

## Research Article

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# Setting up a “good” experimentation: the case of vine varieties testing in Languedoc

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**Abstract:** The vine breeding of varieties resistant to two major pathogens (mildew and powdery mildew) underpins the promise of a pesticide-free viticulture. Numerous questions appear while professionals try to plant these varietal innovations in their vineyard: what is a good grape variety? Can we produce good wines with these ‘new’ varieties that fit our expectations for taste, quality, their capacity to adapt to our terroirs, etc.? Going faster is a challenge for growers who want to test new production methods associated with new markets. In that context, testing these varieties is a necessity. This paper focuses on one of these specific tests conducted in the Languedoc Wine Region (France). Technicians, scientists and economic players in this sector all together organise the testing in order to distribute the first experimental plants through regional winegrowers. To analyse what qualifies a good experimentation, I follow how actors formulate their concerns and what they take into account in such situations. Using a theoretical framework derived from the Science and Technology Studies (STS), I describe how relations between professionals and objects are transformed as they face uncertainties in their efforts to achieve the promise of a more sustainable viticulture.

**Keywords:** varietal innovation, wine, STS, participation plant breeding

## 1 Introduction

Since the late 2000s and early 2010s, new grape varieties have been grasping the attention of wine-growing circles in France. The main characteristic of these new varieties is that they are resistant to two fungal diseases that are very common in vineyards: *Plasmopara viticola* and *Erysiphe*

*necator*<sup>1</sup>. In the family of vines that are cultivated to produce wine in France, resistance to these two diseases was absent until now<sup>2</sup>. We only find resistance in some savage vine varieties. New wine-making vine varieties come from crossbreeding between the usual wine-making varieties that bring quality and savage vine varieties that bring resistance against these two diseases. Thanks to their resistance, they are expected to significantly reduce winegrowers’ use of pesticides (Hochereau et al. 2015). This innovation, which appears promising to resolve environmental problems caused by pesticides, creates a major disruption in the wine context where its quality is closely linked to the varieties of grapes used. These varieties, resulting from various research programs, whose agronomic and oenological qualities are poorly known in the different French terroirs, are the subject of an important sectoral mobilization in Languedoc<sup>3</sup>: “will they be adapted to our soils?” “Which types of wines can be produced?” “Will they be appealing for wine consumers?”

Experiments are carried out to assess these varieties. The varietal experimentation that I follow is particularly interesting as it stimulates a strong dialogue between economic, technical, scientific, and political actors. Their common objective is to implement an ex-ante evaluation of the targeted varieties. The specific experiment begins in 2017 in Languedoc. It answers some questions about the possibility of developing integrated and joint innovations for complex problems through a dialogue between scientists, practitioners and policy makers.

Some actors wish to test vines that are not yet listed in the official catalogue<sup>4</sup>, which would allow them to be

<sup>1</sup> In the next pages, I will talk about downy mildew and powdery mildew, respectively the common names for *Plasmopara viticola* and *Erysiphe necator*.

<sup>2</sup> Except for certain hybrids resulting from selections for phylloxera resistance such as Villard blanc, for example, which is resistant to downy mildew and powdery mildew. Less than 200 hectares are planted in 2016 in France. <http://plantgrape.plantnet-project.org/it/cepage/Villard%20blanc> (consulted on the 24<sup>th</sup> of October 2018)

<sup>3</sup> Languedoc is an area part of the new region Occitanie

<sup>4</sup> In France, winegrowers can only plant vine varieties registered in the official catalogue. This registration system is governed by the Ministry of Agriculture which is advised by a committee that brings

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distributed on the market. A compromise had to be found with the research institute, creator of these new varieties, in order to define an experimental framework conducted in the vineyards of winegrowers. Indeed, professionals wish to be involved in variety evaluations carried out during experiments that could have an impact on the choice of selected genotypes. Some of them want to go faster to conquer a new market with these new varieties. Others insist on production of knowledge on these varieties: “We must experiment *in situ*, in our vineyards; we must make wine with these grapes in different places”. As a result, the implementation of this experimentation produces many uncertainties that emerge during the meetings: “will the producers be trustworthy?”; “is this experimentation a way to disseminate vines rapidly?” and so on.

