

Transcript of 2021 3MT® presentation by Amy Fang Shi, PhD Environmental Sciences candidate at the University of Guelph

All lifeforms have one essential purpose. Survival. But there is one plant that does not want to do that. You may wonder how is that possible, and why? This plant is called American ginseng, and it is native to Canada.

The Canadian expected value of ginseng is over 200 million dollars per year. Because of its high value and high demand in the Asian market, this crop has been grown commercially in the field since the late 19th century.

However, soon after farmers start the cultivation, they realize although they can grow just about any crop after ginseng, if they plant ginseng again where it was first planted, the plant will suffer from a root rot issue and eventually die. Even after waiting 50 years, this devastating issue is known as ginseng replant disease.

This poses a huge problem to our farmers because ginseng is picky in its environment, and it especially likes sunny soil. Well, I guess who doesn't like lying down on a nice sunny beach? But replant disease means farmers always have to look for new land, and you guessed it. They are running out of land.

So, the million-dollar question is why does ginseng die when replanted? This is the main question my research is focusing on. And the other question is, are we able to save ginseng? If people haven't been able to after 100 years, is it because it is mission impossible? The only method that is currently available to our farmers is to use chemicals to kill soil pests before planting. However, when the diseases pests are high, this method doesn't work. Plants are still going to die.

Luckily, some new pest management strategies have been developed. Does it mean we have a new hope for controlling ginseng replant disease? I have been testing some of these new treatments in my research. Some of the treatments use the heat energy from the sun by covering the soil with a piece of clear plastic tarp to raise the soil temperature, roasting soil pathogens to death. This method provides good control of ginseng replant disease, but there is still more work to be done to verify the result.

From my research, I am comparing three soil treatments to see whether if they are able to control ginseng replant disease, and to understand why these treatments may or may not work. By doing that, it can help us to understand the cause of the disease.

My research aims the "vents" are understanding on ginseng replant disease, and bringing the hope of solving this issue. If we keep American ginseng, this Native plant of Canada grown healthy on our land then it will be a mission accomplished.

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