

Killing Frost-Damaged Corn. It's Not as Easy as it Sounds.

According to the National Agricultural Statistics Service, about 12% of the corn was planted in Missouri prior to the freezing temperatures experienced last week. Because of this, I have already received a few calls pertaining to the options for killing out these frost-damaged fields of corn and planting a new stand of corn back into these areas.

First, one of the most obvious options is tillage. Many growers are not willing to resort to this, but this is a viable option and the costs of a tillage operation should be weighed against the cost of the available herbicide options before this possibility is ruled out.

If the decision has been made to use a herbicide to kill out the frost-damaged corn stand, then the type of corn that was planted will be very important in determining which herbicide should be chosen. If the frost-damaged corn was not a Roundup Ready variety, then any of the generic or brand name glyphosate products will provide good control. If the frost-damaged corn was a Roundup Ready variety, then eliminating the corn stand will be much more difficult and costly. This has been an issue of increasing importance over the past several years, and will continue to be a big issue for growers who plant continuous Roundup Ready corn. The problem with eliminating frost-damaged Roundup Ready corn is that there are few herbicides that will provide good, consistent control of Roundup Ready corn and at the same time will allow for corn replanting in a short period of time.

Last year it appears that some of the Roundup Ready corn acres in other states were treated with postemergence grass herbicides like Select Max, Assure II, and Fusilade, which are commonly used in soybeans. The problem with this is that these herbicides are not registered for this use and in some cases, injury to the developing corn crop can occur due to residues of these herbicides in the soil.

The one exception to this may be with the active ingredient in Select Max (clethodim), which has a soil half-life of just 3 days. As a result of several studies conducted last year, we are currently pursuing a Section 18 label in cooperation with Valent for the use of Select Max on frost-damaged Roundup Ready corn in Missouri. This application use for Select Max has already been submitted to the EPA by Valent for a full federal label (expected next year), but due to the conditions we have experienced in Missouri, we are now pursuing this emergency label. This label, if obtained, would allow for the application of Select Max at 4 fluid ounces per acre for the control of Roundup Ready corn and for replanting of the subsequent corn stand as soon as 4 or 5 days after application. In research conducted last year, we observed 95% control of 4-inch Roundup Ready corn with applications of Select Max at this use rate and 92% control of 8-inch Roundup Ready corn. Let me be clear; this is **NOT** a legal use of this product at the time of this writing, but we hope to obtain this label soon for the problem we have encountered in Missouri. If granted, it would provide one of the cheapest options for eliminating damaged Roundup Ready corn stands (Table 1). Contact your regional Extension agronomist or retailer before applying this product in order to ensure that the Section 18 label has been approved for Missouri.

As far as the currently-labeled options, applications of Liberty have provided inconsistent control of Roundup Ready corn in our research. In one of the trials we conducted last year, we observed very poor control of 1- to 3-inch Roundup Ready corn with applications of Liberty at 32 ounces per acre. This is due to the contact nature of Liberty and the likelihood that the growing point remained

below ground at the time of these applications. In this same study, we observed much higher levels of control with applications of Liberty to Roundup Ready corn that was 4 to 6 inches in height, but the overall control was still only about 85%. This means that some frost-damaged corn survivors will be present to compete with the subsequent crop. However, if the replanted corn is a Liberty Link variety, then it is likely that these initial survivors can be controlled with a subsequent in-crop Liberty application. Another thing to keep in mind is that if the initial corn was stacked with Herculex, then this variety also has resistance to Liberty and therefore applications of Liberty would provide no control of the frost-damaged corn.

Our research has also shown poor results with applications of Gramoxone (paraquat) alone. Regardless of the rate or timings evaluated in our studies, we observed less than 40% Roundup Ready corn control with this treatment. However, we have observed good results with applications of Gramoxone in combination with either Sencor or Linex. In our research, Gramoxone Inteon at 2 ¼ pints per acre plus Sencor at 3 ounces per acre or Gramoxone Max at 2 ¼ pints per acre plus Linex at 1 pint per acre both provided greater than 95% control of 1- to 3-inch or 4- to 6-inch Roundup Ready corn 30 days after treatment. Both of these treatments will also allow for corn planting anytime following application. At this time, however, the amended Linex label for this new use pattern has been approved at the federal level, but is still pending state registration for use in Missouri. One of the drawbacks of either of these treatments is the cost in comparison to the proposed Select Max use (Table 1), but until this label is approved, Liberty or Gramoxone plus Sencor appear to be the only legal options for frost-damaged Roundup Ready corn control in Missouri.

Kevin Bradley (882-4039)

Table 1. Approximate costs of herbicide programs for Roundup Ready corn control.

Herbicide Program	Rate	Approximate Cost
	-- Product / Acre --	----- \$ /Acre -----
Liberty	32 fl ozs	15.87
AMS	3 lbs	<u>0.52</u>
		16.39
Gramoxone Inteon	2.25 pts	7.73
Sencor	3 ozs	2.63
Crop Oil Concentrate	1 pt	<u>0.67</u>
		11.03
Gramoxone Inteon	2.25 pts	7.73
*Linex	1 pt	7.00
Crop Oil Concentrate	1 pt	<u>0.67</u>
		15.40
*Select Max	4 fl ozs	3.57
Non-ionic Surfactant	0.25% v/v	0.58
AMS	2.5 lbs	<u>0.43</u>
		4.58

*Indicates products with labels pending for this use in Missouri.