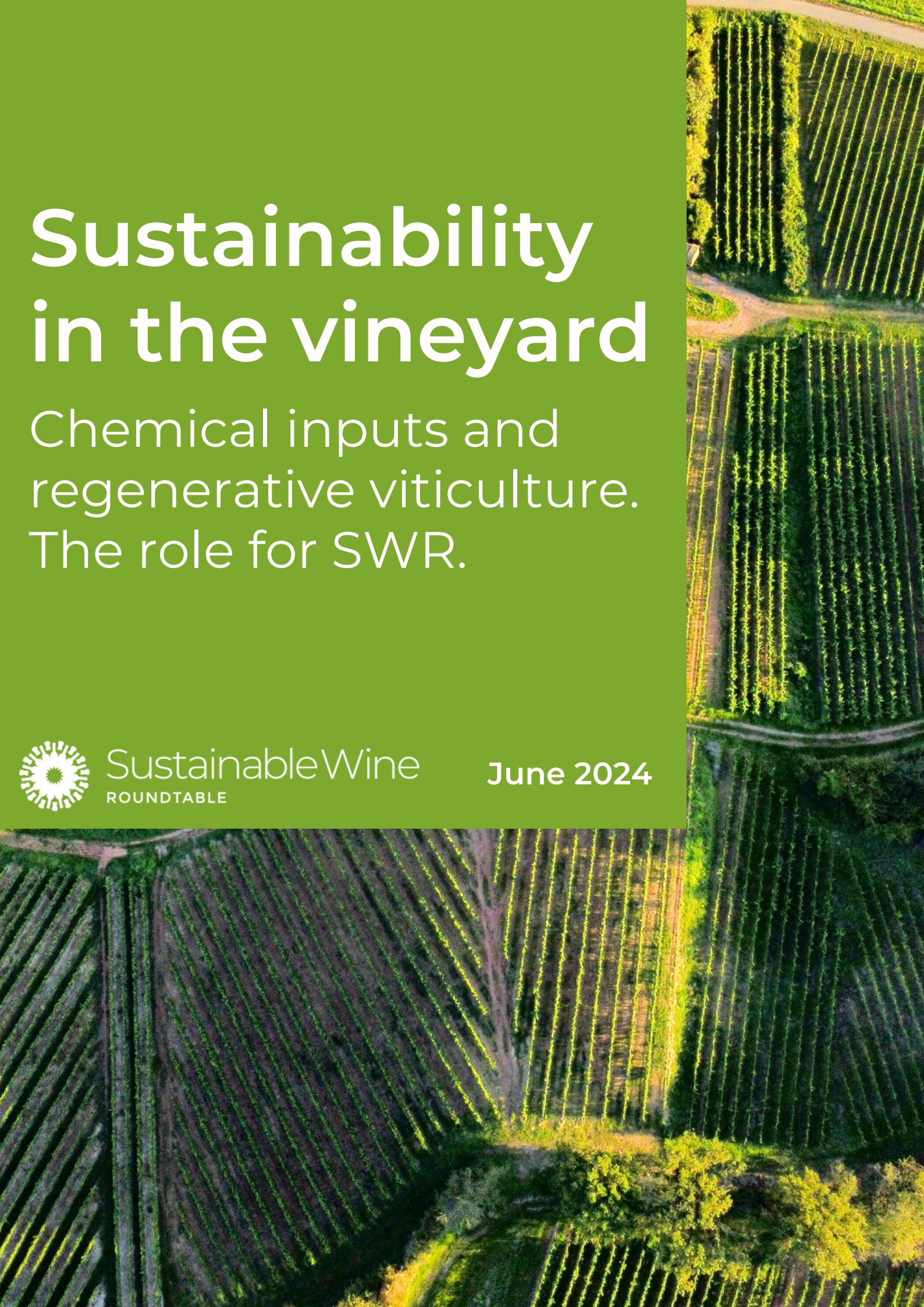
Sustainability in the vineyard

Chemical inputs and regenerative viticulture. The role for SWR.

SustainableWine ROUNDTABLE

June 2024



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Introduction

This paper sets out a strategy for SWR to define and support best practice in sustainable viticulture globally. This paper builds on the work over the past year led by a group of SWR members who focused specifically on issues related to the sustainable use of vineyard chemicals. However, what has become clear is that improving practice lies not just in reducing the amount and the toxicity of chemicals used, but in reorienting 'business as usual' to mean that fewer chemical inputs are needed in the first place. Reductions in chemical use needs to be seen as part of a wider strategy to approach viticulture differently.

