



# Italian Ryegrass Control in Oklahoma Wheat for Fall 2000



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Italian Ryegrass, also known as 'Marshall' or simply 'ryegrass' is being rapidly introduced to most of Northcentral Oklahoma. It is being widely promoted as a forage grass, used on rights-of-way for erosion control, and sold as lawn grass seed. Ryegrass is a completely different species than rye.

Our efforts to alert wheat growers to the seriousness of potential invasion of wheat fields by this highly aggressive species have not prevented people from spreading it far and wide. It is now being reported in wheat fields as far northwest as Woods County. It is moving from roadsides into wheat fields that were weed free in previous years. Ryegrass can spread rapidly and is extremely aggressive. It will take over wheat fields and effectively stop wheat production unless herbicides are applied to control it.

## **HOW TO PREVENT RYEGRASS FROM INFESTING YOUR FARM**

Several steps should be taken to prevent the introduction of this weed into your wheat fields.

1. Each wheat grower should alert his neighbors to the seriousness of Italian ryegrass in wheat and encourage them to not plant it in their fields and to destroy invading plants.
2. County Commissioners should be advised of the potential problem so they do not seed ryegrass on roadsides for erosion control. Ryegrass seeds move in water enough to spread down waterways and off roadsides into fields. Therefore, cooperation from neighbors is essential.
3. Every piece of commercial or custom equipment that enters a field should be inspected. Some people who overseed their pastures with ryegrass get a spreader full of fertilizer, pour ryegrass seed into it and spread both at the same time. Unsuspecting wheat growers then get a load of fertilizer in the same spreader and some unwelcome ryegrass seed along with it. This has caused big problems for some Oklahoma wheat growers.

Custom combines can be another major source of ryegrass infestations. We depend on custom crews, but each wheat grower needs to actually inspect every machine that enters his farm to make sure that it isn't bringing in ryegrass. If the custom crews know that a particular farmer is going to require clean machines, they will clean them before they get to that farm. If the farmer doesn't care, neither will the custom crew. Asking isn't good enough; you have to inspect the combine yourself. Elevator doors should be opened and inspected and auger troughs carefully inspected on every combine. Each header must also be inspected.

1. Insist on clean wheat seed. It is becoming extremely important for each wheat grower to be very aware of what he is planting. Wheat growers that buy seed should keep an eye on fields that they will be buying seed from. Never plant bin run seed or "bought at the elevator pit" seed unless it has been recleaned, and checked for weed seed and germination.
2. Control the property that you own. Most wheat fields in Oklahoma are farmed by renters. Owners of wheat fields should insist that renters keep ryegrass off of the land. Failure to do so could quickly reduce the value of the land for crop production. Absentee landowners need to carefully monitor the situation with ryegrass as it pertains to their land and insist on cooperation from renters.
3. Know the source and content of hay that you buy. Ryegrass hay or ryegrass in hay is common across Eastern, Central, and Southern Oklahoma. Feeding hay with ryegrass in it could quickly spread ryegrass, particularly if the hay was fed to cattle on wheat pasture.

## **RYEGRASS SEED IN CERTIFIED WHEAT SEED**

Certified Seed Standards in Oklahoma specify the maximum amounts of other crop seeds (including amounts of ryegrass seed) that may be present in Certified Wheat Seed. Ryegrass in wheat is classified as an "inseparable other crop" for purposes of field inspections by the Oklahoma Crop Improvement Association (OCIA). The current maximum level of inseparable other crops in a Certified Wheat field is one head per 2000 heads of wheat. OCIA inspectors reject wheat fields that exceed this standard. The wheat seed must also pass laboratory standards after harvesting and cleaning. Total other crop seed (including ryegrass) must not exceed 0.25% to be classified as Certified Wheat. Personnel at the OCIA laboratory at OSU actually hand separate a sample of each lot of seed prior to approval for Certification. In addition, the lot may be rejected on the basis of pure seed, inert matter, noxious weeds, excess common weeds, other varieties, and germination. Growers can check with their County Extension Office or the OCIA website ([www.okcrop.com](http://www.okcrop.com)) for additional information.

Since ryegrass seed is very small, the 0.25 % other crop standard (which equals about 6000 ryegrass seeds per bushel of wheat) may still permit too many ryegrass seeds for most wheat growers, especially those who want none. In order to provide additional information for Seedsmen and Certified Seed Purchasers, this year the OCIA Laboratory will determine the actual number of ryegrass seeds per pound from each wheat sample submitted to the OCIA Laboratory for certification and list that amount on each "Report of Seed Analysis". This report is sent back to the Seedsmen on each lot of Oklahoma Certified Wheat Seed. This report must be issued to the Seedsman before he can sell Oklahoma Certified Wheat Seed. A purchaser

who wants to know what is in the wheat seed that he is planning to buy may want to ask to see the "Report of Seed Analysis".

