

Management of invasive plants in steep slope vineyards

Practices that balance efficiency, productivity, and sustainability

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A growing problem

Invasive species

4'000 native

750 exotic

88 invasive species
with direct impact
on agricultural land

Important impact

Difficult field

Limited access

Mechanization

Multiple challenges

Biodiversity

Topographical
constraints

Economic viability

4 species, a shared challenge

Conyza canadensis



Conyza sumatrensis



Conyza bonariensis



Erigeron annuus



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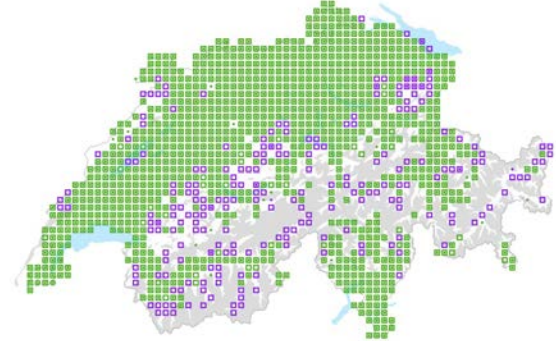
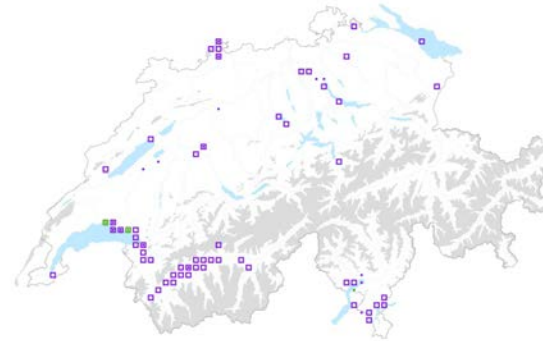
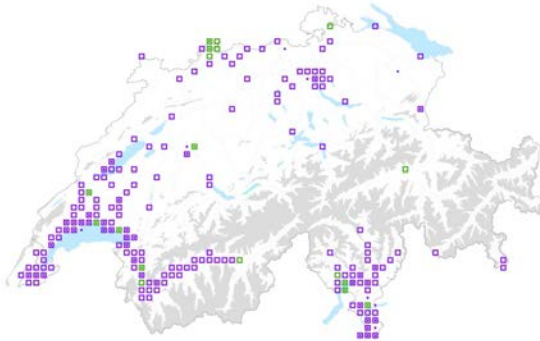
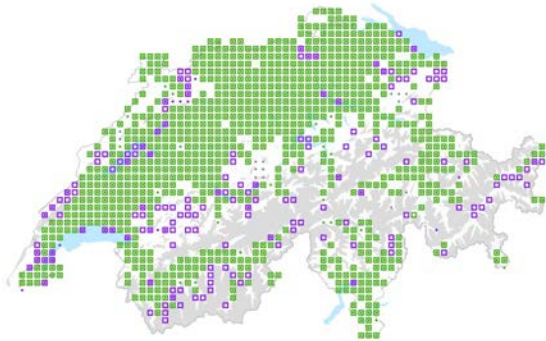
4 species, a shared challenge

Conyza canadensis

Conyza sumatrensis

Conyza bonariensis

Erigeron annuus



What makes them successful ?



