Disposition

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## Topic

“Burgundy truffle monitoring”

## Research question(s) and hypotheses

Prelim.: What is the population structure of the truffles? Are MLGs perennial? Differences between or within populations? Interactions… etc?

## Research aims

To learn about the population structure and life cycle of truffles.

## A review of the current state of research

* Truffles in general
* T. aestivum specifically
* results of WSL

## Identification of gaps in the field of research, motivation for the research and justification of the added scientific value for the field of study

* Monitoring data rare, unique

## Materials and Methods

* describe data collection
* describe molecular preparation

## Expected results

## Risk assessment

## Project schedule

* Data collection almost finished
* Data analysis: splitting into different parts

## Budget plan

* Costs: personnel, analyses

## References

The basis for the research about Truffle Monitoring data is described in detail in the following publications: Virginie Molinier et al. (2013) Virgine Molinier et al. (2016) Virginie Molinier et al. (2016) Staubli et al. (2022) Steidinger et al. (2022) Legendre and Fortin (2010) Kamvar, Tabima, and Grünwald (2014)

summary(cars)

## speed dist   
## Min. : 4.0 Min. : 2.00   
## 1st Qu.:12.0 1st Qu.: 26.00   
## Median :15.0 Median : 36.00   
## Mean :15.4 Mean : 42.98   
## 3rd Qu.:19.0 3rd Qu.: 56.00   
## Max. :25.0 Max. :120.00

## Including Plots

You can also embed plots, for example:



Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Kamvar, Zhian N., Javier F. Tabima, and Niklaus J. Grünwald. 2014. “Poppr: an R package for genetic analysis of populations with clonal, partially clonal, and/or sexual reproduction.” *PeerJ* 2: e281. <https://doi.org/10.7717/peerj.281>.

Legendre, Pierre, and Marie-Josée Fortin. 2010. “Comparison of the Mantel Test and Alternative Approaches for Detecting Complex Multivariate Relationships in the Spatial Analysis of Genetic Data.” *Molecular Ecology Resources* 10 (5): 831–44. <https://doi.org/10.1111/j.1755-0998.2010.02866.x>.

Molinier, Virgine, Claude Murat, Martina Peter, Armelle Gollotte, Herminia De la Varga, Barbara Meier, Simon Egli, Beatrice Belfiori, Francesco Paolocci, and Daniel Wipf. 2016. “SSR-Based Identification of Genetic Groups Within European Populations of &Lt;em&gt;Tuber Aestivum&lt;/Em&gt; Vittad.” *Mycorrhiza*, 99–110. <https://doi.org/10.1007/s00572-015-0649-0>.

Molinier, Virginie, Claude Murat, Andri Baltensweiler, Ulf Büntgen, Francis Martin, Barbara Meier, Barbara Moser, et al. 2016. “Fine-scale genetic structure of natural Tuber aestivum sites in southern Germany.” *Mycorrhiza* 26 (8): 895–907. <https://doi.org/10.1007/s00572-016-0719-y>.

Molinier, Virginie, Claude Murat, Emmanuelle Morin, Armelle Gollotte, Daniel Wipf, and Francis Martin. 2013. “First Identification of Polymorphic Microsatellite Markers in the Burgundy Truffle, Tuber Aestivum (Tuberaceae)1.” *Applications in Plant Sciences* 1 (2): apps.1200220. <https://doi.org/10.3732/apps.1200220>.

Staubli, Florian, Lea Imola, Benjamin Dauphin, Virginie Molinier, Stephanie Pfister, Yasmine Piñuela, Laura Schürz, et al. 2022. “Hidden Fairy Rings and Males—Genetic Patterns of Natural Burgundy Truffle ( *Tuber Aestivum* Vittad.) Populations Reveal New Insights into Its Life Cycle.” *Environmental Microbiology* 24 (12): 6376–91. <https://doi.org/10.1111/1462-2920.16131>.

Steidinger, Brian S., Ulf Büntgen, Uli Stobbe, Willy Tegel, Ludger Sproll, Matthias Haeni, Barbara Moser, et al. 2022. “The Fall of the Summer Truffle: Recurring Hot, Dry Summers Result in Declining Fruitbody Production of Tuber Aestivum in Central Europe.” *Global Change Biology* 28 (24): 7376–90. <https://doi.org/10.1111/gcb.16424>.