



FELLOWSHIP SUMMARY REPORT

<u>Name</u>	Dr Gwen GRELET
<u>Subject Title</u>	Regenerative agriculture – transforming food systems by coupling grassroot innovation with scientific understanding
<u>Home Institution</u>	ManaakiWhenua -Landcare Research, Land Use and Ecosystems team, Lincoln, New Zealand.
<u>Theme</u>	Managing Natural Capital for the Future (Theme I)
<u>Contract number</u>	JA00100839
<u>Host Institution</u>	University of California MERCED, Department of Life and Environmental Sciences, 5200 North Lake Road, Merced, California 95343
<u>Host Collaborator</u>	Dr Rebecca Ryals
<u>Dates of the fellowship</u>	May 6 th to July 5 th , 2019 (9 weeks)

Consent:

I consent to my report being posted on the Co-operative Research Programme's website.

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Manaaki Whenua
Landcare Research





1. What were the objectives of the research project?

The main objectives of this project were to:

(a) appraise the potential benefits offered by regenerative agriculture for a range of ecosystem services spanning across the biological, chemical, physical, economic and social dimensions of the agricultural sector via a review of the scientific and grey literature, and any information available on various public information platforms (social media, blogs, newsletters, YouTube channels etc..).

(b) identify potential pathways or barriers for working collaboratively between regenerative agriculture farmers, scholars and policy makers in order to promote regenerative agriculture as an agent of change for accelerating transition to sustainability in California, in comparison to New Zealand.

This was to be achieved by a combination of interview- and survey-based methods.

Why is the research project important?

Given the rising interest in regenerative agriculture worldwide, contrasted with the current lack of scientific evidence proving its effectiveness, our project contributes to shedding more light on its potential benefits in the USA and in NZ. By undertaking an *information-based* analyses and review of the current state of our knowledge of regenerative farming systems, our project depolarises the current on-going *opinion-based*, polemic debate on the suitability of this approach for regenerating landscapes and communities, whilst producing high nutritious food products.

Our study of knowledge sources underpinning innovation at the forefront of regenerative / biological agriculture highlights areas where greater research emphasis is required, and / or where there is a need for different communication strategies between researchers, landowners, ranchers and farmers, and particularly between Academia and on-the-ground innovators. Specifically, we found that innovation that included social, environmental and economic aspects all at once required changes in structures, processes and/or mindsets.

2. Were the objectives of the fellowship achieved?

The objectives of the fellowship are on the way to be achieved. The program of research was designed to maximise connections with US regenerative innovators whilst the fellow was visiting the USA. The fellow conducted 20 in-person interviews, connecting with different types of innovators in a variety of environmental, social and economic contexts (Table 1) – thereby expanding the study and the fellow’s travel to three US states (Figure 1).

