

SOIL MICROBES OFFER NEW ROAD TO PULSE PRODUCTIVITY

One microbe, Mycorrhiza, could enhance phosphorous delivery from the soil to pulse crops. A two-year project will build knowledge of how this works and can be enhanced.



Healthy pea seedlings as a result of healthy roots and a healthy soil environment.

How do pulse growers produce healthy, high-yielding crops? One broad set of tactics could be called protect the plant. Growers use chemical, genetic and agronomic means to keep insects, disease and weeds from harming the potential of the crop.

Today, a new direction to meet the potential of pulse crops is opening – one you might call *strengthen the soil* – and Dr. Monika Gorzelak is helping to lead the way.

“I’m a soil microbe ecologist,” said Gorzelak, Lethbridge-based Soil Scientist with Agriculture and Agri-Food Canada. “I’m interested in how different soil organisms interact with each other to ultimately create

benefits for plants that we are interested in.”

These potential benefits are many and significant. For example, soil organisms could boost the soil’s ability to sequester carbon. Of immediate interest to pulse growers is the likelihood that soil organisms could contribute to crop nutrition.

Gorzelak points to one soil microbe, *Mycorrhiza*, for its potential to nourish the crop below the soil rather than growers just applying fertilizer to the surface. This could create economic as well as environmental benefits.

“*Mycorrhizas* are well-documented to pick up phosphorous,” she said. “It’s

a complex system, but what I want to understand is its effect on soil health and how well that soil can support a crop.”

How *Mycorrhizas* help field peas

In the spring of 2020, Gorzelak began a two-year study to lay the groundwork for understanding how *Mycorrhizas* function, how they strengthen the soil and how this can aid the production of field peas. This work will be supported by Alberta Pulse Growers and will be managed under the Plot to Field banner (see page 10 for more on Plot to Field).

“*Mycorrhiza* is a symbiotic soil fungus that is wholly dependent on the plant for its life cycle,” Gorzelak said. “They’re not able to grow and proliferate outside the plant root. I’m focusing on field peas because they’re nitrogen-fixing and are therefore better hosts for *Mycorrhizas* than, for example, wheat.”

Under this project, Gorzelak will explore how *Mycorrhizas* interact with field peas in the different growing regions within Alberta, in crops that have and have not received a phosphorous application. She’ll begin by seeking an initial genetic fingerprint of *Mycorrhizas*. Further down the road, a full DNA sequence could be mapped.

With this baseline of knowledge in place, soil scientists could then finetune microbes such as *Mycorrhiza* to increase the potential benefit.

Many ways that growers and science help pulse crops occur above the soil surface. Gorzelak believes that the soil itself holds vast potential and is excited to get started.

“My personal interest is soil health,” she said. “I’m after long-term sustainability of soil, which includes building soil organic matter, focusing on and improving the biology of the soil. The result is that it’s going to be great for crops as well.”