



HAL
open science

Effects of environmental factors and vineyard practices on wine flora dynamics

Chantal Rabolin-Meinrad, Christophe Charles Schneider, Christian
Bockstaller, Marie Thiollet-Scholtus

► **To cite this version:**

Chantal Rabolin-Meinrad, Christophe Charles Schneider, Christian Bockstaller, Marie Thiollet-Scholtus. Effects of environmental factors and vineyard practices on wine flora dynamics. 11. International Terroir Congress, 2016, McMinnville, Oregon, United States. , 496 p., 2016, 11 th. International Terroir Congress 2016. hal-01602880

HAL Id: hal-01602880

<https://hal.science/hal-01602880>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

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

C. Rabolin^{1*}, C. Schneider¹, M. Thiollet-Scholtus²

¹ INRA –EA - UMR-1132-LAE, F-68000 Colmar

² INRA - SAD - UR-0055-ASTER, F-68000 Colmar

*rabolin@colmar.inra.fr



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 PEPSSI 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)

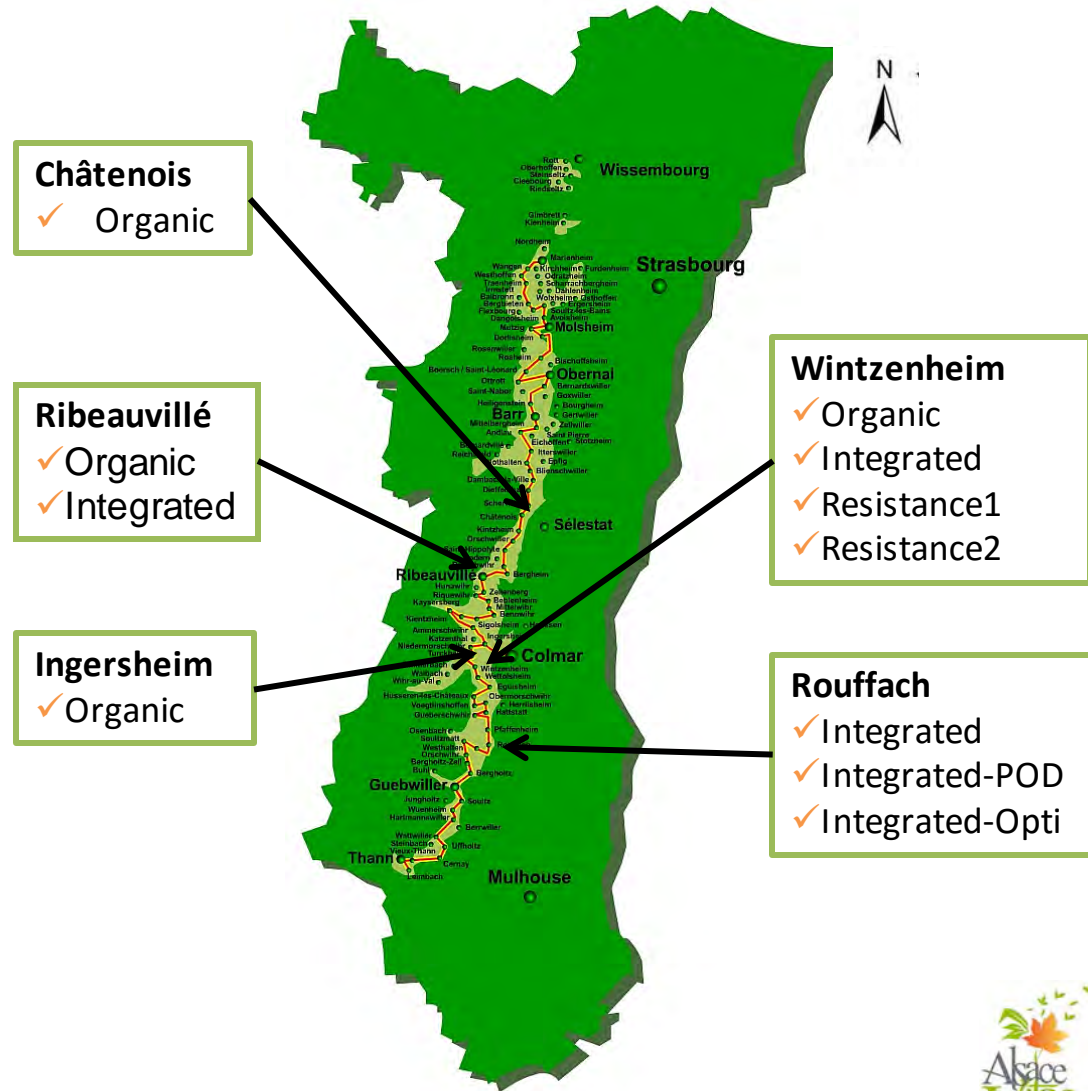
(Metral *et al.*, 2012; Grignon & Thiollet-Scholtus, RO-2015)
- ❖ **Assess** the re-designed systems for yield and quality of
products (harvest grapes and wines)

