

Final Evaluation Report

Your Details	
Full Name	Mariana Laura Allasino
Project Title	Landscape heterogeneity effects on pollinator diversity and pollination service on family farms in Monte desert, Argentina
Application ID	29765-1
Grant Amount	5,650
Email Address	allasino.mariana@inta.gob.ar
Date of this Report	31/8/2021

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Evaluate the influence of wildflowers at crop edges on the diversity and abundance of pollinators.				
Evaluate the influence of wildflowers at crop edges on crop pollination.				
Evaluate the influence of landscape heterogeneity on the diversity and abundance of pollinators.				
Evaluate the influence of landscape heterogeneity on crop pollination (seeds number and weight).				

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

In early March 2020, Covid-19 restrictions began in Argentina. This made purchasing supplies, field work, office work and face-to-face workshops difficult. All these, led to some delays in the project execution. Also, these complications led to some changes in the item "Field Vehicle Gas and Maintenance" and "Food supply during field work" of the budgets.

3. Briefly describe the three most important outcomes of your project.

We found a positive relationship between diversity of flowers at crops edges and: a) pollinator diversity; and b) crop pollination service. Moreover, we found that crops that occupy central positions in their networks have a higher pollination service than those that occupy peripheral places. These results indicate that simple agroecosystem management practices, as the maintenance of crop edges, improve biodiversity and crop pollination service. Finally, we found a positive relationship between: a) crop diversity at landscape level and pumpkins seeds weight; and b) the proportion of semi-natural areas surrounding the focal crop and the abundance of native bees.

4. Briefly describe the involvement of local communities and how they have benefited from the project.

I worked with several sectors of the local community. During fieldwork, I counted on the help of undergraduate students from Universidad Nacional de San Juan. Field assistants learned about field techniques, sampling protocols, logistic organisation, and plants and insect collection and preparation. Moreover, I participated in several virtual workshops, radio interviews and podcast directed to farmers, beekeepers, university students and community at large (find the links in the project updates. See also: <https://www.youtube.com/watch?v=dRxJvBCXs94&t=263s> , <https://www.youtube.com/watch?v=OJXAXi7D0Rw&t=1920s> ,

<https://www.youtube.com/watch?v=E4Pssh53SDc>,
<https://twitter.com/intaargentina/status/1401166414761836545?s=20>,
<https://www.mixcloud.com/lamielenturadio/programa-radial-la-miel-en-tu-radio-8-de-mayo-de-2021/> -min 1:36:43). In these workshops, I talked about pollinators, native bees and their importance for crop pollination. Also, I shared some results of the project and exchanged ideas about pollinator's conservation with farmers and beekeepers during field work.

5. Are there any plans to continue this work?

Yes, I have plans to continue this work because I think it is important to generate information about ecology of pollination in South America.

Results obtained in this project opened up new research questions related to native and non-native bee conservation. Some of these questions are: which crops at landscape level favours wild bees and *Apis mellifera* presence?; which ones have negative effects on bee community?; which wild plants species at crop edges are the best for pollinator maintenance?; and what floral resources do pollinators use the most? Moreover, I would like to work on management actions for landscape restoration. Finally, I would like that the results of my work reach political decision makers to create new local agricultural policies.

6. How do you plan to share the results of your work with others?

I have already shared results with researchers, student and the local community in virtual workshops, radio interviews and classes at university. Moreover, I plan to share my results with the scientific community through scientific publication in national and international journals, and conferences. Last month, for example, I shared some project results with the Argentina's scientific community in Reunión Argentina de Ecología XXIX. Currently, I am working in a pamphlet about the wild bees found in San Juan to share with the community at large. Finally, if Covid-19 situation improves, I plan to meet FECOAGRO members to share and discuss the results.

7. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?

The grant was used from April 2020 to August 2021. The project took more time than I anticipated because of administrative delays in accessing to funds and Covid-19 restrictions.

8. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Field Vehicle Gas and Maintenance	2200	502	-1698	Because of Covid-19 restrictions, I had to reduce the number of trips to crop fields. Also, I had to replace some of the farther places for nearer ones. Moreover, I couldn't organise face-to-face workshops with beekeepers and farmers. It was expected to expend some money for their transfer. Finally, because of the reduction on number of km travelled, it was not necessary to do vehicle maintenance service.
Equipment (external disc)	50		-50	It wasn't necessary to buy an external disc, computer memory was sufficient to save information.
Equipment (Drone batteries)	400	664	+264	The available batteries were more expensive than the budgeted batteries.
Equipment (precision scale)	600		-600	Soil laboratory associated with INTA lent me a precision scale. Instead of buying it, I bought a microscope for pollen analysis.
Equipment (entomological boxes, tweezers and pins)	300	201	-99	Entomological material was cheaper than the budgeted material.
Equipment (GPS)	150	254	+104	The available GPS was more expensive than the budgeted GPS.
Laboratory supplies (petri boxes, blotting paper, chemical solutions)	100		-100	Soil laboratory associated with INTA lent me laboratory supplies.
Field supplies (batteries)	200	375	+175	Field supplies were more