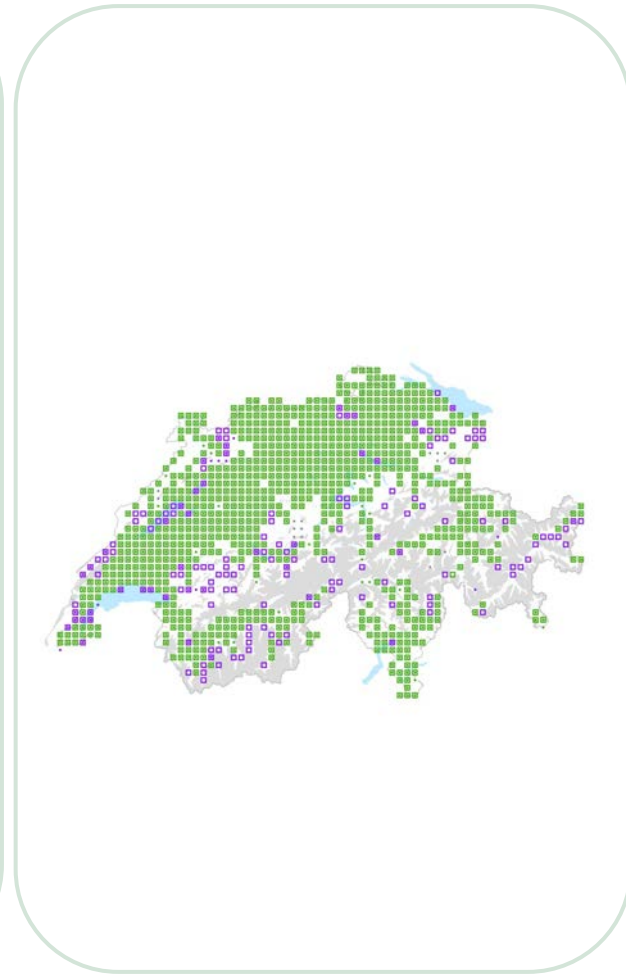
Bare ground



Dissemination



Survival after mowing



Distribution

Map of Swiss resistance groups

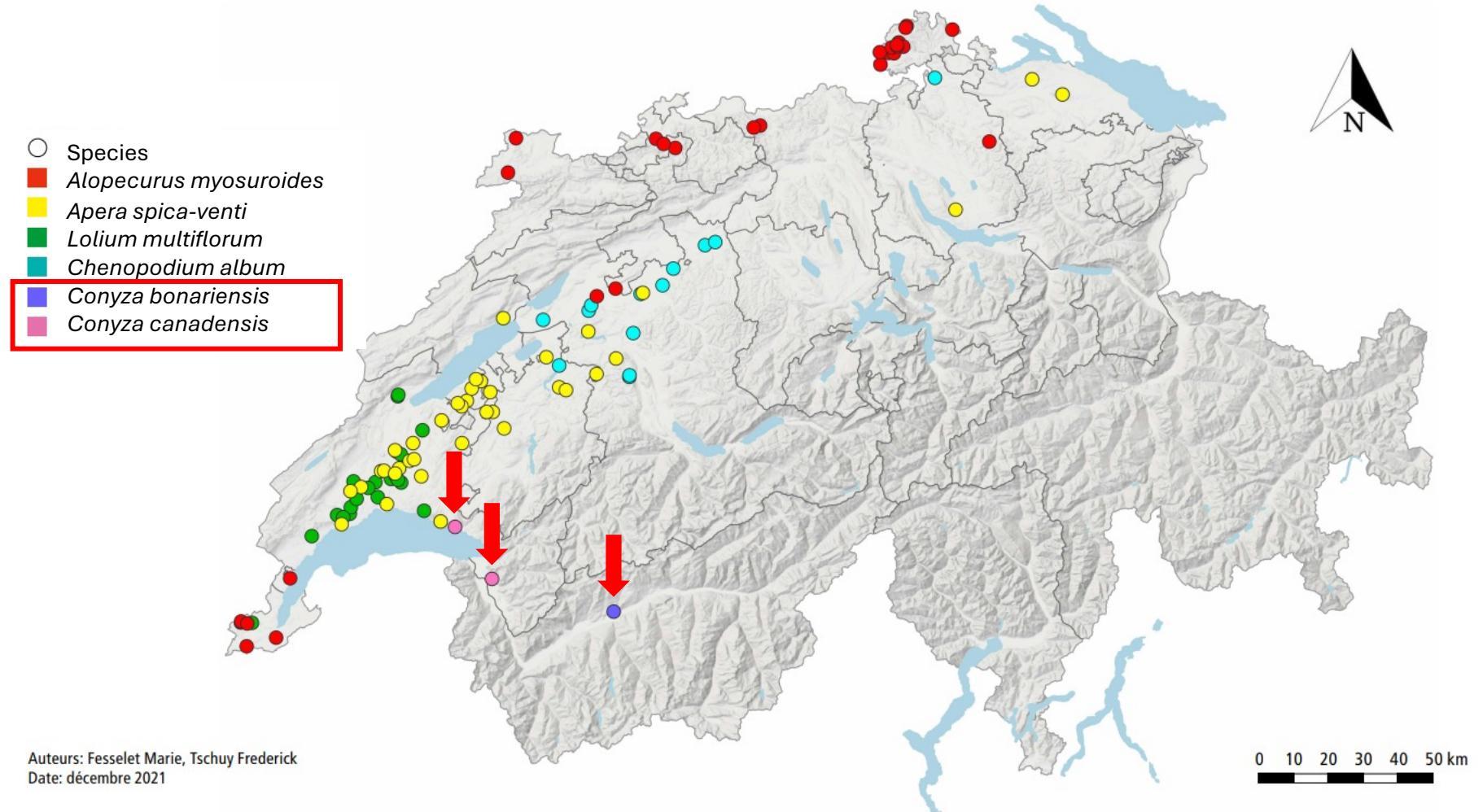


Figure 2 | Population of weeds identified as herbicide-resistant since 2011 in Switzerland, by species



