Plant & Soil Sciences Extension Newsletter

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Plant & Soil Sciences Extension

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Getting ahead of next year's weed problems with fall-applied herbicides

By Joe Armstrong

Introduction

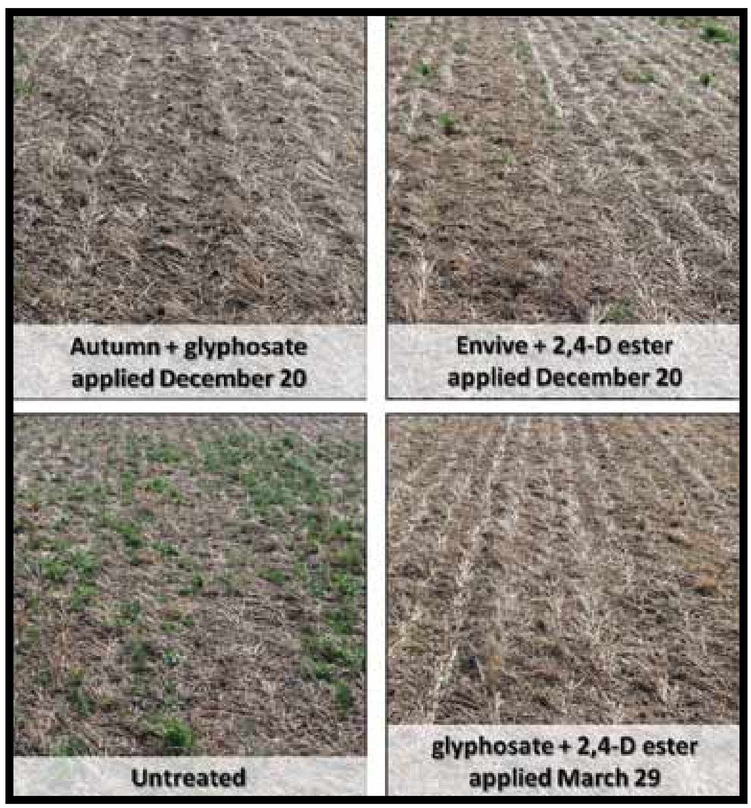
Marestail has become one of the most difficult weeds to control in Oklahoma and throughout much of the United States because of its increasing resistance to glyphosate and its long period of germination and growth. Marestail can germinate on a near year-round basis, making it very difficult to control with a single herbicide application. As a result, many producers are looking at other options to improve weed control during the fall, winter, and early spring when marestail plants are small and easiest to control. Fall-applied treatments can also be useful for reducing populations of other difficult-to-control weeds, including henbit, chickweed, and winter grasses, during the winter and early spring months.

Benefits of fall-applied treatments

There are several herbicide options available for weed control in the fall and winter. Burndown herbicides that do not have soil residual activity, such as glyphosate, Ignite, and Gramoxone Inteon (paraquat), can be used to control any weeds that are present at the time of application. Many additional herbicides are labeled for post-harvest or fall applications and can be used to provide residual control during the fall and winter fallow periods.

Last winter, I initiated a study comparing marestail control for various fall-applied, soil-residual herbicides ahead of soybeans (results are listed in Table 1). Fall treatments were applied on December 20 and weed control evaluations were taken on March 29, April 13, and May 18, approxi-

(Continued on page 2)



A comparison of fall-applied treatments and spring burndown treatments at 4 months after treatment (April 13, 2010). Fall applied treatments can help improve control of tough winter weeds, such as marestail and winter grasses.

Fall-applied herbicides (cont.)

mately 3, 4, and 5 months after the initial application. Spring burndown treatments with herbicides that did not have soil activity were also applied on March 29. In this study, all fall-applied treatments, whether or not they had soil residual activity, provided at least 90% control of marestail at 3 and 4 months after treatment (MAT). At 5 MAT, or on May 18, Autumn® + glyphosate and Envive® + 2,4-D ester provided the best residual activity on marestail with 86% control, while glyphosate + 2,4-D ester provided only 78% control. For the burndown treatments applied on March 29, glyphosate + 2,4-D ester and Sharpen® + glyphosate provided 92 and 90% marestail control, respectively, nearly 2 MAT. While fall-applied herbicides with soil residual activity can control weeds through the winter and into the early-spring, properly timed spring burndown treatments can be as effective as fall-applied treatments.