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

(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.

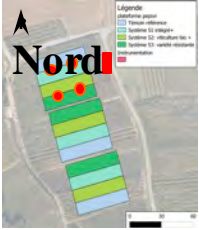

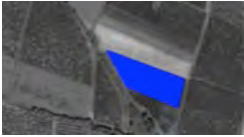

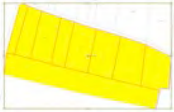


Echelle:1/1000000






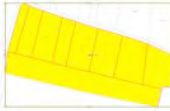


Proseur, viticulteur, transmutateur

Material

Plan	Site	System	Details
	<p>INRA Winzenheim 1.45 ha</p>	<p>PI, AB RES1 RES2</p>	<ul style="list-style-type: none"> •4 systems •3 repetitions in blocks •1 experimental block •Before vineyard: vine or grass •Meteo station
	<p>INRA Ribeauvillé 0.36 ha</p>	<p>PI, AB</p>	<p>AB & 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
	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*)

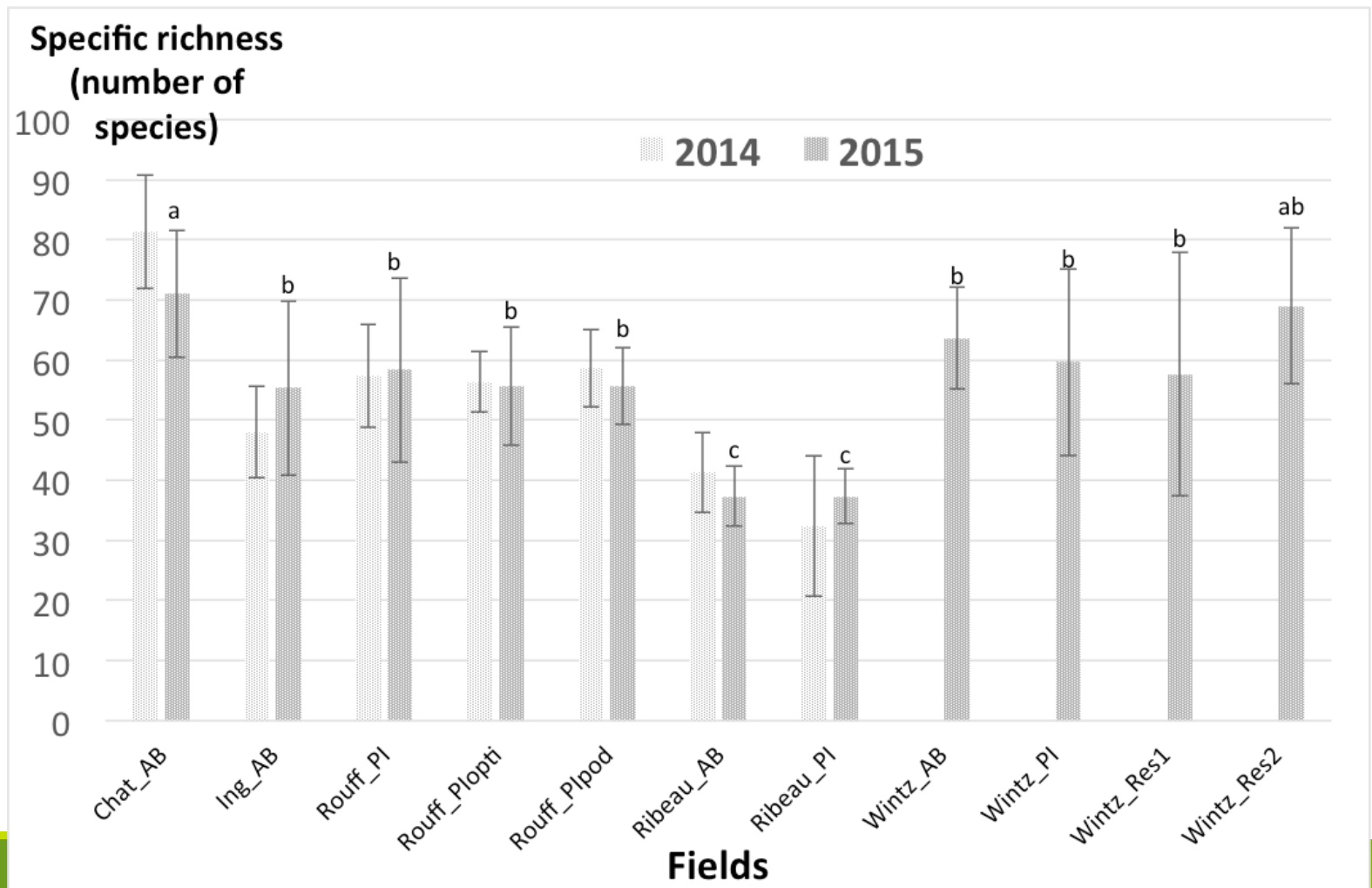


Agrostide stolonifère
(*Agrostis stolonifera*)

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

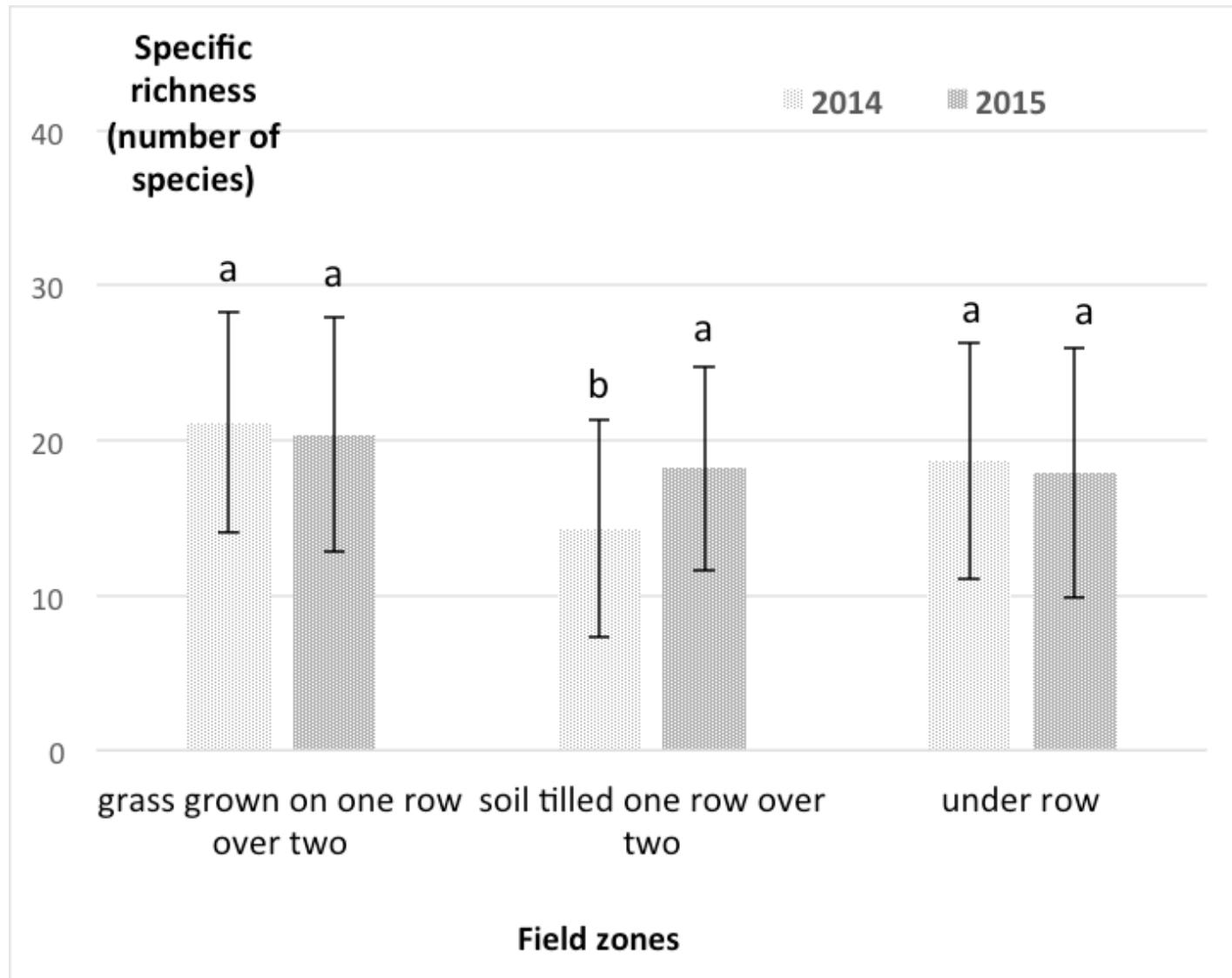
Results: Specific richness of flora between fields