Our survey followed these professionals, during meetings or in experimental plots from August 2016 to July 2017. I paid strong attention to the choices made on the spot, in moments of uncertainty. More specifically, this paper is based on five meetings I attended. The first meeting, in November 2016, brought together about fifty winegrowers interested in planting these vines in their fields, around a tasting and observation in the plots of the targeted varieties. The second one gathered the winegrowers and the breeder’s scientific direction, under the leadership of the interprofessional committee assisted by the technicians of a professional agricultural organisation. The three following meetings were conducted in small committees, with the interprofessional committee representing winegrowers, technicians from the professional agricultural organisation, as well as some researchers specialising in these varieties.

Since the experiment falls within a more institutional framework, not all requests for experimentation can be accepted. On the one hand, some varieties have few experimental vine plants. On the other hand, the maximum experimental area per variety is limited to three hectares on the national territory by some national norms<sup>5</sup>. A selection between potential experimenters has to be made. Actors that are likely to be involved in these field experiments are then assessed on various criteria (seriousness of producers, territorial situation, and so on) both to secure the production of data on varieties and to protect vine plants. The actors I follow then look for ways to select or to discriminate wine-grower’s applications. The article shows how this sorting pushes the actors in charge of the experimentation to singularise the experimenters.

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together technical actors as well as scientific experts.

5 Arrêté du 9 mai 2016 « établissant les modalités de classement des variétés de vignes à raisins de cuve ».

Reducing the space of the experimentation produces performative effects, particularly in the definition of what constitutes a “good experimenter”. Adopting a pragmatist approach, I consider that concerned actors are the first that are involved in the production of knowledge on these varieties (Dewey 2010). The second objective of this work is to show that in this experimentation, the varieties themselves have an agency: they react, they resist, they do something (Hennion 2015). The article analyses the mutual relationships between varieties and their complex ecosystems, integrating natural and human elements, in which the latter are embedded. Each new element thus makes these relationships evolve and redesigns the future of variety evaluation. The first step will be to review the literature on the subject. Then I will discuss the particularities of this experiment and the way it aims at defining the “good” experimentation.

## 2 Literature review

Varietal selection in vines as well as in species cultivated in field crops has been delegated to agronomists, for health and commercial reasons (Bonneuil et Thomas 2009). Producers were then relegated to the role of end-users of varietal innovation (Akrich 2006). The selection was mainly carried out in experimental stations. Cardona et al. show how experimental stations were created with this linear vision of innovation and oscillated between innovation’s promotion and research (Cardona, Lefèvre, et Simon 2018). However, in recent years, this innovation regime has been challenged, particularly in order to enhance the role and involvement of producers in varietal selection (Bonneuil et al. 2006). The experimentation I followed in Languedoc is shaking up the variety selection frameworks proposed by the breeder of varieties, involving new actors who wish to set their concerns as priorities of the experimentation.

While some put a shared definition forward of what “*in situ* experimentation” should be (a plantation among winegrowers, with the possibility of testing the variety until the market by selling the wine produced), others highlight divergences concerning the goals of the said experimentation (for which knowledge production?). Experimentation as a process to produce knowledge about nature, is a privileged object of analysis in the field of STS (Latour 1987; Shapin et Schaffer 1993). These researches have largely focused on laboratory experimentation as Dear explained in a literature review (Dear 2015). More recently, many studies have focused on experiments with non-scientific actors (Stengers 2013; Meyer 2015), or

moving further away from biological research, as in the case of market construction (Muniesa et Callon 2007) or the experimentation of urban objects (Laurent et Pontille, 2018). As in those such works, this article intends to adopt a pragmatist approach to research undertaken with the concerned actors (Dewey 2010), and stresses the importance of involving human and non-human actors in the debate (Callon 1986; Puig de la Bellacasa 2015; Tsing 2015).

