Winter wheat yield following Treflan® HFP applied the previous year in spring canola

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Italian ryegrass is a cool-season annual to short-lived perennial grass that has become a major weed in the higher rainfall region of eastern Washington within the last 30 years. Italian ryegrass has developed resistance to all Group 1 (ACCase inhibitors) herbicides, e.g., clethodim, Hoelon®, Poast®, Assure®, Axial®, and Group 2 (ALS inhibitors) herbicides, e.g., Osprey®, Outrider®, Amber®, PowerFlex®, and Beyond®. Currently, growers have included glyphosate-resistant spring canola in their rotations so they can control Italian ryegrass in the canola crop with glyphosate. Resistance to glyphosate has occurred in other areas but is not yet widespread in eastern Washington. Concern over developing glyphosate resistance in Italian ryegrass has prompted research into using herbicides with sites of action different from glyphosate in spring canola.

Treflan HFP (trifluralin) is a Group 3 dinitroaniline herbicide used for preemergence control of grass and broadleaf weeds, including Italian ryegrass, in many crops. Its mode of action is to inhibit mitosis in the developing root tips by binding to tubulin, thus interfering with the formation of microtubules critical for cell division. Treflan HFP can be effective if applied and incorporated into the soil before weed seeds germinate. Following incorporation, adequate precipitation is needed to move Treflan HFP into the soil water where it can be taken up by seedling roots. Treflan HFP also has soil residual activity that can injure sensitive crops if they are planted too soon after application. Treflan HFP is labeled for preplant incorporated application in wheat, but only if the wheat is planted below the zone of herbicide incorporation. Planting winter wheat following a crop of spring canola where Treflan HFP was applied has raised concerns regarding residual carryover damage to the following wheat crop.

In 2023, we compared herbicides for Italian ryegrass control in spring canola at the WSU Cook Agronomy Farm near Pullman, WA. Treatments included Treflan HFP at 24 oz/A by itself and in combination with PowerMax® (glyphosate) and Liberty® 280 SL (glufosinate) in 10 by 30 ft plots with four replications per treatment. In the fall of 2023, winter wheat was planted over the study site with a Horsch direct-seed drill. In August 2024, we harvested winter wheat from all plots with a small plot harvester. Samples were cleaned and weighed for yield.

We found no statistically significant yield loss caused by Treflan HFP applied in the previous spring crop between individual treatments (data not shown) or between plots where Treflan HFP was applied and where no Treflan HFP was applied. (Table 1). This is congruent with a similar comparison in 2023 where winter wheat yield was not reduced by Treflan HFP applied the previous year (Refer to https://smallgrains.wsu.edu/weed-resources/weed-publications/weed-control-reports/). Treflan HFP applied at the labeled rate of 24 oz/A prior to planting a spring canola crop does not appear to cause yield loss in the following winter wheat crop.

Table 1. Winter wheat yield in 2024 following herbicides applied in 2023 for Italian ryegrass control in spring canola.

Applications in 2023 spring canola	Winter wheat yield in 2024*
	bu/A
Treflan applied	119 a
No Treflan applied	117 a

*Means followed by the same letter are not statistically different (P≤0.05).