Environmental practices in the vineyard are, arguably, some of the most important issues in wine sustainability. However, some aspects of this are highly sensitive, in particular the issue of chemical use: of herbicides, fungicides fertilizers and so on. The public debate often frowns on the use of such chemicals, and the organic movement has thrived in part because it claims to reduce their use.
Yet the reality is that whilst organic and biodynamic approaches are extremely valuable, they are not the only ways to lower a grower's environmental footprint, and they still permit the use of chemicals, like copper, which can be toxic. Moreover, these approaches do not work well in all growing areas, and potential yield drops means some growers do not wish to adopt them.

In the past two or three years, there has been an increasing focus on 'regenerative viticulture'. This is presented as a means not only to address the challenges of sustainability, but also to actually redress the damage done by agricultural practices used in recent decades. Yet there is no single definition of the term 'regenerative viticulture'. The risk therefore, is that the term becomes devalued or associated with greenwashing. Therefore, the questions this paper poses, and which SWR's work in this area will seek to answer are these. Firstly, what does sustainable viticulture look like, regardless of whether a grower uses organic, biodynamic or conventional techniques? Secondly, what do effective, credible regenerative practices look like, and how do these contribute to sustainability in viticulture?

Our proposal is to develop a Sustainable Viticulture Protocol, to provide a shared approach for SWR wine makers and others. This would build on the model of SWR's Bottle Weight Accord which has proven a highly effective means to provide joined-up action to reduce bottle weight. The Accord now has nearly 20 participants, both retailers and growers, who between them make and sell more than a billion bottles of wine. The Protocol would provide a similar shared framework to drive change across the sector. Some of the content of this Protocol has already been developed by the work to date. This paper therefore also sets out SWR's proposal as to how this can be built-out over the next two years.

Key findings of the vineyard chemical use project

The inputs working group consisted of Cloudy Bay, Geisenheim University, Ste. Michelle Wine Estates, Treasury Wine Estates, and VSPT Wine Group. A series of interviews were also conducted with other members of SWR. The core remit of the project was to explore how to develop a shared approach to chemical use which is also consistent with sustainability goals.

The working group met several times during 2023, and one-to-one meetings were also held. In addition to work with members of the working group, interviews were also undertaken with a range of other growers to understand the challenges in relation to vineyard inputs. This is clearly a topic which exercises minds and is a source of considerable worry. It is important to note how isolated even the largest producers feel themselves to be on these issues. On a number of occasions, interviewees expressed the feeling that they worked with inputs in the most responsible way they could but felt very vulnerable to attack by NGOs, campaigners and so on. This section reviews both the issues raised by the group, and potential solutions proposed.

Issues raised

Key issues raised from the interview process were as follows:

Organic / Biodynamic

In the minds of many of the general public, the terms 'organic' and 'biodynamic' are seen as synonymous with best practice in agricultural practice. That these terms are seen as a gold standard tends to imply that any other forms of viticulture will be more damaging to the planet and therefore less sustainable.

There are a number of problems with this association, not the least of which is the fact that organic production does still permit the use of chemical inputs, although many fewer are allowed than for conventional farmers. Moreover some of these, copper sulphate for example, are potentially toxic. The central challenge though is that switching to organic or biodynamic production is not a choice that all can, or want to make. For some, the rules of organic wine-growing will not work well with the topography or other features of a vineyard's geography.

Others may not want to, or be able to afford the cost of switching to organic production – vineyards not established for organic production experience a fall in productivity. Some challenges are hard to solve using only organic approaches.

Moreover, interviewees were adamant that the practices they operate are consistent with sustainability: the term 'conscious viticulture' was coined. What is needed from SWR, therefore, is an approach that allows all growers, whether they use organic, biodynamic or conventional approaches to demonstrate clearly that they are focused on sustainability, and that their methods of growing grapes does preserve, and indeed restore nature.

The regulatory burden

The regulatory burden on wine growers in relation to chemical inputs is significant. In most if not all jurisdictions these substances are regulated in many dimensions, including chemical composition, storage, dosage in use and so on. The challenge is further compounded by the fact that a growers wines may be sold into a range of different end markets, so the chemical usage needs to accord with regulations in those end markets, as well as with restrictions in the country of origin. Moreover, these regulations are subject to frequent changes which further complicates the challenge of complying with them. One interviewee observed that "sometimes the only way we learn about a change in the regulations of one of our sales markets is when we get fined." There is certainly a need for growers to know in advance about significant changes in regulation so that they can change their practices on-farm.

