

Understanding auxinic herbicide resistance in kochia and staying ahead of what's next

Dr. Charles Geddes

Agriculture & Agri-Food Canada

SPG Contributions	Project Status	Duration/Timeline of Project (Year to Year)	Total Project Cost
\$54,000.00	Active	December 2020 – November 2024	\$376,190.00

Project Description

To conduct a baseline survey of PPO inhibitor-resistant kochia in Western Canada; to assess kochia populations for cross-resistance to other synthetic auxin herbicides, herbicide mixtures, and usage windows; to assess the efficacy of a potential "new" (old) herbicide, dichlorprop, for management of auxinic herbicide-resistant kochia; to work toward determining the mechanisms of auxinic herbicide resistance in kochia in Western Canada; to determine whether dicamba or fluroxypyr resistance traits in kochia confer fitness penalties.

The 2021/22 fiscal year was the first year of this 4-year project that aims to further our understanding of synthetic auxin resistance in Canadian kochia populations, and to proactively assess kochia populations for other types of resistance at risk of selection. In the 2021/22 fiscal year, the majority of research focused on a proactive survey of Manitoba assessing the potential for group 14 resistance in kochia and studies assessing cross-resistance to dicamba and fluroxypyr in Alberta kochia populations.

Outcome

Our research to-date suggests that kochia populations in Western Canada exhibit variable cross-resistance to the synthetic auxin active ingredients dicamba and fluroxypyr, meaning that these populations can exhibit resistance to one or both of these active ingredients. In addition, group 14 resistance was not found in a wide range of kochia samples from Manitoba. Overall, the project remains in good health, and the results so far provide an excellent foundation for continuation of the project moving forward.

Research Objective

OBJECTIVE 1

To conduct a baseline survey of PPO inhibitor-resistant kochia in Western Canada.

OBJECTIVE 4

To work toward determining the mechanisms of auxinic herbicide resistance in kochia in Western Canada.

OBJECTIVE 2

To assess kochia populations for cross-resistance to other synthetic auxin herbicides, herbicide mixtures, and usage windows.

OBJECTIVE 5

To determine whether dicamba or fluroxypyr resistance traits in kochia confer fitness penalties.

OBJECTIVE 3

To assess the efficacy of a potential "new" (old) herbicide, dichlorprop, for management of auxinic herbicide-resistant kochia.