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Farming models and professional identities

The use of work horses on vineyard estates: linking traditional methods to innovative and collaborative forms of work

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Abstract: *In France, the agro-ecological systems are the basis for experimenting with alternative practices to industrial agriculture, renewing man to nature relations and considering ecological regulations to reduce the use of chemical inputs.*
Among these agro-ecological practices, the use of horses for mechanical weeding in viticulture has returned to the main French wine-growing regions. In addition to reducing the use of fossil fuels, the horse has a physical and emotional intelligence, which is useful to the winegrower. In fact, the communication between the winegrower and the horse requires developing the attention and observation skills necessary to an agro-ecological approach. It can take a long time to build this cross-comprehension between man and horse. That is why most winegrowers start this practice by using horse traction service providers. How does this observation and this understanding of the condition of the agro-ecosystem with the trio of horse, service provider and winegrower work? Can working with horse traction service providers be considered an agro-ecological practice?
An exploratory study conducted in 2020 puts forward a description and understanding of the activities of the winegrower and the equine traction service provider by retracing the main stages of their cooperation in integrating the horse as an actor. This article presents the first results of this study. It focuses on the main characteristics of the work of the service provider with the horse on the vineyard estate, and on the influence of the climate context and the components of the agro-ecosystem on this work. The findings need to be developed further along two main axes: the role of the horse in the agro-ecosystem and the transformation of the activities of the service provider and the winegrower from year to year.

Keywords: *agroecology, viticulture, service provider, cooperation, equine traction*

Introduction

Diversity of agricultural systems

Agro-ecosystems are complex and dynamic systems, the functioning of which varies according to certain elements (climate, soil, cultivated or uncultivated plants, cropping practices, etc.) that interact and bring out new properties of the system. Each agro-ecosystem is, therefore, recognized as singular.
The systems approach, which has been developing since the 1970s, requires the mobilization of several scientific disciplines to understand and model these agro-ecosystems. Qualitative approaches, based on the analysis of qualitative or expert data, make it possible to understand the different factors of diversity (Kuivanen *et al.*, 2016) such as local circumstances and the moral values and motivations of farmers (Dumont, Gasselin and Baret, 2020). It is difficult to reconcile the diversity of agro-ecosystems with the construction of typologies because there is an "infinity of possible situations" (Sourisseau *et al.*, 2012: 177). In this article, we put forward exploring some agro-ecosystems, which use animal labour for some of their technical operations.

Implementation of agro-ecological practices

The diversity of agro-ecosystems is reflected in particular through the practices implemented by farmers. In fact, many farmers are looking for ways to reduce the use of chemical inputs and enhance

the value of ecosystem services on their agro-ecosystems. Many of them are experimenting practices adapted to their agro-ecosystems, their farms and the local pedoclimatic and economic conditions of agricultural production.

In that respect, in recent years, a branch of agronomy has been interested in strategies for organizing the work of the farmer and the role of individual and collective activities in implementing changes in practices. Therefore, recent works (Catalogna, 2018; Chantre, 2011; Cristofari, 2018; Toffolini, 2016) have focused on the processes of change in farming practices and, in particular, on what has been learnt during these phases. These works have highlighted several characteristics of agro-ecological practices. For example, Toffolini (2016) considers that these practices are knowledge-intensive, since they involve "a renewal of agronomic principles and numerous interactions between agro-ecosystem components and their regulation". This process of transformation of farmers knowledge is carried out over a long period of time and in a situational manner. Indeed, farmers develop a progressive understanding "of the functioning of part of their own cropping system" (Toffolini, 2016: 144) in relation to a changing climate context. In particular, some key transition practices "reveal new aspects of the agro-ecosystem that were not previously visible" (Chantre, 2011: 214). Chantre (2011) defines key transition practices as allowing movement from one agronomic coherence to another.

Therefore, the observation of this agro-ecosystem becomes a core activity for the farmer in order to gather information that will enable him to adjust his actions and to manage his system. The questions then arise of how to interpret what is observed and how to give meaning to these observations? Can interactions with other living beings (human or non-human) be a support to an understanding of the situations encountered?

