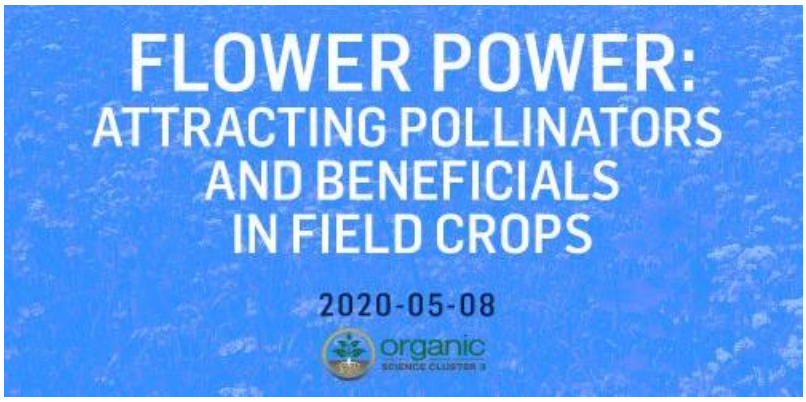

The Organic Federation of Canada is pleased to present Organic Science Conversations, a series of podcasts presenting the researchers of the Organic Science Cluster 3.

Dr. Jason Gibbs, a Canadian researcher, leads a scientific activity with the objective to increase the abundance and the diversity of pollinators and beneficial insects on farms of the Prairies. Nicole Boudreau interviewed Dr. Gibbs on May 8th, 2020. You can listen to the podcast here.

Bonjour Jason, I understand that you are a researcher at the University of Manitoba. What is your academic background?
I went to the University of Toronto, and then did my Ph.D. at York University, studying the taxonomy of bees. I went on to do postdoctoral research in the United States, where I worked on pollinator ecology in agricultural systems. Finally, I wound up here at the University of Manitoba, where I've been sort of merging those two aspects of my research. I work on the diversity of bees in the Prairies, looking at how landscapes and how land use changes affect their diversity in Manitoba, and also to understand what species we really have in Canada.

And you are the coordinator of a museum, of an insect museum, on the campus?
That's right. The University of Manitoba has one of the largest insect collections in the western Canada. We estimate that there are about two to two-and-a-half million specimens. We have over 70,000 bees alone in the museum. I function as a curator of that collection and so part of my job is to ensure that that collection is protected and to make sure that it grows so that we have a clear understanding of what species of insects we have in Manitoba.

It is a good mission. Now you are leading an activity to increase pollination in Manitoba where intensive agriculture practices are known to reduce biodiversity. How are you addressing this challenge?
We've teamed with farmers in Manitoba to install strips of flowering plants next to their fields. We've been working on those for a couple of years. We're monitoring those floral strips

and cash crops next to them to see whether or not [the flowering strips] will increase the number of wild bees in the area, but also the numbers of other beneficial insects. Some insects are predators of pest insects, so we want to be able to find ways to increase those different kinds of insects in farms.

The farms are exceptionally large. Do you have large strips or how does it work?
That's a really great question. These floral strips have been applied in other agricultural systems that are not usually on the scale of agriculture that we have in Manitoba. These strips run the full length of a field, which is a quarter section--that's about 800 metres long. They're relatively narrow because we don't want to interfere too much with agricultural production. In this fairly long narrow strip, we've planted a variety of different flower and plants. It's designed to have flowers throughout the season and hopefully attract a variety of different insects. We don't know the answer to whether or not that'll have a large effect or not--that's part of the reason why we're doing this. We're monitoring those strips and the crops next to them to see whether or not there's a benefit to the crops and insects.

So, the benefit that you would see on the crops would be a better yield?
That's exactly right. Ultimately what we're interested in is making sure that farmers have more yields and more sustainable yields. There are a couple different ways that could potentially happen.
In years that they have a flowering crop, like canola, that can benefit from pollination, we hope that by sustaining these flowers year after year, those bees will be present whenever the farmers need them. On the other hand, we are hoping that those flowering strips will also provide refuges and resources for predatory insects, so that they'll be helping to control the pest populations throughout the years so they never become a problem. And in combination, we hope those two things will mean that farmers are getting less pests, more pollination and therefore, ultimately more yield.

Do you work just on organic farms or also on what we call conventional farms?
We work in both. We are working on organic farms and we also have conventional growers as well. We want to know whether or not these strips work in both systems because if they do, that's great. Or, do the practices that are already going on in organic systems make these flowers strips more effective because there is already some additional support for diversity in the organic systems?

On conventional farms, if they spread pesticides, can it be harmful for the bees, the pollinator population that you are trying to develop?
That is definitely a risk that people have thought about a lot--whether or not you will draw pollinators into these strips and then they will be at the mercy of what the farmer is doing. But generally speaking, we think that because bees always come back to a nest, we are probably not drawing bees from outside of the area. We're hoping that those bees that are already present in the landscape will come and have more resources, so they can have more offspring and a larger population. So, it is not going to change necessarily what the farmers do in terms of spraying pesticides but I think that in the Prairies, for the most part, they are spraying herbicides more so than insecticides.

But with all those strips of flowers, it will change the landscape. You will have more colours. Is it an option to, for example, put hives alongside the field?
That's one aspect of it and some people will do that. If you have a canola crop in a given year, you might have a beekeeper have hives next to your field and none of that changes. Farmers are still free to do that in order to increase their pollination and it might actually benefit the honeybees as well because they might have a more diverse diet. It might help the honeybee keepers maintain healthy hives by having these sorts of flowering strips on the landscapes. That way, the honeybees can visit things that are in bloom even when the canola is not in bloom; these things could flower before canola or could be flowering after canola, so they are going to support those pollinators.

Now you are entering the third year of the research activity. So far, you have planted the flower strips; have you started to measure the impact of the activity?
We have been monitoring a few different things. We've been collecting different kinds of insects, such as bees and predatory beetles, and also trying to collect pests to make sure we don't accidentally support them as well. We're also measuring weed pressure in the crops to make sure we are not having any sort of negative effect. We want to make sure that we're doing good things for the farmers but not accidentally causing bad things as a side effect. And we're also measuring what this is actually doing to the crop yields.
So far, we've found that whenever we measure insects on these flowering strips and also in fields that don't have them, we see a three-to-four-fold increase in the number of wild bees and the number of predatory insects [in the flowering strips]. That suggests that [the flowering strips] are at least attracting these bees and beneficial insects. We don't have enough long-term data yet to know whether or not they're increasing their populations, that is going to take a few years, but we know that [the bees and other beneficial insects] are coming in and visiting and using these floral strips. That is what we want. The next phase will be to see whether or not those numbers increase.

I read that you might develop fact sheets of best management practices to help farmers have more sustainability in their fields.
Yes, I think a lot of farmers are interested in these sorts of activities but sometimes they don't necessarily know where to start. What we are trying to do, because no one else has really done it before in Manitoba or on the Prairies to this level, is to see what flowering plants are good to grow; how we can make a mix that can be beneficial for all these different insects that we're interested in; but isn't going to cost a lot. You can buy native prairie plant seed but that's quite expensive for every acre that you want to plant, so we're using a mix of native plants, perennials and annuals that are relatively inexpensive and easy to manage. We'll try to figure it out and to make all the mistakes for the farmers so that they don't have to. We want to figure out all the good things and bad things about these floral strips.

I think this activity is very welcome within the organic community. I thank you very much Dr. Gibbs for this information and we will follow up soon on the results of your research

Thanks for having me.

A flowering strip in August 2019, in Manitoba