Although actors themselves do not speak about being involved in a “participatory-selection process”, i.e. “a type of research in which users are involved in the implementation and design of a new technology” (Ceccarelli 2006), it is interesting for us to take a look at this literature with regards to the emergence of new groups of actors involved in variety experimentation. These researches highlight the benefits obtained in terms of knowledge production, particularly on the interactions between the genotype and the environment (Lançon 2001). This method of varietal selection is particularly interesting for studying social issues, as Sarah White shows. According to her, “the idea of participation as empowerment is that the practical experience of being involved in examining options, making decisions and taking collective action to combat injustice is in itself transformative” (White 1996, 146). However, only a few studies are interested in changes induced by technical teams involved in the experiments, and they reveal the “objective” results of the experiments. They do not highlight the uncertain, unstable and negotiated nature of the process, particularly when it comes to the selection of experimenters. Varietal experimentation in viticulture appears only in a few SHS research projects. However, we can highlight the singular experience in testing GMO rootstocks at INRA in a system that includes anti-GMO actors (Bertrand et al. 2005). The authors examine how public research institutions integrate the questions of concerned groups into their research, whether they are potential future users of innovation or citizen groups mobilized for a common cause. We will see that the nature of actors involved in the experimentation that I follow in Languedoc and the presence of the interprofessional group guide some of the questions on the quality of wines produced with the experimental vines.

Many studies focused on questions related to the definition of the quality of wines, in the market strategies used to combine grape varieties, appellations and terroirs (Dubois 2006; Olivesi 2016). Antoine Hennion offers a reading of Valuations Studies (Helgesson and Muniesa 2013; Heuts and Mol 2013) through the experience of wine tasting (Hennion 2015). He puts forward a resolutely

pragmatist interpretation of how the quality of a wine is evaluated, by focusing on uncertainties that actors share, and by moving away from a dualistic vision following which the value of things is either natural (an intrinsic property of the object) or attributed according to social and cultural logics. The same approach confirms Barrey et al.’s interest in the highly indeterminate notion of “authenticity” when they examine wines in the AOC (Barrey and Teil 2011). In this paper, I will also follow how actors define what constitutes a “good” varietal experimentation on grape varieties resistant to mildew and powdery mildew. Their concerns are multiple and involve technical, political and relational elements that enter into dialogue with the implementation of this experimentation.

## 3 Results

### 3.1 The implementation of an atypical experimentation

After months of negotiation, the research institute accepts the testing setting in February 2017. Winegrowers, researchers and technicians gather around the official launch of grape variety experimentation. This is the result of several months or even years of local actors’ mobilization around these varieties. At the beginning of my investigation, the varieties in question were shelved by the French research Institute who did not wish to distribute them due to their seemingly uncertain resistance. At the end of 2016, I witnessed a change of direction among scientists who, under the pressure of professionals, accepted testing the said varieties within a strict secure framework, in a kind of pre-registered experimentation. Non-registered varieties are usually tested in experimental plots or with partner producers by technical institutes. Grapes and vines need to be recognized and protected (registered in the national catalogue) before being distributed to winegrowers. They are tested through different kinds of indicators including their physiology (colour, size, and so on), their behaviour according to the seasons, terroirs, etc. Wine itself is also tested but not sold. With this new experimentation conducted in parallel with the experiments generally set up for the catalogue registration<sup>6</sup>, its promoters wanted to test vines *in situ*. The definition they give to what constitutes *in situ* is rather broad. It means that vines are

<sup>6</sup> DHS (Distinction Homogénéité Stabilité) and VATE (Agronomic, Technologic and Environnemental Value) are preliminary tests on a variety before its registration in the official catalogue.

to be located directly in the producers' vineyard plots, not only in two or three different stations determined as referees. The collective experimentation may also include an ever-increasing number of vineyards testing by themselves wine making according to their know-how and their marketing methods toward consumers.