Appropriation of practices related to cooperation between actors (human and non-human)

Changing practices can address a farmer's problem and help reach an objective. So, he begins by testing a practice which he considers to be promising, starting on a small scale of his agro-ecosystem (one or more plots). However, introducing a new[1] practice into the agro-ecosystem involves adjustments upstream and also during the experimentation of the technical itinerary, of tool settings, etc., which will raise questions for the farmer (Catalogna, 2018). Exchanging with peers or with an advisor or service provider about the implementation of new practices plays a fundamental role in the success of these experiments. In fact, these exchanges can provide access to key elements for resolving technical-economic issues or efficient work organization strategies. For example, when the farmer uses a service to implement a new practice in his agro-ecosystem, we assume that the quality of interactions between the farmer and the service provider influences the farmer's appropriation of the practice. How do farmers and service providers develop their cooperation aimed at adjusting the practice to local agro-ecosystem conditions? Do they share information on the agro-ecosystem or past experiences to adapt the practice?

Could other interactions with non-human collaborators, such as animals, be a source to learn more about the agro-ecosystem and contribute to the appropriation of practices?

So, some vineyard estates are once again using the horse to work the soil for the mechanical weeding of certain plots. This practice is considered as agro-ecological because it reduces consumption of fossil energy and the use of chemical herbicides. It also generates new balances and regulations within the agro-ecosystem requiring the implementation of an adaptive approach by the winegrower. Does the horse play a role in this understanding of the agro-ecosystem? Does it bring to light certain

[1] New as a practice not previously implemented on the agro-ecosystem or plot in question.

aspects not previously visible with tractor use (especially on the soil)? What indicators are taken into account by the service provider[2] while working with the horse? How are these indicators interpreted and communicated to the winegrower?
An exploratory study was undertaken to describe and understand how the winegrower and the equine traction service provider interact while the horse works on the vineyard estate. For this article, we were particularly interested in the main characteristics of the activity[3] of the service provider and the horse on the vineyard estate in collaboration with the winegrower, and the influence of the climate context and the components of the agro-ecosystem on this activity.
We took an "enactive cultural anthropological" approach (Theureau, 2015) aimed at describing, understanding and even explaining the dynamics of the different asymmetrical couplings between the actors and their environments. It was based on their experiences while taking into account the constraints and effects of this activity in their bodies, situations and cultures.

Method

For this exploratory study, we have used ethnographic methods of access to human activity: participant observation, interviews, census procedures and the collection of written sources (Olivier de Sardan, 1995). We have borrowed each of these types of data production because, as expressed by Laplantine, "while we believe that we only record facts, we also produce forms. ...] Scientific knowledge can only be gained from a process of establishing relationships" (Laplantine, 2015: 114-115).
Three contrasting situations have been studied to describe the path taken by different pairs of winegrowers and equine traction service providers from the introduction of the practice to the time of the study.

Presentation of the research fields

Three equine traction service providers operating in different wine-growing areas were contacted by the observer-interlocutor in order to select a winegrower with whom they had been cooperating for at least three years[4] (Table 1).
Although the horse is used in various types of estates[5] (conventional, organic, biodynamic), it must be noted that the three winegrowers made a study of crop vineyards with biodynamic practices. They evoked a global and complete approach, from the care taken in working the soil and cultivating the vines to the maturing of the wine and bottling by seeking to optimise the quality of the wine produced. They are all concerned about conserving the genetic diversity of old vines and, therefore, use massal selections for their grape varieties. All of them also have a cellar on the vineyard estate to ensure the direct sale of their wines. For all of them, equine traction is used as a practice adapted to certain contexts and responding to targeted problems. Equine traction is therefore used on part of the plots of vineyard estate.

