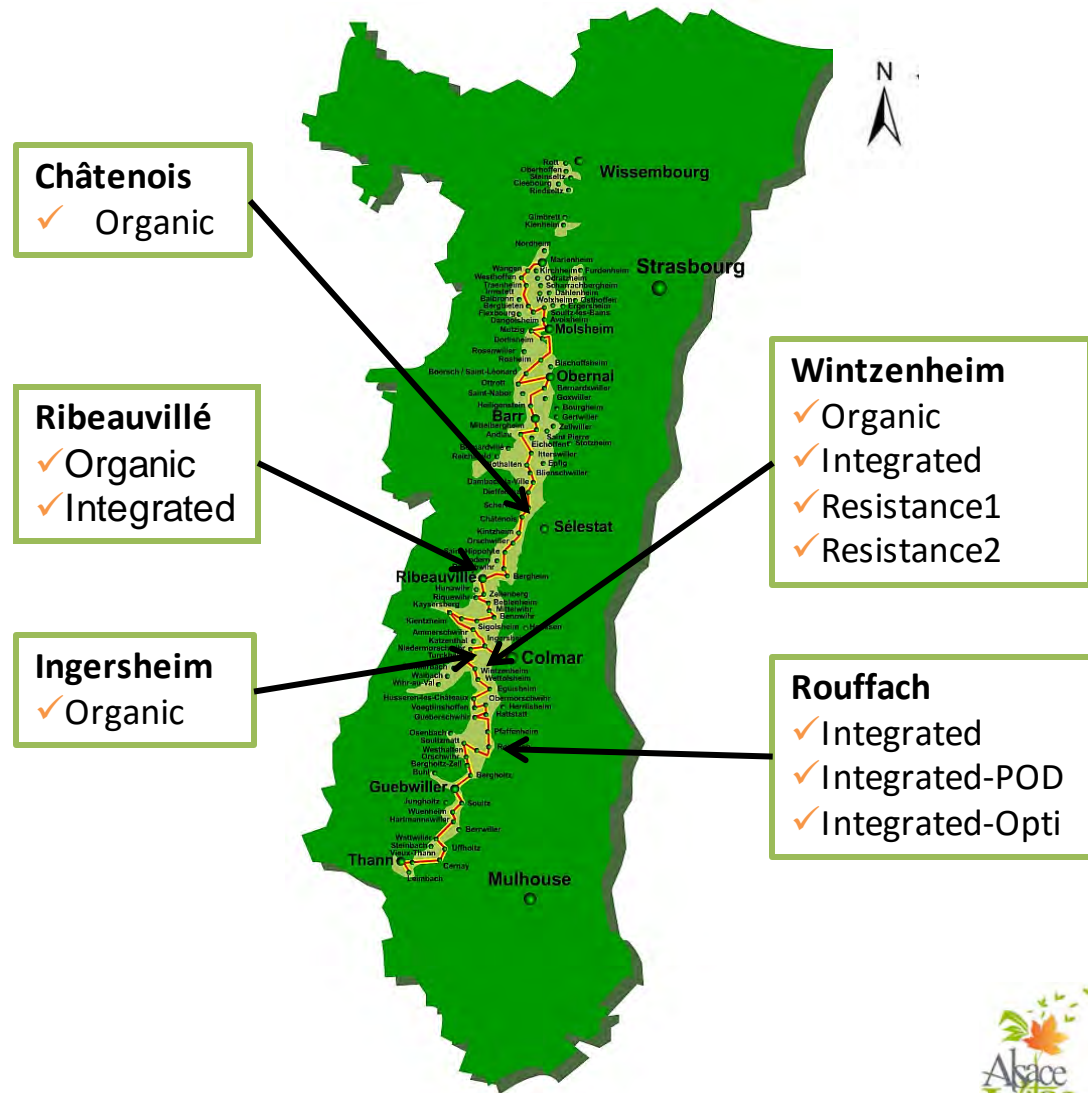
❖ **Assess** the re-designed systems for yield and quality of

products (harvest grapes and wines)

(Thiollet-Scholtus *et al.* Giesco 2015)

# Material

- ❖ 11 re-designed systems are located in 5 villages in Alsace, Northern of France, Europe.
- ❖ Data collected are from 2 years of measurements: 2014 and 2015.