A regional interprofessional committee leads this experimentation in Languedoc. This private organisation brings together all economic players of the regional wine production sector (producers and merchants). About 1300 producers are members of this organization. Its director leads the meetings on the setting up of the experimental device. He gathers various regional actors with various skills: researchers who have visibility on the oenological potential of varieties (two researchers are involved in the experimental device) and technicians from the professional agricultural organisation, who are used to conduct experiments on the agronomic qualities of the tested varieties (two technicians are involved in the experimental device). Together, they reinvent ways of experimenting with wine growers. In this paper, I will call them 'the small team'. In 2016, when these five actors started thinking about setting up the experiment, they already knew each other very well. They have already worked on joint projects involving these varieties. They have been mobilizing for several years to show the interest of these varieties. What we are seeing with the small team here is not just a simple local version of a national project, but the result of many years of mobilization by these actors. They are linked by a Languedoc wine context that has improved in quality in recent years and is able to integrate an innovation as ambitious as the change of grape varieties in its vineyards. Where other terroirs that are attached to emblematic grape varieties are struggling to take an interest in resistant grape varieties, Languedoc is the driving force on the subject.

I attended the information meeting in February 2017 that brought together producers, the research institute and various locally involved partners to launch the experiment. Then, the small team was formed and I followed their meetings around the experiment's implementation. The director of the interprofessional committee asked me to analyse the results of the questionnaire, which had been distributed among all the producers, members of the interprofessional committee. About sixty of them expressed an interest in these varieties. In the following, I will analyse the choice of the questions in the questionnaire, along with the responses and the emerging debates that took place during those preparatory meetings. My engagement in the field allowed me to seize sensitive questions arising behind the scenes.

### 3.2 To accept the uncertain nature of experimentation...

The producers' commitment during the kick-off meeting appears in the discussion. Stakeholders relocate wine-growers at the heart of the action: *"it is thanks to **you** if today we accept the experiment of these varieties, it is **you** who will produce the results at home, and all the results will be shared between you"*<sup>7</sup>. During the course of the meetings, concerns are raised about the uncertainties involved in the implementation process. Technical, regulatory or political in nature, they change problems and answers that are brought to solve them. Among the uncertainties, there are various elements that are already known and those that emerge as the discussions progress. The members of the small team debate, assess the difficulties those uncertainties impose, imagine ways to take them into account or to transform them into strengths. A first element had not been anticipated: a collective winery needs a minimum quantity of grapes. However, the small team decides to note its importance and make it influential in the ways in which the "good experimenters" are selected. A wine-grower's commitment with a cooperative cellar is not an individual commitment, it is cooperative cellar behind him that is also committed with him. Then, the "good experimenter", initially thought as a single wine-grower, becomes a collective entity. Another example of a known difficulty transformed into a great asset in the selection of the experimenters involves the availability of the plants. Initially, this appears to be a constraint. Some varieties cannot be planted in 2018 because there are too few vines<sup>8</sup>. There are also fewer producers who can participate in the experiment. We will see that members of the small team decide to take up the problem and set up the conditions to produce healthy plants quickly. This largely impacts the definition of the "good experimenter". Depending on the way in which these two elements emerge and are considered, the screening of the applications leads to a more precise definition of what qualifies as a "good varietal experimenter".