[2] Also called working equine handlers, ploughmen on horseback, we will call them service providers in this article.
[3] "Activity", considered in our theoretical framework (Theureau, 2004), as the dynamics of asymmetrical interactions between an actor and his environment (including social).
[4] Duration after which, according to some service providers, work with the horse begins to have an effect on the soil.
[5] A study entitled Equivigne (results being analysed in June 2020) shows that more than half of the estates using horses are certified in organic agriculture (96 respondents to the study).

	Vineyard estate A	Vineyard estate B	Vineyard estate C
Wine-growing region	Languedoc-Roussillon	Bourgogne	Vallée du Rhône
Winegrower[6]	Cyril, agricultural engineer and oenologist, employed on the vineyard estate since 2003	Jérémie, in charge of the vineyard estate since 2001	Damien, in charge of the vineyard estate with his brother
Equine traction service provider	Rick, service provider since 2016, trained by a mentor since 2014	Claire, service provider since 2013 (Jérémie = 1st and biggest customer), took the harness horse driving specialization certificate in 2011	Olivien, service provider since 2003, took the harness horse driving specialization certificate in 2001
Total area of the vineyard estate	45 Ha (relatively concentrated plots)	7 Ha (plots in one piece)	63 Ha (fragmented plots)
Total area worked with the horse in 2020	10 Ha	2,1 Ha	8 Ha
Environmental Certification	Biodynamic agriculture since 2011	Biodynamic agriculture since 1998	Biodynamic agriculture since 2007
Year of introduction of equine traction	2015	2013	2003

Table 1. Presentation of the actors met and the main characteristics of the vineyard estates.

Presentation of the methodological framework

Data construction phase

The data construction started with the collection of information on the 3 vineyard estates from service providers and from the Internet (websites, Facebook, Instagram, Youtube).
The websites allowed us to understand part of the history (especially the biography) and context of the vineyard estate, including the geographical location, the size of the surface area the development processes (appellations, environmental certifications) as well as the practices and actors highlighted on their communication tools for the general public. The horse and the equine traction service provider often appear in the photo and video galleries of these vineyard estates (Figure 1).



Figure 1. Excerpts from the websites of vineyard estates A, B and C (from left to right).

The meetings took place on each vineyard estate in the presence of the winegrower and the equine traction service provider. The objective was to identify the highlights of the experience of introducing

[6] The first names of the actors we met have been changed. The actors from the vineyard estates will be named "winegrower" in the article.

equine traction for each one. Some of these moments could be common to both the winegrower and the service provider, others specific to one or other. The observer-interlocutor considered that a collective meeting would facilitate the initial contact with the winegrower and the each actor's recollections of the remarkable situations during the period of mobilization of the horse for the tillage of the plots of land on the vineyard estate. The meetings were organised in two parts: a collective interview and a visit to the plots where the soil had been worked with the horse. The observer-interlocutor relied on an interview framework that allowed him to guide the exchanges to understand the trajectory of the collaboration between the winegrower and the equine traction service provider. Each actor was free to speak, being interrupted or stimulated by the observer-interlocutor's specific interventions, in order to develop a point raised by one of the actors or to resume the chronology of the situations evoked.
The main information collected during the interview and the visit was: the key dates of the vineyard estate, the current concerns of the winegrower including tillage with the horse, the implementation and major changes in the collaboration between the service provider and the winegrower, as well as the observed or experienced effects of working with the horse on the agro-ecosystem. Additional data were collected: photos (Figure 2) and written documents (diaries of the stakeholders, notes on the context of intervention (climate, condition of the land, behaviour of the horse, etc.) and invoices for intervention with the horse).



Figure 2. Visit of plots where the soil is worked with horses in vineyard estates A, B and C in February / March 2020 (from left to right).

Data analysis phase

Data processing was carried out using an inductive approach that is particularly well suited to exploratory research objects (Blais & Martineau, 2006).

• Elaboration of a first analysis grid based on a case study
First, the observer-interlocutor made a full transcription of the exchanges recorded during the meeting with vineyard estate B. Careful reading of the verbatim enabled to identify categories and sub-categories representing units of meaning evoked by the actors on their experience of mobilising horses to work certain plots of land.
These categories and sub-categories constituted a first analysis grid used to listen to the exchanges recorded between the other pairs of stakeholders working on vineyard estates A and C. The aim was to find out what the other two pairs of actors said about the categories built from the first vineyard

estate, to find out whether new categories emerged and to transcribe verbatim reports illustrating their points of view.