Appropriateness of regulation

A further complaint from interviewees was not simply the amount of regulation with which they have to deal, but also its appropriateness. Criticism was levelled in particular at the EU: "they develop regulations which might be appropriate for Europe, but are not relevant in places where the prevailing climate is different." Furthermore, there were concerns that, in some cases the banning of one chemical required the use of other treatments, the cumulative effect of which could be more damaging. "If you have to use three other chemicals because you can't use glyphosate, that may well be worse!" was one remark.

Science or the media?

Interviewees expressed considerable disquiet about the public debate around chemical use in viticulture, and in agriculture more generally. As one group member put it, "are we meant to follow the science or follow what the media thinks the science says?" The fear is that public discussion about some of these issues can sway political opinion around what should and should not be allowed.

Defining an ideal chemistry set

Initially, the group looked at the idea of developing a list of practices and chemicals which would constitute 'the softest impact chemistry.' Whilst sharing best practices will be a valuable on-going remit for this group, the idea of developing a single list of chemicals is problematic simply because of the variability in growing conditions which people work with. One interviewee operating in California said that even in one (albeit very large) state, the chemical inputs varied considerably from site-to-site. The reality is that good viticulture requires growers to select chemicals which are most appropriate to the conditions in each location.

Sharing good practice

Even though it is not possible to define a single set of recommended chemicals, there is nonetheless a need for greater communication between growers on this topic. It was notable how isolated even some of those in the group who represented larger wine groups felt?. A strong sense came from the interviews that whilst all strived for practices as sustainable as possible, they nonetheless still felt vulnerable, for example to being attacked by NGOs and accused of poor practices. "We feel not in the know, and that worries us", was a comment from one interviewee.

There is clearly a need for a shared approach to managing vineyard chemistry. However, there is also a need for SWR's producer members to be able to share practices about what works in particular circumstances, so they can learn from each other. In particular, examples of how alternative chemicals can be used to achieve the same effect as more toxic ones.

Most interviewees said that they would welcome a basis for discussion of what alternatives are most viable in situations when existing chemicals are banned. Obviously, the specifics will vary given different terroirs and regulations, but nevertheless, there is considerable appetite to share knowledge and learned (sometimes 'best'!) practice.

It's not just about chemistry

Whilst this project was established specifically to look at the sharing of data, impacts and applications, of vineyard chemistry, the point was made by a number of participants that this discussion needs to be seen in a wider context of viticultural practices in the vineyard. Issues raised included the use of more detailed mapping of the vineyard to allow better targeting of inputs; the use of IPM; and the use of different practices to achieve what might have been done in the past with chemicals.

In the long run, there is also a strong need to consider the choices that are made in relation to cultivar selection. As climate change continues to affect vineyards, reducing chemical inputs may be increasingly difficult with varietals not native to a particular location. Moreover, new plant breeding is moving fast, and new varieties of vines are being developed which are disease resistant. There is huge potential in these developments to move to cultivars which by their very nature will need fewer chemical inputs.

Risk-based approach

Building on the previous point, there was considerable agreement that central to good practice on inputs is a risk-based approach. Some risks may be periodic, for example the prevalence of insects; others may be on-going. The key is to "understand the risk to your variety, in your region, in a given season." This then allows a hierarchy of control, and the top of which is to explore how a risk can be avoided or, over time engineered out for example by canopy management and the use of bio-security controls. Where chemical inputs are still required, then the minimum should be used of the least damaging substance available. "Interventions need to be as focused and relevant as possible."

The financials matter

As one interviewee said, "we need to get this right because we want to export more." There is also a recognition that issues of sustainability, and of what residues might be present in foods is an issue of increasing concern to some consumers. At the same time, although growers accept that "we have to do what the retailers want", there is still a need for solutions to be cost-effective. At every meeting it was stressed that good vineyard practices are only sustainable if the underlying business itself is financially sustainable.

How to move forward

As well as identifying the challenges in relation to vineyard chemistry, the project also focused on what a solution might be to these. Self-evidently, the idea of a single, universal set of inputs to be used by all growers is not realistic given the variability in the needs of different vineyards – be that in relation to altitude, water prevalence, soil type or other factors.

