



Management of Italian Ryegrass in Wheat

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Introduction

Italian ryegrass (*Lolium perenne* L. ssp. *multiflorum*) is the most common weed reported in wheat fields in Virginia. It is a winter annual weed and germinates when day/night temperatures range from 50/41°F to 77/41°F, which coincides with wheat germination. The emergence of this weed can occur both in fall as well as spring seasons. However, emergence and growth slow down in winters and re-accelerates during spring. Italian ryegrass populations have different degrees of seed dormancy and thus show a staggered but continuous emergence pattern until the shade from the cash crop completely suppresses their emergence. Flowering occurs in summers mainly during May to July, producing a large number of seeds. High levels of seed shattering lead to larger weed seed banks which affects the weed levels in upcoming wheat crop.

High infestation of Italian ryegrass may cause significant yield losses in wheat. Wheat yield losses can reach over 50% and even as high as 100% in severely infested fields. Italian ryegrass cannot self-pollinate and must rather be pollinated by a different plant. This obligate outcrossing results in weedy and herbicide-resistant traits spreading quickly. Having similar genetic features as that of perennial ryegrass (*L. perenne* L. ssp. *perenne*), favors its rapid hybridization resulting in wide range of plants with similar characteristics making it difficult to identify and manage.

Identification

At early stage this weed looks similar to wheat, and few other weed species, so identification of the Italian ryegrass can be challenging. Italian ryegrass can be identified with a purple stem base and more shiny leaves compared to wheat plant. The leaves

are generally ribbed or have fine parallel lines. The claw-like auricles in the collar region (where the leaf blade meets the stem) is another way to differentiate Italian ryegrass from most other grass species (Figure 1 & 2)

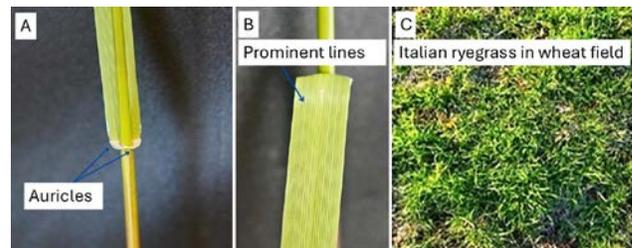


Figure 1. Identifying characteristics of Italian ryegrass, A) presence of auricles, B) prominent lines on leaves, and C) representation of Italian ryegrass infestation in wheat field



Figure 2. Italian ryegrass in wheat field (A) before maturity, (B) after maturity

Management

Controlling Italian ryegrass in wheat with herbicides becomes challenging as both are grass species, and limited herbicide options are available, especially when it is herbicide-resistant. In Virginia, Italian ryegrass populations are resistant to ALS-inhibitors (Group 2), and/or ACCase-inhibitors (Group 1) herbicides. Therefore, it is important to know the status of herbicide-resistance in a field before devising an herbicide-program, and focusing on

different herbicide groups in rotation or tank-mixes for achieving excellent results. Experiences from on-station and on-farm research indicate that postemergence herbicides alone cannot provide complete control of Italian ryegrass. A combination of preemergence and postemergence herbicides ensures effective control of this troublesome weed.

Starting weed-free is a good strategy. For burndown applications, growers can consider Roundup PowerMax 3 (1 qt/A), or Gramoxone SL 3.0 (2 pt/A). Due to Italian ryegrass' waxy leaf coating that can reduce herbicide absorption, all preplant burndown and postemergent herbicides should include a surfactant according to the product label. Paraquat (Gramoxone) is a broad-spectrum herbicide option ahead of planting, especially in areas where Italian ryegrass is resistant to glyphosate (Roundup) and other ALS- and ACCase-inhibitors, but it may require multiple applications. Italian ryegrass populations in Virginia are not resistant to glyphosate, therefore, it will be effective as burndown against most broadleaf and grass weeds.

Valor EZ and Fierce EZ are viable options for preplant applications (Table 1). Valor EZ (4 fl oz/A) must be applied 7 days prior to planting in no-till or minimum-till wheat but a 30-days interval is recommended for conventionally tilled wheat. Fierce EZ (6-9 fl oz/A) can be applied 14 days before planting wheat in no-till or minimum till fields only.

