PREPLANT CONTROL OF COMMON GROUNDSEL IN OKLAHOMA

Shane Osborne
Randy Boman
Oklahoma State University
Department of Plant & Soil Sciences
Southwest Research and Extension Center
Altus, OK

Introduction

Common groundsel has become a challenge in many no-till fields over the past few years. It is a winter annual that can emerge any time from late fall or winter through early spring. A unique characteristic of this weed is that it begins to flower soon after emergence in winter and will continue to grow and flower through cotton planting time. Similar to horseweed, the seeds of common groundsel disperse in the wind which results in rapid spread from uncontrolled areas (figure 1). Many grower's recent encounters have resulted in glyphosate applications followed by "horseweed-type" hormone (2,4-D or dicamba) treatments that often fall short the second time around. One common producer field observation is that frequently this weed tends to be found in conjunction with horseweed. Since horseweed continues to be one of the top weed pests that growers face in limited tillage production, one of our objectives was to evaluate the performance of standard horseweed recommendations for the control of common groundsel. In addition, very few labels cite control of this particular weed. Sharpen, paraquat and Harmony Extra XP are three products which list groundsel control on the label. Two trials were initiated in the spring of 2012 in order to better define current options available to growers.

Objectives

Evaluate the effectiveness of Sharpen, paraquat and Harmony Extra XP for control of common groundsel in a preplant burndown application.

Determine the effectiveness of hormone-based (horseweed type) treatments for the control of common groundsel prior to cotton planting.

Materials and Methods

Both studies were randomized complete block designs with four replications and were conducted on clay loam soils. Broadcast over-the-top applications were made with a compressed air, high-clearance sprayer with a spray volume of 10 gallons per acre (GPA). Separate treatments were applied at each of the two locations. Site 1 focused on the use of products listing groundsel on their label. Fifteen treatments were applied on February 16th, 2012 focusing on the performance of Sharpen, paraquat or Harmony Extra XP. Treatments at Site 2 more closely resembled local horseweed control programs focusing on the inclusion of 2,4-D or dicamba. These treatments were applied on February 29th, 2012. The common groundsel was past the ideal stage (< 3 inches) at both sites ranging from 3 to 6 inches in height at application. Treatments were applied at 28 psi with flat fan nozzles. Treatments from each site are listed in Figures 2-3 which also contain each trial's respective data.

Results and Discussion

All treatments were evaluated at 7, 14 and 30 days after treatment (DAT). However, treatments at Site 2 were also evaluated 45 DAT. Data from the 7, 14 and 30 day observations for Site 1 are listed in figure 2. Although Sharpen or Verdict alone controlled common groundsel sufficiently (76-87%) at the 14 day observation, control diminished (to 28-33%) by 30 DAT. Tank-mixes of Sharpen with either Direx or dicamba provided similar control (25%) 30 DAT. Tank-mixes of Harmony Extra XP with either 2,4-D, dicamba or Direx controlled common groundsel 71-76% 30 DAT. When Sharpen was tank-mixed with Harmony Extra XP common groundsel control increased significantly (to 99.5%). Similar control was observed when Harmony Extra XP was tank-mixed with paraquat or when paraquat was tank-mixed with Direx, Caparol, 2,4-D or dicamba.

Data from the 14, 30 and 45 day observations are presented in figure 3 for Site 2. Dicamba (8 oz/a) + Aim (2 oz/a) did not sufficiently control common groundsel at any observation date (3-33%). When Aim was tank-mixed with

2,4-D (1 lb ai/a) control increased significantly at all observations (53-61%). Combinations of 2,4-D plus paraquat or Sharpen plus dicamba controlled common groundsel very effectively 14 DAT (86-96%). However, by 45 DAT this control diminished (to 71-78%). Dicamba (8 oz/a) or 2,4-D (1 lb ai/a) plus glyphosate (0.50 lb ai/a) controlled common groundsel 91-96% 45 DAT. The addition of Valor to these treatments (dicamba or 2,4-D plus glyphosate) did not significantly change control of common groundsel. Sharpen (1 oz/a) plus 2,4-D (1 lb ai/a) provided similar control of common groundsel at the 45 day observation (97%). Sharpen applied at 1 oz/a plus 0.75 lb ai/a of glyphosate only provided 81% control 14 DAT, however by 45 DAT control had increased to 100%.