• Adaptation of a second analysis grid by comparing the three case studies
Following the comparison of the verbatims of the three interviews, a new analysis grid (Table 2) was therefore developed based on the reformulation of certain categories and the grouping of certain redundant sub-categories.

Categories	Sub categories	
The work of the service provider and the horse on the vineyard estates	Identification of relevant intervention situations and work adaptations (tractor/horse complementarity, economic reasoning, adjustment of tillage implements and adjustment with other viticultural practices)	
	Sensitive dimension of the service provider's activity	Use of the body (interaction with the plough)
		Cooperation with the horse
Influence of context and agro-ecosystem on the provider's work with the horse	Adaptation to climate change	
	Interactions with the winegrower	
	Interactions with soil and weed flora	
	Interactions with the vine	

Table 2. Analysis grid developed from the inductive analysis of the data from the three vineyard estates.

Results

The service provider's activity with the horse on the vineyard estate: an agro-ecological practice

Identification of relevant intervention situations with the horse and adaptations of the work[7]

Horse tillage is used in each of the vineyard estates for situations where the **use of the tractor is irrelevant** or even impossible. These include:

- weeding under the row to avoid the problem of competition for water between the vine and the weeds;
- sloping plots, difficult to access, or high value plots where working with the horse allows individualised monitoring of the vines;
- plots with high density and narrow row spacing;
- plots with delicate or difficult to work soil.

We had already realised that it [work with the horse] was happening everywhere [...], we didn't know and I thought that it wouldn't be feasible for the horse. And in practice, everything could be done. Cyril (winemaker).

In some cases, the tractor is used upstream to facilitate and optimise the horse's activity.

Some people say, "Ah, that's nonsense, some people have the support of tractors!" The winegrower won't pay €500 or €1000 more for his plot because we will spend more time

[7] The term "work" is used here in the sense of work organization as defined by Madelrieux and Dedieu (2008: 436). « We define work organisation […] as the social and technical division of work and, more precisely, the interaction between the technical management of agricultural activities, other activities (economic or private) and manpower. »

and he has the tools to do the work easier. He does a rough preparation and we do the finishing job. Thierry (service provider).

The three winegrowers talked about the significant cost of working the soil with the horse, which is why they identified situations where the horse provided a solution to a problem and therefore had an added value compared to other practices. The duo of winegrower and service provider cooperates and adapts the interventions every year according to their past experiences, as well as to several factors, such as the climate.

Therefore, the service provider looks for the best combination to adapt the intervention and tool to the technical itinerary for the plot, the capacities of the horse, the context and the objective of the winegrower. The **adjustment of the tools** is a key step in the activity of the service providers in relation to their understanding of the agro-ecosystem.

The **economic balance** represents a shared interest in order to perpetuate the practice. One winegrower talked about the interest of **slower tillage of the soil** with the horse, in order to gain in precision. Indeed, he believes that working the soil as close as possible to the vines without injuring them maximises the yield of the plot. In an effort to maximise the value of each intervention on the vine, the winegrower coordinates **other viticultural practices** with the work of the soil carried out by the service provider and the horse, such as inter-row sowing, trellising and even pruning–the vines. However, the three winegrowers interviewed did not consider it a priority to **commercially exploit the image of horse for soil tillage** by increasing the price of the bottles of wine from these plots. Rather, this practice illustrates the particular attention given by the winegrowers to the soil and the vines.

In fact, and with hindsight, today, part of the vines that are worked with the horse is perhaps better valued than the rest, but it was not a choice at the outset. The choice of the technical itinerary was made before. Damien (winegrower).

Sensitive dimension of the service provider's activity

Working the soil with the horse is a physical activity where the service provider mobilizes his body to intervene. The force used by the service provider to work the soil with his horse is an indicator of the state of the soil and its evolution. The service providers evoked sensations indicating the change in the structure of the soil from year to year, with the soil becoming like "velvet".

