Fall Pre-emergent Herbicide Timing Results and Takeaways

Mike Basedow, CCE-ENYCHP and Janet van Zoeren, CCE-LOFP

In the August TFN, David Bittner and I discussed his strategy of post-harvest applications of 2,4-D and clopyralid (Stinger) to clean up the herbicide strip and row middles of perennial broadleaves. In addition to making that application in the fall to manage your problem perennials, post-harvest can also be a good time to get your pre-emergent materials on to get a leg up on your annual weeds heading into the next growing season. In the next few paragraphs, we'll discuss some results from our ARDP funded project comparing fall and spring pre-emergent herbicide applications, and some strategies you can use to get the most out of your fall pre-emergent herbicide applications.

In our ARDP herbicide study, we compared fall versus spring timings of two pre-emergent herbicide combinations. In the fall of 2020, we applied Chateau and Prowl (along with glufosinate for burndown of existing vegetation) on a portion of a commercial herbicide strip in Peru and Albion, respectively. Another portion of the strip received that same combination of materials the following spring, while a third treatment received no pre-emergent application at all, just glufosinate to burn down existing vegetation. We scouted the weed plots throughout the growing season, paying close attention to the plots during the critical weed free period of May through July. We made follow up applications with post-emergent materials to each plot as needed.

Here you can see the full list of applications that went on each treatment in Peru (Figure 1) and Albion (Figure 2) in 2021.

Figure 1. Applications made to the three treatments at our Peru field site in 2021.

2021 Peru Treatment Calendar			
Date	**Treatment 1: Fall Applied**	**Treatment 2: Spring Applied**	**Treatment 3: Posts Only**
11/6/2020	Prowl 4qt/Acre + Chateau 12oz/Acre + Forfeit 48 fl oz/Acre		
3/22/2021		Prowl 4qt/Acre + Chateau 12oz/Acre + Forfeit 48 fl oz/Acre	
4/27/2021	Poast at 1.5pt/Acre	Poast at 1.5pt/Acre	Poast at 1.5pt/Acre
5/14/2021			Rely 280 48 fl oz/Acre
5/24/2021	Milkweed hand cut	Milkweed hand cut	Milkweed hand cut
5/26/2021	Rely 280 48 fl oz/Acre	Rely 280 48 fl oz/Acre	
6/8/2021	Milkweed hand cut	Milkweed hand cut	Milkweed hand cut
6/16/2021	Poast at 1pt/Acre	Poast at 1pt/Acre	Poast at 1pt/Acre
6/22/2021	Milkweed and rootsucker hand cut	Milkweed and rootsucker hand cut	Milkweed and rootsucker hand cut
6/29/2021	Glystar Plus 2.5qt/Acre + Stinger at 1/3 pt/Acre	Glystar Plus 2.5qt/Acre + Stinger at 1/3 pt/Acre	Glystar Plus 2.5qt/Acre + Stinger at 1/3 pt/Acre
8/6/2021	Milkweed and rootsucker hand cut	Milkweed and rootsucker hand cut	Milkweed and rootsucker hand cut
8/10/2021	Rely 280 70 fl oz/Acre	Rely 280 70 fl oz/Acre	Rely 280 70 fl oz/Acre
10/12/2021	Hand cut	Hand cut	Hand cut
10/28/2021	Gramoxone 2.5pt/Acre	Gramoxone 2.5pt/Acre	Gramoxone 2.5pt/Acre
11/4/2021	Alion 5 fl oz/Acre + Rely 48 fl oz/Acre		

Figure 2. Applications made to the three treatments at our Albion field site in 2021.

2021 Albion Treatment Calendar			
Date	**Treatment 1: Fall Applied**	**Treatment 2: Spring Applied**	**Treatment 3: Posts Only**
10/23/2020	Prowl 4qt/Acre + Chateau 12oz /Acre + Interline 48 fl oz/Acre		
3/22/2021		Prowl 4qt/Acre + Chateau 12oz /Acre + Interline 48 fl oz/Acre	
5/6/2021			Interline 48 fl oz/Acre
7/11/2021	Mad Dog Plus 2.5qt/Acre	Mad Dog Plus 2.5qt/Acre	Mad Dog Plus 2.5qt/Acre
8/19/2021	Interline 80oz/Acre	Interline 80oz/Acre	Interline 80oz/Acre
10/22/2021	Alion 5oz/Acre + Interline 48 fl oz/Acre		

The Peru sites received more follow up applications than the Albion site. This was due to the heavy perennial weed pressure we had in Peru from species like quackgrass and perennial sowthistle.

