Common Lambsquarters Management in Soybeans

Common Lambsquarters Distribution and Biology

- Common lambsquarters is one of the most prevalent weed species found in the U.S. Soybean Belt.
- This summer annual is one of the first to emerge in the spring with approximately 25 percent of the plants emerging prior to any spring tillage or burndown-herbicide application. While peak emergence is in mid- to late spring, lower numbers of common lambsquarters seedlings can emerge throughout the growing season.
- Due to common lambsquarters early emergence and rapid growth, it is extremely competitive with soybeans. One common lambsquarters plant per foot of row can reduce soybean yield by as much as 25 percent.
- Early-emerging common lambsquarters plants generally flower and set seed in late summer and fall. However, later-emerging plants have been reported to reach reproductive stages in as little as six weeks.
- Green common lambsquarters stems can disrupt soybean harvest by clogging up combines.
- Common lambsquarters plants produce an average of 72,500 seeds per plant.
- Common lambsquarters seeds have different dormancy requirements. Seed dormancy generally increases with increasing burial depth, and conditions needed to break dormancy include high levels of soil nitrate, exposure to light and fluctuating temperatures.
- Common lambsquarters seed is one of the most persistent in the soil seedbank. On average, it takes 12 years to reduce common lambsquarters seed in the soil seedbank by 50 percent and 78 years to deplete the seedbank by 99 percent.

Herbicide Resistance in Common Lambsquarters

- Since the early 1970s, common lambsquarters has evolved resistance to two different herbicide sites of action.
- Currently, there are no confirmed populations of glyphosate-resistant common lambsquarters. However, differences in glyphosate sensitivity have been documented. The prevalence of common lambsquarters in soybean fields treated with glyphosate, along with anecdotal observations in several states, suggest common lambsquarters populations are not being effectively controlled with glyphosate.

Group #	Group 2	Group 5
Site of Action	ALS Inhibitors	Photosystem II Inhibitors
Product Examples	Harmony®, Raptor®	atrazine, metribuzin

Common lambsquarters has shown resistance to the herbicides listed above.

- Regardless of the current resistance profile of common lambsquarters, the continued exclusive use of one herbicide (i.e., glyphosate) or site of action will lead to more control failures and the evolution of glyphosate-resistant common lambsquarters.

Management of Common Lambsquarters in Soybeans

Follow the steps below for the best management of herbicide-resistant and sensitive common lambsquarters in soybeans. Cultural practices that help make soybeans more competitive with common lambsquarters will also improve the consistency of the herbicide programs listed below. These practices include altering planting date relative to weed emergence, planting soybeans in narrow rows and using higher seeding rates for greater crop competition. Implementing crop rotations with small grains also disrupts the life cycle of common lambsquarters discouraging its future success.

1. **Start clean!** Common lambsquarters present at the time of planting needs to be managed with either tillage or an effective burndown-herbicide application. Do not plant into existing stands of common lambsquarters.
   - *The consistency of common lambsquarters control is improved with the addition of 2,4-D ester at 16 fl. oz./A. to either glyphosate or Gramoxone® in the burndown application. Note: A minimum of seven days is needed between 2,4-D ester application and soybean planting. If Enlist E3® soybean is planted, Enlist One® (2,4-D choline) at 32 fl. oz/A can be tank-mixed with glyphosate or Gramaxone® and applied prior to or immediately after soybean planting to improve common lambsquarter control. Do apply with Gramaxone® if soybean has emerged.*
   - *Effective soil-applied residual herbicides should be included with the burndown herbicide application. .*
2. **Apply an effective soil-applied (preemergence) herbicide.** Common lambsquarters is most effectively controlled by soil-applied herbicides. Apply the full rate (according to label guidelines for soil type and organic-matter content) of an effective soil-applied herbicide prior to or soon after soybean planting (Table 1, see reverse side).

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Table 1. Effective soil-applied herbicides for common lambsquarters control indicated by biotype.

Herbicides	Group #	Susceptible	Resistance to:	
			ALS (Group 2)	PS II (Group 5)
Afforia	2/2/14			
Authority Assist/First/XL	2/14	X*	X	X
Authority Edge/Supreme	14/15	X	X	X
Boundary	5/15	X	X	
BroadAxe XC	14/15	X	X	X
Classic	2	X		X
Command	13	X	X	X
Envive, Enlite	2/2/14	X	X	X
Fierce EX, Fierce MTZ, Fierce XLT	14/15, 5/14/15, 2/14/15	X	X	X
FirstRate	2	X		X
Linex**	5	X	X	X
Metribuzin	5	X	X	
Prefix	14/15	X	X	X
Prowl**	3	X	X	X
Pursuit	2	X		X
Python	2	X		X
Scepter	2	X		X
Surveil	2/14	X	X	X
Sonic	2/14	X	X	X
Synchrony XP	2/2	X		X
Tendovo	2/5/15	X	X	X
Trivence	2/5/15	X	X	X
Valor, Valor XLT	14, 2/14	X	X	X
Warrant Ultra	14/15	X	X	X
Zidua PRO	2/14/15	X		X

*X indicates good-to-excellent control of common lambsquarters.

**Will likely require subsequent POST applications for complete control.

3. If needed, make timely postemergence herbicide applications.

There are few options available for postemergence common lambsquarters control. The effectiveness of postemergence herbicides is often based on common lambsquarters size. Table 2 lists postemergence herbicide options for common lambsquarters control.

4. Scout fields 10 to 14 days later for effectiveness.

If common lambsquarters escapes initial control, glyphosate may be applied a second time in glyphosate-tolerant soybeans (Roundup Ready 2®, Enlist E3®, Roundup Ready 2 Xtend®, or XtendFlex®), or Liberty may be applied a second time in glufosinate-tolerant soybeans (LibertyLink®, Enlist E3®, or XtendFlex®). Enlist One® or Enlist Duo® may also be applied a second time in Enlist E3® soybean. Make sure not to exceed the maximum soybean stage for application of the respective herbicides. These applications are "rescue" treatments, and will increase the selection pressure for the evolution of herbicide resistance. Weeds not controlled with the second application should be tested for herbicide resistance.

Table 2. Postemergence herbicide options for common lambsquarters control based on size.

Herbicides*	Site of Action Group #	Product rates (per acre) based on common lambsquarter size		
		< 4 inches	≤ 6 inches	6 inches
Harmony**	2	0.12 oz	--	--
Raptor**	2	5 fl oz	--	--
Synchrony XP**	2/2	0.375 oz	--	--
Enlist E3 (2,4-D-resistant) soybean				
Enlist One	4	2 pt	2 pt	--
LibertyLink, Enlist E3, or XtendFlex (glufosinate-resistant) soybean				
Liberty	10	32 fl oz	43 fl oz	--
Liberty Ultra	10	24 fl oz	29 fl oz	--
Roundup Ready 2, Roundup Ready 2 Xtend, Enlist E3, or XtendFlex (glyphosate-resistant) soybean				
glyphosate	9	0.75 lb ae	1.0 lb ae	1.5 lb ae

*Follow label guidelines for adjuvant selection for each.

**Will not control ALS (Group 2)-resistant common lambsquarters.

For more information and links to additional resources, visit ***www.IWillTakeAction.com****.*

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Brought to you by the soy checkoff.

Take ACTION Herbicide-Resistance Management