However, an approach that did have traction was the development of a shared approach to decision-making in relation to chemical use. This would be a principles-based approach to be used by all participating members. This would mean that, even if the specifics of what each member was doing in relation to IPM, fertilisers, herbicides and so on were very different, in each case that 'basket of inputs' had been arrived at by precisely the same decision-making process. This would potentially be extremely valuable in demonstrating how decisions taken derived from clear values and priorities, and this could be communicated within the supply chain, for example with buyers and retailers.

Principles-based frameworks

A number of approaches exist which could be valuable in developing a shared framework for managing these issues in a consistent fashion. As with all of SWR's work, it makes good sense to build on what others have already done. The wine industry could be a leader in these topics, especially if it leverages knowledge, models and insight developed elsewhere.

Allan Savory model of holistic management

This eponymous model was developed by Allan Savory as "a framework for managing complexity." [1] Savory himself had been a farmer and agricultural consultant, and developed a model for land management which he believes restores degraded land, and address challenges such as desertification. This he refers to as 'holistic management', which is intended as a decision making tool in complex agricultural environments.
Whilst his model was developed principally with agriculture rather than viticulture in mind, it is relevant to this report to review his recommendations since the demonstrate the 'principles-based" approach. It is based on four so-called 'key insights', and on an understanding of ecosystem processes, which are set out as follows:

Brittleness scale: A scale from 1 to 10 that describes the availability of moisture across the calendar year, and thus how plants are able to decay (or not) during a landscape's growing and dormant seasons.

Predator-prey connection: The co-evolved relationship between herding animals and pack-hunting predators shows how livestock behaviour changes when grouped in herds, allowing for proper grass trampling, forage utilisation, breaking up of capped soils, and movement to fresh pasture.

Nature functions in wholes: Nature does not function at the plant or animal population level, but synergistically at the level of whole biological communities, which management should never lose sight of.

Plant and soil recovery time: Overgrazing and trampling are commonly believed to be caused by too many animals, but they are a function of time – not numbers. Plants and soils aren't damaged when exposed to animals for short periods followed by longer periods that allow full recovery.

[1] "Holistic Management," Savory Institute, April 19, 2024, https://savory.global/holistic-management/.

Ecosystem processes: Sunlight converts to grass; dung turns to fertility; rain recharges aquifers; and life begets more life.

Savory's organisation makes great claims for this approach, but it has met with criticism. English campaigner, George Monbiot that Savory's "statements are not supported by empirical evidence and experimental work." [2] The same criticism was made also by The Sierra Club in the US.[3]
Despite these criticisms, the planning process at the centre of this approach does bear out the importance of a structured approach.

- Ecological monitoring: Evaluating leading indicators of ecosystem function.
- Land planning: Ensuring that infrastructure on a farm matches short-term actions with long-term vision.
- Planned grazing: Optimal use of animals on the farm, although in the case of wine this will not be universally applicable.
- Financial planning: All of this needs to be done whilst maintaining profitability.

Integrated viticulture

Integrated management in agriculture (and, by extension, in viticulture) in reality is not an alternative method of farming, but more a way of restricting the chemical inflow and farming interventions so as to reduce the negative results on the environment without putting the financial survival of farming at risk.

Integrated management is based on the "right dose at the right moment". This means close and continuous monitoring of the farm so that any problem can be immediately detected and dealt with appropriately—as opposed to letting the problem get out of control and needing stronger interventions. Before fertilizing, the soil and leaves are closely analysed to determine the quantity and type of fertilizer necessary. In order to deal with the insects, traps and predatory mites are used as well as some bio-preparations, wherever they can be applied.

The system of integrated management appeared in the 1990s in Germany, Switzerland and Austria. This was a logical place for the movement to start not only because of its history of heavy chemical interventions in the fields as a response to the prevailing climatical

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[2] George Monbiot, "Eat More Meat and Save the World: The Latest Implausible Farming Miracle | George Monbiot," The Guardian, August 4, 2014, https://www.theguardian.com/environment/georgemonbiot/2014/aug/04/eat-more-meat-and-save-the-world-the-latest-implausible-farming-miracle.

[3] Christopher Ketcham, "Allan Savory's Holistic Management Theory Falls Short on Science," Sierra Club, February 23, 2017, https://www.sierraclub.org/sierra/2017-2-march-april/feature/allan-savory-says-more-cows-land-will-reverse-climate-change.

conditions and the subsequent increased pollution (observed in the environment and in the water sources), but also because of an increased demand from the consumers for healthier and more environmentally friendly products. Nowhere has a specific "certification" of integrated management has been established.