Potential concerns with fall-applied treatments

If you decide to use a fall-applied herbicide with soil residual activity, pay careful attention to the rotation restriction for each herbicide. Some herbicides, such as Autumn, have fairly short restrictions that allow for flexibility in the crops that could be planted in the spring after application. Other herbicides, such as Envive or Canopy EX®, limit your options for crops the next spring or summer.

Fall-applied treatments, whether or not they contain a herbicide with soil-residual activity, may not eliminate the need for burndown, preplant, or preemergence applications in the spring. Depending on temperature and precipitation during the fall and winter, weeds may germinate for an extended period of time and require additional herbicide applications for sufficient control. To maximize weed control in the fall, treatments should be applied when weeds are still actively growing and before the soil has frozen.

In summary, fall-applied herbicide treatments may not always be a cost-effective weed control option for every situation. However, in fields that have high populations of winter weeds that have become difficult to control or in situations where it is difficult to make timely burndown applications in the spring prior to planting, fall-applied herbicides can be a useful option to help spread the workload and improve overall weed control.

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Table 1. Marestail control at 3, 4, and 5 months after treatment (MAT) for various fall-applied and spring burndown herbicide treatments.

	Treatment Use rate (per acre)	% marestail control		
		3 MAT (March 29)	4 MAT (April 13)	5 MAT (May 18)
Fall treatments (applied December 20)	**glyphosate + 2,4-D ester** 0.75 lb ae + 1 pt	**99**	**99**	**78**
	Autumn + glyphosate 0.3 oz + 0.75 lb ae	**99**	**99**	**86**
	Autumn + 2,4-D ester 0.3 oz + 1 pt	**99**	**98**	**75**
	Envive + 2,4-D ester 4 oz + 1 pt	**99**	**93**	**86**
	Canopy EX + 2,4-D ester 1.5 oz + 1 pt	**99**	**90**	**68**
Spring treatments (applied March 29)	**glyphosate + 2,4-D ester** 0.75 lb ae + 1 pt	**--**	**98**	**92**
	Sharpen + glyphosate 1 fl oz + 0.75 lb ae	**--**	**96**	**90**
	Untreated	**0**	**0**	**0**

[a] LSD = least significant difference.

Time to adjust the drill

By Jeff Edwards

Most of Oklahoma received some desperately-needed rainfall on October 21 and 22. Once wheat sowing resumes we will be slightly past the optimal sowing window for most of the state, and it will be time to open those drills a little wider. The primary reason to increase seeding rates for late-sown wheat is to compensate for reduced tillering as compared to earlier-sown wheat. The number of tillers present at jointing in the spring will have a huge impact on grain yield potential. Since late sown wheat will emerge later in the year into a cool environment that is less favorable for tiller development, we are in a race against time to produce an adequate number of tillers. Increased amounts of winterkill will exacerbate the issue further. Ultimately, to compensate for fewer tillers per plant, we must have more plants per acre.

Producers should increase seeding rates by about 20% the last week of October. Wheat sown the first couple of weeks of November will need to be sown at no less than 90 lbs/A. Larger-seeded varieties such as Overley, or varieties that don't tiller well should be sown at 120 lbs/A. As indicated in the table to the right, once we reach mid-November, all varieties should be sown at no less than 120 lbs. acre. These seeding rates might be hard to swallow, but it is important to remember that an inadequate stand of wheat will reduce the profitability of every other input for the next eight months.

Sowing date	Seeding rate
October 24 - 31	70 – 90 lbs/A
November 1 - 14	90 – 120 lbs/A
November 15 & after	> 120 lbs/A

Seeding rate is not the only consideration for late-sown wheat. Cool, wet soil conditions can delay emergence. Wheat planted in these conditions should be sown no deeper than 1 inch, but resist the temptation to sow shallower than ½ inch. Late-emerging wheat can be more susceptible to winter kill than wheat sown in mid-October. Sowing wheat too shallow will exacerbate any problems with winter kill. Even in cool, wet conditions, wheat sown at 0.75 to 1 inch should have adequate time to emerge.