As the work is long and repetitive, certain conditions must be met in order to optimise its implementation. This is particularly the case with the cooperation between the service provider and the horse, which is essential in reducing the arduousness and physical fatigue during tillage.

When they [those who start the activity] put their arms in the soil which has never been worked, you take all the vibrations of the metal in your arms, and you have to sweat and then push on your arms and abs to bring in the ploughs and your horse is not okay because it doesn't want to, or it doesn't know how to do it and then it jerks. When it starts jerking, it's the worst of all [...] it's really the shit. Thierry (service provider).

In some cases, the service provider noted difficulties in guiding the horse. Such negative interactions with the horse revealed the need to take a step back to analyze the situation to understand and learn so as not to get into difficulties.

One year, we made mistakes, [...] we pulled our mare, we made her rear in the rows of vines because it was really hard, the marls were a bit too dry [...]. It took us a long time before we came back to his place he always calls us before the marl is dry. Thierry (service provider).

The relationship between the horse and the service provider is built over time thanks to the different work situations encountered and leads to a detailed understanding of the horse's reactions by the service provider.

> *It is almost the physical suffering that made me understand that I was wrong and then to also have bad interactions with my horse, [...] it was not that he was going too fast, it was that he was not able to do the work in relation to the tool I was using at the time. It was those events that made me realize that I had to look elsewhere.* Olivien (service provider).

Influence of the context and agro-ecosystem on the service provider's work with the horse

The service provider and his horse are in relation with a complete agro-ecosystem located in a particular context (climate, economic, etc.). Their interactions with the living beings or environment of this agro-ecosystem are numerous and diverse and have an effect on the service provider's work with his horse. It comprises adaptation to climate change, interactions with the wine grower and with soil, weed flora and vines.

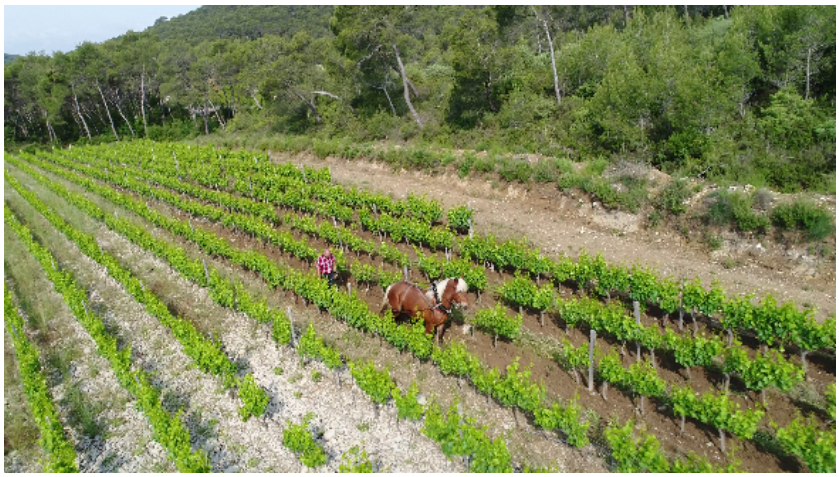


Figure 4. Tillage with the horse in the agro-ecosystem. *© Régis Domergue.*

Adaptation to climate change

The three duos of winegrower and service provider evoked the increasingly **extreme climatic events** (intense rain/drought, hail episodes) linked to climate change. The winegrowers need to fully anticipate these events and intervene as soon as possible on the plots that are the most difficult to work.

> *We'll say that this is the one [the plot] we have to do first because afterwards it will be very complicated, the other one will be complicated but we'll manage, it gives you additional priorities so it means it's more subtle.* Damien (winegrower).