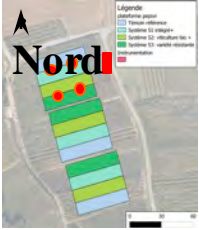

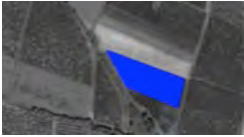

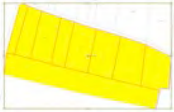


Echelle:1/1000000








Proseur, viticulteur, transmutateur

# Material

Plan	Site	System	Details
	<p>INRA Winzenheim 1.45 ha</p>	<p>PI, AB RES1 RES2</p>	<ul style="list-style-type: none"> <li>•4 systems</li> <li>•3 repetitions in blocks</li> <li>•1 experimental block</li> <li>•Before vineyard: vine or grass</li> <li>•Meteo station</li> </ul>
	<p>INRA Ribeauvillé 0.36 ha</p>	<p>PI, AB</p>	<p>AB &amp; PI compared since 2010</p>
	<p>EPLEFPA Rouffach À.25 ha</p>	<p>PI</p>	<p>PI since 2000</p>
	<p>Winery Chatenois 0.26 ha</p>	<p>AB</p>	<p>AB since 1998 Biodynamics since 2008</p>
	<p>Winery Ingersheim 0.25 ha</p>	<p>AB</p>	<p>AB since 1994 Biodynamics since 2009</p>

# Material

Sites	↑ Nord	Variety	Soil
Nord		Pinot blanc and resistant varieties	Sand and loam
		Riesling	Loam-Clay with stones on limestones
		Pinot gris	Clay and loam
		Riesling	Granitic arena deposits
		Riesling	Dark soil on granitic and clay arena

# Methods

- ❖ Species richness of flora measurement in each field
- ❖ Interviews of winegrowers to inquire practices
- ❖ Two year of measurement and interviews of practices
- ❖ Statistical test ANOVA

(Merlen, 2015)