For preemergence control, Axiom DF (8 oz/A), Prowl H₂O (2.5 pt/A), Zidua SC (2.5 fl oz/A) or Anthem Flex (3-4 fl oz/A) are reliable options, especially for the control of Italian ryegrass (Table 2). Zidua SC and Anthem Flex are highly effective in controlling Italian ryegrass even resistant to group 1 and 2 herbicides, but crop injury may result under prolonged wet soil conditions. Check the labels for rates specific to soil types.

If Italian ryegrass escapes any preemergence treatment, Axial XL (16.4 fl oz/A)/Axial Bold (15 fl oz/A), Osprey (4.75 oz/A) or PowerFlex HL (2 oz/A) (Table 3) can be used as a rescue treatment when applied postemergence (POST). Axial XL/Axial Bold and Osprey are more effective when applied early postemergence when Italian ryegrass is at 1-leaf to 2-tiller stage.

If there are broadleaf weeds growing along with

Italian ryegrass, consider tank-mixing or separate applications of Harmony/ Harmony Extra (0.5 – 0.9 oz/A), Huskie (11-15 fl oz/A), Tricor/metribuzin (3 oz/A), Aim (1-2 fl oz), or Starane Ultra (4.8-6.4 fl oz/A).

Table 1. Selected herbicide programs for controlling Italian ryegrass in winter wheat – Preplant

Timing of application	Rate (per acre)	Efficacy
Valor EZ	4 fl oz/A	Good
Fierce EZ	6-9 fl oz/A	Good
Anthem Flex	2-4.5 fl oz	Excellent

Table 2. Selected herbicide programs for controlling Italian ryegrass in winter wheat - Preemergence

Timing of application	Rate (per acre)	Efficacy
Axiom DF	6-10 oz	Very good
Prowl H ₂ O	1-3 pt	Very good
Zidua SC	1.25-4 fl oz	Excellent
Anthem Flex	2-4.5 fl oz	Excellent

Table 3. Selected herbicide programs for controlling Italian ryegrass in winter wheat – Postemergence

Timing of application	Rate (per acre)	Efficacy
Axial XL	16.4 fl oz	Excellent
Axial Bold	15 fl oz	Excellent
Osprey	4.75 oz	Very good

Other considerations for the control of Italian ryegrass

Harvest weed seed control (such as chaff lining) at harvest, helps by placing all weed seeds in single line rather than spreading weed seeds throughout the field (Figure 3). Herbicides can be used on chaff lines to effectively manage Italian ryegrass and other weeds. This in turn reduces the weed seedbank.

Cover crops generally suppress weeds' emergence and growth during spring and early summer which coincides with Italian ryegrass growth pattern. A combination of herbicides with cover crops, helps in controlling of Italian ryegrass and reducing soil seed bank. Along with this, no-till also helps in reducing Italian ryegrass infestations over the years. No-till generally reduces soil weed seed bank by 56-72% per year in comparison to conventional tillage (Zamljen et al. 2024). Emerged weeds are usually killed with herbicides, and weed seeds underneath

the soil are either disintegrate, lose viability or eaten up by predators. Reports indicated that more than 95% of the Italian ryegrass seeds buried in soil become non-viable within 540 days, regardless of burial depth (Cechin et al. 2020).



Figure 3. A) Weed seeds and chaff narrowed down into a line during wheat harvest, B) Chaff liner fixed behind the harvester to concentrate chaff and weed seeds therein.

Conclusion

In summary, ALS-inhibitor-resistant Italian ryegrass should be managed with a preemergence application of Axiom DF plus Prowl H₂O or Zidua SC or Anthem Flex followed by postemergence application of Axial XL or Axial Bold. If Italian ryegrass is not ALS-inhibitor-resistant, Osprey or PowerFlex remain good postemergence options. Glyphosate alone should be avoided in the preplant burndown or in Roundup Ready crops if resistance issues are suspected.

For more information, refer to Pest Management Guide – Field Crops:

https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/456/456-016/ENTO-602.pdf

References

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