Key elements of an approach to integrated viticulture are listed by the Austrian Wine site as follows:[4]

- Control diseases and pests exclusively with approved plant protection products and only as a last resort.
- Employ all mechanical, physical, biological and land-management methods. If there is no avoiding chemical plant protection, products used must be the most state-of-the-art and carefully chosen so that they have as little an impact on the soil as possible.
- Keep the minimum regulatory distance away from surface waters when using plant protection products.
- Protect groundwater by complying with regulations on the use of fertiliser.
- Maintaining land in good agricultural and ecological condition: cover crops on land that is no longer being farmed as well as a minimum ground cover over the winter months.
- Lower CO2 emissions by making fewer tractor trips through the vineyard, thanks to an effective combination of plant care and plant protection measures.

Regenerative viticulture

In recent years, the terms regenerative agriculture and regenerative viticulture have become much more widely used. However, as one academic review of the topic put it "despite widespread interest in regenerative agriculture, no legal or regulatory definition of the term "regenerative agriculture" exists nor has a widely accepted definition emerged in common usage." [5] A paper prepared for the New Zealand government agreed. "Regenerative agriculture (RA) is proposed as a solution to reverse climate change, biodiversity loss, declining water quality and health of freshwater ecosystems, wellbeing crisis in rural and farming communities and food system dysfunctions. … However, there is a lack of clarity about what RA actually is, [and] scepticism about its claimed benefits…"

Even if the term remains inexactly defined, the concept has received significant attention from producers, retailers, researchers, and consumers, as well as politicians and the mainstream media.

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[4] Integrated Viticulture," Austrian wine. The art of wine. down to earth., 2024, https://www.austrianwine.com/our-wine/environmental-consciousness-in-austrian-viticulture/integrated-viticulture.

[5] Newton et al., "What Is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes," Frontiers in Sustainable Food Systems 4 (October 26, 2020), https://doi.org/10.3389/fsufs.2020.577723.

In the wine sector the most comprehensive work on regenerative practices has been compiled by the Regenerative Viticulture Foundation [6] which has developed a toolkit of the various techniques and approaches which, in their view, are encompassed by the term regenerative viticulture. These include:

- **Monitoring soil health:** Monitoring is essential if improvements are to be made in soil health. RVF recommends lab tests every three years to show trends over time.
- **Soil organic matter:** This needs to be improved over time, for example by reducing tillage, and using compost and cover crops.
- **Inter-row tillage:** Tilling should be reduced as far as possible as it exposes soil to the air, leading to carbon emissions to the atmosphere.
- **Compaction:** Compacted soils perform less well. This means reducing tractor passes, and using earthworms and plants with deep root systems as approaches to remedy this.
- **Use of cover crops:** Cover crops provide a range of benefits, including reducing evaporation from the soil, improving biodiversity, and improving soil health. RVF recommends the use of native species.
- **Animal integration:** Animals in the vineyard can promote improved soil health. Their dung can also act as a fertiliser.
- **Water use**: It is important to consider the wider watershed in how water is managed and stored.
- **Herbicide use:** In RVF's view, the eventual goal should be the elimination of herbicides. However, before that, the aim should be to see these chemicals as a last resort after other techniques and approaches have been tried.
- **Insect control:** A vineyard should encourage native species of predatory insects as a means of insect control. Disruption of mating of damaging species is also recommended.
- **Biodiversity:** A vineyard should encourage as much biodiversity as possible, for example by creating habitats to encourage different species.
- **Agroforestry:** As well as being a key element in promoting biodiversity, trees can reduce temperature, provide shade, sequester carbon and prevent soil erosion.
- **Ecosystem design:** The vineyard should be designed to be an integral part of the wider landscape and ecosystem.

[6] "Undervine Tillage," The Regenerative Viticulture Foundation, May 8, 2024, https://www.regenerativeviticulture.org/toolkit/undervine-tillage/.

The role for SWR

Given all of the above, what is the best role for SWR to play? A number of options have been suggested which are set out below.

Options raised by the research process

The research process identified a number of areas where SWR might operate.

Regulatory information hub

It is clear that a central challenge for many growers is the sheer complexity of the regulatory environment which they need to navigate. Growers are subject to the regulations not only of the country where they operate, but also to those of the countries to which they sell. The quantity of rules to be observed is mountainous, and constantly in flux.