**Orge des rats**  
(*Hordeum murinum*)



**Brome des toits**  
(*Bromus tectorum*)



**Trèfle rampant**  
(*Trifolium repens*)



**Trèfle souterrain**  
(*Trifolium subterraneum*)

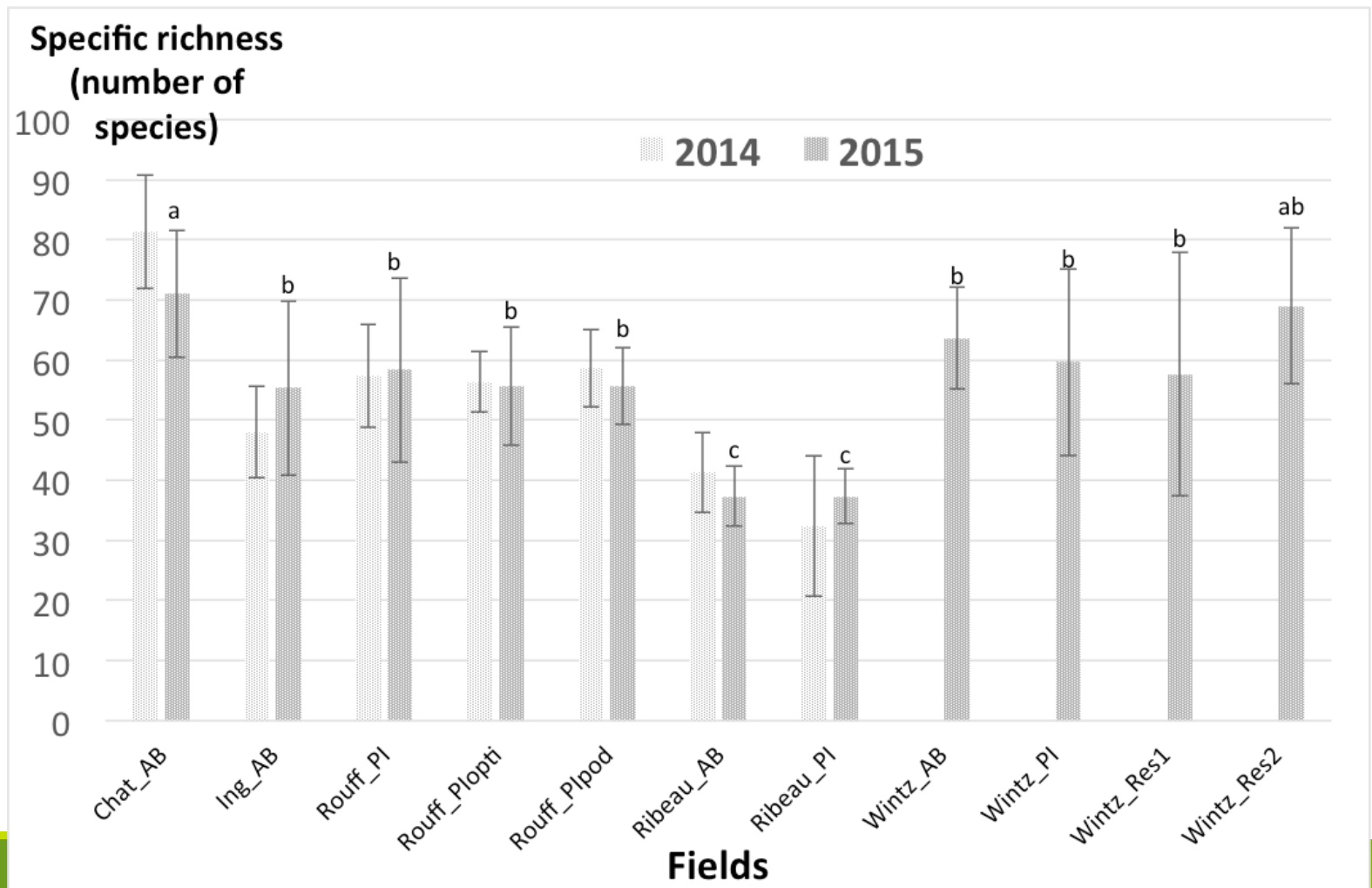


**Agrostide stolonifère**  
(*Agrostis stolonifera*)

Flora varieties selected according to their qualities for grassing vineyards  
(Merlen, 2015)