Many seed wheat growers and seed dealers in Oklahoma take a lot of pride in the seed they sell and would never consider selling wheat for seed that had ryegrass in it. The key is to know your seed grower and buy from a reputable seed grower or dealer, preferably one who will welcome you to inspect his fields before harvest. Avoid buying "out-of-state" seed of unknown quality. Be especially careful of seed grown in areas where ryegrass is common, or you may buy seed contaminated with ryegrass seed or even with herbicide-resistant ryegrass seed.

## **HERBICIDES FOR RYEGRASS CONTROL IN WHEAT**

We have conducted research on the use of herbicides for Italian ryegrass control for over 20 years. The comments below are a summary of what we have found to be generally true over the years in Oklahoma.

### **AMBER, FINESSE and GLEAN:** (sulfonyleurea family of herbicides)

For light-to-moderate infestations of Italian ryegrass apply Amber, Finesse, or Glean immediately after the wheat is seeded. Use only the highest rate on the label. Lower rates are not effective for ryegrass control. If it rains before the ryegrass comes up, control usually ranges from 80 to 95%. These levels of control usually result in positive wheat yield responses. At harvest, some ryegrass will be present in the field. Still, these are the cheapest herbicide treatments we have for ryegrass right now. Timing is critical. These herbicides will NOT control the ryegrass once it comes up and gets one full leaf on it. If it does not rain before the ryegrass comes up the control will be poor (this usually doesn't happen but can if the wheat is seeded into a wet seedbed). If wheat is seeded and it rains before the herbicide is applied, don't apply the herbicide. Use another herbicide that can be applied after the ryegrass has emerged, i.e. a postemergence herbicide treatment.

There is no grazing restriction on these herbicides, but in replicated research these high rates of Finesse and Amber, applied preemergence, can slightly reduce wheat forage production. We expect Finesse to reduce forage production a little more than Amber but the ryegrass control with Finesse is usually a little better than with Amber. You can not see the slight reductions in forage production just by looking at the wheat because they are not that evident. The reductions in forage production are usually offset by increases in grain production. The choice between using Amber, Finesse, or Glean should be based on what other weed species need to be controlled and the price of the products.

## **SULFONYLUREA RESISTANT RYEGRASS**

Ryegrass has developed resistance to the sulfonyleurea class of herbicides in several states including Texas. Resistance is suspected in Oklahoma but has not been confirmed. Usually performance problems are related to rainfall, application timing, or application accuracy rather than resistant ryegrass. Grazing typically reduces control because hoofprints break the layer of

herbicide and create spots where the ryegrass can grow. Late emerging ryegrass will then come into these hoofprints. It is recommended that cattle be removed during wet weather to avoid this problem.

You can not apply these herbicides in a band with liquid fertilizer and expect them to work. They must be broadcast uniformly across the soil surface. We have had good results with mounting the spray boom on the grain drill so that the spray falls behind the presswheels. Mount the boom so that it is adjustable from right to left. Then adjust the boom to correct for any overlapping of the grain drill. Do not let the grain drill disturb the soil that has already been sprayed.

A surfactant is not needed for preemergence applications of these herbicides.

### **MAVERICK (MAVERICK PRO)**

Maverick is much more effective on cheat than it is on ryegrass. In experiments where both cheat and ryegrass are present, we have seen that it does control quite a bit of ryegrass. If both weeds are present in a wheat field but there is more cheat than ryegrass, this would be the best herbicide to use. If ryegrass is the main target weed, then Maverick would not be the first choice to use. The first label for Maverick listed Italian ryegrass as a species that Maverick controls. At times in our research we have seen over 90% control. However, control is often not that good. Therefore, the new label for Maverick Pro will indicate that this herbicide suppresses ryegrass rather than controls it.

Our data also indicate that, unlike the other sulfonylurea type herbicides, Maverick should not be applied preemergence for ryegrass suppression. It works better when applied early postemergence with a good quality surfactant. Spray coverage on every plant is essential for effective suppression. Control of ryegrass should not be expected to exceed 60%. If that isn't good enough, use a different herbicide.

Biotypes that develop resistance to Glean, Amber and Finesse will be expected to be resistant to Maverick also.