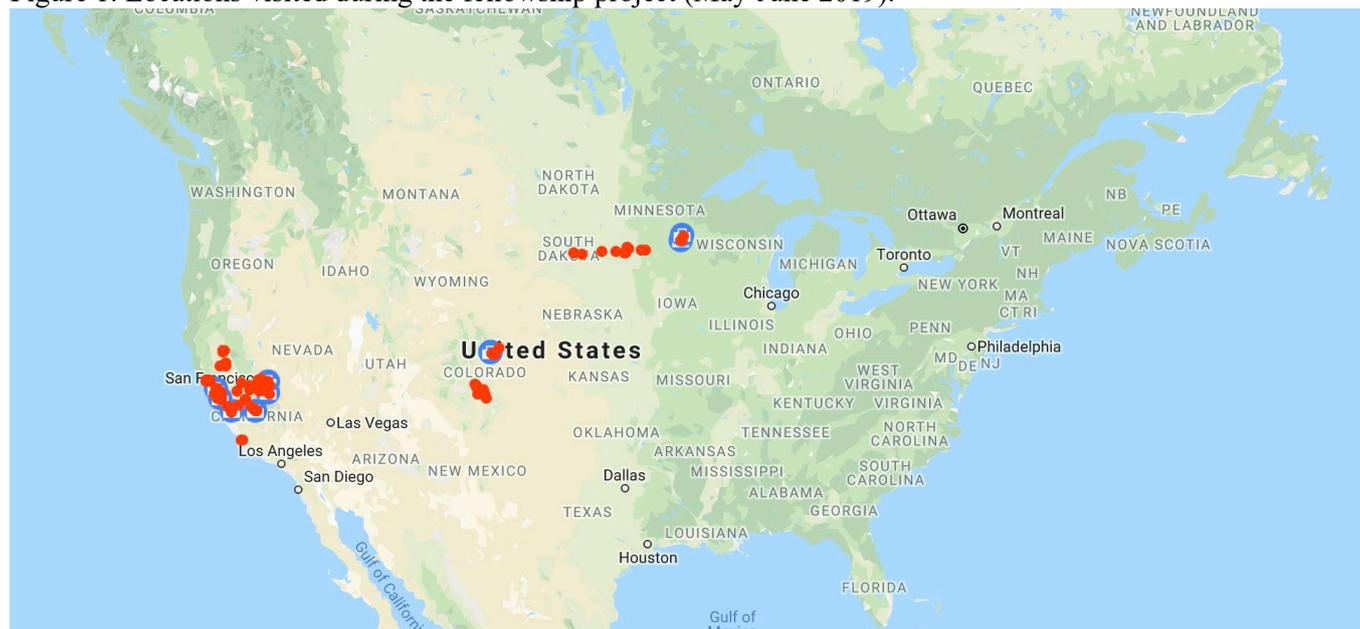
Table 1: list of interviewees sg

Interviewee	Job / Role description	Meeting Place	Website
Prof Cynthia A. Daley	Founder of the Centre for Regenerative Agriculture	Center for Regenerative Agriculture, California State University, Chico, CA	https://www.csuchico.edu/regenerativeagriculture/
Dr Timothy LaSalle	Co-Founder of the Centre for Regenerative Agriculture	San Luis Obispo, CA	https://www.csuchico.edu/regenerativeagriculture/
Sallie Calhoun	Owner and founder of Paicines Ranch and the #NoRegretInitiative	Paicines ranch, CA	https://paicinesranch.com/
Kelly Mulville	Agricultural activities manager	Paicines ranch, CA	https://paicinesranch.com/
Wendy Millet	Ranch Director	TomKat Ranch, Pescadero, CA	https://tomkatranch.org
Hayley Strohm	Regenerative Ranching Coordinator	TomKat Ranch, Pescadero, CA	https://tomkatranch.org
Mark Biaggi	Ranch Manager	TomKat Ranch, Pescadero, CA	https://tomkatranch.org
Stephen Goldblatt Clark	Ranch Manager	SoMar Farm, Petaluma, CA	https://somarfarms.com/about-the-farm
Loren Poncia	Owner, Ranch director and Manager	Stemple Creek Ranch, Tomales, CA	https://stemplecreek.com/
George Whitten and Julie Sullivan	Owner, Ranch director and Manager, Educators	San Juan Ranch, San Luis Valley, Saguache, CO	https://quiviracoalition.org/sjr/#mentors
Patrick O'Neill	Advisor and educator	Soil Health Services, Alamosa, CO	https://www.nacdnet.org/soil-champs/southwest/patrick-oneill/
Tom Willey	Organic Farmer	Madera, CA	www.tdwilleyfarms.com
Phil Foster	Owner and director	Pinnacle Organic, Hollister CA	https://www.pinnacleorganic.com , https://www.csuchico.edu/regenerativeagriculture/demos/phil-foster.shtml
Dr Jeff Mitchell	Extension officer and researcher	UC Davies, West Side Research and Extension Center, Five Points, CA	https://www.plantsciences.ucdavis.edu/people/jeffrey-mitchell
Sheila Barry	director	University of California Cooperative Extension, Santa Clara County, Los Gatos	https://ourenvironment.berkeley.edu/people/sheila-barry
Dr Dwayne Beck	Manager	Dakota Lakes Research Farm, Pierre, SD	http://www.dakotalakes.com/contact/
Rosie and Ward Burroughs	Owners	the Burroughs Family Farms, Denair, CA	https://www.burroughsfamilyfarms.com
Dr Jonathan Lundgren	Director, independent Researcher	Oak Lake field Research Station, Astoria, SD	https://www.ecdysis.bio
Dr David Johnson	Professor	Center for Regenerative Agriculture, California State University, Chico, CA	https://www.csuchico.edu/regenerativeagriculture/bioreactor/david-johnson.shtml
David Hodgson	Social Entrepreneur	Café Leila, Berkeley, CA	https://www.linkedin.com/in/davidhodgson/