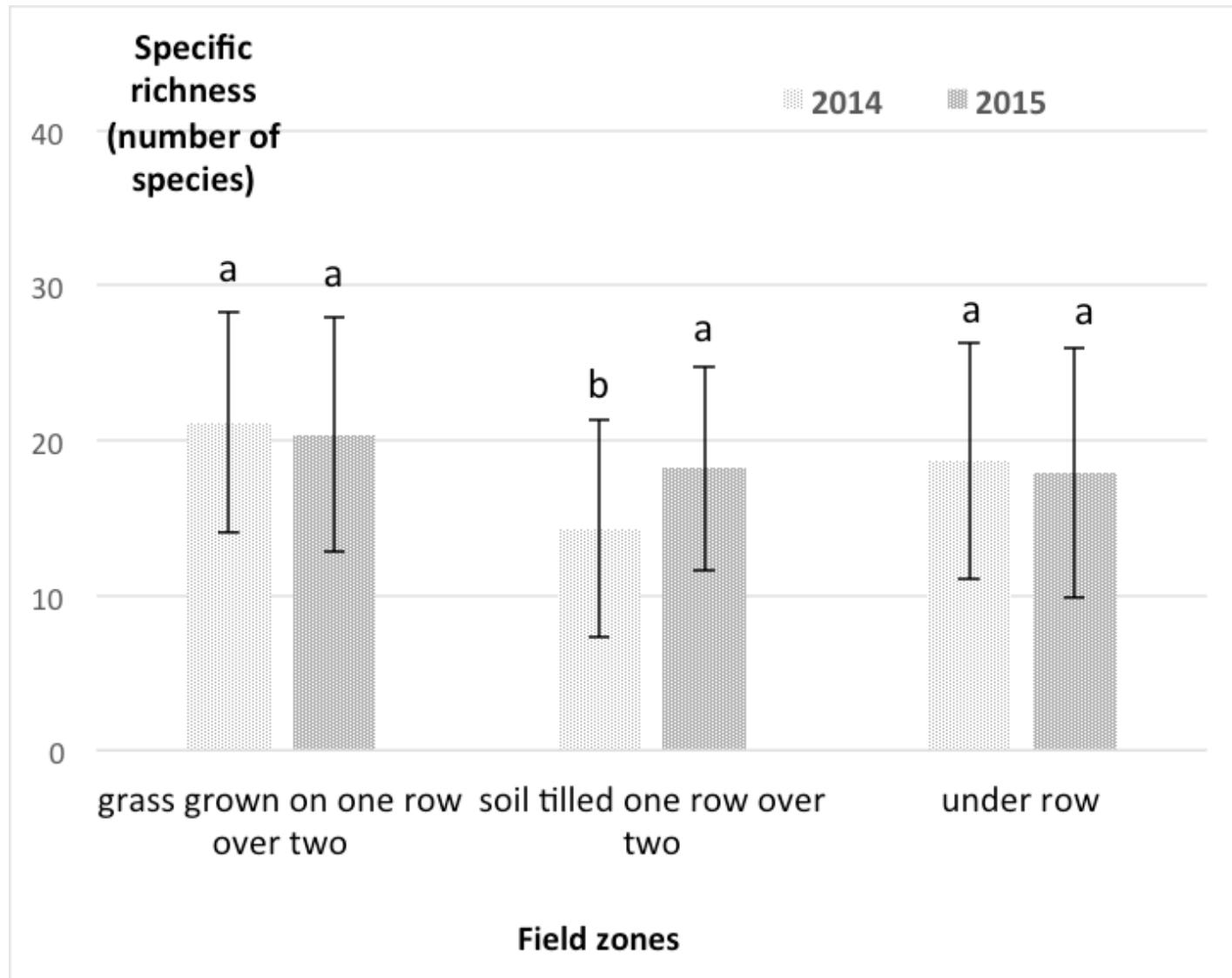
# Results: Specific richness of flora between fields

- ❖ First we observed an average of 54 different species present in the fields each year and evolution of flora between the two studied years