Located at the centre of experimentation, wine-growers are, above all, the new element of this pre-registered variety experimentation. Their presence raises new questions and new problems in the technical team: how to ensure their commitment to the experimentation? How to work with them? Will they be rigorous enough

<sup>7</sup> Field notes February 2017

<sup>8</sup> The vine is reproduced by cutting. The plants proposed by nursermen are generally from a small part of the branch of a vine called a mother vine.

to provide scientifically treatable results? Two elements emerged from the discussions between the protagonists: the necessity to share common values (knowledge, risk, etc.) and to re-examine one’s own uncertainties (availability of planting, areas to be planted, etc.). A technician from the professional agricultural organisation nevertheless stresses the constraints imposed by the experimentation:

*“I have experimented for 40 years, I was pleasantly surprised to see so many applications. It was mentioned, it’s huge (...). But there is one word that has been uttered since the beginning and that repeatedly came back: “experimentation”. And I believe in this theme for several reasons, but I agree to say that this experimenting will go to the end and will work, but I also accept the idea that maybe it will happen with things that are not planned and that maybe it will not work. (...) I’m afraid that many people who from the start responded nicely, confused “experimenting” with “being the first to have at home” innovative material”*<sup>9</sup>

This technician underlines the uncertain nature of the testing results. He staged himself to support his point. The risks exist (results could be disappointing, the plot could have to be torn out) and will be borne by the producers, i.e. the experimenters. Winegrowers will be able to access genetic innovations more quickly, within a strict framework (supervised by public and semi-public institutions and with size and duration limits) without knowing in advance vines’ characteristics in similar pedoclimatic zones. They take *“the risk of not getting good results”*, says the technician from the professional agricultural organisation. What “good results” mean, is not defined at this stage of the survey. He notes his preference to work with flexible people. An essential characteristic of the “good experimenter” already appears: one that accepts the uncertain nature of the experiment.

Varietal’s pre-registration testing has been carried out until now by public or semi-public bodies; now they could be carried out in parallel with the experimental stations and at producers’ vineyards<sup>10</sup>.

### 3.3 To choose the right experimenters

Some of the producers present at the kick-off meeting expressed their disappointment when they learned that only some of them would be able to plant the requested varieties in 2018. Indeed, the constraint related to the

number of producers involved in the experiment is possibly related to two major factors: a planting restriction per variety and per production area, and a restricted number of authorized varieties in the experimentation. The first restriction is explained by a legislative text which regulates the areas that can be planted according to the varieties characteristics<sup>11</sup>. In the absence of DHS (Distinction, Homogeneity, Stability)<sup>12</sup>, only three hectares can be planted on the national territory. And only seven vine varieties over more than ten proposed have been chosen by the research institute to be experimented. The selected varieties were also the most demanded ones, during the first call for interest in the fall 2016. One of the seven varieties received more than 37 hectares of applications, while only 3 hectares were to be planted by 2018. How to separate applications? What additional information should producers be asked for? These are all the issues on which the small team has been working on since March 2017.

The expected commitment of wine-grower doesn’t have the same meaning for all the five actors of the small team. According to one of them, the grower must be a trustworthy person who protects the plants from theft and preserves the genetic resource. According to another one, the grower is the guarantor of the knowledge produced. Finally, the experimenter sometimes appears to be the master of the experimentation that he will carry out at home, committed to the optimal conditions for the development, production, wine-making process and the sale of these little-known grape varieties.

#### 3.3.1 Objectivity in the choice, building a questionnaire

Following the kick-off meeting, a questionnaire is sent out to all producers who have expressed an interest in participating in the experiment so that they can detail their conditions for implementing the project (plot number, soil and climate conditions, type of finished product, etc.). More than knowing the producers, this questionnaire aims at anticipating a possible knowledge production. How to define objective selection criteria? The task is a delicate one, as the criteria of optimal conditions listed by the various partners are numerous: “the plot is healthy”, “easily accessible”, “the producer is trustworthy”, “and certain selected parcels are located in terroir PDO”, “favouring the development of collective projects”.

<sup>9</sup> Personal field-notes February 2017.

<sup>10</sup> Arrêté du 9 mai 2016 « établissant les modalités de classement des variétés de vignes à raisins de cuve ».

<sup>11</sup> Arrêté du 9 mai 2016 « établissant les modalités de classement des variétés de vignes à raisins de cuve ».