Summary

Sharpen applied alone (or when combined with dicamba) did not effectively control common groundsel. However, tank-mixing Harmony Extra XP with Sharpen did result in very effective control. Similarly, all treatments including paraquat were very effective at controlling common groundsel. This suggests that future work may be needed to explore potential paraquat rates that may be more economical but still remain effective. In addition, if choosing a tank-mix partner for Aim, these results suggest a much more effective relationship with 2,4-D as opposed to dicamba for common groundsel control.

Although Sharpen plus dicamba has been observed to be very effective at controlling common groundsel in the past, these results suggest that the weed size at application (larger than the recommended <3 inch stage) could have reduced the effectiveness of this treatment. Though many producers have found glyphosate alone to be very ineffective, these trials indicate that the inclusion of glyphosate (with either 2,4-D or dicamba) is beneficial since all treatments including glyphosate provided at least 90% control of common groundsel.

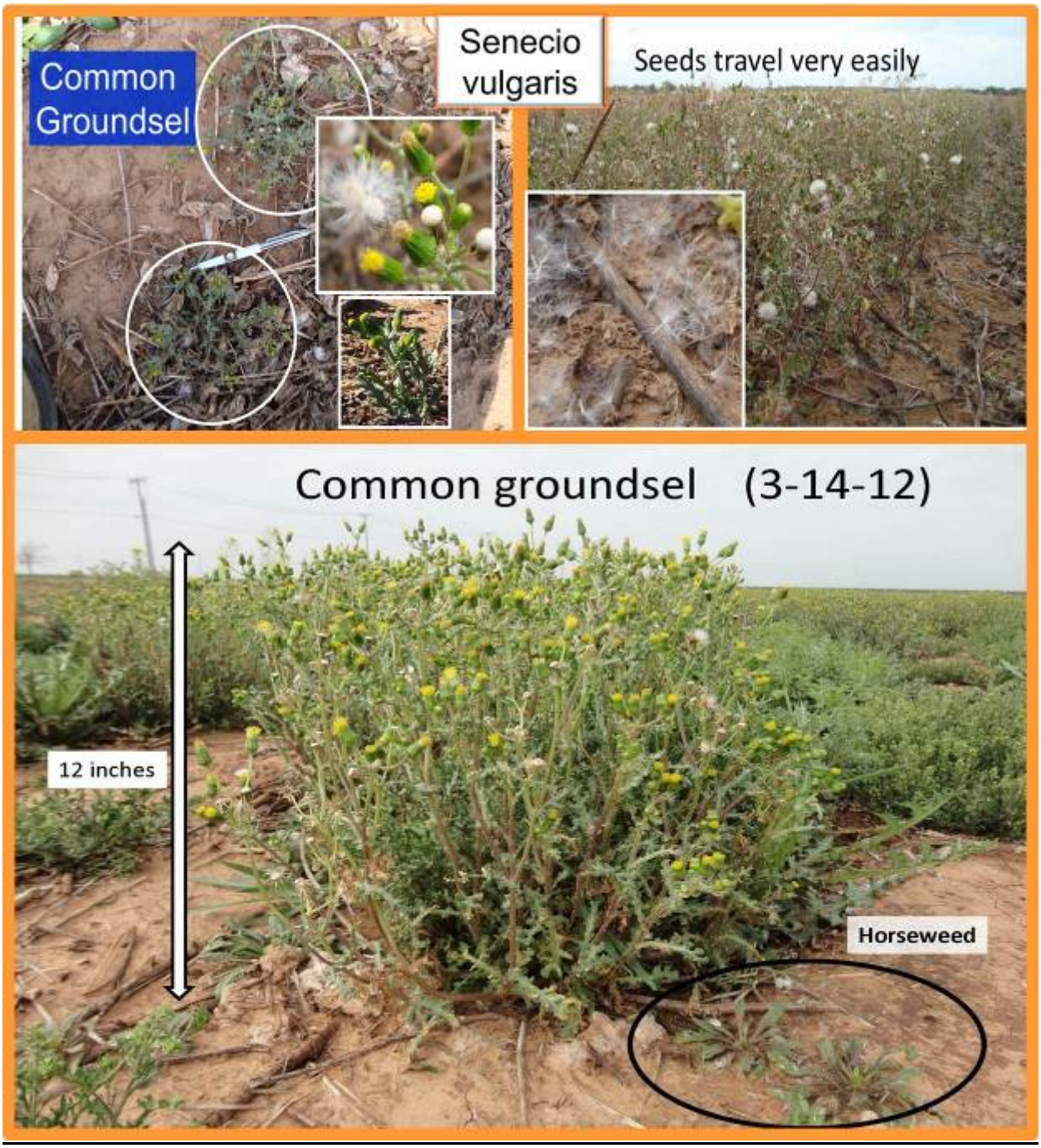
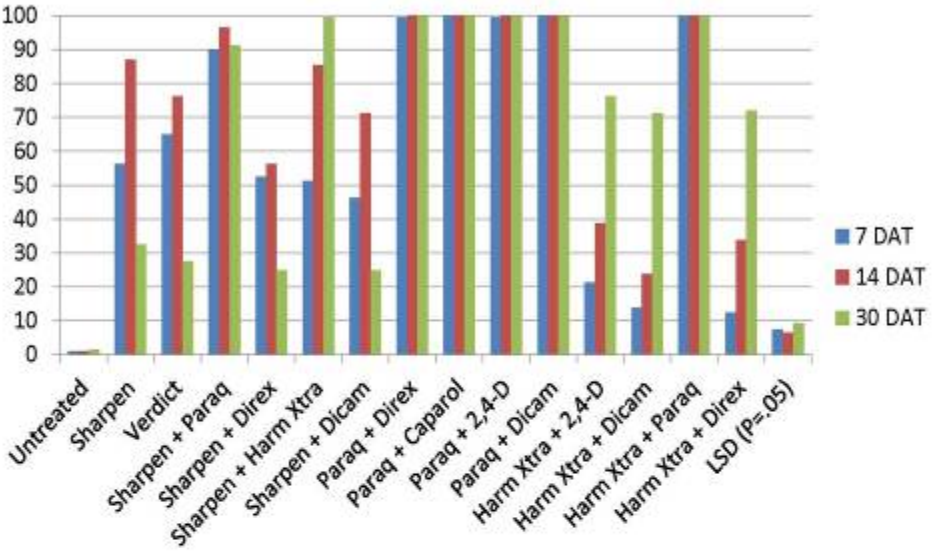
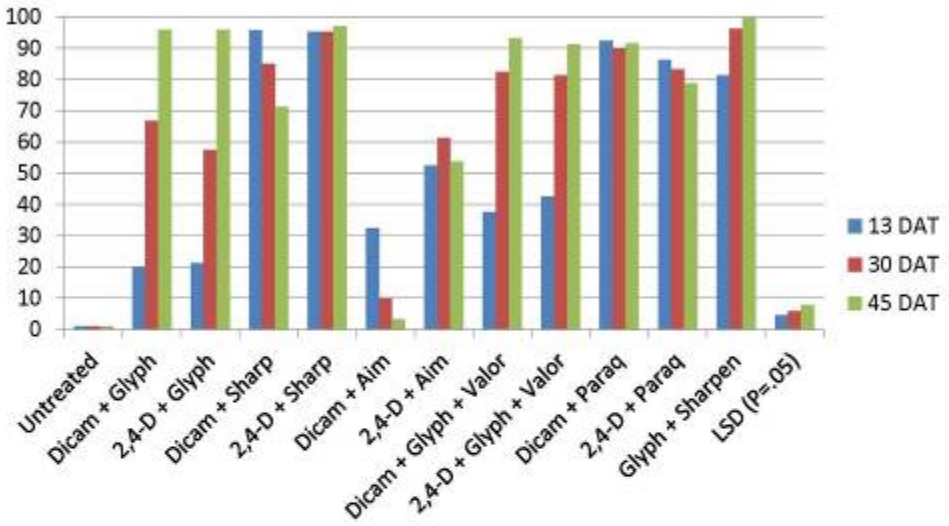