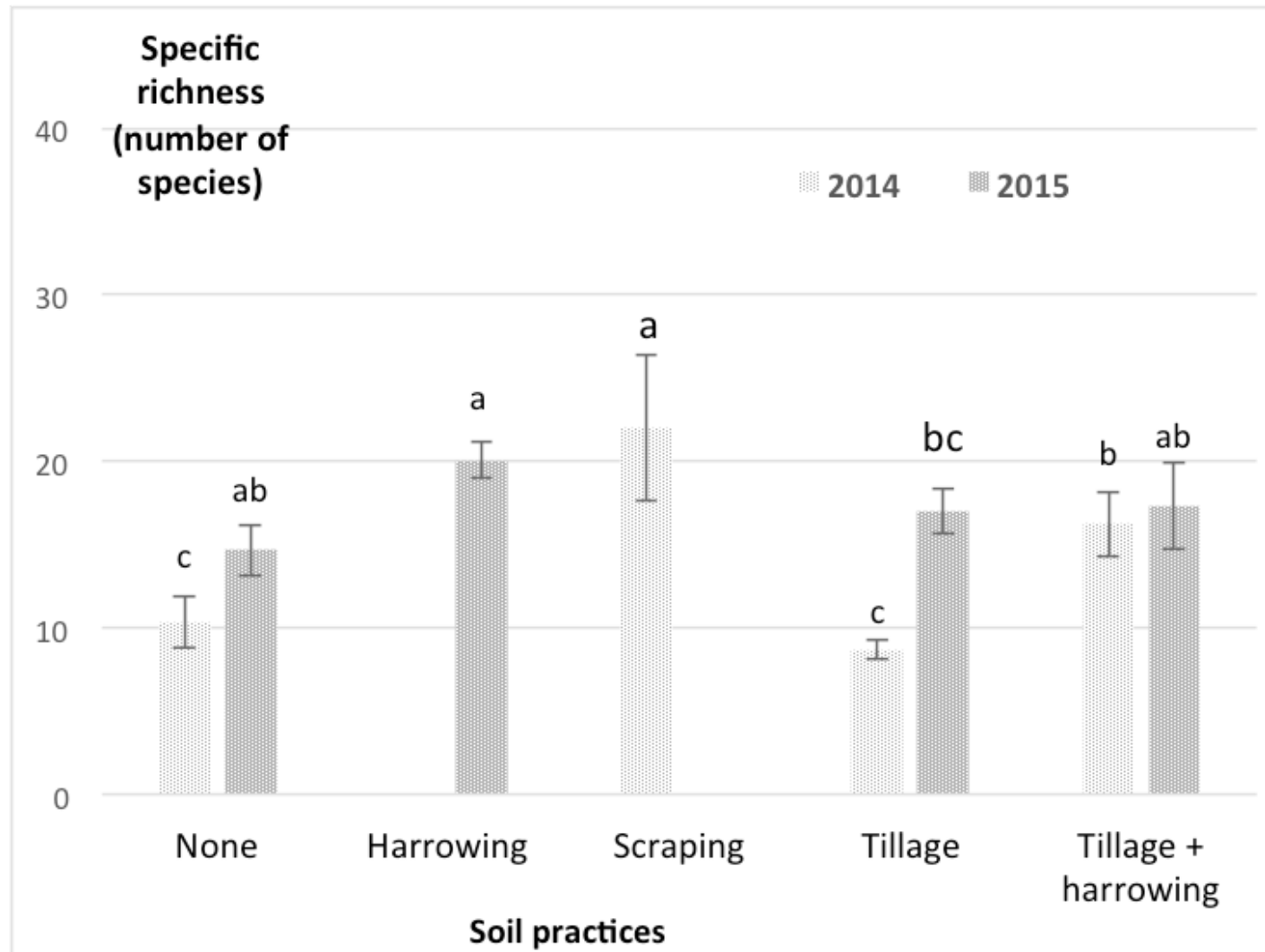
# Results: Specific richness of flora inside fields

There is no significant difference between the different soil managements Except a year-variation on tilled soils