We repeated these methods in the fall of 2021, this time using Alion as our preemergent material. Here you can see the full list of treatments that have gone in Peru (figure 3) and Albion (figure 4) in 2022 to date.

Figure 3. Applications made to the three treatments at our Peru field site in 2022.

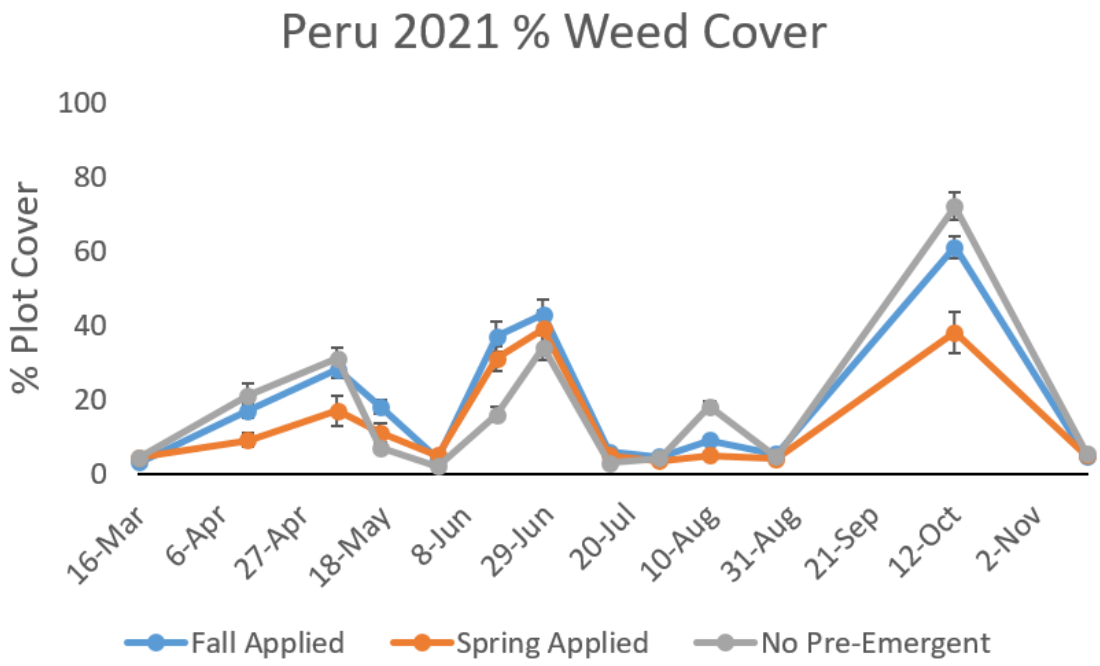
2022 Peru Treatment Calendar			
Date	**Treatment 1: Fall Applied**	**Treatment 2: Spring Applied**	**Treatment 3: Posts Only**
11/4/2021	Alion 5 fl oz /Acre + Rely 280 48 fl oz/Acre		
4/26/2022	Select Max 16 fl oz / Acre	Select Max 16 fl oz / Acre	Select Max 16 fl oz / Acre
4/30/2022		Alion 5 fl oz /Acre + Rely 280 48 fl oz/Acre	
5/11/2022			Rely 280 48 fl oz/Acre
5/20/2022	Rely 280 48oz/Acre		
5/31/2022	Select Max 16 fl oz / Acre	Select Max 16 fl oz / Acre	Select Max 16 fl oz / Acre
6/3/2022	Milkweed hand cut	Milkweed hand cut	Milkweed hand cut
6/16/2022	Milkweed hand cut	Milkweed hand cut	Milkweed hand cut
6/28/2022	Milkweed hand cut	Milkweed hand cut	Milkweed hand cut
7/7/2022	Glystar Plus 3qt/Acre	Glystar Plus 3qt/Acre	Glystar Plus 3qt/Acre
8/12/2022	Milkweed and rootsucker hand cut	Milkweed and rootsucker hand cut	Milkweed and rootsucker hand cut
8/16/2022	Gramoxone 3pt/Acre	Gramoxone 3pt/Acre	Gramoxone 3pt/Acre

Figure 4. Applications made to the three treatments at our Albion field site in 2022.

