



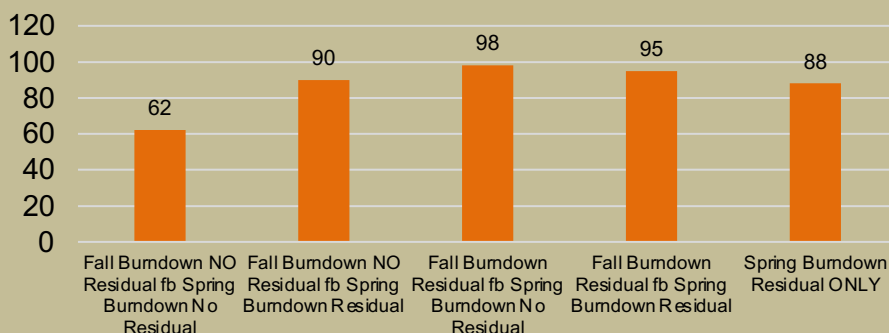
Start Clean, Stay Clean

We've heard it repeated by weed scientists across the country for years: keeping fields clean can reduce our weed seedbank, improve yields and maintain the viability of our cropland and chemistries. However, do herbicide resistance, species shifts, and agronomic practices justify a fall application, or can we continue to rely on spring preemergence applications followed by a single postemergence application?

The presence of fall or early-spring emerging weeds slows soil warming, harbors insects and nematodes, and can decrease seed-soil contact during planting causing uneven emergence.

University research has shown that fall-applied residual herbicides can improve weed control of winter annuals over POST-only burndown programs. While fall applications are not designed to provide full-season control of summer annuals such as waterhemp, velvetleaf and grasses, they provide an effective tool for growers who want to start clean, which is a critical first step to controlling herbicide-resistant weeds. For best results, apply residual herbicides when soil temperatures are lower than 55 F and declining to prevent herbicide degradation. At these lower temperatures, soil microbial activity is slow, and herbicides will remain active into the spring when they are needed to control emerging weeds but also when early rains prevent timely spring applications. It is important to use at least 15 GPA when treating fields with heavy crop residue or weed populations for better coverage.

Marestail Control Recorded in June, Dr. Johnson - Purdue University, 2014.



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Fall Herbicide Programs for Spring Corn or Soybeans

- **Are They Worth It?**
- **Best Management Practices**

Cover Crop Use

Harvest Aid

Contact your local FMC representative for more information

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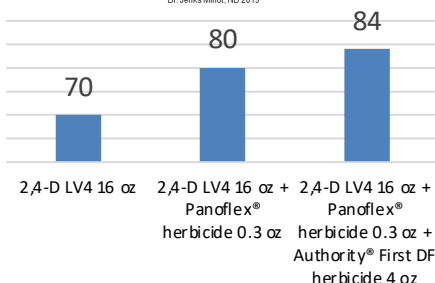
FMC

Standard burndown programs typically include 0.77 lb. ae of glyphosate plus 0.5 lb. - 2 lb. of 2,4-D or dicamba but may also include glufosinate or paraquat. The issue with standard programs is they become a force of habit rather than agronomically sound. Over-reliance on POST herbicides and lack of residual control are two key causes for weed escapes and resistance selection. See how FMC is building programs that work for everyone. Products can be mixed and matched to provide the custom fit each grower requires.

Standard Burndown Program

**Glyphosate 0.77 lb. ae/A
+ 2,4-D 16 oz.**

Dandelion Control
Dr. Jenika Minot, ND 2019



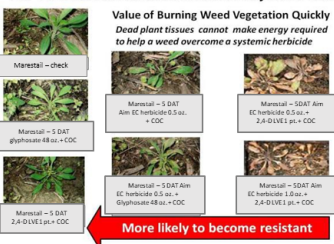
PANOFLEX[®]
HERBICIDE



0.3 – 0.6 fl. oz./A

Improved control of winter annuals that can be planted with corn or soybeans. The low use rate and dual active ingredient product makes a big splash for an inexpensive addition. Very effective on dandelion and chickweed.