It was suggested, therefore, that a role for SWR could be to act as a hub for information in relation to regulation, and in upcoming changes to these. In practice, however, this is not something which SWR is currently set up to do. The scale of effort to achieve this would be significant, as we would need to have access to data from all growing countries, and all those where wine is sold. Moreover, this information is often available through trade bodies. In California, for example, the State authorities themselves provide a tracker of those chemicals allowed, and guidance around their use.

A hub for best practice sharing

It was also suggested that SWR could act as a hub for sharing best practices on reductions in the use of chemicals, and on the best alternatives to use in different growing conditions if a chemical is banned. As with the regulatory issue, the sheer quantity of information which such a hub would need to process would be hugely time-consuming, and is therefore something which SWR is not currently set up to do. Through our network and meetings, and using our new membership engagement tools, we can certainly provide a venue for exchange of best practice between members. However, it is not practical to do more at this stage.

‘Lobbying’

A further area where there is clearly common concern is that in many cases regulations are introduced that are not relevant or even counter-productive. A particular focus of annoyance was the EU. “They develop regulations that might work for the growing conditions in Europe, but we operate in a very different environment” was one comment.

There is a need for these concerns to be better presented to those putting regulations in place. This is an area where, over time, SWR will seek to make a difference, specifically in relation to the EU. We are currently exploring how to set up a small office in Brussels, which would allow us to develop a network there which would allow concerns to be presented and discussed in advance of regulatory changes. We have already secured an experienced representative in Brussels who may be able to assist us with this, over time.

The SWR Sustainable Viticulture Protocol – a pivot to regenerative practices

However, whilst there is clearly a role that SWR can play in relation to vineyard inputs, this activity needs to be seen as part of a wider set of activities to work with members to develop a more holistic approach to vineyard management. A key lesson from this research is that the aim is to manage a vineyard in such a way that the need for chemical inputs is minimised, and this implies a need to 'pivot' towards regenerative practices in viticulture.

A focus on regenerative techniques will also address another factor identified by the research: the need for flexibility. Frustrations with regulations around chemical use stems from the fact that they impose a 'one size fits all' approach. Likewise, organic and biodynamic approaches dictate specific pathways to addressing problems. By contrast, regenerative farming allows a flexible approach. Take the use of cover crops, for instance. In cooler, wetter growing zones, cover crops have a vital part to play in restoring nutrients to the soil and helping to prevent erosion, as well as supporting biodiversity. But in hot, dry regions, cover crops might well compete with vines for scarce water resources, so growers in these regions may well place greater emphasis on composts and mulches.

There was strong support from interviewees for the idea of a 'principles-based' approach to the management of chemical inputs in the vineyard. We propose using such an approach to this wider agenda. In doing this we can also build on the spirit of the integrated viticulture and Allan Savory models set out above. SWR will launch a Sustainable Viticulture Protocol as a shared approach that can be adopted by members. In doing this we will work with other organisations focusing on this topic, in particular the Regenerative Viticulture Foundation. We anticipate that the Protocol would work on a model similar to the SWR Bottle Weight Accord, which allows participants to get international recognition for their actions in reducing bottle weight. The Protocol would therefore provide similar credibility to its participants.

Key audiences

The aim of this Protocol is to demonstrate to external stakeholders that decisions on vineyard inputs are being taken with sustainability as a key driver.

Given this, it is important to understand which audiences are seen by members as the most significant, and the ones which it is key that the 'protocol' is able to influence. The following were seen as the most important audiences:

- Buyers in end markets: Companies procuring wine into markets like Europe and North America are increasingly demanding in the requirements they have of their suppliers. In particular, the Nordic monopolies were referenced.
- Certification bodies: In a number of cases, standards organisations ban the use of certain inputs even where the scientific evidence is absent. Given the importance of standards to consumer perception, this is a key issue.
- Local communities: A number of members stated how important it was for local communities to have confidence in a vineyard's chemical use, and its commitment to sustainable principles.
- Regulators: Implementing a principles-based protocol on inputs would be a valuable lever in demonstrating to regulators that a set of desirable outcomes can be delivered in a number of locally-appropriate ways.
- Consumers: As one group member said, "most consumers don't know what organic and biodynamic are, but they see them as the only 'sustainable' options." There is a need to demonstrate to consumers that other means of vineyard management are sustainable too. Given the traceability inherent in wine, regenerative practices represent a significant opportunity to create a new conversation with consumers.