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



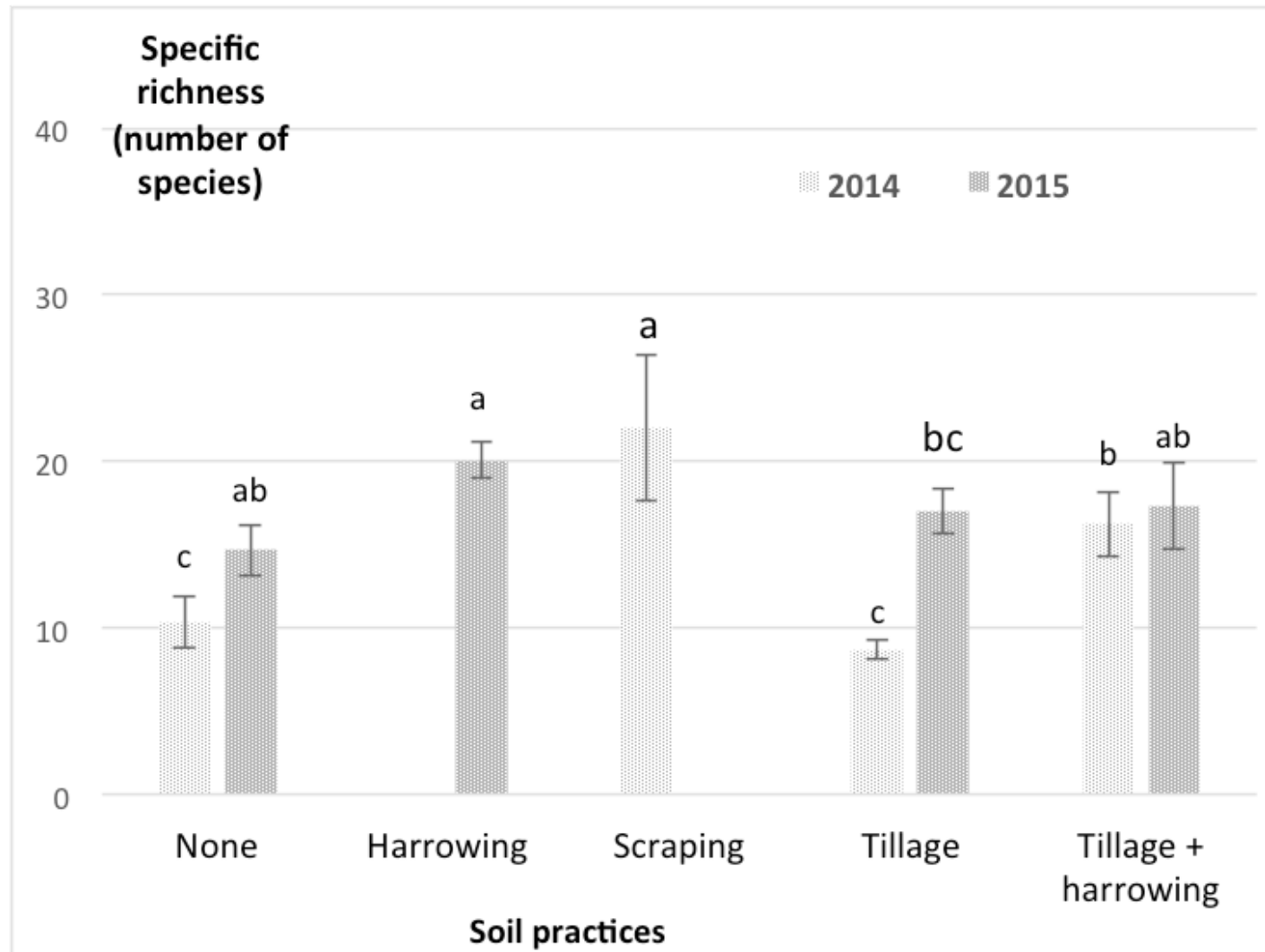
Results: Specific richness of flora inside fields