tulle, net, steel rods, measuring tape)				expensive than the budgeted field supplies.
Food supplies during Field (assistants, voluntaries)	1500	500	-1000	I spent less money for food supplies than I expected because of reduction on field trips and inability to do face-to-face workshops.
Offices supplies (books, pamphlets, printings for diffusion)	150	188	+38	I spent more money for offices supplies than I expected.
Computer		807	+807	A computer was bought to build orthomosaics from the photos taken by the drone, and to analyse images in QGIS.
Tablet	-	220	+220	A tablet was necessary to drive the drone.
Microscope	-	1381	+1381	A microscope was bought in replacement of the precision scale. It is being used for answer next questions of the project.
Freezer	-	689	+689	A freezer was bought for preserve entomological samples.
Total	5650	5781	+131	£1 = \$ARG 79.65 (April 2020)

Note: All equipment purchased were used for the project purpose, they are all now part of INTA assets and are available for future INTA projects.

9. Looking ahead, what do you feel are the important next steps?

The most important next steps are to continue the research line, to spread the results among farmers, beekeepers and community at large, to apply the generated knowledge into management plans, and to share the results with the scientific community by the publication of manuscripts. These steps are necessary to improve local knowledge about wild bees and their important function on agroecosystems. I hope the spread of this information encourage farmers to reduce agrochemicals use, maintain crop edges, diversify their production and deepen the interactions with beekeepers. Also, I hope this information encourage community at large to recognise and take care of wild bees.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes, I used The Rufford Foundation logo in my oratory presentation, university classes, workshops, congresses and pamphlets.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Mariana Allasino: leader of the project

Juan Pablo Torretta: adviser of the project leader

Hugo Marrero: adviser of the project leader

Germán Pantano, Emiliano Argumosa, Alexis Celiz, Sol Santander, Tania Marín, Natalia Silva & Lidia Furlani: field assistants. Their work consisted mainly in record pollinator and wildflowers. Also, they collaborated with pollination treatments on crop flowers. Germán Pantano also helped me with seed count and weighing, and with landscape images analysis.

FECOAGRO and independent farmers: they offered their crop fields for the study.