Figure 1: Locations visited during the fellowship project (May-June 2019).



A parallel study is underway in NZ with 20 interviewees selected, representing a range of expertise in various regions of NZ.

The literature review was completed and is being written up for submission to publication.

A follow-up survey-based study is underway, set as a questionnaire that was determined based on the data collected from the 20 interviews.

3. What were the major achievements of the fellowship? (up to three)

- a) Cross-pacific connections between researchers, farmers and extension agents at the forefront of innovation in Biological agriculture – accelerating knowledge transfer and further innovation. As a result of the fellowship, already two additional cross-pacific initiatives have been instigated: (i) biological agriculture in vineyards to optimise livestock integration as pest, weed and disease control, (ii) maximising/understanding impact /philanthropic investment to accelerate education and transformation towards regenerative land management.
- b) A new idea, building on citizen science methods, to acquire a quantitative dataset on ecosystem responses to regenerative practices. Our literature review clearly highlighted the paucity of peer-reviewed studies on regenerative agriculture, contrasting with the wealth of anecdotal evidence available from farmers in the US, NZ and elsewhere. We have developed a survey-based method to gather anecdotal evidence and allow semi-quantitative analyses of ecosystem responses to management based on farmers' perception of their farm, and based on the variables they measured directly (visual assessments, sensors) or indirectly (herbage and soil tests).
- c) Public outreach: the topic of the fellowship attracted public attention and the work undertaken during and as a follow-up from the fellowship has already been and is planned to be featured at multiple public events and on publicly available websites (e.g. in planning <https://pureadvantage.org/authors/>, already available US radio interview: <http://tdwilleyfarms.com/podcast-down-on-the-farm-with-tom-willey/> and NZ press article: <https://www.odt.co.nz/rural-life/rural-life-other/ground>)

4. Will there be any follow-up work?

- o Is a publication envisaged? Will this be in a journal or a publication? When will it appear?

At least one publication in a peer-reviewed journal is being prepared for submission before June 2020.

At least one publication for a public audience is being prepared for release before June 2020 (see above)

Multiple public seminars and radio/press interviews have already been given by the fellow (see above)





○ Is your fellowship likely to be the start of collaboration between your home institution and your host?
No, there is currently no plans for setting up any MoU between the two institutions. However the collaboration between the fellow and the host collaborator was started with the fellowship and will continue (pending funding).

○ Is your research likely to result in protected intellectual property, novel products or processes?
No

5. How might the results of your research project be important for helping develop regional, national or international agri-food, fisheries or forestry policies and, or practices, or be beneficial for society?