2022 Albion Treatment Calendar			
Date	**Treatment 1: Fall Applied**	**Treatment 2: Spring Applied**	**Treatment 3: Posts Only**
10/22/2021	Alion 5 fl oz /Acre + Interline 48 fl oz/Acre		
4/30/2022		Alion 5 fl oz /Acre + Interline 48 fl oz/Acre	
6/8/2022	Select Max 16 fl oz / Acre	Select Max 16 fl oz / Acre	Select Max 16 fl oz / Acre
6/25/2022			Interline 48 fl oz/Acre
7/29/2022		Interline 48 fl oz/Acre	
8/18/2022			Interline 48 fl oz/Acre

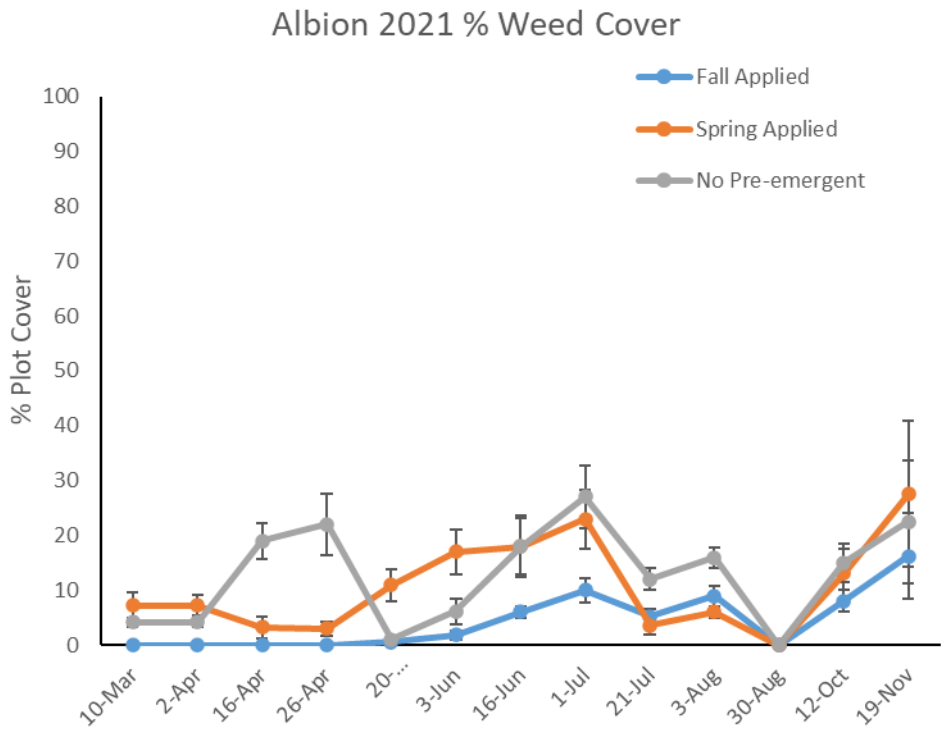
Below you can see the effects of the timings on the overall weed cover within the plots when Chateau and Prowl were used in both Peru (Figure 5) and Albion (6).

Figure 5. 2021 weed cover in Peru following fall applied Chateau + Prowl, spring applied Chateau + Prowl, and a post-emergent only program. Additional post-emergent applications were made on each plot as needed.



In Peru, fall and spring applications of Chateau and Prowl gave similar levels of control, except on August 10 and October 12th when the fall treatment had more weed cover. We found there were no differences between any of the three treatments during the critical weed free period from May through July. This was likely due to us needing to make multiple follow-up burndown applications on all three treatments to keep the perennial weeds in check in these plots (refer back to figure 1 to see dates of follow up applications on each treatment).

