In 2017, the following glyphosate formulations are available as chemical ripeners: Roundup WeatherMAX®, and Roundup PowerMAX II®. **Note:** these products are labeled for use in stubble sugarcane crops only and **not in plant cane.** When used according to the label and the following recommendations, these products should increase recoverable sugar per ton of cane, while minimizing losses in tons of cane per acre. Sugarcane response to ripener application may be lessened when conditions favor good natural ripening or when conditions are not conducive to glyphosate absorption. Further, ripener response is variety dependent. Ripener application will reduce vegetative growth and may reduce cane yields. However, cane yield losses are generally offset by increases in recoverable sugar per ton of cane, resulting in equal or greater yields of sugar per acre when harvested during the recommended treatment-to-harvest interval.

### Rates

The recommended application rate for both Roundup WeatherMax® and PowerMax II® is 5.3 oz. per acre. A 5.3 oz. per acre rate of these products is equivalent to 6 oz. of Polado® ripener per acre. Please carefully read the label before ripener use. For higher tonnage cane, use the upper end of the rate range.

<table>
<thead>
<tr>
<th>Glyphosate Formulation</th>
<th>Recommended</th>
<th>Label Rate Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundup WeatherMAX®</td>
<td>5.3</td>
<td>4 to 12</td>
</tr>
<tr>
<td>Roundup PowerMAX II®</td>
<td>5.3</td>
<td>4 to 12</td>
</tr>
</tbody>
</table>
Drift and Surfactants

Glyphosate can cause serious damage when drifted onto non-target sites, such as newly planted cane, other crops, or residential landscapes. Drift-control agents may be added to reduce drift. However, ripeners should only be applied when wind speeds are between 3 and 10 mph and should not be applied when there is a surface temperature inversion. A surface inversion occurs when temperature at the surface is cooler than air above the surface; usually in the evening or early morning. Surface inversions restrict vertical air mixing and cause spray droplets to remain suspended. The spray droplets can then move laterally reducing effectiveness of application and cause damage to off-target sites. Also, wind direction should be taken into account when applying glyphosate ripener to avoid drifting onto off-target sites.

All recommended glyphosate formulations contain surfactants, so under normal conditions, no additional surfactant is needed. Rainfall less than 6 hours after application may reduce sugarcane response to glyphosate. The low use rate of glyphosate, when applied as a sugarcane ripener, results in a lower than ideal concentration of surfactant in the spray solution. This lower amount of surfactant may not provide the rain-fastening properties obtained when these formulations are applied at much higher herbicidal rates. Therefore, do not apply glyphosate ripener if rainfall is likely within 6 hours of application.

Variety Response

Sugarcane varieties vary in their response to glyphosate. Higher rates of glyphosate may be needed to obtain the desired increase in recoverable sugar per ton of cane (TRS) in varieties that are less responsive (see Table below). Caution should be used when applying higher rates in order to increase response in poor responding varieties as this may also increase injury to the following year's stubble crop.

<table>
<thead>
<tr>
<th>Highly Responsive Varieties</th>
<th>Moderately Responsive Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>HoCP 96-540</td>
<td>HoCP 00-950</td>
</tr>
<tr>
<td>L 99-226</td>
<td>L 01-283</td>
</tr>
<tr>
<td>L 01-299</td>
<td>Ho 07-613</td>
</tr>
<tr>
<td>L 03-371</td>
<td>HoCP 09-804</td>
</tr>
<tr>
<td>HoCP 04-838</td>
<td></td>
</tr>
</tbody>
</table>

Treatment-to-Harvest Intervals

A 28 to 49 day treatment-to-harvest interval is recommended following glyphosate ripener application. Harvesting prior to 28 days is not recommended because this will not maximize TRS for ripener applications. Delaying harvest beyond 49 days not only reduces yield potential in the current crop, but increases risk of injury and further yield loss in next year's crop.
**Application Schedule**

When glyphosate ripener is applied in late August and early September for harvest in late-September or early-October, sugarcane will still be actively growing. Therefore, it is recommended that the first application be scheduled no earlier than 28 days before mill opening to minimize reductions in cane tonnage. This will also allow for delays in factory openings without greatly impacting the current and future stubble crops.