<sup>12</sup> DHS is a test for the variety to be listed in the official catalogue.

Different points of discussion appear not only around the choice of plots but also around the experimenters' choice and are translated in the questionnaire (Figure 1). The testing project is defined during the course of the debates: its objectives, framework, along with the knowledge one wishes to produce.

9. Maintenez-vous votre engagement s'il est appliqué une réfaction par rapport aux hectares demandés initialement ? \*
- Une seule réponse possible.*
- ☐ OUI
- ☐ NON
10. Seriez-vous prêt à participer à une formation qui fixera l'ensemble des règles à respecter dans le cadre du projet (conduite du vignoble, traitement,...) ? \*
- Une seule réponse possible.*
- ☐ OUI
- ☐ NON
11. Accepteriez-vous une visite de la parcelle afin d'établir un état de la parcelle avec une étude de l'environnement par une personne habilitée ? (juillet) \*
- Une seule réponse possible.*
- ☐ OUI
- ☐ NON

**Figure 1:** three questions among the thirty six questions of the questionnaire

While the special feature of this experiment is, above all, to create the possibility for producers to experiment on their plots of land, in their cellars and even in their markets, with varieties that are not yet registered in the official catalogue, it must also make producing knowledge about these varieties possible: their behaviour in the different soil and climate environments, their behaviour towards populations of indigenous pathogens, their characteristics with regard to different types of winemaking process, and so on. In order to distribute the available vines as early as 2018, the small team in charge agrees on the data to be requested from producers concerning the characteristics of their plot, their management of cultivation and their final product. These elements are usually self-informed when they carry out variety experiments: soil type and composition, climate, presence of winds, technical itinerary, etc. In addition to these, there are also specific criteria about the nature of the varieties: the sanitary pressure on mildew and powdery mildew, the fact that the plot is on the edge of a village on a protected area. Concerning the final product, the questions aim at specifying whether the producer is in an individual or a cooperative cellar, whether the wines produced will be wines to blend or not, what types of winemaking (colour and sign of quality allowed by the terroir) and the sales objectives. Finally, someone proposes to leave a comment so that the producer can comment on the advantages of his plot for the experimental network. One of the actors reacted to this proposal, exclaiming that “it looks like a competition!” For the others, it is rather a “letter of intent”.

The questionnaire should give the local group the

opportunity to select experimenters in an “objective” manner. The attention given to elements of the questionnaire differs according to the skills of each members of the local group. While some of them are accustomed to following varietal experiments in pre-registered situations (monitoring the behaviour of varieties in order to include them in the official catalogue), others are competent in plant production or in wine-making practices. All of these competences are intertwined to justify the selection of listed criteria and to prioritize them in relation to objectives attributed to the experimentation. However, some criteria compete with others. For two of the seven varieties, plant material is not sufficient: no vine may be distributed to growers, or at the margin. One of the actors in the small team points out that he knows a producer who is very interested in one of them. He is quickly called to order by his neighbour at the table who reminds him that he too has been approached by many winemakers who have told him: “*don't forget me!*”. This interaction highlights the willingness of the small team to explain their choice of the plots of land with objective criteria and not by political considerations. At a subsequent meeting, one of the partners will welcome the fact that an elected representative, who is nevertheless heavily involved in the defence of these varieties, was not chosen among experimenters.

Involved in the small team to sort out the answers obtained to the online questionnaire, I tried to render visible the various criteria that were discussed during the first meeting. More than twenty hectares are required for one of the seven vine varieties available for the experimentation. Only three hectares can be planted from 2018 on, which implies that a choice must be made. I started by cleaning the spreadsheet, some of the requests were duplicated. Then I brought all applications above 1 hectare to 1 hectare. The total number of applications amounted to more than 14 hectares. I then reduced all the applications to a maximum of 0.5 hectares, but the total demand was still too high: 9 hectares. Then I tried to highlight demands in PDO terroirs, those which emanate from the same collective project (in a cooperative cellar), those in particular cellars which have interesting characteristics (those whose plots intended for experimentation are virgin plots or which have not seen vines for more than 10 years, the plots in natural areas and the production in organic viticulture). I thus identify two collective projects (for which some of the parcels proposed have been grubbed up in vineyards for more than ten years) as well as individual producers who have identified several criteria ranked among the most important ones by the small team. I presented the results and my actions to

the small team at a meeting on June 9, 2017.