Interactions with the winegrower

The service provider's interactions with the winegrower are therefore essential for the understanding of each person's objectives and concerns. The winegrower has a detailed knowledge of the plots, their history, and the terroirs, which he passes on to the service provider. The service provider knows his own working capacity and that of his horse and uses his experience in a variety of situations. This cross-understanding of each person's activities is built up over the years. The duration of the

cooperation on the cases studied is linked to the fact that the winegrower recognises the existence of a special relationship between the service provider and his horse. The winegrower benefits from this cooperation between the service provider and the horse because it enables him to build more detailed knowledge of the soil of each of his plots.

> *There's the feeling I had before and the fact of sharing this with a man and an animal allows you to be really sure that you are in the right, you know [...] it just makes you understand more things, that's all*. Damien (Winegrower);

So, the winegrower and the service provider communicate regularly to choose the right window of intervention, according to the weather forecast and the condition of the soil. Indeed, the soil must be neither too wet nor too dry and the weed flora must be at the right stage of growth. The service provider and the winegrower observe and learn the reactions and the evolution of the agro-ecosystem through working with the horse.

> *At the beginning, there were places where it was a bit hard and now the soil feels lumpy. [...] There were areas that were rather hard, with soil that seemed almost beaten. Today, I don't even know where those areas are anymore, so there's been a transformation.* Damien (winegrower).

Interactions with soil, weed flora and vines

In addition, new balances are being created within the agro-ecosystem that seem to bring **favourable properties to the soil** (change in weed flora) and to the vine (less vine-trunk "breakage", risk management of late frost, resistance to drought).

As other agro-ecological practices, working the soil with horses, therefore, requires a subtle adaptation of the intervention–to the local context. The condition of the agro-ecosystem is evaluated by the observation and interpretation of indicators. Some of these indicators are the behaviour of the horse as a work partner (its gait or defensive reactions), as well as the physical sensations of the provider (force used, vibrations, etc.). They enable the service provider to better understand the environment he works in and, thus, to adjust the practice to the context of the agro-ecosystem.

Discussion

Methodology

This exploratory study is based on three case studies with specific characteristics (location, total surface area of the plot and surface area worked with the horse, history of the vineyard, different service providers). This choice of case studies was of interest to identify the common or divergent elements in the activity of working the soil with the horse on a vineyard. Thus, the comparison of the interviews with the three pairs of actors enabled to enhance and nuance the grid elaborated following the inductive analysis. However, as these three case studies are part of a biodynamic approach, the study panel will need to be enlarged in the future because biodynamics can be a highly structuring element.

Indeed, biodynamics take the role of the animal into consideration, which may not be the case for other ways of producing. "Animals take their place as working partners or because of their ontological capacity to mediate with their environment, thus contributing to its richness" (Pineau, 2020: 1).

In addition, the Equivigne study, conducted in 2020 by the French Horse and Riding Institute and the French Institute of Vine and Wine among 96 winegrowers who use horses on their plots,

reveals that 68% of them do organic farming and 22% do biodynamic farming. It would therefore be interesting to confront and adapt the analysis grid to other ways of producing.
In the same way, an extension of the study panel to include winegrower-managers who drive horses themselves, could provide a better understanding of the relationship developed between a service provider and a winegrower on the integration of equine traction on the vineyard.

The working relationship with the horse

Animal labour is questioned by some animal rights activists. Anti-speciesist and abolitionist movements compare animal domestication to a form of slavery. Societal changes, such as urbanisation and the technological revolution, have driven part of the population away from the rural world, greatly reducing their contact with livestock. In this context, the interests for the farmers, and for the agrosystem in general, of working with animals in an agro-ecological approach should be brought to the fore. It could recreate, or tighten the links between humans in the countryside and in the cities, as well as those between humans and animals.
The horse has characteristics such as 'bodily and emotional intelligence' (Deneux, 2018: 67) that differentiate it from a simple work tool. "Winegrowers then discover personalities, reluctances, taking of initiatives, work refusal or incapacities of those colleagues" (Mulier, Müller, 2019: 9). Consequently, the farmer has to develop attention, observation skills and understanding during interactions with the horse, providing additional indications on the actual state of the agrosystem.
By working with the horse, the winegrower implements the adaptive behaviour promoted in the agro-ecological approach because "it is in the interaction with the horse and confronting to objectives that the emotions, the unsatisfying moments and frustrations reveal themselves, and must incite to adapt or modify the objectives of this particular day" (Mulier, Müller, 2019: 9). Observing this working relationship during the course of the activity will enable us to develop further how the interaction with the horse affects the activity of the service provider at the plot level and the winegrower at the farm level.