Given the rising interest in regenerative agriculture worldwide, contrasted with the current lack of clarity on its effectiveness, our project contributes to providing *fact-based information* to depolarise the current on-going *opinion-based, polemic debate* on the suitability of regenerative agriculture for regenerating landscapes, communities and bio-economies, whilst producing high nutritious food products. Particular attention was given during the fellowship study on the suitability of regenerative practices for food production in water-sensitive areas, either due to scarce / irregular water supply, or sensitive watersheds threatened by agricultural activities. Our project also looked at multiple and varied case-studies of socio-ecological innovation on-the-ground, and the extent to which these innovations relied on academic research or were mostly decoupled from it. We found that multiple models occurred, and that these models were people- and context- specific. Our findings urge policy makers to embrace local specificity and diversity of solutions put forward for solving the current global food crisis associated with climate change – one-size-fit-all solutions are more easily implemented, but not necessarily viable or relevant everywhere.

6. How was this research relevant to:

○ *The objectives of the CRP?*

The overarching goal of our project was to provide relevant scientific information and advice about the potential suitability of regenerative agriculture to regenerate landscapes whilst maintaining profit, production, security of food supply under changing climate and increased food quality. Such information can inform future policy decisions related to the sustainable use of natural resources in the areas of agriculture and food production.

Our project accelerated international co-operation not only among research scientists, but also between research scientists and on-the-ground innovators.

○ *The CRP research theme?*

During the course of the fellowship we have interviewed innovators who have implemented management and business practices which take into consideration:

-the protection and enhancement of biodiversity (grazing for protection of threatened plant species in the Californian rangelands)

- water tables, so as to mitigate their overuse and even encourage replenishment (biological improvement of soils in the San Juan Valley, Colorado, where the aquifer is diminishing to meet current agricultural demands)

- the impact of agriculture on quality and water ecosystems, soil structure and carbon sequestration in soils (no till and crop rotation & diversification in South Dakota, to mitigate soil degradation and restore wetlands and lake ecosystems whilst simultaneously increasing Soil organic matter and profit)

- the quality of the farm produce, produced with a biologically sound approach as per consumers' demand and thereby securing a premium market (grass-fed beef in Sonoma county, California).

All of the case-studies examined during our interview work include examples of agricultural practices promoting the delivery of key services provided by landscapes, including the stabilisation of water resources, significant buffering of climate through carbon sequestration of soil and the role of vegetation cover in addition to agricultural productivity. These topics are central to theme I of the program.

7. Satisfaction

○ *Did your fellowship conform to your expectations?*

Notwithstanding the need to contribute to my travel expenses personally, the fellowship exceeded my expectations.





- *Will the OECD Co-operative Research Programme fellowship increase directly or indirectly your career opportunities? Please specify.*

The OECD Co-operative Research Programme fellowship has already begun to directly increase career opportunities or directions. My engagement with innovators outside of academia has attracted a lot of attention both in NZ and in the US, motivating multiple requests for engagement / collaborations in various forms. It is too early days to assess clearly the long-term impact of this work on my career, but the short-term impact are much bigger than I had ever imagined them to possibly be.

- *Did you encounter any practical problems?*

No, I did not encounter any problem.

- *Please suggest any improvements in the Fellowship Programme.*

If the aim of this fellowship is to foster innovation and knowledge exchange across borders in biological agriculture, some projects might be better hosted by non-academic organisations which are at the forefront of innovation by necessity. Fostering collaboration between academics and non-academics is also one of the recognised pathways for innovation and adoption of these innovation, yet such cross-sector collaboration is still poorly supported by most funding bodies. Finally, the transformation required in our global food system will necessity large-scale collaborations – it seems that projects should be encouraged to be hosted across multiple host organisations.

8. Advertising the Co-operative Research Programme

- *How did you learn about the Co-operative Research Programme?*

Online research

- *What would you suggest to make it more “visible”?*

- Advertise the program on various social media platforms relevant to biological agriculture – there are many.
- Invest in the public dissemination of the work accomplished by the fellow, via short videos or www blogs – storytelling is not very often embraced in academia and within most research communities, yet is very effective at grasping the attention of the public which then relay information widely an fast.

- *Are there any issues you would like to record?*

No.