The elements presented below focus on the three specific points specifically selected to feed this article: the question of producing woods; the question of vinification in the experimentation and the choices imposed by the European project. They reflect the discussions that emerged following the presentation of the sorting I carried out on the database. I then observe a recomposition of what a “good experimenter” should be.

### 3.3.2 Objective of the experiment: to produce numerous healthy plants?

Many problems appeared in the vine wood harvest of winter 2017: loss of vines woods, lack of woods for grafting. These woods, resulting from the pruning of the vines, would be transmitted to the institution in charge of plant multiplication. It would ensure grafting these woods on rootstocks, resistant to phylloxera. The operation is not simple, and the technician’s testimony reveals all the difficulties he faced. The inventory of plant material shows that most varieties have too little mother plants to meet the exponential demand for experimental plants in the coming years. Indeed, once the DHS has been obtained, 20 hectares of an unregistered variety can be planted per production basin, compared to 3 hectares when the variety has not passed the DHS test<sup>13</sup>. However, most of the varieties in question are awaiting DHS by the end of 2018. The exponential need for future plants pushes the actors to anticipate the production of plants while opening the experiment to a maximum of winegrowers. What if winegrowers also became suppliers of woods? The technician of the professional agricultural organisation proposed that the first plantations should be wood reserves for experiments in following years. To do this, selection among applications must be strict. There are official criteria for planting mother vines, he tells us: on virgin land, or on land where the last vine was uprooted more than 10 years ago (without regrowth).

These considerations show that the vine itself is a major actor in experimentation. Its particularities, requirements concerning its breeding conditions are elements that the small team seriously takes into consideration. The small team wonders: should proposed parcels be required to have no vines for more than 10 years? This may disqualify many candidates from the experimentation, and there is a risk that no application would fit the criterion. Among

winegrowers in cooperative cellars, few make crop rotations. This criterion contradicts the group’s desire to favour collective projects as we will see below. They consider asking for this information on the plots of land, without exclusively considering the plots that had rested for more than 10 years.

### 3.3.3 Can a “good experimenter” be a collective one?

During the kick-off meeting in February 2017, a producer in a cooperative cellar points out that “*three hectares is peanuts!*” and that there can be no “product” objective in a cooperative cellar unless there are at least three hectares to be vinified. A cooperative winery (or cooperative cellar) needs a minimal production to fill a vat and cannot do micro-vinifications. At least two or three producers from the same cooperative have to be part of the experimentation. For observing pathogens, this is tantamount to accepting a single observation site. The cooperative members are generally located on terroirs very close to the cooperative winery and there is no heterogeneity of soil and climate contexts, compared to the distribution of experimental plots over several departments. Yes, but enlisting the producers of a cooperative winery will ensure a rapid dissemination of plant material if the experiment is conclusive<sup>14</sup>. The emergence of new constraints expressed by this producer, such as a minimum volume of wine to be vinified in a cooperative winery, forces technicians in charge of the experimentation question their priorities: should we favour collective projects (wine making that is carried out by the cooperative winery) or should we encourage the diversity of soil and climate sites? One of the members of the small team suggests that the network should take charge of oenological experimentation in case it is too complicated for the winegrower. According to him, taking charge of vinification outside the farms engaged in experimentation is a guarantee of obtaining results on micro-vinifications. Yes, but other members consider that this stage, “life-size winemaking at the winegrower’s”, should also be at the heart of the project. According to the regional interprofessional committee-director, the commercial aspect is also an expected result of the experimentation. At the end, the small team agrees: it is better to take into account the constraints of some winegrowers or cooperatives by allocating them a little more hectares. The choice made is to favour collective projects that emerge by 2018. The “good experimenter” could become a collective unit rather than a single winegrower.

