

Dicamba alternatives to control weeds in soybean

With the recent removal of dicamba products (XtendiMax, Engenia, FeXapan) in Xtend soybeans, there has been questions about what other herbicide options can be used in their place.

- Tavium, which is a pre-mix of dicamba and S-metolachlor that can be applied up to the V4 growth stage in Xtend soybean, was not part of the ruling and will continued to be sold, though supply is likely to be limited.
- Keep in mind, other dicamba-containing products such as Clarity, Banvel, Status, and the many generics can NOT be legally sprayed over-the-top of Xtend soybeans.
- **Glyphosate (group 9)** in Roundup Ready systems is still a viable option to control many weed species; however, it will not control glyphosate-resistant weeds such as marestail, Palmer amaranth, and waterhemp. In a standard Roundup Ready system, a 2x rate (1.5 lb ae) of glyphosate or a couple of in-crop applications of glyphosate usually stunts marestail. It is always best to treat them soon after they start regrowing from the burndown application. This will not control them but might suppress them somewhat if they are sprayed early enough. Keep in mind, marestail plants are generally not very tolerant of shade and most soybeans will begin to canopy over the marestail and outcompete them. See below for other herbicide options to control Palmer amaranth.
- **ALS herbicides (group 2)** such as Pursuit, Raptor, Classic, Harmony, FirstRate still provide control of several key broadleaf weeds; however, ALS-resistant marestail and pigweeds are common in the state. Classic controls cocklebur, smartweed, burcucumber, and provides suppression of certain perennials such as bindweed and pokeweed. Harmony is effective on lambsquarters, smartweed, and velvetleaf. FirstRate controls cocklebur, annual morningglory, and ragweed. Pursuit and Raptor are good on cocklebur, eastern black nightshade, and velvetleaf as well as annual grasses. These herbicides can be used in conventional or GM soybeans.
- **PPO herbicides (group 14)** such as Reflex, Flexstar, Cobra, Ultra Blazer, Cadet, etc. have activity on certain broadleaves. But keep in mind that not all of them have the same effectiveness on all broadleaf weeds. For example, Reflex/Flexstar, Cobra, Ultra Blazer provide good control of pigweeds including Palmer amaranth and waterhemp, and suppression of ragweed and eastern black nightshade, but have limited activity on marestail and are weak on lambsquarters. Cadet is great on velvetleaf but weak on other species including pigweeds, lambsquarters, ragweed, cocklebur, and marestail. In general, the pre PPOs (Valor, Authority, etc.) are effective on both marestail and Palmer. Any of these PPO herbicides can be used in conventional or GM soybeans.
- **Glufosinate (group 10)**, the active ingredient in Liberty, Cheetah, Interline, Scout, and other generics, can be used over-the-top in LibertyLink, LLGT27, and Enlist E3 soybean varieties. It controls marestail, Palmer, waterhemp, cocklebur, lambsquarters, ragweed, and some others.
- **Acetamide herbicides (group 15)** such as Dual, Zidua/Anthem Maxx, Outlook, Warrant and a few others do not control existing weeds, but these should be included in the post spray mixture to provide “overlapping residual” control of weeds like Palmer and waterhemp. These weeds have a prolonged germination period during the summer and residual products will be necessary for adequate control through the season. Premixed products such as Prefix or Warrant Ultra are also available.
- **Enlist E3 soybean** varieties have not been affected by this lawsuit and thus registered 2,4-D choline (group 4) products (Enlist One and Duo) can be used in that system. These 2,4-D products can NOT be used in Xtend soybean systems, otherwise major crop damage will occur. Enlist One provide control of several common broadleaf weeds, while Enlist Duo controls both broadleaves and grasses.

Refer to the table below from the Mid-Atlantic Field Crop Weed Management Guide for ratings of herbicides on selected weed species.