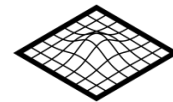
Study area



470 m



> 40 %



756 m²



Chasselas



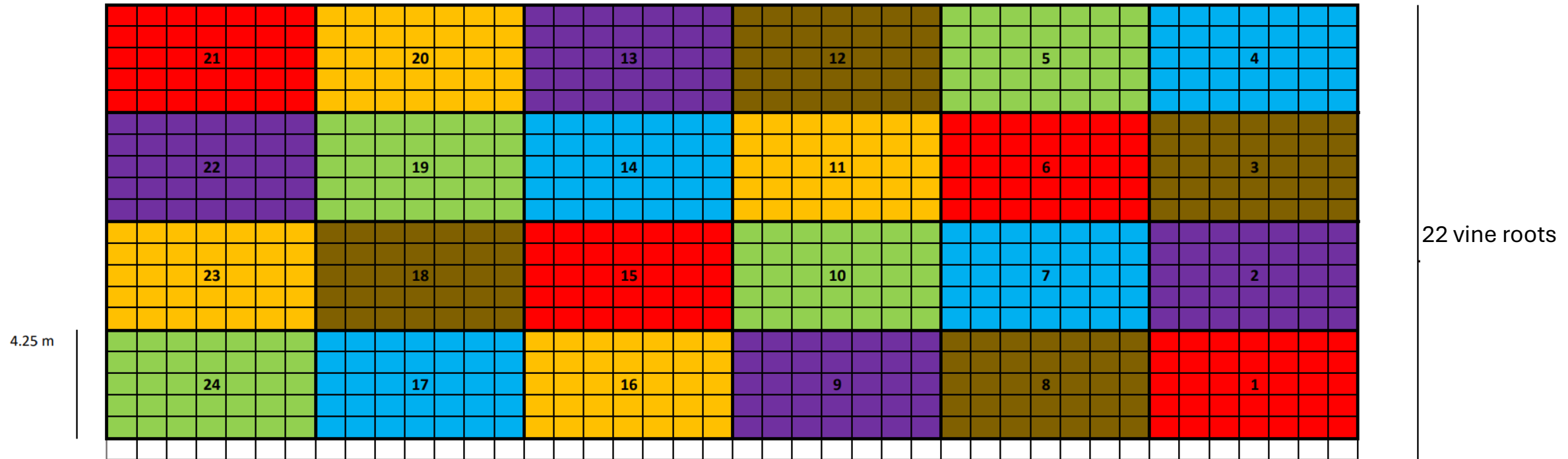
3309C



2013

Experimental design

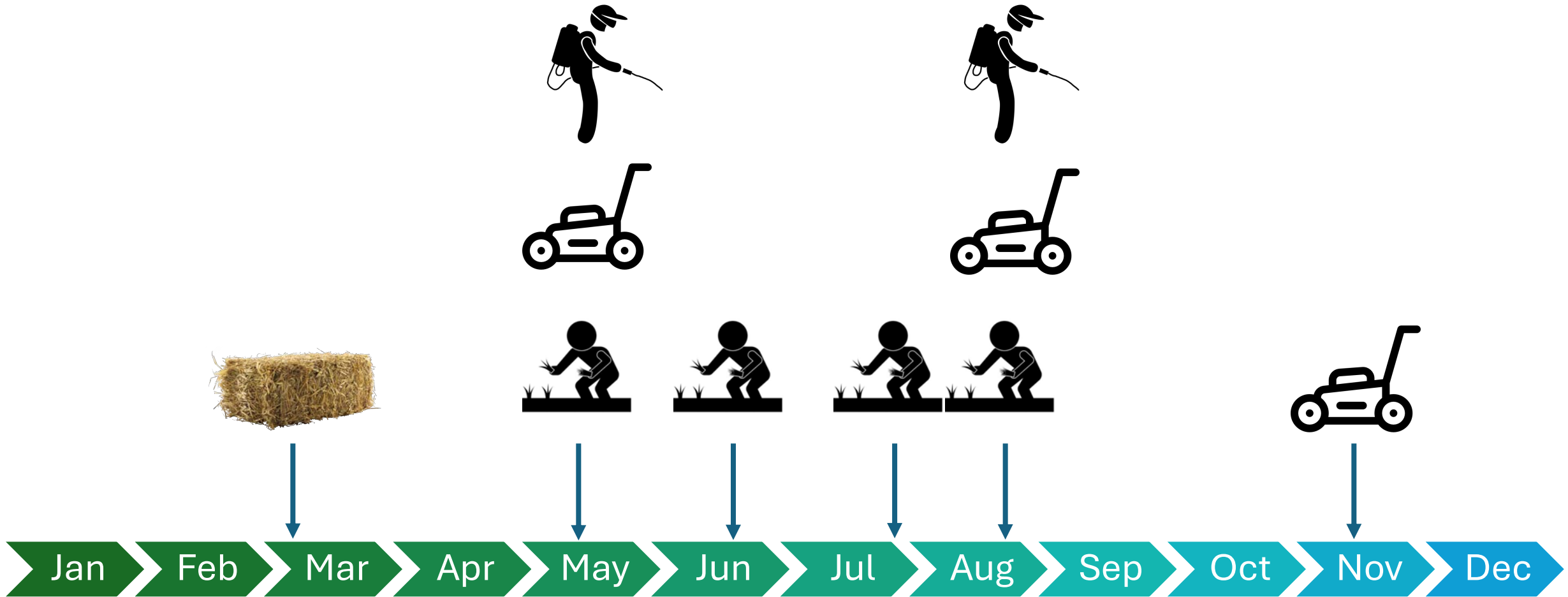
42 vine roots



- Glyphosate (GL)
- Manual removal (MR)
- Intensive mowing (IM)

- Sowing (S)
- Combination (C)
- Mulching (M)

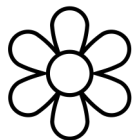
Field operations in 2025



Assessment

Vegetation diversity

- Richness
- Abundance
- Coverage