<sup>13</sup> Arrêté du 9 mai 2016 « établissant les modalités de classement des variétés de vignes à raisins de cuve ».

<sup>14</sup> Field notes spring 2017.

### 3.3.4 A choice driven by an UE funding?

Each of the five varieties<sup>15</sup> available for experimentation from 2018 onwards is reviewed by the small team. At the end of this inventory, as the choices are fine-tuned, some questions remain: “such a producer had informed us of his interest in a particular variety but did not fill out the questionnaire”; “could such a cooperative cellar be able to vinify so little grape?” and so on. Actors around the table take care of these remaining uncertainties by contacting the targeted experimenters. Then one technician, head of a future potential FEADER project (UE funding), scribbles a table on his notebook to list the selected experimental projects, and the departments concerned. He explains that in the project to be submitted, it is necessary to reach a balance between different areas (Gard, Hérault and Aude) because the parcels will be monitored by each of the departmental professional agricultural organization. A new criterion appears: the necessity to reach a balance in the number of parcels to be distributed between the three departments.

## 4 Conclusion

Descriptions above show some elements behind the scenes of the experimentation. The planting has not yet taken place. This period is particularly conducive to observing the emergence of each project partner's concerns. Questions and problems arise in the implementation of the experiment. Far from being monolithic, the implementation process reveals the differences in the definition of what qualifies as a “good experimentation” among the members of the small team. It is co-defined by experimenters and vine plants along the process. Describing all these details allows us to witness the variety of problems emerging along the way. This underlines the uncertainties inherent in the experimental approach, in the absence of a protocol already tested.

I have accepted a role in data processing. Just like the actors involved, I learned what it means to experiment, to form a group, to see problems emerging and being formulated. The actors I follow produced the grafts necessary for planting, built a questionnaire to determine the winegrowers' requests, set up the financing files for the follow-up of the experiment. Being attentive to their practices makes it possible to become aware of what matters for each of the actors in the small team, different

ways of being involved in experimentation, whether it is through the production of healthy plants, production of data around varieties, development of new markets, etc. The experiment is indeed the object of this study. It is not simply a means to achieve a goal. The goals themselves are changing. The one that unites all the actors is their will to experiment *in situ* with the varieties. Two uncertainties guide the desire to carry out a participatory experimental project: the quality and resistance to mildew and powdery mildew of these varieties. The experimentation among producers is creating new uncertainties. Monitoring the selection work of the experimental plots reveals a set of questions that will have technical, social and even sometimes political aspects. But these elements are not clearly distinct. On the contrary, there is a fine entanglement between all these elements.

The case study presented above allows us to observe how experimentation and experimenters are defined at the beginning of the experiment. The presence of stakeholder groups that include wine-growers, but also their vineyards, their wine-cellar and so on complicates the knowledge production process. However, it highlights what really matters: all the emerging issues are linked to the desire to integrate winegrowers into the heart of the experience. The purpose of this paper is to describe precisely how the small team – some local actors mobilized for many years – has tried over the past few months to define the “good experimentation”. Drawing on the STS literature about experimentations (Dear 2015; Stengers 2013) and on participatory plant breeding (Ceccarelli 2006), we suggested that a focus on defining the framework for participatory varietal experimentation provides a relevant entry point for studying transformations in contemporary plant breeding. We stress that the definition of this framework also helps the actors to define the objects of the experimentation: are they varieties? Winegrowers? Terroirs? Markets? Or all at the same time?

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<sup>15</sup> Two of the seven varieties do not have enough wood to be distributed by 2018

**Ethical approval:** The conducted research is not related to either human or animal use.



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