The working relationship between the service provider and the winegrower

The complexity of agro-ecosystems means that there are no "off-the-shelf" solutions, as farmers use a variety of practices in their search for autonomy from chemical inputs. Working with horses requires expertise both in the relationship with the horse and in the adjustment of tools. These skills are necessary to make any appropriate adaptation to the context of the agro-ecosystem and to satisfy the objectives of the winegrower.
In this study, we were looking at cases where the cooperation between the horse-service provider and the winegrower has led to the continuance of the practice on the vineyard estate. The trios we encountered have been cooperating for 5 to 17 years. Together they have adjusted the technical itineraries to the scale of the plot, by looking for an economic balance and adapting to the climate. Consequently, we may wonder if the same evolution of this technical itinerary cannot be found in other plots, even those not worked with horses. In fact, the people working the soil on the same plots with the horse and with the tractor interact and adapt in order to coordinate and optimise their interventions (number and duration of passages, etc.). These interactions can facilitate learning, including that of their own practice, which can benefit other plots. In this case, the delegation of tasks by the winegrower gains added value by benefiting from the advice and recommendations of an expert service provider which is conducive to understanding their own agro-ecosystem.

Conclusion

The first results of this exploratory study have led us to consider together the cooperation of the horse, the service provider and the winegrower through their practices within the same agro-ecosystem and to discuss it along two lines.

The first axis concerns **the role of the horse in the observation and understanding of the agro-ecosystem** by the service provider and the winegrower.

Agroecology incites us to reconsider working with living organisms and, in particular, animals. During this observation, service providers and winegrowers mobilise not only sight but also other senses, such as, touch, smell, and potentially taste and hearing. "At a pinch everything is a clue, everything we can see, touch, hear, taste, but also everything we can know about what has been seen or perceived elsewhere" (Delbos, 1983: 17). What indicators are taken into account by the duo of service provider and winegrower when working with the horse on a vineyard estate? What learning about the soil and the vine is generated by the horse's activity?

Other studies show the importance of man and animal interaction in the acquisition of knowledge. For example, during a research project on the training of transhumant herders, Anne Moneyron (2003) studied the knowledge required to manage flocks of sheep in the mountains and showed "how the animal's place is dominant in the construction of transhumant knowledge" (*Ibid.*: 245). Transhumant knowledge involves the construction of personal reference points and "sensitive listening to the environment" (*Ibid.*: 248). This "knowledge of contact and intimate relationship with nature" is called eco-knowledge (*Ibid.*: 248).

In the same way, would working with the horse and interpreting its behaviour (using its emotions and senses) enable the duo of service provider and winegrower to strengthen their observation of the agro-ecosystem and, thus, build the eco-knowledge necessary for the agroecological approach?

The second line of thought concerns **the trajectories of transformation of the activities of the service provider and the winegrower** from year to year. The experience acquired over the years has enabled the duos of winegrower and service provider we have met to prioritise the objectives and plots targeted for working the soil with horses. The organisation of work, as defined by Madelrieux and Dedieu, 2008, is evolving on the vineyard estate.

How do these actors work together to optimize the practice with the horse on the agro-ecosystem? What are the common/divergent concerns of the winegrower and the service provider? What information is shared? How are they transforming their practices to better match agro-ecosystem developments? Are there collaborative innovations and knowledge transfers from one profession to another, from one culture to another?

These two lines of research trace avenues that will be explored in a future study, combining the lessons learnt from the literature on man and animal interactions, the analysis of human activity, the impact on the work organization of cooperation between stakeholders and the characterization of agricultural practices.

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