

The Effects of Crimper-Rolled Winter Rye on the Agroecosystem and its Impact on Transplanted Vegetable Crop Productivity.

C. Leyva Mancilla^{1*}, J. C. Bede¹, M. Leblanc² and J. Boisclair²

1. McGill University, Montreal, QC.

2. Research and Development Institute for the Agri-Environment (IRDA), Saint-Hyacinthe, QC.

* cinthya.levyamancilla@mail.mcgill.ca

Background:

One of the issues of particular concern in organic agriculture is the control of weeds as their presence in the field can lead to important crop yield losses. Producers are challenged to implement weed control methods that do not threaten soil quality and health while maintaining high crop yields. One technique for weed suppression that has shown promising results is the use of cereal rye (*Secale cereal* L.) as a cover crop. In addition to controlling weeds through physical and allelochemical mechanisms, it can provide multiple benefits to the agroecosystem in terms of soil health and insect relative abundance.

Project Overview:

This study has four objectives to determine the effects of crimper-rolled winter rye as a cover-crop on the agroecosystem and its impact on transplanted crop productivity of two different vegetable crops: Broccoli (*Brassica oleracea* L.) variety 'Diplomat' and Spanish onion (*Allium cepa* L.) variety 'Vaquero'. Field experiments will be conducted at the new platform for innovation in organic agriculture of the Research and Development Institute for the Agri-Environment (IRDA) in St-Bruno-de-Montarville, Québec. Both crops, broccoli and onion, will be submitted to four different treatments: (1) transplanted crop in crimper-rolled rye, (2) transplanted crop mechanically weeded (finger weeder), (3) transplanted crop manually weeded, and (4) transplanted crop not treated (control).

The effect of each treatment on the agroecosystem will be assessed by evaluating the microclimate (soil temperature measurements), insect relative abundance (visual scouting for beneficial and insect pests, pit-fall trapping for ground beetles (Carabidae)), weed establishment (weed biomass and count) and vegetable crop productivity (marketable yield by category following Canadian Food Inspection Agency standards). Data will be statistically evaluated by subjecting it to an ANOVA and analysed using the Proc Mixed procedure in SAS. We expect a decrease in weed biomass and an increase in insect relative abundance in the winter crimper-rolled rye treatments thereby positively affecting crop productivity.

Conclusions:

Results of this experiment can give insight into potential ways of improving weed control management by cover crops in south-eastern Canada.

Acknowledgments: Thank you to the Research and Development Institute for the Agri-Environment (IRDA) for providing funding for this project done in collaboration with McGill University.