

## “You can't always get what you want”<sup>1</sup>

*Phoma macrostoma*, a new fungal herbicide that attacks Canada thistle and dandelion, made a splash in the media last winter. Producers were very interested. Karen Bailey, the Agriculture and Agri-Food Canada research scientist who made the discovery, was inundated with calls from people offering their weed patches as trial sites.

So where is that project now? Unfortunately, not yet ready for the many organic producers who want it. Home owners and golf course managers will be the first happy recipients; The Scotts Company, who have worked with AAFC for several years on registration, hope to have the product on the market for use on turf grass in 1 to 2 years. Testing has only begun to determine the **agricultural** potential of *Phoma*.

*Phoma* is a native micro-organism that was isolated from diseased Canada thistle plants near Melfort, SK. The disease slows root growth, and turns the leaves and stems white. Without the green chlorophyll, the plant the plant can not survive. Tests thus far indicate that the bioherbicide affects plants in the Canada thistle and dandelion family, as well as some of those in the mustard family. It does not affect grasses (which includes cereal crops) or flax. When applied as a granule to the soil, the bioherbicide is short-lived. It is not detectable in the year after application. Before *Phoma* can be registered as a bioherbicide for agricultural purposes, scientists will need to collect data on its effect on a wide range of weeds in the desired crops, and on its safety for use with food and feed crops.

Experiments were conducted this summer to consider the range of species that might be controlled by the fungus, and what rates would be needed. Because these experiments were conducted in the field, they also looked at the impact of environmental factors on the efficacy of the bioherbicide.

Scientists will need several years of data before they can confidently make recommendations, but already some results are emerging. The bioherbicide was not effective against all weeds. Because it did not affect stinkweed, lamb's-quarters or wild oats, it is likely to be registered for targeted control of specific weeds, rather than broad spectrum weed control.

The exciting news is that in some tests, the affected weeds included some very challenging species: field bindweed, dandelion, Canada thistle, annual sow-thistle and wild mustard. A number of weeds were partially reduced: false cleavers, hemp nettle, smartweed, perennial sow-thistle, volunteer canola. However, results were variable and the weeds were not uniformly controlled. Differences in moisture at the sites may have played a part.

Comparisons of different bioherbicide rates were not decisive. More work will be needed in this area.

Environmental effects were also evident. In two trials, one on Canada thistle and one on wild mustard, the bioherbicide was broadcast as a granule onto soil seeded to a cereal. Dry conditions resulted in little initial weed growth, and no apparent injury from the *Phoma*. But in both cases, the bioherbicide remained dormant, and did not die. Later season rain “activated” the

bioherbicide and later emerging plants were infected. This could be especially good news for wild mustard control. Wild mustard is notoriously difficult to control because of its tendency to emerge anew after each rainfall. For the flush of wild mustard that came in response to the rain, control was very good (82%).

So what is the take home message? Will *Phoma* be on the market for organic field crop producers any time soon? Probably not. Initial research needs to be substantiated with further testing. Further research is needed to sort out environmental interactions, perhaps fine-tuning application technology. Food and feed safety testing will be needed and registration would require a company to champion the product through the process. It would take time and economic incentive for that to happen.

Does *Phoma* have potential as an agricultural product? It certainly looks that way. Under ideal conditions, it has the potential to deal with some truly challenging weeds and weed situations. Field bindweed and Canada thistle are difficult for chemical and organic producers alike. An effective biological control could be very important. For organic producers, the ability to deal effectively with flushes of wild mustard up to a month after seeding could be a significant advantage. Yes, there is potential.

Where does this go from here? For those looking to *Phoma* as a quick fix, “no, you can’t always get what you want”<sup>1</sup>. But for those looking for an additional weed management tool, Karen Bailey’s continuing research offers exciting possibilities in the long-term. Karen Bailey is seeking further funding to continue her research in the field. Hopefully for Karen, the second half of the Rolling Stones chorus will also be true:

“And if you try sometime you find  
You get what you need.”<sup>1</sup>

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<sup>1</sup> Rolling Stones, 1969.