AIM[®] EC Herbicide Burndown Marestalk 5 Days After Treatment

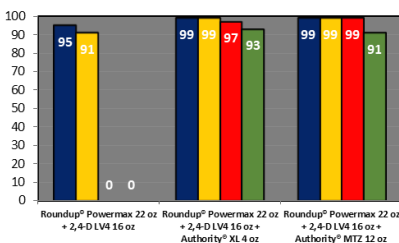


AIM[®] EC
HERBICIDE

1.0 – 2.0 fl. oz./A

Improves activity of auxin-based treatments during cold weather. Excellent rotation allowances make this a must-add for 2,4-D or dicamba burndown applications.

Fall Herbicide Weed Control in No-Till Soybean
Univ. of IL, Urbana – 2013/2014 Fall Application: 11/15/13, Ratings: 4/28/14



AUTHORITY[®] FIRST DF
HERBICIDE

OR

AUTHORITY[®] XL
HERBICIDE

4 – 6.4 fl. oz./A

Great extended residual control of marestalk in conventional or no-till situations.



Authority MTZ DF herbicide applied Nov. 2014 vs. Check.
Photo: June 2015. – Cheyenne Co., CO.



AUTHORITY[®] MTZ DF
HERBICIDE

10 – 14 fl. oz./A

Great extended residual control of kochia, Russian thistle, and winter annuals with rotation to corn or soybeans.



Cover Crop Selection

Cover crops are being employed on more acres in many areas. Cover crops offer beneficial attributes including but not limited to: 1.) protection from soil erosion, 2.) nutrient scavenging, 3.) increased biodiversity and 4.) suppression of winter annual and early emerging summer annual weeds. Cover crops that are not used for feed or forage may be planted prior to normal herbicide rotation intervals. However, producers will need to determine herbicide injury potential prior to seeding. When making this decision several factors should be considered. These factors include: Active ingredients employed for the season, inherent sensitivity of cover crop species to those actives, herbicide timing (later applications of residual herbicides will increase injury probability) and season rainfall patterns. In certain areas of IL and IN below normal rainfall patterns have occurred from May to August. Drier conditions typically represent a higher risk scenario for cover crop injury with herbicides. Limited rainfall reduces herbicide degradation and increases persistence. Conducting bioassays prior to seeding in these areas will assist in determining whether or not to plant a specific cover crop. Bioassays can be conducted by collecting soil from the area where the cover crop is planned to be seeded, as well as a separate sample from a similar soil type that does not have any herbicide residue. Place both soil samples separately into corrugated potting trays, seed cover crops, lightly water and observe growth for 3 weeks. If similar emergence and growth patterns transpire, proceed with cover crop seeding in desired field. Below is a data chart from the University of Missouri, less than 30% stand reduction is typically the threshold to determine acceptable injury for a specific cover crop species. However, in higher risk situations planting a mixture of grass and broadleaf species will often result in adequate vegetation. Furthermore, if a mixture is employed ensure that one or two of the selected species confer tolerance to herbicides utilized the previous spring / summer.

University of Missouri Cover Crop Seeding Trial – Selected Treatments

Herbicide	Rate	Wheat	Tillage Radish	Cereal Rye	Crimson Clover	Oats	Annual Ryegrass	Hairy Vetch
	LB AI/A	-----% Stand Reduction 28 Days After Emergence-----						
Sulfentrazone - Spartan® 4F herbicide (Authority® Brand herbicides)	0.25	16	7	12	6	7	4	14
Authority® First herbicide	0.28	6	24	9	8	18	5	13
Pyroxasulfone – Anthem® MAXX herbicide	0.16	11	4	15	14	30	53	3

Data Courtesy of The University of Missouri, Influence of Soybean Herbicide Treatments on Subsequent Cover Crop Stand Reduction in the Fall. © Kevin Bradley, Univ. of Missouri.