Broadleaves		Site of Action Number	Amaranth, Palmer/Waterhemp ^{1,2}	Anoda, Spurred	Burcucumber	Cocklebur	Horseweed/Marestail ^{1,2}	Jimsonweed	Lambsquarters	Morningglory, Annual	Nightshade, Eastern Black	Pigweed ¹	Ragweed, Common ^{2,3}	Ragweed, Giant	Sida, Prickly	Smartweed	Velvetleaf	Soybean Tolerance	
Trade Name (rate/A)																			
Basagran (1 qt)		6	6	8+	N	9	N	9	8	N	N	6	8	7	8	9	8+	FG	
Cadet (0.9 oz)		14	7	7	N	N	N	N	7	7	7	7	N	N	7	N	9+	F	
Classic (0.67 oz)		2	N ¹	N	8	9+	7 ¹	9	7	7	N	9 ¹	8 ³	7+	N	8+	8	F	
Cobra (12.5 fl oz)		14	9	7	8	8	N	9	7	8	8+	9	9	8+	6	7	8+	F	
Engenia (12.8 fl oz)/ XtendiMax (22 fl oz) ⁴		4	8+	8	8+	9	8+	9	9	8	8	8+	8+	7+	8	8+	8	VG	
Enlist One (2 pt) ⁵		4	8+	—	7	9	8+	8+	9	8	8	8+	8+	7+	8	7	8	E	
FirstRate (0.3 oz)		2	N	9	6	9	8 ¹	8	N	8+	N	N	9 ³	9	N	8	9	VG	
Glyphosate (0.75 lb ae) ⁶		9	N ²	9	8+	9	6 ²	9	8+	8	8	9+	9 ²	8	8	8+	8	E	
Harmony SG (0.125 oz) ⁷		2	N	N	7	7+	N	7	9	N	N	9 ¹	6 ³	N	N	9	8+	— ⁸	
Liberty (32 fl oz) ⁹		10	8+	7+	8	9	8+	9	9	8	8	8+	9	8+	8	8+	8	VG	
Pursuit (4 fl oz) ¹		2	N ¹	7	6	9	N	8	7	7+	8+	9 ¹	8 ³	6	6	8+	9	FG	
Raptor (5 fl oz) ¹		2	N ¹	7	6	9	N	8	8+	7	8+	9 ¹	8 ³	8	6	8	9	G	
Reflex/Flexstar (1.25 pt)		14	9	6	7	8	N	9	6	8	8+	9	9	8	N	8	7+	FG	
Resource (6 fl oz)		14	7+	6	6	6	N	7	7	N	8	7+	7+	6	6	6	9+	FG	
Ultra Blazer (1.5 pt)		14	9	6	7	8	N	9	7	8	8	9	9	8	N	8+	7+	F	
Mixtures																			
Extreme (3 pt) ⁵		2/9	N ^{1,2}	8+	8	9	6 ²	9	8+	7+	8	9	8+ ^{2,3}	8	7	8+	9	VG	
Flexstar GT (4.5 pt) ⁵		9/14	9 ²	9	8+	9	6 ²	9	8+	8	8	9	9 ²	9	8	8+	8+	F	
Permit Plus (0.75 oz) ⁶		2/2	N ¹	—	7	9	N	7	9	6	6	9 ¹	9 ³	8	7	9	9	— ⁷	
Storm (1.5 pt)		6/14	8+	8	6	8	N	9	7	7+	7	8+	8+	7	7	8+	8	FG	
Synchrony (0.75 oz) ⁶		2/2	N ¹	N	8+	9+	8 ¹	9	9	7	N	9+ ¹	8 ³	7+	N	9	9	— ⁷	

¹ Group 2 resistance has been confirmed for this species and it is widespread in the region; Group 2 herbicides will not control these biotypes.

² Glyphosate resistance has been confirmed for this species and widespread in the region.

³ Common ragweed biotypes resistant to Group 2 herbicides have been confirmed in the region.

⁴ For use on dicamba-resistant (Xtend) soybean varieties only.

⁵ For use on 2,4-D resistant (Enlist E3) soybean varieties only.

⁶ For use on glyphosate-resistant soybean varieties only.

⁷ For use on STS, Bolt, or non-STS soybean varieties; a lower rate must be used on non-STS varieties.

⁸ Excellent crop tolerance for STS or Bolt varieties, but fair or worse ratings if used on non-STS varieties.

⁹ For use on glufosinate-resistant soybean varieties only.

10=95-100% control; 9=85-95%; 8=75-85%; 7=65-75%; 6=55-65%; N=<55% or no control; +=upper end of scale

Taken from 2020 *Mid-Atlantic Field Crop Weed Management Guide*

Prepared by Dwight Lingenfelter, Penn State Extension – Weed Science