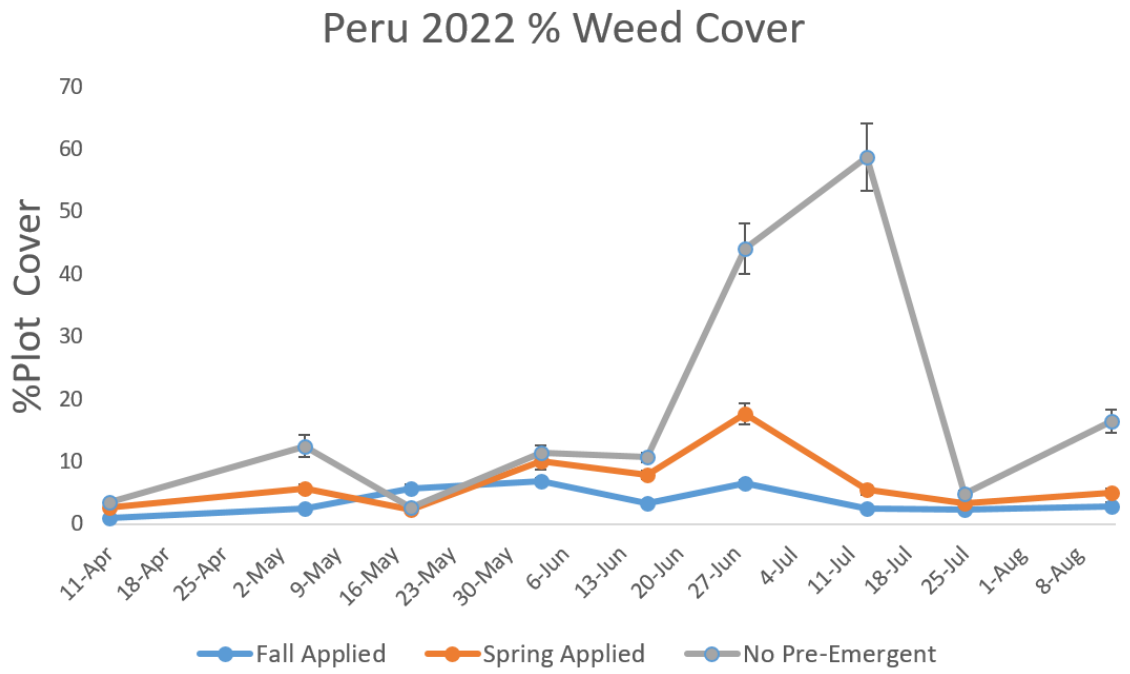
Figure 6. 2021 weed cover in Albion following fall applied Chateau + Prowl, spring applied Chateau + Prowl, and a post-emergent only program. Additional post-emergent applications were made on each plot as needed.



In Albion, the fall-applied Chateau and Prowl had the least weed cover during the weed free period relative to the spring and post-emergent only treatments.

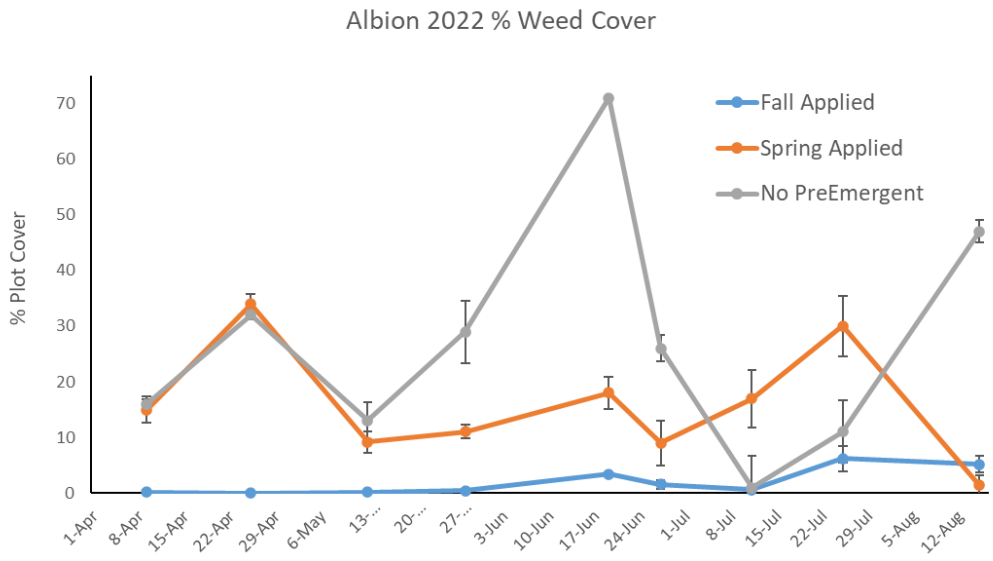
Now we will review the results of our Alion treatments in Peru (Figure 7) and Albion (Figure 8).

