



TAKING A SCIENTIFIC LOOK AT BIODYNAMICS

By Jennifer Reeve

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Agricultural planting guide & calendar,
published by Camphill Village Kimberton Hills
<http://www.stellanatura.com>)

I have been working on biodynamic research at Washington State University (WSU) for over four years now, and the experiences I have had and the conclusions I have drawn have greatly shaped my perception of biodynamics and how it is viewed in the world.

Having grown up on a small biodynamic farm, attended a Waldorf school* and worked for two and a half years at the Josephine Porter Institute**, I had been immersed in the concept and practice of biodynamics and was very much in love with the ideal of agriculture that it presented. I came to the growing conviction, however, that if the benefits of the biodynamic method and more specifically the preparations were true, they needed to be verified using the rigors of the scientific method at an independent research institution. With this grand aim in view, I enrolled in a Master's Degree program and then a Ph.D. program under Dr. John Reganold in the Department of Crops and Soils at WSU.

In 1996, John Reganold, together with biodynamic viticulture consultant Alan York, had implemented a randomised, replicated study at McNab Ranch, Mendocino County, California, to test the effect of the biodynamic preparations on soil and wine-grape quality. This work was particularly timely, given the recent surge in interest in biodynamic viticulture and the fact that no research had been published on the possible effects of the method.

The study consisted of a biodynamic treatment and an organic treatment, identical in every respect except for the addition of the biodynamic preparations. The plots were an average of 0.6 hectares in size, planted to Merlot grapes and located on the same soil type. We tested a large number of physical, chemical and biological soil properties over a period of six years but found no consistent significant differences. We also measured a variety of vine growth and fruit physical and chemical characteristics such as pruning weight, yield, berry weight, sugars, tannins and colour pigments. Unlike the soil tests, we did see some small statistically significant differences in vine growth in the final three years of the study, and grape chemistry in the final two.

The biodynamic vines had an ideal shoot-to-yield ratio for optimal grape quality, while the organic vines were slightly over-cropped. The biodynamic grapes had higher brix (sugar) in 2003 and higher levels of tannin and colour pigments in 2002 and 2003. Although these differences were certainly very interesting, and the most likely reason for them was use of the biodynamic preparations, in practical terms they were very small and so the degree of benefit to the winemaker uncertain. The proof of the pudding is in the wine, however, and so far at least we have not been able to make any wine from the grapes.

The overall quality of the grapes from both treatments was extremely high and MacNab Ranch consistently fetches the highest price for grapes in the county. In addition to this study we are also currently completing three years of tests of the biodynamic compost preparations on compost development, as well as a forage Study on S&S Homestead Farm, Lopez Island, Washington.

So how is my work perceived by the university and the scientific community at large? I have been lucky. The faculty, staff and my fellow students responded to news of my project with genuine interest and a good-humoured smile at worst. Many had blazed the trail for me, including Walter Goldstein***, as well as Drs Dave Bezdicek, John Reganold and Lynne Carpenter Boggs. I have presented my work at meetings and workshops as well as through the peer-reviewed journal process. It would not be true to say I have not experienced any hostility, but it has been relatively rare. Criticism is part of the peer review process and can only serve the useful purpose of ensuring that the science is rigorous. Scientists and other people outside of biodynamics are often genuinely interested, but a major question is raised again and again: Where are the results?

This question became central to my own experience in conducting research on the measurable effects of the preparations. I have to be blunt because it was a shock to me when I first started reading the small amount of scientific literature on biodynamics and conducting my own experiments: the dramatic results I had heard about simply were not there. Statistically significant effects in favour of the preparations can be seen some of the time but not all of the time, and perhaps most telling is that the differences are very small. They are certainly not anything to convince many scientists. Many biodynamic practitioners are as shocked as I was by the seeming lack of results, and I face the question whenever I talk about my work in biodynamic circles: Is it even appropriate to apply the scientific method to something like biodynamics?

I think this question leads directly to our theme of the relationship of biodynamics to the outside world. The results are small, but they are relatively consistent. When taken as a whole the question could be asked, are these small physical changes indicative of something larger happening on a deeper level? To take a familiar example: if I am not feeling my best I may be standing straight and even smiling. The difference in my physical posture and measurable exterior might be very slight compared to when I have a sense of vitality. Nevertheless, most perceptive people would notice straight away that something was not quite right. Of course, as human beings we are incredibly sensitive to these kinds of subtleties. In the world of music, dance or sports we are familiar with this too. A figure skater may be technically brilliant but somehow lacking the radiant sparkle of a true master. We don't know how to measure these qualities but we definitely sense them and we also know they are directly health-inducing on multiple levels of the body, soul and spirit.

So what has this to do with science and biodynamics? It is my belief that science can give us the clues. Science is an incredibly powerful tool that strips us of our illusions and, when properly applied, can show us reality on the physical plane. But it can also, if we are aware of this, point us in the direction where it fails and where new methods need to be developed in order to answer the questions revealed. Such new methods would train our ability to become finely tuned instruments for perceiving these subtle yet incredibly powerful forces with which biodynamics is active.

So I suspect the small differences we are seeing in our experiments with regards to the preparations are in fact meaningful and could point

us in new directions of understanding. In addition, going through the scientific process wins biodynamics credibility that may warrant some people to take another look. When people actually see even pictures of a beautifully working biodynamic farm or vineyard they are impressed, and then the hidden language of life begins to speak for itself.

Biodynamics has already had a huge impact on the development of the organic agriculture movement and even on conventional agriculture. Talk of feeding the soil not the plant is now commonplace, as well as the idea of an agriculture that is integrated into the local landscape and functions harmoniously as an organism. Conventional farmers are increasingly conserving their soil, rotating crops and applying compost. Compared to only a few years ago I see an acceptance and even convergence beginning to happen between conventional agriculture and the ideas of organic and biodynamic farming. Biodynamics has played a key part in inspiring this movement and is increasingly recognized for that role. Francis of Assisi is quoted as saying, 'Start by doing what is necessary, then what is possible, and suddenly you are doing the impossible.' In the spirit of these words, when biodynamic farmers and gardeners work out of an ideal, the every day becomes possible and the door is opened for the impossible to become a reality.

References:

Details of the above research can be found in the December 2005 issue of the American Journal of Enology and Viticulture and in an upcoming article in Biodynamics.

*Waldorf education, now the fastest growing private school movement, is inspired by the pedagogical ideas of Rudolf Steiner.

**The Josephine Porter Institute for Applied Biodynamics, Woolwine, VA makes and distributes the biodynamic preparations in addition to providing education on biodynamic theory and practice.

***Walter Goldstein PhD. Research Program Director at the Michael Fields Agricultural Institute, East Troy, WI. Received his PhD in Agronomy in 1986 from Washington State University.

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