### **SENCOR**

Wheat growers who fail to apply a sulfonylurea herbicide preemergence before rain have the option of applying Amber plus 2.25 ounces of active ingredient per acre of Sencor early postemergence. The Sencor is used to kill the emerged ryegrass and the Amber to provide residual control. Timing and herbicide rates are very important for this treatment and the degree of control or suppression obtained will vary with weed size and environmental conditions. The wheat must have at least 3 leaves on it and the ryegrass cannot have over 2 leaves when this treatment is applied. Surfactant must not be used. Fertilizer must not be used as the carrier, and no other pesticides can be applied as a tank mix. This treatment can not be used on soils with less than 1 % organic matter content or when the pH exceeds 7.7.

This treatment is not listed on the EPA label for Sencor, but rather is a FIFRA 2 ee

recommendation. The details are provided on a special Sencor Product Bulletin for Oklahoma that must be in the possession of the user at the time of herbicide application.

Some wheat cultivars are sensitive to Sencor and crop injury can be severe on sensitive cultivars. Consult the product label for information on sensitive cultivars. Sencor has a 14-day grazing restriction.

## **HOELON**

Hoelon is very effective for controlling Italian ryegrass and for controlling wild oats, but not cheat. If you have a serious ryegrass problem this is probably the first herbicide that you should use. It must be applied postemergence, preferably in the fall soon after most or all of the ryegrass has emerged. The rate depends on how big the ryegrass is. Control should exceed 95% and usually is in the 98 to 99+% range. Hoelon does not control any broadleaf weeds. It will kill cultivated oats.

There are two major drawbacks to using Hoelon. First, it has a full season grazing restriction and second, it is expensive, compared to Maverick, Finesse, or Amber. Because of the grazing restriction, we have looked at applying Hoelon in the spring after grazing. Right now the label does not seem to allow this, and sometimes it works and sometimes it doesn't. So, we don't recommend spring application. In addition to the risk of poor control in the spring, spring applications do not allow the wheat enough time to recover from the ryegrass competition and as a result, grain yields will be lower.

The application rate of Hoelon depends on the size of the ryegrass. Thus, it is important to spray early so that the lowest rate can be used, which is much more economical. Hoelon can not be tank mixed with 2,4-D and can not be applied with liquid fertilizer.

In some states, such as Arkansas, some of the ryegrass has already developed resistance to Hoelon. Hoelon is a Restricted Use herbicide.

## **ACHIEVE**

Achieve is a relatively new herbicide that usually performs well when applied to small ryegrass, but it does not control cheat. Control with Achieve has not been as consistent as control with Hoelon. Achieve is strictly a postemergence herbicide, so thorough coverage of all of the ryegrass plants is essential for effective control. The label indicates that Achieve should be applied in the fall after the ryegrass has emerged and before it tillers. Our data indicate that very early applications can result in less control, probably because all of the ryegrass had not yet emerged. Applications up through the 1-tiller stage have been more effective, probably because most of the ryegrass had emerged by the time larger plants had one tiller. Further delays can reduce control substantially. This is a fairly narrow window of application. Growers who plan to use Achieve should make arrangements beforehand to see that it is sprayed at the proper time, and that the adjuvant specified on the label is used with it.

The higher rate on the label (0.24 lb. active ingredient /acre) has been more consistent in Oklahoma than the lower rate. Therefore, until we gain more on-farm experience with this herbicide, only the higher rate is suggested. Control with the higher rate, applied to ryegrass with two to five tillers has ranged from 75 to 97%. Control with the same rate, applied to ryegrass with 2 leaves to one tiller has ranged from 55 to 99%.

Achieve has only a 30 day grazing restriction, so basically we might suggest that the correct time to apply it is about 30 days before you plan to start grazing. It will not control any broadleaf weeds and can not be tank mixed with any of the sulfonyleurea herbicides. It can be tank mixed with ester formulations (not amines) of MCPA or 2,4-D, but 2,4-D should not be applied in the fall when Achieve is applied. Control will be reduced substantially if it is applied with 28-0-0 liquid fertilizer carrier.

NOTE: Always read the label and follow the label directions when using any pesticide.

## **WHAT SHOULD WHEAT GROWERS EXPECT FROM RYEGRASS**

Ryegrass is a much more difficult problem to deal with than cheat. It grows thicker and taller than cheat. It has weaker stems and lodges the wheat worse than cheat and stays green longer than cheat. The green spikelets (sections of the seed head) usually collect in the combine bin with the wheat and can cause the wheat to heat and spoil. Elevator operators have learned by experience to not dump wheat that has very much green ryegrass in it.