- Height
- Phenological stage
- Aggregation index



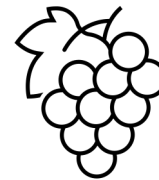
Vine physiology

- Water stress
- Nitrogen stress
- Grapevine vigor



Yield, must quality

- Berry weight
- Acidity
- pH
- Available nitrogen
- °Oechsle

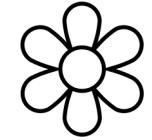


Management costs and workload

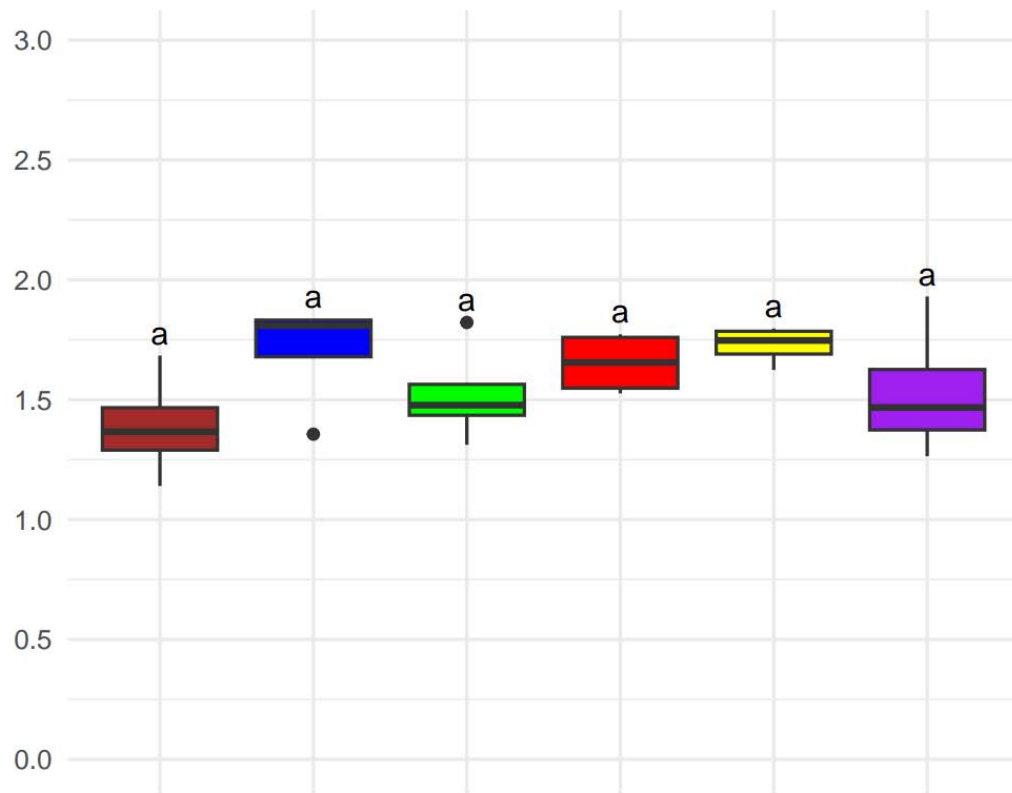
- Time and Labor Costs
- Calculations of the costs associated with implementing and managing each program



