

## Weed control in organic viticulture

### Mechanical weeding techniques to reduce environmental impact and reduce costs

**A French Operational Group has been working on mechanical weed control techniques in organic viticulture to substitute application of herbicides, while controlling fossil fuel consumption and reducing production costs. Surveys, evaluations and monitoring were carried out with organic winegrowers in Occitanie followed by field experiments on 2 different soil 'itineraries' (step-by-step procedures).**



There have already been a number of initiatives and programmes in France to encourage farmers to reduce the application of chemical plant protection products and the use of fossil energy. An alternative to herbicides is mechanical weed control, which is a common practice in the vineyards of Occitanie. The main objective of the project was to analyse how much energy tillage tools and other soil cultivation techniques consume and to identify the factors which influence this consumption. The second objective of this project was to study how to articulate the different techniques over the period of a year in order to optimise fuel consumption and costs for the winegrower. "At the start of the project, we had very few references on the consumption of each tool. Our priority was therefore to establish a consumption range for the most commonly used tools, according to their condition of use. We aimed to create step-by-step procedures, called 'soil itineraries,' this includes when, where, how and how often to apply the soil cultivation techniques", explains Nicolas Constant, the manager of this study.

The project began by carrying out surveys on soil cultivation practices including mechanical weed control amongst 334 winegrowers in Occitanie (specifically the former Languedoc-Roussillon region) of which 129 were organic. Results indicated that organic winegrowers use many different soil cultivation strategies, depending on their production objectives, the local climate, their available material and labour resources. However, the surveys did identify that an important strategy was keeping the grass in the vineyards during the vegetative rest period and mechanically clear the grass during the vegetative period. All the winegrowers surveyed said they use mechanical tillage, demonstrating the relevance of this project.

Working with 2 organic winegrowers, the project partners set up 2 field experiments in order to monitor fuel consumption and time spent on weed control operations. Both vineyards were in the same pedo-climate context, but the each applied a different soil itinerary. The partners compared the efficiency of weed control and the energy performance when using these two different itineraries.

**The first itinerary** aimed to maximise yields by limiting the presence of weeds completely both around the vines and between the rows, all year round. The weed control interventions began after the harvest to prevent weeds setting in. Over the 3 years of the field trial, the winegrower tested a number of different tools in order to achieve this, identifying the most efficient and those to be avoided.

**On the second farm**, the winegrower wanted to preserve the quality of the soil by limiting tillage as much as possible. This itinerary aimed to keep the ground covered with a cover crop in the winter and then during

the growing season, limit competition from weeds for water and nitrogen consumption with a mulch cover between the rows (by rolling the winter cover crop with a vegetable crusher roller). In Autumn, as far as possible, the winegrower kept the plant covered and sows under cover of new species. If the plant cover was too polluted by weeds, he got rid of it by growing a cover crop.

Both itineraries enabled the winegrowers to reduce their use of herbicides and fuel, and reduce production costs. The different itineraries developed are available to other winegrowers and can be adapted to local context or according to the equipment available.

“The results of this whole project indicate that the possible fuel consumption gain for a given soil cultivation strategy is in the order of 20-30% by choosing the right tools, the right settings, the right times of intervention. If winegrowers want to further reduce their consumption, they must think differently, modify their strategy. This is not always possible because changes in strategy often entail investments in equipment and have an impact on the organisation of work.”

“The results are useful for winegrowers who already use soil cultivation techniques to prevent weeds as they are able to optimise their interventions. It also has helped to promote the transition to mechanical weed control for winegrowers who currently apply herbicides. The technical results from our project will also provide support to conventional winegrowers who are looking to convert to organic farming, or who wish to greatly reduce the use of herbicides.” – says Nicolas Constant.

### More information

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<https://www.reseaurural.fr/centre-de-ressources/projets/optimisation-des-itineraires-techniques-dentretien-du-sol-en>

Report (PDF) in French on the results of the project: <https://www.sudvinbio.com/qui-sommes-nous/conseil-technique-viticole>