Figure 7. 2022 weed cover in Peru following fall applied Alion, spring applied Alion, and a post-emergent only program. Additional post-emergent applications were made on each plot as needed.



In Peru, the fall applied treatment had the least amount of weed cover on six of the nine scouting dates. On the other three dates, the other treatments had recently received a follow-up burndown application. The fall applied Alion also had the least weed cover when averaged over the weed free period. The spring applied Alion had a few breakthroughs early in the season, but still had considerably less weed cover than the post-emergent only treatment throughout much of June and July. All treatments once again required follow up post-emergent applications throughout the summer to keep perennial weeds in check (refer back to figure 3 for the timing of these applications).

Figure 8. 2022 weed cover in Albion following fall applied Alion, spring applied Alion, and a post-emergent only program. Additional post-emergent applications were made on each plot as needed.



In Albion, the fall application of Alion kept weed cover below 5% through mid-July, and even by August weed pressure in the fall applied Alion plots was below 10% plot coverage. No burndown herbicide was applied to those plots aside from the single application of the grass-specific Select Max. Weed control was also fairly good in the spring applied Alion plots, although those required one burndown application in mid-summer. The post-emergent only plots required two burndown applications, and pressure still reached 70% plot cover in mid-June.

Image 1. The Peru field site on August 12 2022. The plot on the left is the post-emergent only treatment covered with amaranth, while the plot on the right is the fall-applied Alion treatment with only a few quackgrass present.

Given these results, **we conclude fall applications of these materials at both sites provided efficacy as good or better than applications made the following spring when integrated into a season-long weed management program. We recommend making fall applications of pre-emergent herbicides where your herbicide strips are clean enough and weather conditions are favorable.** Previous work by Deborah Breth, Dan Donahue, and Anna Wallis also found good efficacy from fall applications with the following materials/combination of materials.

- Chateau (mostly annual broadleaves and some grasses) + Prowl (mostly annual grasses)
- Alion (annual broadleaves and grasses)
- Sandea (annual broadleaves and sedges)+ Prowl (mostly annual grasses)
- Goaltender (annual broadleaves and some grasses)
- Simazine (mostly broadleaves) + Diuron (mostly broadleaves)
- Sinbar (annual broadleaves)
- Casoron (annual broadleaves and grasses)
- Matrix (annual broadleaves and grasses)

Here are a few suggestions if you would like to apply pre-emergent herbicides this fall:

Choose materials that fit your weed composition – different materials work better on different weed species. Look at your plots this fall and see what you have in your plots when deciding on which material to apply. Our herbicide lookup table can help you select which material to use. Few products will cover everything you have, so tank mix materials to get the full spectrum of control that you need.

Pay close attention to weather requirements – Pre-emergent herbicides are finicky materials. For them to work well, they need to be applied under the right temperature/soil/tree conditions. Most need to go on prior to soil freeze up. Check the labels closely to make sure you are applying them under (as close to) ideal conditions as possible to maximize your weed control the following spring.

Apply to as clean of a strip as possible – Many pre-emergent materials need to be applied to bare soil to get maximum efficacy. The chemical needs to reach the soil surface, so applying them on top of a weedy strip is going to greatly reduce your control. So with that in mind….

Clean up the strip ahead of your application as much as possible – In Peru, we went through two weeks ahead of our Alion application with paraquat to burn down the vegetation that had come up during harvest. We applied the Alion two weeks later, after the vegetation had time to burn back and expose the soil surface.

Don't rely on one application to give season long control – Like any IPM program, the best control is going to be gained by using multiple tools from the tool box. Use a variety of tactics (pre-emergent materials, timely burndown applications, well-timed systemic materials) to manage your weeds season-long.

If you would like to discuss weed management on your farm in more detail, or if you have ideas for future weed management research you would like to see me perform, please get in touch with Mike at 518 410 6823 or at mrb254@cornell.edu!