The following schedule is recommended to maximize the response to application of these ripeners. For harvest dates of September 15 to October 15, consider a treatment-to-harvest interval of 28 to 35 days; from October 15 to November 15, 28 to 42 days; and from November 15 to December 1, 35 to 49 days. Treatment-to-harvest intervals beyond 49 days are not recommended and are not labeled, especially if additional stubble crops are planned. Sugarcane scheduled for harvest after December 1 should not be treated with a ripener as sugarcane will have matured naturally and little to no increase in recoverable sugar should be expected.

Response to glyphosate is based on sugar levels at the time of ripener application. Use a hand refractometer to test for Brix as an indicator of the cane’s sucrose content prior to application. Fields with the highest Brix should be treated first; accordingly, fields with the highest Brix at the recommended treatment-to-harvest interval should be harvested first. Please refer to *Brixing to Improve Sugarcane Quality*, online Publication No. 2888. You can access the publication by holding the Ctrl key and clicking on the title.

**Use the TimeRange app to estimate ripener application dates.**

**Regrowth**

Glyphosate ripener applications may delay spring shoot emergence and, in some cases, harvestable stalk populations in subsequent stubble crops. In some years and in some varieties, spring shoots will appear bleached and stunted (see photo on the right). Sugarcane will typically outgrow this injury with warmer weather. Yield reductions are infrequent, occurring primarily when higher than recommended rates of glyphosate are applied, and/or recommended treatment-to-harvest intervals are exceeded, and/or harvest residue is not removed on a timely basis following harvest. Leaving mulch on ripener-treated sugarcane can reduce sugar yields by as much as 30% the following year. In fields where mulch cannot be removed, a ripener should only be applied to the last stubble crop.
Points to Consider When Applying a Glyphosate-based Ripener

Follow product labels and use recommended rates.
Do not apply to seed-cane or plant cane.
Apply the higher recommended rates only to the last stubble crop and high tonnage crops.
Do not exceed the maximum recommended treatment-to-harvest intervals (49 days).
Do not apply glyphosate ripeners to sugarcane after the third full week of October.
For best results, apply glyphosate to erect cane. If recently lodged, allow sufficient time (7-10 days) for the cane to erect itself.
Add a non-ionic surfactant (0.25% by volume) only if rainfall is likely with 6 hours of application. (Do not apply ripeners when rainfall is imminent.)
Use a drift control agent to reduce off target movement.
Use a hand refractometer to measure Brix to optimize ripener scheduling.

Moddus Program

The plant growth regulator Moddus is labeled for use as a ripener on sugarcane in Louisiana. Moddus can be applied to all crops in the sugarcane crop cycle. The recommended rate for Moddus for ripening sugarcane in Louisiana is 16 – 19 oz. per acre. The label states that Moddus can be applied 28 – 60 days prior to sugarcane harvest; higher theoretical recoverable sugar per ton of cane (TRS) response was achieved in the 50 – 60 day range.

Moddus ripener rates for sugarcane grown in Louisiana.

<table>
<thead>
<tr>
<th>Product</th>
<th>Recommended</th>
<th>Label Rate Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moddus™</td>
<td>16 – 19</td>
<td>11 – 19</td>
</tr>
</tbody>
</table>

Research Experience

Moddus did not increase theoretical recoverable sugar (TRS) as effectively as glyphosate. The average TRS increase was 5 percent above non-treated sugarcane; whereas, the increase for glyphosate treated sugarcane was 10 – 20 percent.

Moddus response among Louisiana varieties was more variable. Varieties such as L 99-226 and HoCP 00-950 exhibited little to no TRS increases due to Moddus application; varieties such as HoCP 96-540 and HoCP 04-838 exhibited greater TRS increases.

Moddus reduces sugarcane growth that can reduce cane yield (tons/acre) when compared to non-treated sugarcane. Reductions in cane yield as a result of ripener application, glyphosate or Moddus, depend on rate of growth at time of application, treatment-to-harvest interval, and sugarcane variety.