

CULTURAL AND AGRONOMIC MANAGEMENT OF HERBICIDE-RESISTANT KOCHIA IN SASKATCHEWAN

MEASURE THE IMPACT OF WINTER CEREAL CROPS VERSUS SPRING CEREAL CROPS FOR WEED COMPETITION

Introduction

Herbicide-resistant kochia (*Bassia scoparia*) continues to cause substantial yield losses across Saskatchewan, with resistance to multiple herbicide groups limiting chemical control options. With Group 14 resistance now confirmed in Saskatchewan, producers must increasingly rely on integrated weed management strategies. This Strategic Field Program project evaluates practical cultural and agronomic tools to reduce kochia pressure. Field trials that included 3 objectives were conducted from 2024–2025 at Swift Current (Light Brown soil zone) and Redvers (Dark Grey soil zone).

Methods

Roundup Ready canola was seeded in Year 1 to increase weed pressure, followed by fall seeded winter wheat, winter triticale, and hybrid fall rye compared to spring seeded crops, such as spring wheat and spring triticale. Weed density was tracked pre-season, mid-season, and post-harvest along with crop establishment and grain yield.

Results

At Swift Current, winter cereals reduced early-season kochia densities by approximately 50–75% compared to spring cereals. Across treatments, kochia populations declined 67–90% during the growing season, demonstrating strong in-crop suppression. However, environmental stress limited winter cereal yields. Spring wheat yielded highest (1,510 kg ha⁻¹), while winter wheat yielded lowest (665 kg ha⁻¹).

At Redvers, results differed. Winter cereals often had higher kochia densities prior to harvest, though kochia plants were smaller (lower biomass), suggesting suppression through shading, which also reduced in-crop herbicide efficacy on those treatments. Yield performance strongly favored winter cereals: hybrid fall rye (2,723 kg ha⁻¹) and winter triticale (2,096 kg ha⁻¹) significantly out-yielded spring wheat (412 kg ha⁻¹). By post-harvest, kochia densities were low and similar across treatments.

Overall results demonstrate that winter cereals can reduce kochia pressure, as winter cereals suppressed early-season kochia by up to 75%, but environmental conditions largely determine yield outcomes. Across sites and objectives, environmental conditions were the dominant driver of crop yield and an integrated approach combining light tillage, fall herbicide, competitive crops and annual forage harvest systems provides the greatest potential to reduce reliance on herbicides and manage herbicide-resistant kochia sustainably. The project will continue through 2027 to evaluate cumulative multi-year impacts. A full project progress report can be found on wheatlandconservation.ca

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