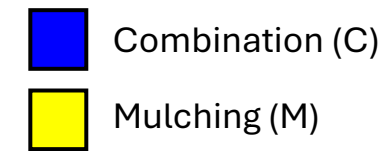
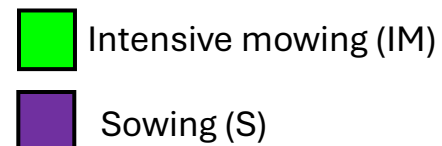
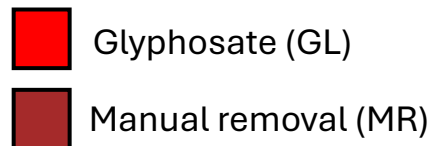
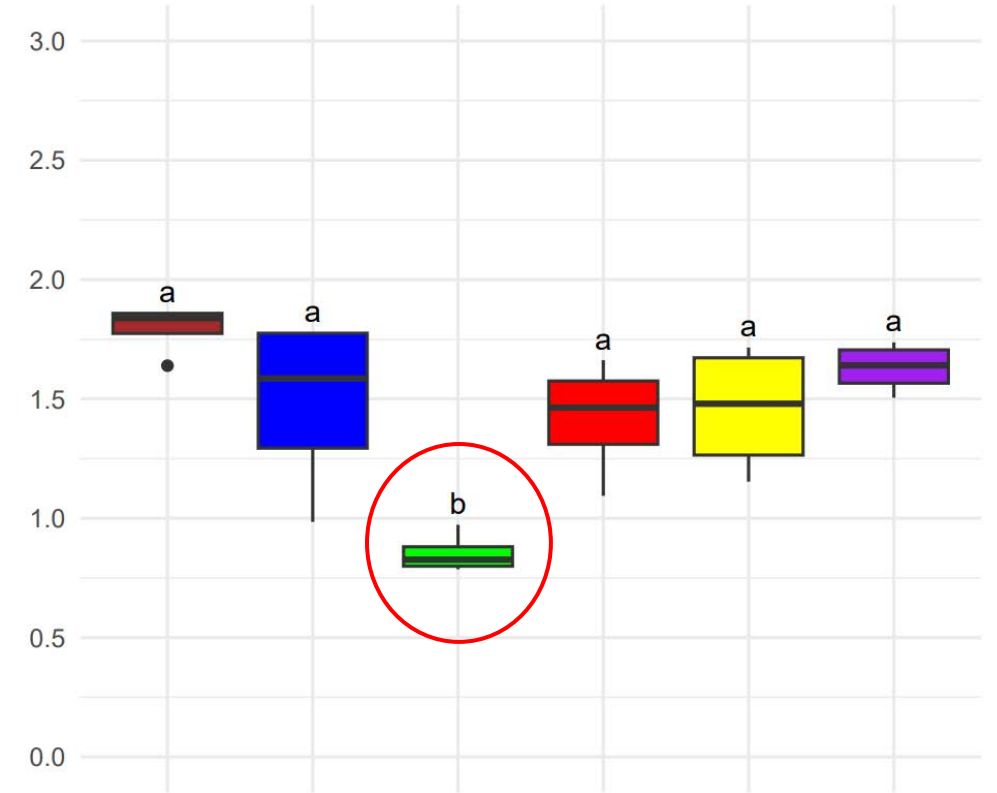
Vegetation diversity – Shannon index