Within a few years we expect to see wheat fields in Northcentral Oklahoma where the wheat crop is a total failure because of ryegrass. Northern Oklahoma wheat growers will need to learn a lot more about ryegrass control to limit their problems with it, and will have to increase the use of herbicides a great deal to keep it under control enough to grow wheat. Infested fields will probably never be free of ryegrass again.

Grazeout wheat favors ryegrass and causes it to increase. In the spring of 1999, we had to apply Roundup at 1.5 pints per acre twice to kill ryegrass regrowth where wheat had been cut for hay. When rainfall is normal, disking or chiseling once after grazeout wheat does not kill the ryegrass effectively enough to keep it from going to seed. Repeated tillage or tillage plus a nonselective herbicide are necessary.

Crop rotation sounds like a good option for ryegrass suppression. However, ryegrass is now being reported as a major weed problem in early season soybeans in Kentucky. Therefore, just rotating from wheat to soybeans may not solve problems with ryegrass. We are currently conducting research on the use of crop rotations for ryegrass control and the economics of various options.

Many farmers from the Gainesville, TX area up through Comanche, OK and over toward the Washington, OK region have given up on growing wheat because they can't economically control the ryegrass. They have switched to other crops, seasonal grazing, and the CRP for survival. We expect to see the abandonment of wheat production because of ryegrass move

rapidly north across Oklahoma over the next few years.

Ryegrass showed up this year in many fields in Noble County and we expect it to become widespread in Garfield, Kingfisher, Grant, Kay, and Major Counties within a few years. Wheat growers must be on the alert for this invader and take whatever steps are appropriate and necessary to keep it out of their fields

The Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation recognize the potential economic loss for our wheat growers from ryegrass. They are supporting research on new methods of control. Therefore, your checkoff funds that support these organizations are critical to our efforts to develop methods to limit the amount of damage wheat growers will suffer from ryegrass.

## RESISTANCE MANAGEMENT

Herbicide resistant ryegrass is a major weed problem in wheat growing areas around the world. In the USA, herbicide resistant ryegrass is a major weed problem in Oregon, Washington, Idaho, Arkansas, Texas, and other Southeastern States. As ryegrass becomes more common in Oklahoma and is subjected to annual herbicide treatments, it will be necessary to develop "resistance management strategies" to keep herbicide-resistant ryegrass from dominating wheat fields. Today, there are some general principles of resistance management that should be employed to help prevent this problem.

1. Prevent direct introduction of herbicide-resistant ryegrass onto your farm by preventing all introduction of ryegrass.
2. When herbicides are used each year for ryegrass control, use herbicides with different modes of action on a rotational basis. For example, use a sulfonylurea herbicide one year and Hoelon the next year.
3. Do not plant wheat seed from fields treated with herbicides to control ryegrass, unless that seed has been recleaned to remove all seeds of surviving ryegrass. Assume that ryegrass seed in wheat seed came from plants that were resistant to the herbicide the farmer applied to kill the ryegrass. In practical terms, this means don't allow any ryegrass seed in your wheat seed.
4. Be alert for the development of resistant populations in a field. After a herbicide is applied, look carefully for patches where some of the ryegrass was not killed by the herbicide, especially when those patches are long in the direction that the combine travels. In contrast, areas where none of the ryegrass was killed generally indicates a sprayer skip.
5. Keep accurate records of the herbicides used on each field and the effectiveness of the ryegrass control obtained. It is usually not possible to control resistant ryegrass by simply increasing the herbicide rate. Therefore, it will be necessary to change herbicides. Good records are essential to developing an effective resistance management strategy.
6. Avoid moving ryegrass seed from one of your own fields to another. Clean your equipment between fields. When possible, till, sow, and harvest ryegrass infested fields last. Clean your combine after harvest.
7. Destroy stubble soon after harvest. Ryegrass will typically regrow after being cut off with

a mower or combine sickle. To prevent ryegrass seed production after wheat harvest, it is necessary to thoroughly till the wheat stubble to kill the ryegrass. If the soil is moist, it may be necessary to apply a nonselective herbicide such as glyphosate followed by tillage to get adequate control.

8. Rotate out of wheat to a summer crop if possible. Control the ryegrass in the summer crop with herbicides with a different mode of action than the herbicides available for ryegrass control in wheat. Do not let the ryegrass go to seed in the summer crop.

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