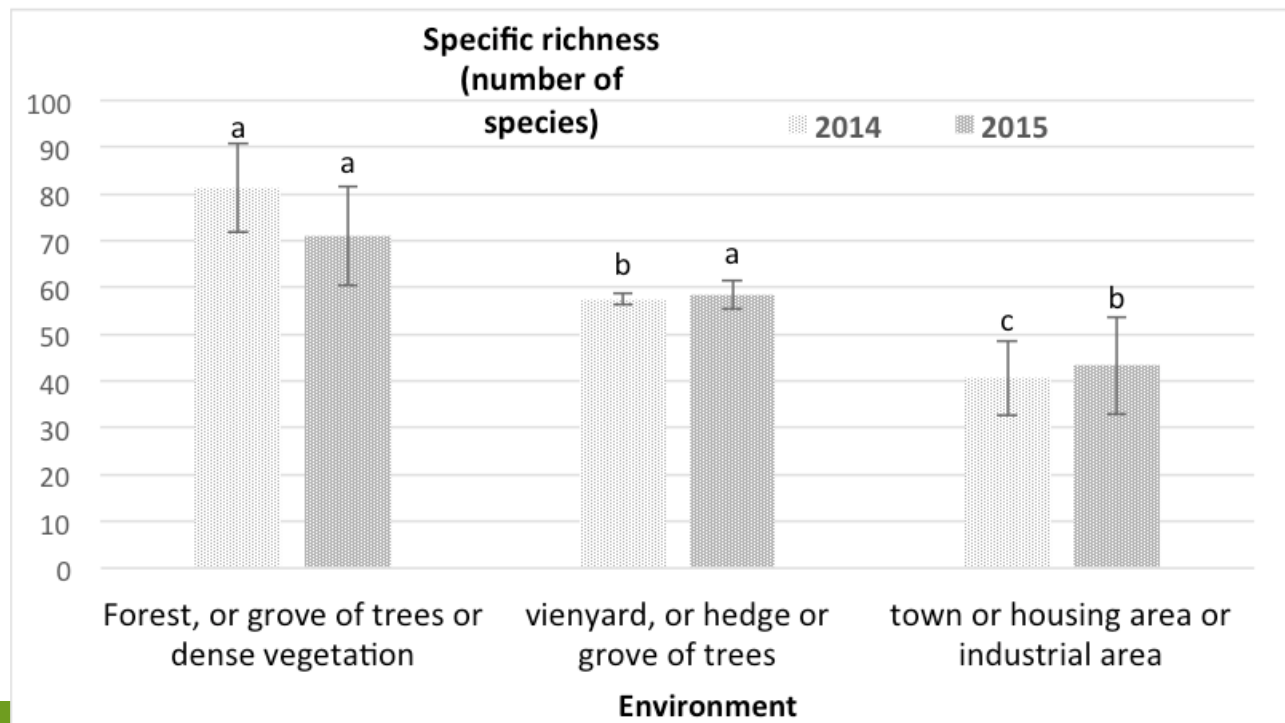
# Results: Specific richness of flora depending on soil management practices

The average flora diversity in organic fields is the highest in grassed inter-row for each re-designed system. And there are variations between studied years



# Results: Specific richness of flora depending on what is around the field

- ❖ Surrounding vegetation of the fields has an influence on species richness in the studied fields.
- ❖ Species richness is the highest for field surrounded by forest or natural area than by vineyard and hedges. *attack of fungi* in 2015 caused grapes harvest



# Discussion

- ❖ This started **method** is not enough and will be completed by a **recovery rate** of flora and more studied years of measurement and interviews.
- ❖ **Results:** separation of fields according to soil management practices will be completed by fertilization and pesticides practices analysis.

# Conclusion

- ❖ **Diversity of flora** in the field changes during two following studies years according different outstanding factors.
- ❖ One outstanding parameter, which influences specific richness of flora, is **soil management** of the field and in particular soil mechanical work.
- ❖ A second outstanding interesting parameter influencing specific richness of flora in the vineyard is the **environment of the field**. “Forest, or grove of trees or dense vegetation” and “vineyard, or hedge or grove of tree”, at a lesser degree, positively influence specific richness of flora.

# Perspectives

- ❖ Calculation of **Raunkiaer's index** and **recovery rate** will extend knowledge about dynamic of flora in vineyard according to soil management practices.
- ❖ Application of this method to other fields and vintages will **increase the database**.
- ❖ Database will contribute to build a **biodiversity indicator** according to INDIGO<sup>®</sup> method, a Decision Aid Tool for winegrowers



# Thank you for attention

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