While farmers with planted and/or emerged wheat might want to now breathe a sigh of relief, the truth is that the real work is just starting. Wheat that is already emerged should be scouted weekly for weeds, insects, and disease. It is likely that we will have a nice window for spraying weeds sometime in November. Farmers with emerged wheat and no plans to graze should take advantage of this window.

As always, it is extremely critical to know exactly what weeds you have and choose a herbicide product accordingly. Approaching the sales counter without knowing what weeds you have is like approaching the counter at McDonalds and asking the cashier to pick something out for you that they think you might like. The easiest way to identify grass weeds at this time of year is to dig them up and inspect the seed. Then use a publication such as OSU Extension Publication *L- 316 Identification of grasses commonly found in Oklahoma wheat fields* to determine which grass weeds you have.

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Ability of wheat to germinate after dehydration

By Jeff Edwards

When conditions are too dry for germination, Oklahoma farmers will frequently choose to "dust in" wheat in the hope that rain will arrive in the near future. If conditions are too dry to start the germination process, the seed will simply wait in limbo and start germinating when adequate moisture arrives. A trickier situation, however, is when there is enough moisture in the soil at planting to start the germination process but not enough to finish it. Will these partially-germinated seeds go ahead and emerge when rain arrives? The answer depends on how long the germination process had been underway at the time of dehydration, the length of dehydration, and how deeply the wheat was sown.

Kansas State researchers conducted a study in which they hydrated wheat seeds and initiated the germination process but then dehydrated the germinating seeds at 1, 2, 3, 4, or 5 days after the germinated process started. Seeds were then rehydrated at 1, 2, 3, 4, or 5 days after they had been dehydrated and germination was monitored. Seeds that had been dried out within three days of initiation of the germination process generally recovered once they were rehydrated. Seeds that were dehydrated four or five days after the germination process had started could only survive about one day without moisture. So, seeds that have just started to swell and germinate can go ahead and produce an acceptable stand of wheat if the germination process is stopped due to inadequate moisture.

This is not to say that the dehydration process does not exact a toll on the developing wheat plant. This same study found that coleoptile length of seedlings that had endured dehydration was greatly reduced as compared to seedlings that were allowed to germinate without the interruption of dehydration. Researchers also found that seedlings produced from seeds that had endured a period of dehydration after the germination process started were smaller and had less robust rooting systems. This left these seedlings more susceptible to desiccation, winterkill and other environmental stresses. For Oklahoma wheat producers, these results reinforce that dusting in wheat or planting to moisture are viable options but growers should avoid planting into moisture that is not sufficient to see the germination process all the way through.

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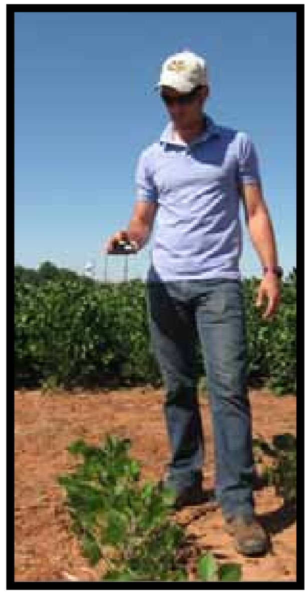
Subscription Information

To receive an electronic copy of the OSU PASS Extension Newsletter, contact Janelle Malone at janelle.malone@okstate.edu. Please include "PASS Newsletter Subscription" and your name in the subject line.

Pocket Sensor

By Brian Arnall

Through a grant from the Oklahoma Conservation Commission, OSU's Biosystems and Ag-Engineering and Plant and Soil Sciences Departments have been working on the development of a new sensor that is capable of producing the same readings as the GreenSeeker™ but comes in a much smaller package. The smaller "Pocket Sensor" will be much more affordable and user friendly with the desired target groups being producers, consultants and extension educators. For the past few months the first proto-types have been put through a rigorous testing and calibration period. I am happy to report that through the hard work of Drs. Stone and Raun and the whole Soil Fertility Graduate Student group I have been given several Pocket Sensors that will be delivered to a select group of producers. These producers will work with OSU in the evaluation of the new equipment. Also in development at this time is an SBNRC iPhone App. The combination of the Pocket Sensor and SBNRC App will make mid-season N rate decisions much easier and more importantly improve nitrogen use efficiency. Keep in mind that fields trials have shown a $10 per acre benefit of using the N-Rich Strip and sensor to make top-dress N recommendations in wheat. With the target cost of the Pocket Sensor being only a few hundred dollars, it represents a small initial investment that could mean a large chunk of cash in your pocket at the end of the season.