12. Any other comments?

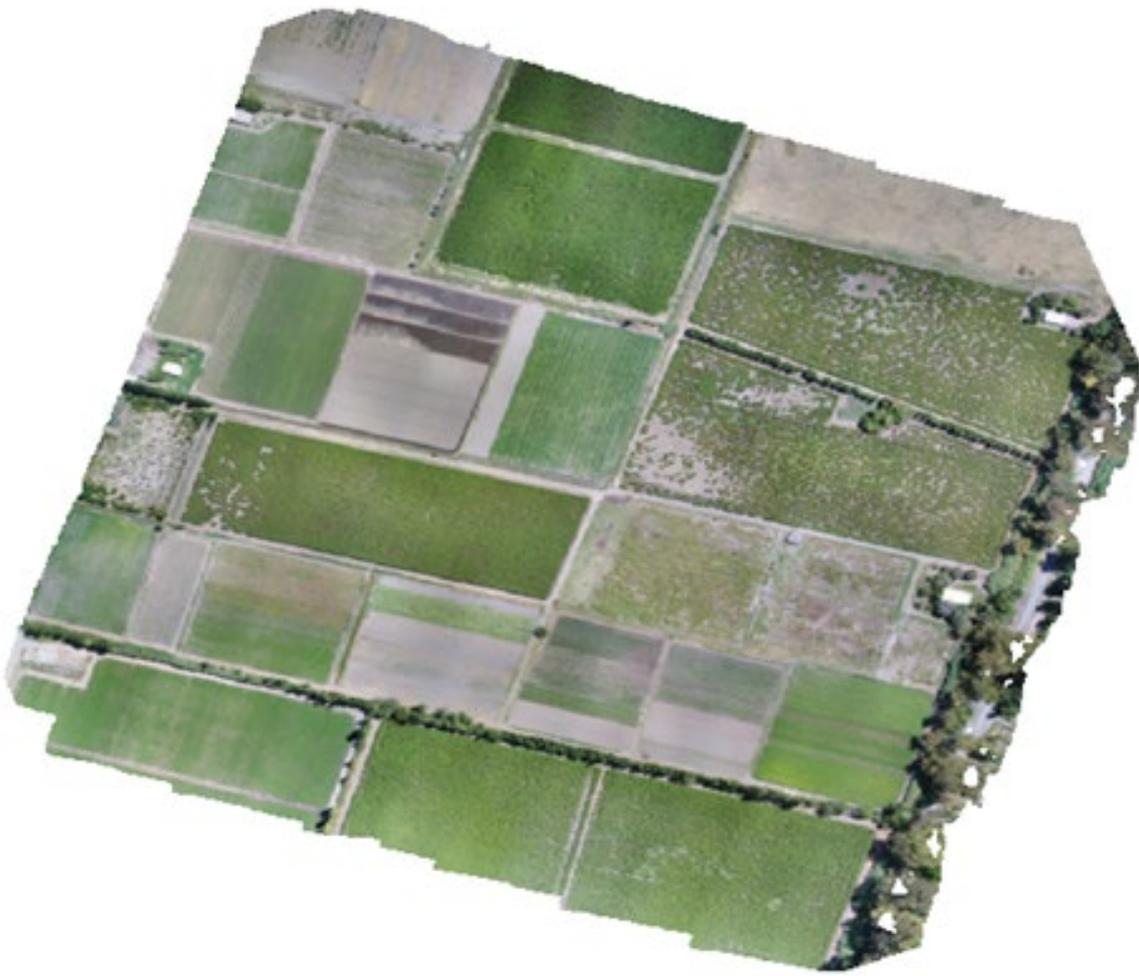


Fig. 1: Orthomosaic of an agricultural landscape. It was built from photos taken with a drone.

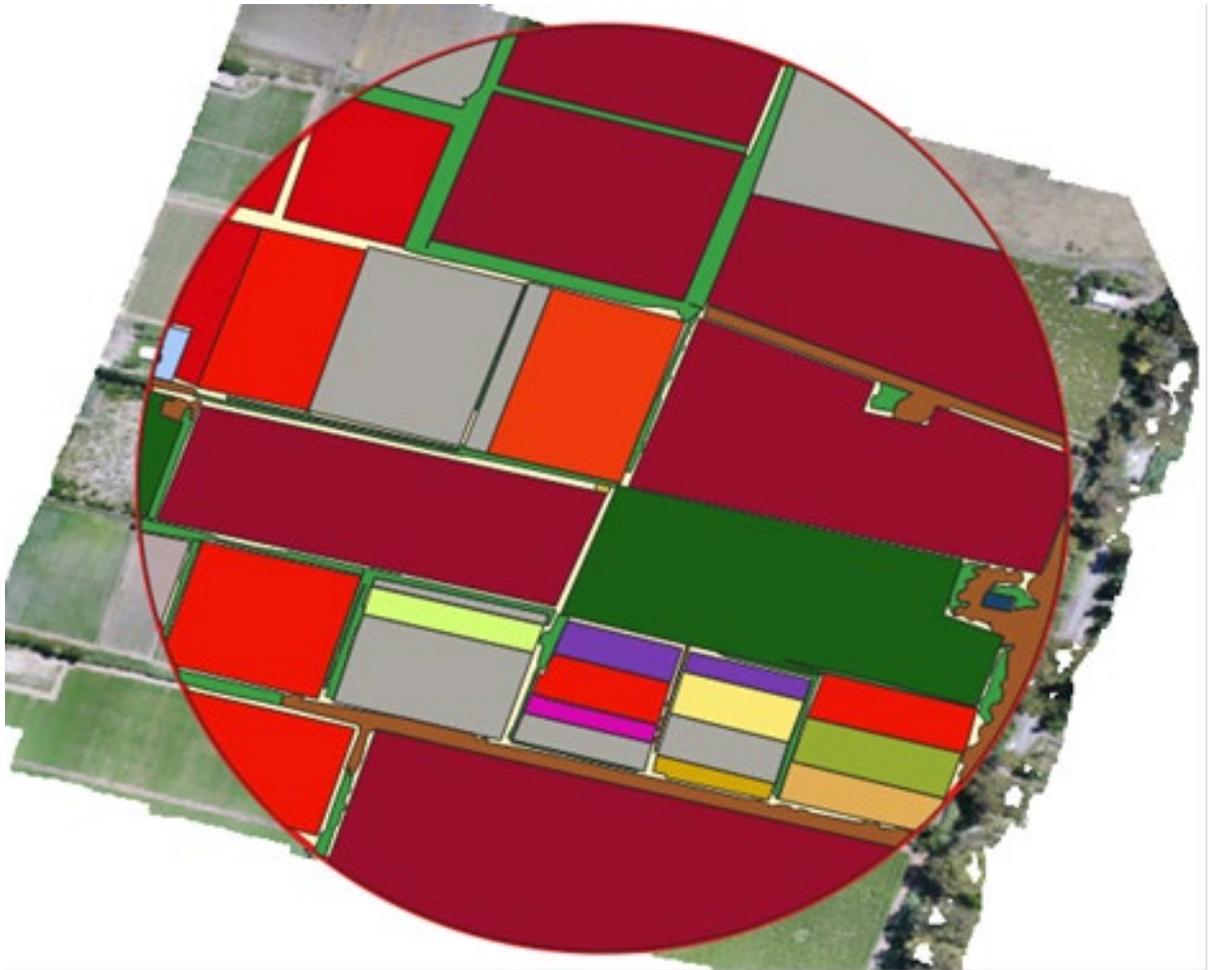


Fig. 2: Orthomosaic analysed with QGIs.



Peponapis fervens on a pumpkin flower.



Centris brethesi on a flower of *Hoffmansegia glauca*



Mariana Allasino in a pumpkin crop.