Studies Observing Authority[®] Brand Herbicide Influence On Cover Crops

2014 fall planted winter wheat (top); tillage radish (middle); annual ryegrass on 9-10-14;
Application made 5-27-14. ; Photo'd 11-4-14

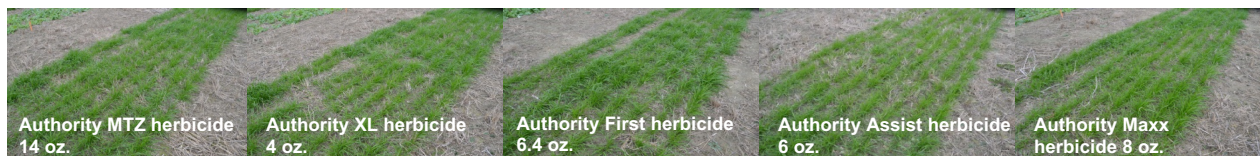
(Purdue University, Throckmorton Farm, West Lafayette, IN 14S-THP-CTS)



Fall planted tillage radish - Fishers, IN Heartland Technologies
Application Date 6-2-14 ; Planted 9-18-14 ; Photo'd 11-3-14



Fall planted annual ryegrass - Fishers, IN Heartland Technologies
Application Date 6-2-14 ; Planted 9-18-14 ; Photo'd 11-3-14



Potential injury by specific preemergence herbicides to fall-planted cover crops –
% stand reduction 105 days after application. Non-replicated trial.
(2014 Ohio State – OARDC Western Branch, South Charleston, OH)

Herbicide – rate/A	Wild Radish	Field Pea	Winter Rye
Anthem [®] herbicide 8 oz.	0	0	0
Authority MTZ herbicide 14 oz.	0	5	0
Authority XL herbicide 4 oz.	0	10	0
Authority First herbicide 4 oz.	0	5	0
Authority First herbicide 6.4 oz.	0	25	0
Authority Assist herbicide 6 oz.	0	15	0
Authority Maxx herbicide 8 oz.	0	30	0

2014 preemergence herbicide carryover to
cereal (winter) rye cover crops planted 98
days after application.

(Univ. of Delaware - Georgetown, DE.)





Aim[®] EC Herbicide – Harvest Aid

Broadleaf weed escapes are evident in many fields. A harvest aid application may provide a few benefits:

1. Reduce growth and/or desiccate weeds to improve harvest.
2. Reduce weed seed production from late-developing weeds to reduce pressure next season.

Corn (Field, Seed, Pop), Soybeans and Sorghum

Use a tank mix for weeds like velvetleaf, morningglories, bindweed, black nightshade, waterhemp, lambsquarter and others.

Soybeans

1.0-1.5 oz./A Aim[®] EC herbicide + 1.5 lbs. glyphosate + 1 pt./A COC/MSO
OR

1.0-1.5 oz./A Aim EC herbicide + 1 pt./A Gramoxone[®] SL 2.0 herbicide + NIS 0.25%

- Aim EC herbicide + Gramoxone herbicide better for waterhemp and other glyphosate-resistant weeds.
- Aim EC herbicide + glyphosate; good for velvetleaf, morningglories and grasses
- Soybeans - when pods turn brown

Corn & Sorghum

1.0 oz./A Aim EC herbicide + 1-2 pt./A 2,4-D + 1.0 lb. ai/A glyphosate + 1 pt./A COC/MSO

- Roundup Ready[®] herbicide corn - start after hard dough
- Sorghum - Grain moisture is <30% to avoid crop damage
- Check Aim EC herbicide partner product for timing and PHI restrictions
- Aim EC herbicide pre-harvest interval on above crops - 3 days
- PHI for glyphosate and 2,4-D is 7 days

3-5 gal./A aerial application
15-20 gal./A ground application



Untreated Check



Aim EC herbicide 1 oz. + 2,4-D. Seven days after Appl. – Seed Corn. Velvetleaf 3-5 ft. tall