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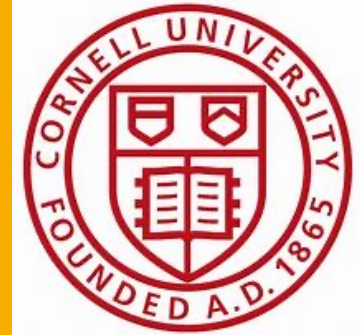
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Challenges and Opportunities For Increasing Organic Carbon in Vineyard Soils: Perspectives of Extension Specialists

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Practices and Soil Organic Carbon (SOC) in vineyards

- Vineyards are often located on soils with low SOC
- Improving SOC can lead to improved soil health
- Improved SOC = improved resilience in challenging climates

(Muñoz-Rojas et al., 2012; Lal, 2016)



- SOC is reduced in vineyards with use of herbicide or tillage
- Effective SOC sequestration is achieved through a combination of practices
- Barriers for winegrowers' adoption of SOC-improved practices

(Raclot et al. 2009; Eldon & Gerhenson, 2015; Karl et al., 2016; Payen et al. 2021; Payen et al. 2023;)



Perception of extension personnel regarding challenges and opportunities for improving SOC in vineyards



What is the perception of extension specialists regarding practices which are known to maintain and increase SOC in vineyard?

What barriers do extension specialists perceive for the wine industry to maintain or improve soil carbon ?