This Protocol will also be vital in addressing the issues of greenwashing. Campaign group and media attention, and increasingly regulatory changes such as those being considered in the EU are paying increasing attention to the veracity of green claims being made. For example, in September 2023, a Deutsche Bank controlled investment firm, DWS was fined $25m by the US's Security and Exchange Commission[7] for "misstatements" regarding its environmental, social, and governance (ESG) investing. By adopting the SWR Protocol, wine growers will be able to demonstrate that they are operating to a set of evidence-backed principles.

Considerations in developing a protocol

A number of considerations which will need to be addressed in developing an SWR regenerative viticulture and inputs protocol. These include:

- **Focus on key principles:** A central criticism made by group members of, for example, regulations coming from Brussels is that they focus on specific actions, rather than on broader outcomes. There is general agreement in the group that any 'protocol' should be based on a smallish number of key, desirable outcomes. These may be soil health, reduction in water use or others.

[7] Chris Prentice, "DWS to Pay $25 Mln to End US Probe into Greenwashing, Other Issues | Reuters," Reuters, September 25, 2023, https://www.reuters.com/legal/dws-pay-25-mln-over-us-charges-over-esg-misstatements-other-violations-2023-09-25/.

- **There will be compromises:** A focus on 'big picture' outcomes will inevitably lead to conflicts in practice. For example, a focus on soil health may suggest the use of cover crops. Yet this may conflict with another focus on reduction in water use.
- **Exploring the alternatives:** The sort of dilemma posed above needs to lead to an imaginative approach to problem solving. A focus on sustainability may mean that some previous norms and inputs will need to change. There is a need for collaboration in finding workable alternatives, for example to some chemicals.
- **Internal challenges – farming vs marketing:** Any protocol also needs to address the challenge many members cited about tensions in their own businesses. Marketing departments want to be able to make claims about the product, including having appropriate sustainability labelling. However, these needs may not always fit with what the viticulture team deem to be the best approach.
- **How to address out-growers:** Many wine makers use grapes bought in from other growers. Whilst this can make commercial sense, from a sustainability perspective this practice can be problematic. Any protocol needs to be developed and implemented so that it can be used by these out-growers, as well as the buying company.

Structure of the protocol

Key Outcomes

The reason why vineyard chemicals are controversial is because they are seen as being damaging to key elements of the ecosystem. Clearly therefore, the key outcomes of the Protocol should be to ensure that whether the approach to viticulture used is organic, biodynamic or conventional, it does not damage, and indeed enhances, the environment; specifically in four ways:

1. Soil health is maintained and improved over time.
2. Water-courses on- and off-farm are kept clean and free from chemical residues.
3. Carbon emissions from the vineyard are reduced over time.
4. Biodiversity within the vineyard and the wider estate is monitored and enhanced.

Core principles

Given that the growing conditions vary considerably even within a single country, it is not feasible to define a core set of actions that need to be taken in order to achieve the outcomes set out above. Rather, participants to the Protocol will agree to approach their management of chemical inputs in a shared fashion:

- Vineyard mapping
    - Understanding what is needed, and where. Treating the entire vineyard will often not be necessary.