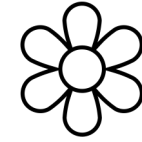
April 24, 2025



August 7, 2025



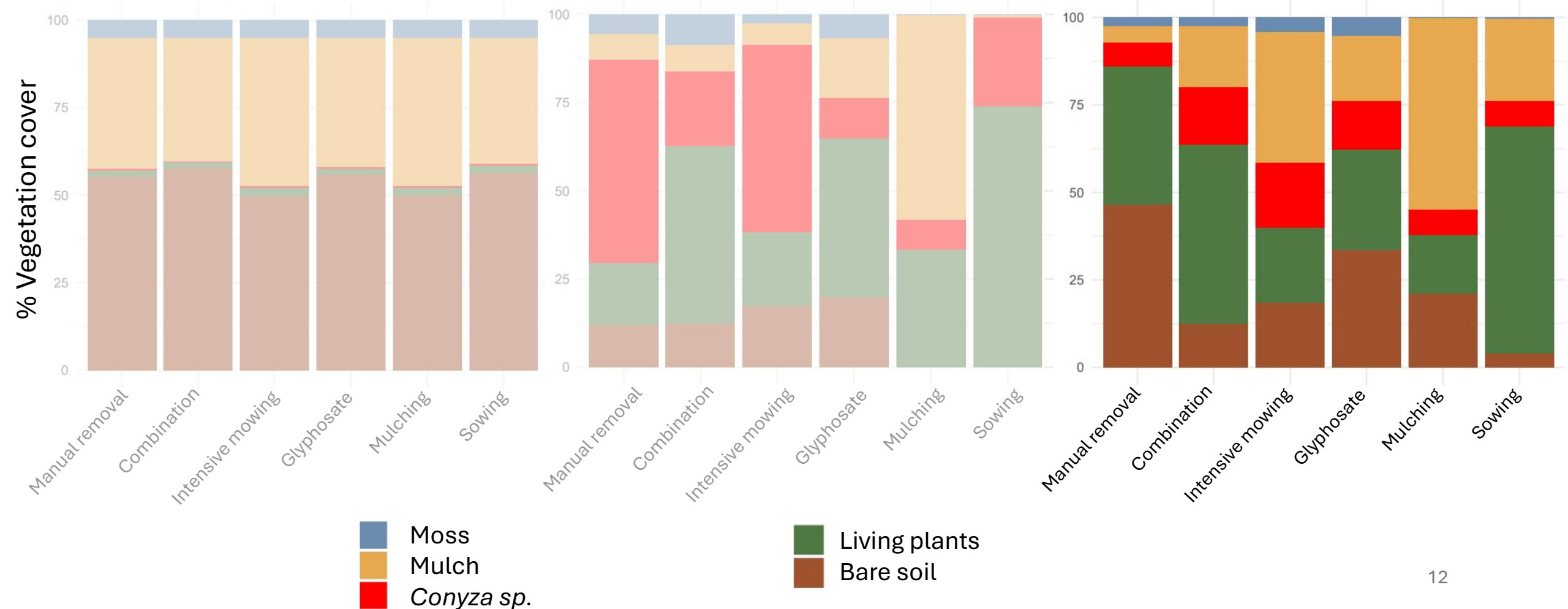
Composition of the vegetation cover



October 3, 2023

December 18, 2024

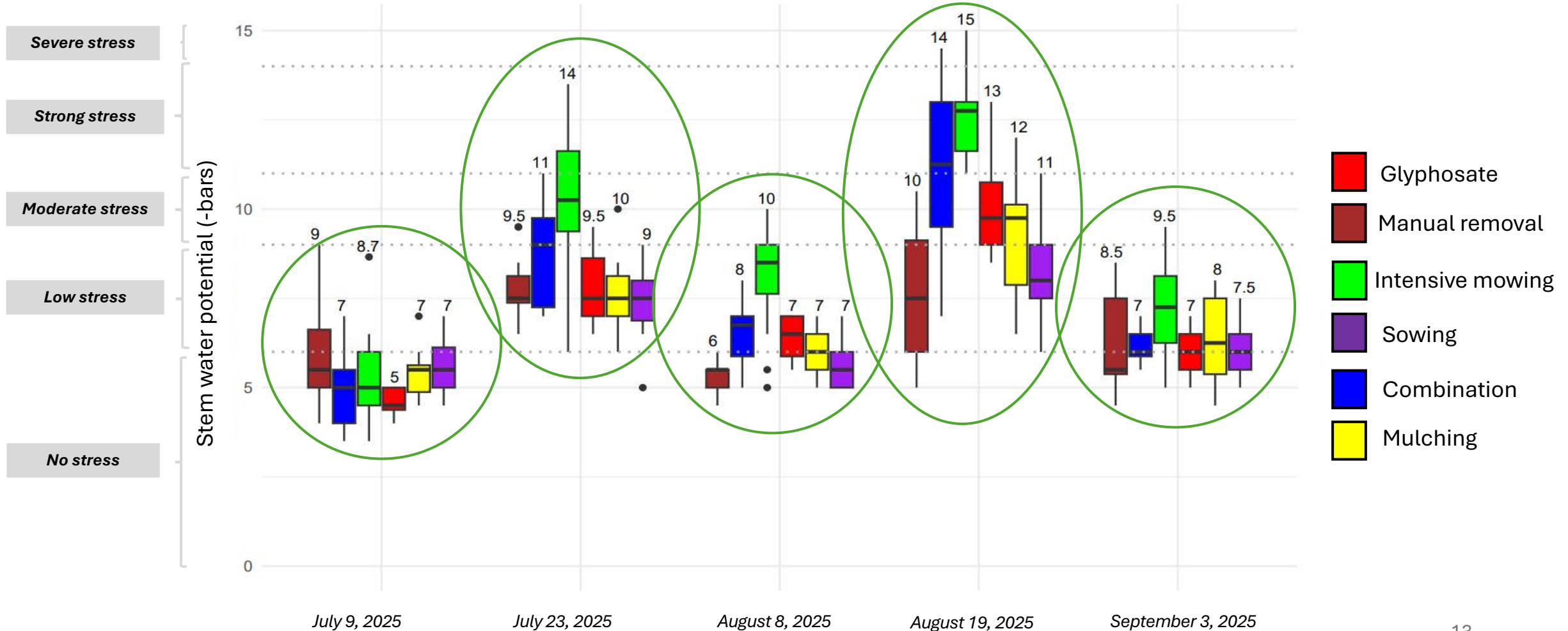
October 9, 2025



Water stress



Water potential by treatment



Weed growth by treatment



Intensive mowing



Mulching



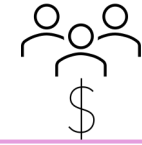
Glyphosate



Sowing

September 10, 2025

Management costs and workload



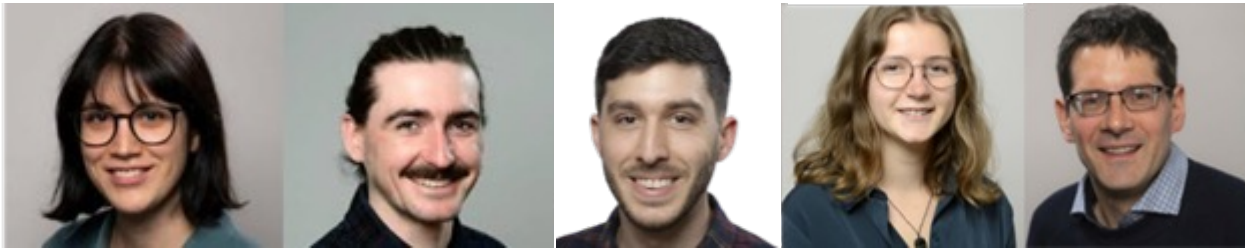
Method	Total time in hours	Total cost in Swiss francs
Glyphosate	2,25	49,6
Combination	3,00	62,3
Intensive mowing	4,75	95
Sowing	8,42	168,3
Mulching	9,75	235
Manual removal	15,83	316,7



Summary and Conclusion

Method	Short-term effectiveness	Impact on the vines and the must	Impact on plant biodiversity	Labor time and costs	Work-related physical strain
Glyphosate	Green	Green	Red	Green	Yellow
Manual removal	Yellow	Yellow	Green	Red	Red
Intensive mowing	Green	Green	Yellow	Yellow	Yellow
Sowing	Green	Red	Green	Yellow	Green
Combination	Green	Green	Red	Green	Yellow
Mulching	Green	Green	Yellow	Red	Green

Thanks for your attention



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And Martin Suardet, Château Maison Blanche



Yvorne Grandeur Nature
— *Vignoble durable* —



changins

Hes·so