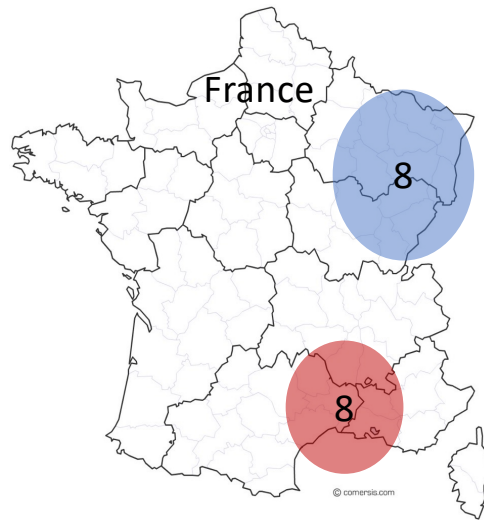


Aim

Method

Results-discussion

Conclusion



Step1: 69 cases identified



Step 2: 32 interviews performed

warm and cool in USA + warm and cool in France



Step 3: practices to maintain or increase SOC identified



Step 4: challenges and levers to apply SOC-friendly practices analyzed

Ryschawy et al., 2021; Warne et al., 2019

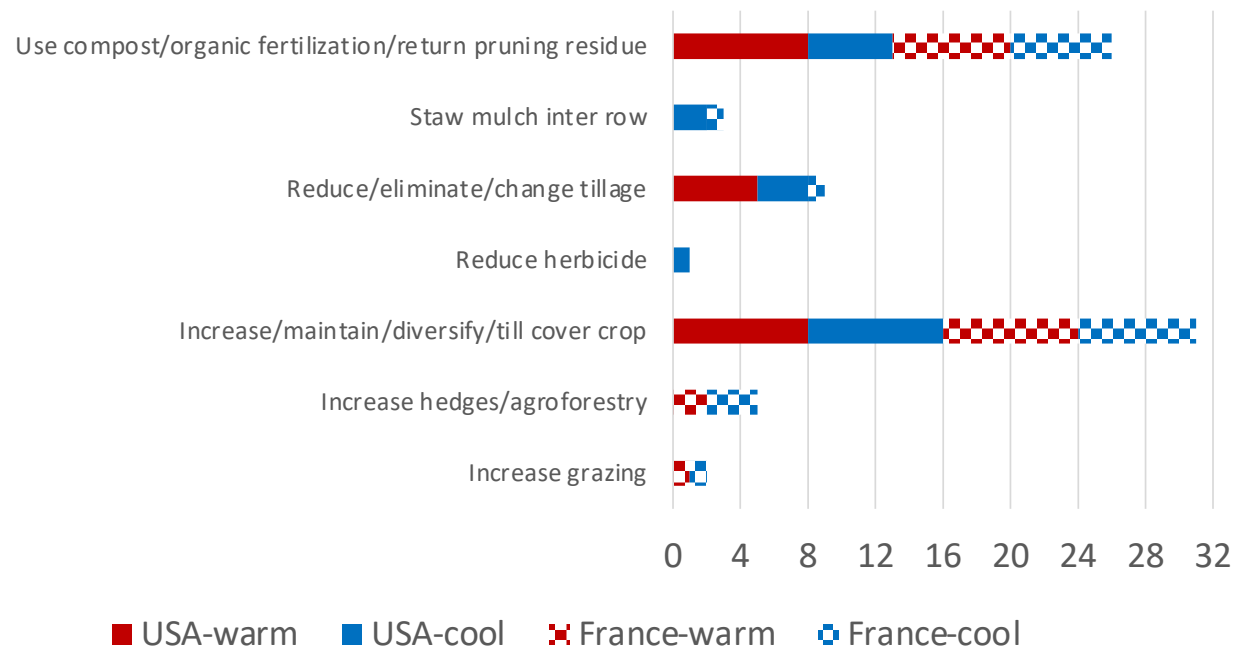


Step 5: challenges and opportunities identified



Study zones. Climate: red: warm; blue: cool

7 current practices identified to maintain or increase SOC

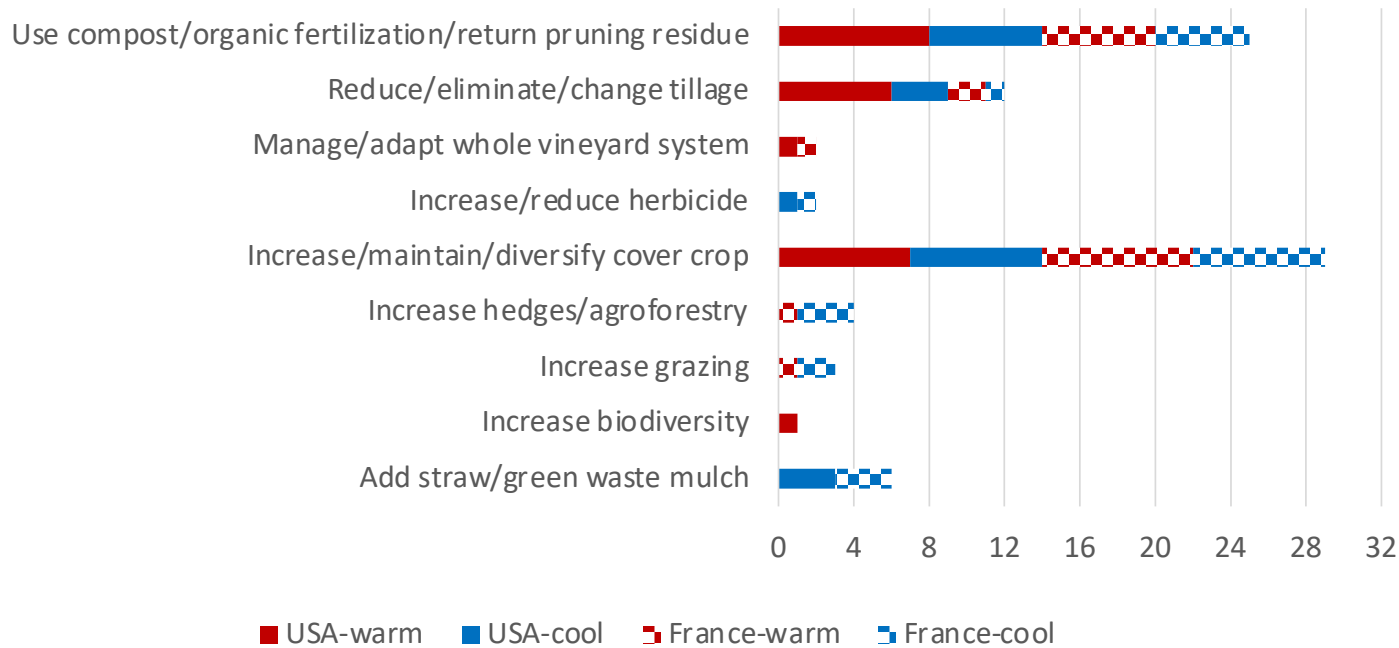


higher occurrences of answers are for organic fertilization, tillage and cover crop emphasized by extension:

- Cover crop
- Organic fertilization
- Tillage reduction
- Grazing
- Agroforestry
- Mulching
- Herbicide use reduction



