

## Can LibertyLink Cotton or Soybeans Work in Florida?<sup>1</sup>

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Palmer amaranth, or herbicide-resistant Palmer amaranth, is on the rise in Florida. The area of the state infested with this weed has been increasing for several years, but many herbicides have been available that provide excellent preemergence and/or postemergence control. Although these herbicides are still available, more and more populations of Palmer amaranth have confirmed or expected resistance to ALS-inhibiting herbicides (Staple, Pursuit, Classic, Cadre, Strongarm) and/or glyphosate (Figure 1). It is essential to supplement these herbicides if resistance is suspected. Therefore, it is important to develop a control strategy that does not rely on ALS-inhibiting herbicides or glyphosate for Palmer amaranth control in cotton or soybeans. One possible solution is LibertyLink crops.



**Figure 1.** Field of herbicide-resistant Palmer amaranth.

that can be used to control a wide variety of grass or broadleaf weeds.

### How does glufosinate (Ignite 280) work?

Glufosinate kills plants by blocking an important step in nitrogen metabolism. The result is that ammonia rapidly builds up within the plant and becomes toxic. This buildup of ammonia happens very quickly, and the plant begins to die before the herbicide can be thoroughly moved throughout the plant. Therefore, plants die within 3 to 5 days of

### What is LibertyLink?

A LibertyLink crop is one that has been genetically modified to tolerate applications of glufosinate (the active ingredient of Ignite 280 herbicide). Glufosinate is a nonselective herbicide

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application, and herbicide injury symptoms appear contact in nature, similar to paraquat (Figure 2). Since glufosinate is not systemic in the plant, good spray coverage is essential. We recommend that glufosinate be applied in a minimum of 15 gallons of water per acre to ensure proper spray distribution.



**Figure 2.** Typical glufosinate injury symptoms.

### **How does LibertyLink differ from Roundup Ready technology?**

Roundup Ready and LibertyLink technology seem related, but they could not be more different. Though glyphosate and glufosinate sound similar (and are even structurally similar), they are two distinct herbicide molecules that kill plants in very different ways. Therefore, glufosinate will kill Roundup Ready crops, and glyphosate will kill LibertyLink crops. It is true that many cotton or soybean lines have "stacked genes" (multiple genes inserted to give tolerance to several herbicides and insects) that impart tolerance to both glyphosate and glufosinate, but this is not true for ALL varieties. It is essential that you know exactly what technology you have planted before you make an application of glufosinate or glyphosate. The good news is that glyphosate-resistant weeds will also be killed by a glufosinate application.

### **Is there a difference between LibertyLink and WideStrike technology?**

Some crop varieties use the glufosinate-tolerance genes with the inserted Bt-insecticide traits; an example of this is WideStrike technology. Although the WideStrike Bt trait is tolerant to glufosinate, it is not equal to the level of tolerance provided by LibertyLink.

### **Does glufosinate kill all the same weeds as glyphosate?**

It is true that glufosinate is a nonselective herbicide that has the potential to kill many weed species. However, glufosinate and glyphosate are very different herbicides. For example, glyphosate provides excellent control of most grasses, while glufosinate is weak on grasses. Conversely, while glyphosate struggles with morningglory and volunteer peanuts, glufosinate is excellent on both. It will be important to carefully read the Ignite 280 (glufosinate) label to ensure that your most problematic weeds will be controlled. It is also important to note that glufosinate will not routinely control large weeds. Glufosinate is most effective on small weeds (<3 inches), and larger weeds will routinely escape control.

### **Where does glufosinate fit?**

The primary fit for glufosinate is in nonirrigated fields with herbicide-resistant weeds. Preemergence herbicides can provide essentially zero weed control if they are not activated with rainfall or irrigation. Therefore, being able to control these emerged weeds in nonirrigated crops with a postemergence herbicide is essential. It will also allow the opportunity to apply another soil-active herbicide for prolonged control. Another fit would be irrigated fields with high Palmer amaranth infestations. As a soil-active herbicide begins to fail, glufosinate can be used to manage these weeds until another soil-active herbicide is applied.

## Where does glufosinate not fit?

Glufosinate applications must target small weeds to work at optimum levels. A 6" Palmer amaranth can be controlled with glufosinate, but control of big weeds is not consistent and should not be targeted. Therefore, a glufosinate program will likely be less effective on fields that are not viewed on a regular basis, such as those that are physically distant from your home location. For maximum effectiveness, fields should be scouted regularly so weeds can be sprayed in a timely manner.

## What is the potential for weeds to become resistant to glufosinate?

All weeds, particularly Palmer amaranth, will become resistant to any herbicide that is used repeatedly. Therefore, it is essential to use glufosinate in combination with other herbicides—particularly residual herbicides. Glufosinate has no soil activity, so it will need to be applied as part of an entire weed control program that contains other herbicides. Applying glufosinate in a program that includes metolachlor (Dual Magnum), flumioxazin (Valor), diuron (Direx), fomesafen (Reflex), metribuzin (Sencor) and others is a great way to maximize weed control while minimizing the likelihood of resistance. **Simply adopting a "glufosinate only" weed control program will likely lead to resistant weeds in a mere 3 to 5 years.**

## Important considerations when using glufosinate

The time of day when glufosinate is applied is one issue that needs to be mentioned when considering a LibertyLink weed control program. It has been observed that glufosinate applications made soon before or after darkness do not control weeds as effectively as applications made during midday. This phenomenon is unique to glufosinate and is easily overcome by spraying between 9 a.m. and 6 p.m.

An additional consideration should be tank cleanout. Peanuts are highly sensitive to glufosinate at rates as low as a few ounces per acre. After spraying glufosinate on cotton, it is essential that the tank be well rinsed so carryover to peanuts is not a concern.