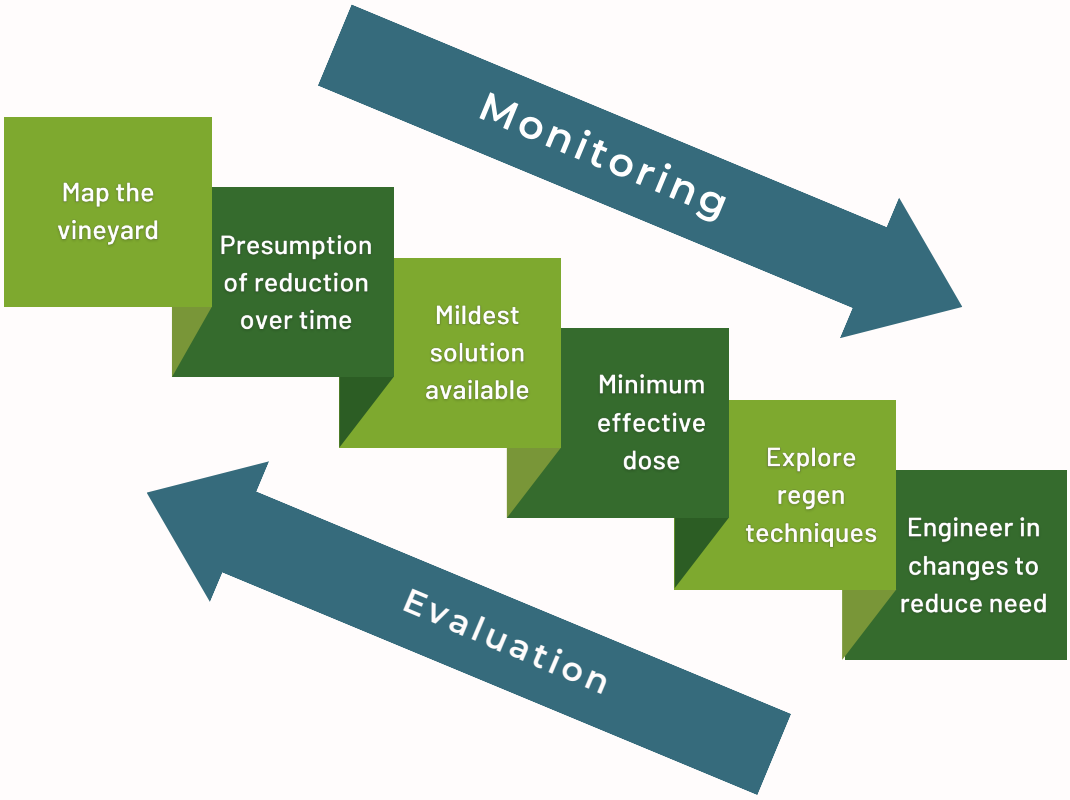
- Presumption of reduction over time
  - Even if zero is not possible, how and where can reductions be made?
- Use mildest chemical solution available
  - Taking account of the impact on people and the environment, but which is still effective
- Use the least possible
  - Even if legally-permitted amounts are higher, use the lowest dosage possible to address the problem
- Increase use of regenerative techniques
  - Not all will be relevant, but many reduce the need for chemicals. They also have other benefits in relation to sustainable viticulture.
- Over time, plan in changes that may reduce base need
  - For example, replanting with local and/ or disease resistant varietals, improving drainage and other approaches.

Monitoring and evaluation

It will be important to monitor the impact of changed usage of chemical inputs over time, and to evaluate whether those changes work.

Knowledge sharing

Notwithstanding that growing conditions will differ considerably between participants it will be useful to share knowledge, for example in relation to swapping between chemicals.



Next Steps

The work to date has provided the basis for a Protocol which SWR members can adopt as a shared framework to demonstrate responsible practice in relation to chemical inputs and, over time increasingly to adopt regenerative viticulture techniques. However, there is clearly a strong need for SWR to undertake further work in this space in order to flesh the Protocol out over the coming years. There will be a number of aspects of this:

The need for verification

It will clearly be important that a mechanism exists for those who sign up to the SWR Protocol are able transparently and clearly to demonstrate that they are implementing it. We will need to explore how this can be done in a way which is credible, but as light-touch as possible. It may be that this can be built into SWR's Global Reference Framework, which is being used to benchmark the world's wine sustainability standards.

Developing regional practices

A key reason for developing a principles-based approach is that defining specific practices, or 'ideal chemistry' is impossible given the variabilities between different grape growing areas. However, over time, SWR will facilitate the development of sets of practice which work for different growing conditions. Working with partners such as the Regenerative Viticulture Foundation, we will aim to develop 'suites' of practice which apply different regenerative practices optimally to different terroirs.

Sharing best practice

A key strength of SWR is its ability to convene actors in the wine industry; something demonstrated by the work done by this working group. SWR will therefore establish processes to share best practices around regenerative viticulture and sustainable vineyard chemistry at both a global and regional level.

Tools and guidance

Over time, all of the above will allow us to develop tools and guidance materials that can be used more widely within the wine sector. The organisations involved in the working group to date have been amongst the world's leaders in sustainable viticultural practices, and it will be important to have that knowledge and insight spread more broadly. SWR's core aim is to facilitate change throughout the wine industry. Tools and guidance that can spread best practice will enable this.

Profile raising, and influencing the public debate

A central aim of this process is to demonstrate that responsible, sustainable practices in the vineyard do not need to equate only to organic or biodynamic approaches. SWR will use its network, and increasing profile to make the case that the approach driven by the Protocol is genuinely the best means to drive sustainability in the vineyard.

Project Participants

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