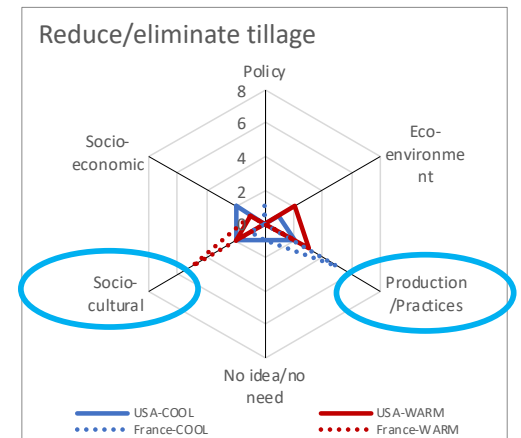
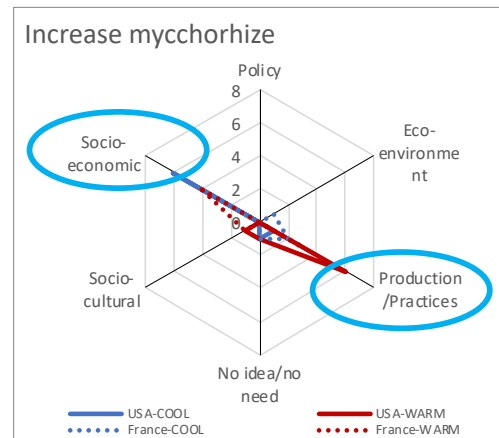
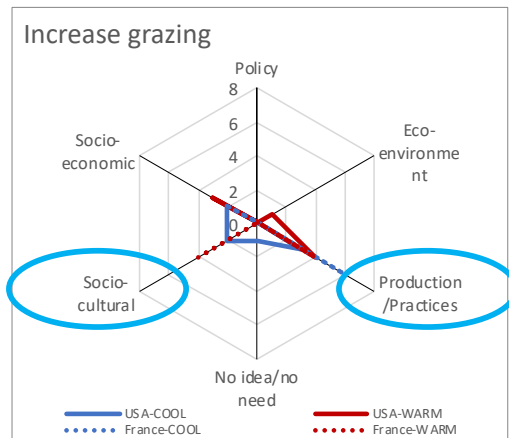
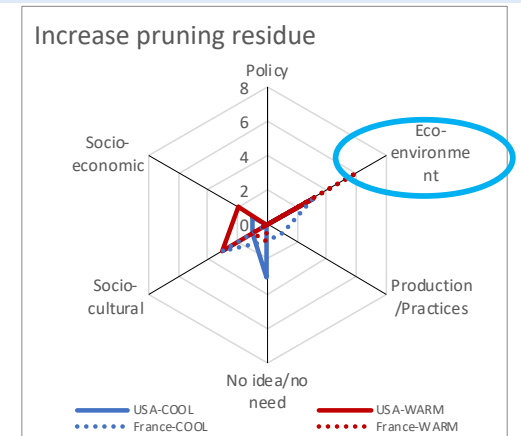
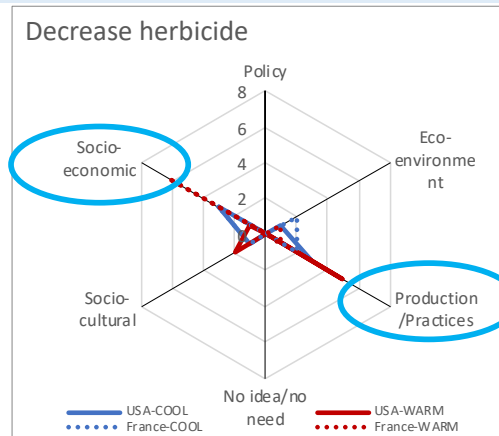
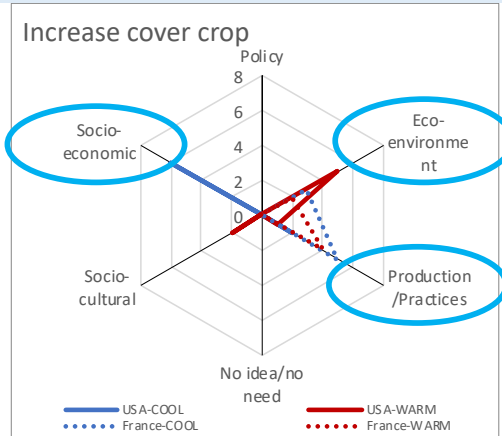
Practices identified that could be adopted to improve SOC in their region



Cover crop
Organic fertilization
Tillage reduction
Grazing
Agroforestry
Mulching
Herbicide use reduction



Diversity of barriers to adopt SOC-friendly practices in vineyard: Differences in study areas



Diversity of barriers to adopt SOC-friendly practices in vineyard: economic, agricultural, educational, conflict of interest, and structural

Economic & agricultural

- 69% of the extension specialists mentioned the **cost** of the SOC-friendly practice as the first barrier
- the **potential negative impact** of the SOC-friendly practice **on yield**
- The **competition of cover crop with vine vigor**

Education and training of winegrowers needed included knowledge to implement

- the practices at the field scale
- systems redesign at the farm scale

SOC-friendly practices

Conflicts of interest

Potential **food safety issues associated with livestock grazing**, particularly in table grape production

Structural barriers

- **Climate of the location** of the vineyard for competition for water and nitrogen
- **Planting density** for agroforestry in Protected Designation vineyards
- **Availability of organic fertilizers** close to the farm



Discussion

Greater emphasis on addressing the challenges to adoption of SOC-favorable practices is urgently needed to inform national and regional agricultural policies in both countries

Couple extension specialists with winegrowers point of view because they work together in vineyard



Take home message

Agronomic, educational, conflict of interest and structural challenges for SOC-favorable practices in vineyard

Need of agricultural policies at both national and regional scales

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