For more information visit: *http://nue.okstate.edu/Pocket_Sensor/Pocket_Sensor.htm* and *http://npk.okstate.edu/greenseekersensor/index.htm.*

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Westerman's Warriors

Although not too bad for a bunch of professors, the marathon relay team (Krehbiel's Krew) came in fifth in their bracket at the Oklahoma City Memorial Marathon. However, we will have an opportunity to redeem ourselves, and bring that finish up a notch or two at the upcoming Route 66 Marathon. We have another team (Westerman's Warriors) training hard to run in honor of Dr. Brent Westerman. Please consider visiting our website at: *http://main.acsevents.org/goto/brent* to make a donation to the American Cancer Society on his behalf. Every little bit helps.

Control of Foliar Wheat Diseases with Fungicides

By Bob Hunger, Mr. Brian Olson, Mr. Rocky Walker

The purpose of this trial was to determine the efficacy of fungicides for controlling foliar diseases when applied to hard red winter wheat in Oklahoma. The trial was conducted near Stillwater, Oklahoma. The wheat variety Jagger was used because of its susceptibility to most foliar diseases. Seed was treated with Gaucho 480 F (3 fl oz/cwt) to limit fall aphid infestations and subsequent barley yellow dwarf virus (BYDV). The trial was planted on the 28-Oct-2009 at 60 lb seed/acre, and was harvested on 21-Jun-2010. Fungicides were applied in 20 GPA on 26-Mar-2010 at Feekes' growth stage 6 (1st node detectable at base of main tiller), 12-Apr-2010 at Feekes' growth stage 8 (flag leaf just emerging), and/or 21-Apr-2010 at Feekes' growth stage 10.1 (heads just emerging from the boot0. Plots were 49 in. (7 rows on a 7" spacing) by 20 ft and were replicated four times in a randomized block design. Fifty lb actual nitrogen (46-0-0) per acre was applied to the trial on 25-Sep-2009 and 18-Feb-2010.

Heavy rain was received within a week after planting. Consequently emergence was delayed and was less than optimal so the stand was thin through the fall and winter. Topdressing in February was followed by adequate and timely moisture that promoted tillering. Some foliar discoloration indicative of barley yellow dwarf virus (BYDV) was observed in the trial in spring 2010. However, no stunting or head thinning was associated with this discoloration, so BYDV was judged to not be a confounding factor. No late freezing occurred and yields from this trial were considered typical.

During the first half of May, powdery mildew (PM), stripe rust (YR), and leaf rust (LR) were observed, which led to the rating for incidence of all three diseases on flag leaves on 11-May. After 11-May, LR became the predominate disease and was rated on 21- and 25-May.

Yield from this trial ranged from 43.5 (untreated check) to 62.8 bu/A while TW ranged from 53.4 to 55.9 lb/bu (Table 1). The average grain moisture of six samples taken at the time of yield and TW determination was 10.2% (st dev=0.64).

Foliar disease pressure in this trial was severe by the final rating on 25-May when LR reached an incidence of 99%. However, this high incidence of LR came late in the season, and within a week after 25-May foliage senesced as the wheat matured. The LR rating on 21-May (30 days after application of treatments at GS 10.1) indicates a loss of disease control in many treatments, which was confirmed by the rating on 25-May. All treatments where a fungicide was applied at growth stage 10.1 yielded significantly more grain than the untreated check.

(Data provided on page 7)

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Control of Foliar Wheat (cont.)

Effect of foliar fungicides on powdery mildew (PM), leaf rust (LR), and/or stripe rust (Yr), yield and test weight (TW) of hard red winter wheat in Stillwater, OK, 2009-10.

