Science Applied to Organic Agriculture Helps All Farmers

by Ralph C. Martin

Organic agriculture has far more in common than it has differences with non-organic agriculture. It is based on similar traditions and information flows both ways.

Science applies to organic agriculture as much as it does to agriculture at large. Research conducted in unmasked biological systems, under organic methods, reveals relationships and interactions sometimes not observed under conditions of high synthetic inputs. The kicker is that research in organic systems often boosts efficiency in non-organic systems as well.

For example, organic farmers were correctly challenged by their neighbours about too much tillage and over the last decade with research support, many of them practice reduced tillage with roller crimpers. Howard G. Buffet, author of the book, Forty Chances, still farms with pesticides, as he deems necessary, but given he has the genes of his father, Warren, he assesses the roller crimper to be very cost effective.

"There is a small, sturdy, low-tech implement that we are starting to believe may have more potential, pound for pound, to help poor fragile farmers feed their families than big tractors and planters can. It's not fancy or shiny and our guys welded modifications to the original design themselves…It's called a roller crimper and it looks like an oversized kitchen rolling pin with a raised-pattern surface. It kills cover crops without chemicals. It can be scaled up to a 60 foot rig, pulled by a large tractor, or scaled down to be pulled by oxen."

Some non-organic squash and pumpkin farmers in Ontario started using the roller crimper on a rye cover crop before they seeded their large gourds. Now retailers are asking more farmers to use this 'organic' technique because the squash stays cleaner, without a flat spot, in contrast to dirtier fruit with flat spots, on bare ground. Non-organic farmers are lining up to check out the cost savings, aesthetic appeal and ecological benefits for other cash crops including corn and soybean.

Participatory plant breeding funded by the Bauta Family Initiative on Canadian Seed Security and the Growing Forward 2 program of Agriculture and Agri-Food Canada, is showing that organic farmers do select superior wheat lines for their farms

from populations of crosses provided by collaborating scientists. Dr. Martin Entz of the University of Manitoba reports that they selected advantageously, given the inherent variability, such that the maturity of the same line varied by 5 days from one region to another.

This model of scientists and farmers engaging in a type of citizen science is moving the bar for improved varieties, under organic conditions. Instead of the specific soil and climatic conditions of each farm restricting yield and resilience possibilities, this model is helping farmers adapt with varieties tailored to their agro-ecosystem; not a bad strategy when climate change comes calling. These cost effective methods could also be adopted on non-organic farms, to improve resiliency.

Although research in organic systems strengthens the entire agricultural sector, it is also important to note that the demand for organic products in Canada has grown by more than 4 times since 2006 when the Organic Agriculture Centre of Canada first assessed the value of organic products purchased in the Canadian food market at $1.1 billion. Ten years later, in 2016, this market was at $4.7 billion, according to the Canadian Organic Trade Association.

Unfortunately, most of this growing organic market is being served by non-Canadian farmers. Why should so much organic food come from outside Canada, if we can grow it here? It makes sense for the value of this expanding market to accrue to farmers and others along our value chain at home. Consumers would love to tick off the 'local' and 'organic' boxes with one purchase.

There's no doubt that science applied to organic systems can be handed off to non-organic farmers to spread the wealth across the country. In addition, research in organic systems is supporting a long neglected agricultural sector that is responding remarkably. Investment in organic agriculture research is a solid bet.

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