

A systematic review of field bindweed (*Convolvulus arvensis*) control and management studies in organic and diversified cropping systems for the Northern Great Plains region

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Executive Summary

One of the greatest challenges to the long-term sustainability of organic agriculture in the Northern Great Plains (NGP) is perennial weed management. Organic producers in Montana have identified field bindweed (*Convolvulus arvensis*) management as a specific challenge. Despite the variety of potential mechanical and cultural management techniques available to control field bindweed, producers continue to struggle with it in organic systems. We systematically reviewed previous research to determine which aspects of non-chemical field bindweed management warrant further study and highlight best management practices for its control.

Our literature search revealed that very little research has been conducted about non-chemical management of field bindweed in the NGP. Only five studies out of the 48 that met our criteria for inclusion in the study were conducted in this region. However, in looking at literature from the rest of the world, we were able to delineate research areas that seem promising and highlight management practices that could be considered by growers in our region. Our main research findings from the systematic review were:

- Overall, integrated management, where two or more control methods are combined to manage field bindweed, holds the most promise. In annual cropping systems, integrated management in the NGP would be an excellent area for future on-farm research, especially if studies included a form of mechanical control combined with a competitive crop or cover crops in the study design.
- Intensive cultivation can control field bindweed in agricultural systems, but this may not be a method that producers across the NGP may be willing to undertake because it is expensive and decreases soil health. The most interesting and potentially useful aspect of mechanical control is how it can be integrated with other methods.

- It would be beneficial to investigate if intercropping methods are effective in Montana, and which might work best within the climatic constraints of the NGP.
- Research about the most effective cover crop species and varieties for managing field bindweed in the NGP would be useful.
- Mulching for field bindweed management in either annual or perennial systems would be an interesting focus for future research, as there is little information about this method in the NGP, but studies suggest it is effective in other parts of the world.
- For perennial systems such as pasture and hay fields, research that focuses on increasing or sustaining the competitive ability of crops or other desired plants may be the most useful for field bindweed management. Possibilities include research about competitive species or cultivars, cover crops, and fertilizing or mowing regimes.

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