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



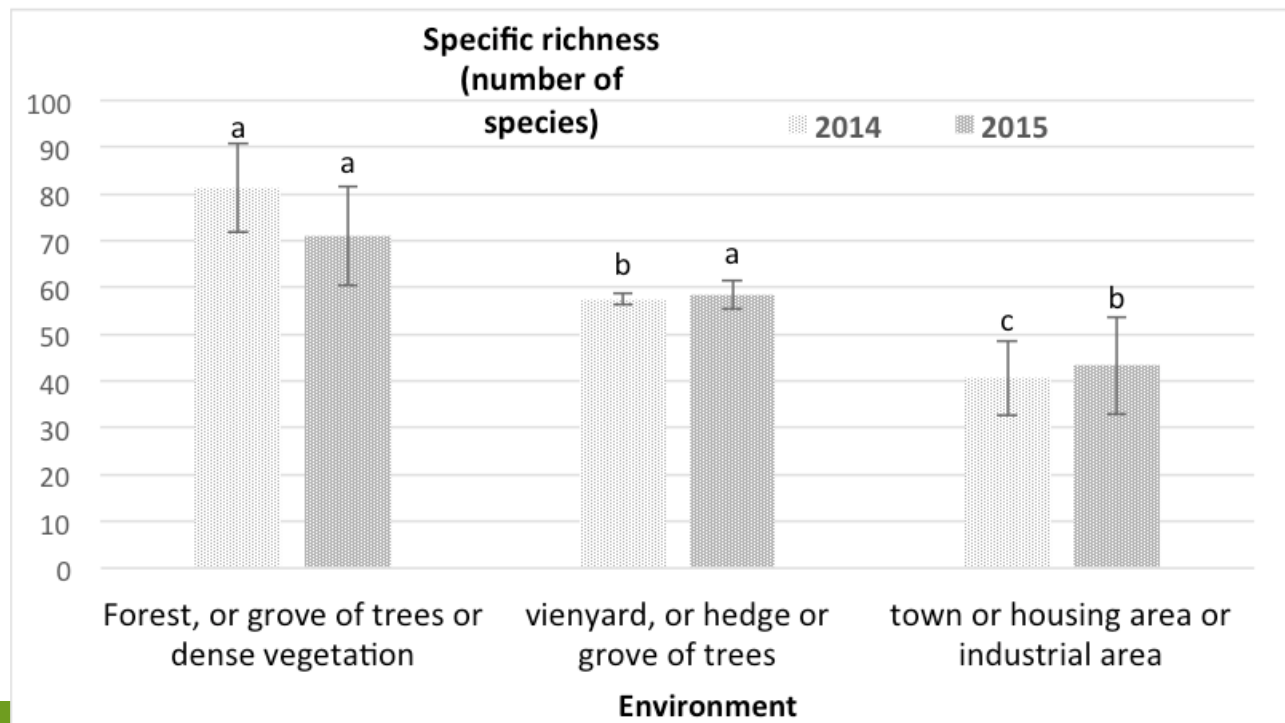
Results: Specific richness of flora depending on soil management practices

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[®] method, a Decision Aid Tool for winegrowers

Thank you for attention

❖ Thanks very much to the students, Julie Grignion and Marie Merlen who got and analysed data.

❖ Contacts:

Chantal.rabolin@colmar.inra.fr

Marie.thiollet-scholtus@colmar.inra.fr

❖ Financial supports

- French Agricultural Minister, ECOPHYTO program
- Regions of Alsace