Figure 1. Common groundsel



Untreated
1 oz/a Sharpen + 17 lbs/100 gal amm. sulfate + 1% mso
5 oz/a Verdict + 17 lbs/100 gal amm. sulfate + 1% mso
1 oz/a Sharpen + 0.50 lb ai/a paraquat + 17 lbs/100 gal amm. sulfate + 1% mso
1 oz/a Sharpen + 32 oz/a Direx + 17 lbs/100 gal amm. sulfate + 1% mso
1 oz/a Sharpen + 0.50 oz/a Harmony Xtra XP + 17 lbs/100 gal amm. sulfate + 1% mso
1 oz/a Sharpen + 8 oz/a dicamba + 17 lbs/100 gal amm. sulfate + 1% mso
0.75 lb ai/a paraquat + 32 oz/a Direx + 1% coc
0.75 lb ai/a paraquat + 32 oz/a Caparol + 1% coc
0.75 lb ai/a paraquat + 1.0 lb ai/a 2,4-D + 0.25% nis
0.75 lb ai/a paraquat + 8 oz/a dicamba + 0.25% nis
0.50 oz/a Harmony Xtra XP + 1.0 lb ai/a 2,4-D + 0.25% nis
0.50 oz/a Harmony Xtra XP + 8 oz/a dicamba + 0.25% nis
0.50 oz/a Harmony Xtra XP + 0.75 lb ai/a paraquat + 0.25% nis
0.50 oz/a Harmony Xtra XP + 32 oz/a Direx + 1% coc

Figure 2. Common groundsel control with Sharpen, paraquat and Harmony Extra XP



Untreated
8 oz/a dicamba + 32 oz/a glyphosate(4lb) + 17lbs/100gal amm. sulfate + 0.25% nis
1.0 lb ai/a 2,4-D + 32 oz/a glyphosate(4lb) + 17lbs/100gal amm. sulfate + 0.25% nis
8 oz/a dicamba + 1.0 oz/a Sharpen + 17lbs/100gal amm. sulfate + 1% mso
1.0 lb ai/a 2,4-D + 1 oz/a Sharpen + 17lbs/100gal amm. sulfate + 1% mso
8 oz/a dicamba + 1oz/a Aim + 1% coc
1.0 lb ai/a 2,4-D + 1oz/a Aim + 1% coc
8 oz/a dicamba + 32 oz/a glyphosate(4lb) + 17lbs/100gal ammon. sulfate + 2 oz/a Valor + 1% coc
1.0 lb ai/a 2,4-D + 32 oz/a glyphosate(4lb) + 17lbs/100gal amm. sulfate + 2 oz/a Valor + 1% coc
8 oz/a dicamba + 0.50 lb ai/a paraquat + 0.25% nis
1.0 lb ai/a 2,4-D + 0.50 lb ai/a paraquat + 0.25% nis
48 oz/a glyphosate(4lb) + 1 oz/a Sharpen + 17 lbs/100 gal amm. sulfate + 1% mso

Figure 3. Common groundsel control with 2,4-D and dicamba

Figure 4. Common groundsel control next to untreated plot