Fungicide & rate	Growth stage applied[1]	Date(s) applied	Pm-Lr-Yr[2] 11-May	Lr[3] 21-May	Lr[3] 25-May	Yield bu/A	TW lb/bu
1. Untreated Check	-----	-----	77.5	85.0	99.0	43.5	53.4
2. Tilt @ 4 oz	10.1	4-21	0.3	38.8	87.5	55.9	54.6
3. Headline[4] @ 3.1 oz FB[5]	6 FB	3-26 FB					
TwinLine[4] @ 9 oz	10.1	4-21	0.3	0.8	7.5	62.1	54.7
4. Headline[4] @ 6 oz FB	6 FB	3-26 FB					
TwinLine[4] @ 9 oz	10.1	4-21	0.3	0.0	6.3	62.6	55.1
5. Stratego Pro[4] @ 2 oz FB	6 FB	3-26 FB					
Prosaro[4] @ 6.5 oz	10.1	4-21	5.5	38.8	68.8	59.9	55.1
6. YT669[4] @ 3 oz	6	3-26	79.8	76.3	96.8	51.5	52.8
7. Topguard @ 10 oz	8	4-12	17.5	71.3	85.0	58.9	54.4
8. Topguard @ 14 oz	8	4-12	7.5	58.8	85.0	61.8	54.1
9. Evito[4] @ 2 oz	8	4-12	31.3	52.5	87.5	57.9	53.9
10. Q8X63[4] @ 19.2 oz	10.1	4-21	6.5	12.5	62.5	57.8	54.4
11. Q8X78[4] @ 18 oz	10.1	4-21	4.0	12.5	46.3	55.6	55.1
12. LEM 17[4] @ 24 oz	10.1	4-21	16.3	3.0	32.5	58.1	54.7
13. TopGuard[4] @ 7 oz	10.1	4-21	4.5	58.8	85.0	58.0	54.2
14. TopGuard[4] @ 10 oz	10.1	4-21	5.3	52.5	92.3	57.5	55.4
15. TopGuard[4] @ 14 oz	10.1	4-21	1.5	32.5	75.0	57.9	54.2
16. Quilt[4] @ 10.5 oz	10.1	4-21	0.0	1.8	22.5	60.9	55.7
17. Quilt[4] @ 14 oz	10.1	4-21	0.0	0.5	11.3	62.6	55.6
18. TwinLine[4] @ 7 oz	10.1	4-21	0.0	2.0	12.5	60.8	55.2
19. TwinLine[4] @ 9 oz	10.1	4-21	1.3	0.3	8.8	62.7	55.6
20. Evito[4] @ 2 oz	10.1	4-21	7.5	16.3	40.0	54.9	54.2
21. Evito T[4] @ 4 oz	10.1	4-21	0.3	1.5	6.3	61.0	55.9
22. Evito T[4] @ 5 oz	10.1	4-21	0.3	0.8	12.8	59.5	55.2
23. Stratego Pro[4] @ 4 oz	10.1	4-21	6.5	13.8	32.5	60.7	55.2
24. Prosaro[4] @ 6.6 oz	10.1	4-21	0.3	1.0	17.5	60.8	55.0
HSD (p=0.05)			24.3	23.7	20.8	9.0	2.7

[1] Growth stage (GS) is reported according to Feekes' scale, where GS 6=first node detectable at base of main tiller, GS 8=flag leaf just visible, GS 10.1=awns and heads beginning to emerge from boot.
[2] Ratings are of the combination of powdery mildew (Pm), leaf rust (Lr), and stripe rust (Yr), which were all present on flag leaves on this date.
[3]Ratings are of Lr only on flag leaves, which by this date became the predominate disease.
[4] Plus 1% COC for Evito, Quilt, and Evito T; plus 0.125% Induce (v/v) for Headline, TwinLine, Stratego Pro, Prosaro, YT669, Q8X63, and LEM 17.
[5]FB=followed by.

Upcoming Events

Grant County No-till Meeting

Nov. 19, 2010 Grant County
Medford, Okla.

OSU Winter Crop School

Dec. 14-15, 2010 Wes Watkins Center - OSU Campus
Stillwater, Okla.

No-till Oklahoma Conference

Feb. 1-2, 2010 *Norman, Okla.*