Harvest Aid Products for Soybean

- Late or poor canopy closure can lead to weedy soybean fields late in the season.
- Harvest aid herbicides can be used to preserve soybean seed quality and protect yield potential by controlling weeds that may interfere with harvest operations and by also drying aboveground green tissue (pods, stems, and leaves).
- Harvest aid products should be applied after soybean plants have reached maturity.

Harvest Aid Products

Knowing some characteristics of the harvest aid product can help in the selection and application processes.

- Advantages of using a harvest aid product include potentially better harvested seed quality, reduced weed populations, earlier harvest, and increased harvest efficiency.
- Desiccants are commonly used harvest aids to remedy problems that may interfere with harvest, but will not speed up crop maturity or make seed dry down faster. A desiccant will only help to drop remaining leaves and dry out green tissue of both crops and weeds.
- Desiccants, such as Gramoxone SL, reduce green vegetation, but do not remove excessive moisture from the seed. The addition of sodium chlorate to a desiccant can help remove moisture from green soybean tissue and/or seed, and provide additional control of weeds.
- Crop and weed drydown may be slowed during periods of cool, wet weather. Additional time beyond the pre-harvest interval may be needed to dry down large weeds.
- Avoid applying a desiccant just before a rain.
- Only harvest the soybean crop according to the harvest aid label.
- Drought-stressed weeds may not desiccate effectively due to poor translocation within the plant.

Pre-Harvest Aid Herbicides

Gramoxone® SL, Sharpen® powered by Kixor®, Aim® EW, and Clarity® can be used as harvest aids in soybean (Table 1). Each product has unique attributes and products differ in speed of activity, efficacy, pre-harvest intervals, and re-cropping restrictions. Please check product labels prior to use for specific recommendations and precautions.

Spray coverage is essential to the success of contact herbicides. Gramoxone SL is a contact herbicide, which can provide the quickest desiccation of soybean plants and should be applied in at least 20 gallons of water/acre for good coverage.

Translocated herbicides, like Sharpen or Clarity, are taken up and move through the plant requiring more time for more complete activity. Tank mixtures may provide the best combination of crop desiccation and weed control. Spray adjuvants are typically recommended with harvest aid products to improve coverage and efficacy.

Pre-harvest Weed Management

Even low densities of weeds have been shown to reduce harvest efficiency. A research study showed that the presence of broadleaf weed densities (selected to be below a yield loss threshold, 0.25 to 2 plants/meter of row) at harvest reduced cylinder and combine speed. The amount of foreign material nearly doubled, while damaged soybean seed and seed moisture increased, compared to the weed-free control plots.

Pre-harvest herbicides most likely will not prevent weed seed production, but some research has demonstrated a reduction in weed seed production and viability. Keep in mind that results can be influenced by the type of herbicide used, weed species, and application timing in relation to weed seed development. Pre-harvest herbicides that are translocated within weed species have the potential to reduce seed viability when applied during the initial seed set stage of weed growth. Precise herbicide application timing is required to have any positive impact on weed seed viability. In most cases, the application timing may not coincide with label restrictions for application to the crop to prevent crop seed injury or herbicide residues in crop seed. Weed competition should be addressed early in the season to protect crop yield potential and reduce weed seed production. In situations where crop growth or canopy closure is delayed and weeds continue growth late in the season, pre-harvest herbicide applications may be used to help increase harvest efficiency.

Time of Application

Commonly used harvest aid products have specific instructions regarding application timing (Table 1). Fields should begin to be sampled in preparation for a harvest aid application once soybeans reach the R6 growth stage. In general, it is advisable to wait until the plants have reached the R7 growth stage, which is when rapid leaf yellowing begins and one or more pods reach the mature brown or tan color. Once seeds turn yellow, they begin to separate from the white membrane of the pod, indicating that seed filling is reaching completion and a harvest aid application may be considered. Application of a product prior to label instructions can reduce seed yield potential or quality. Mississippi State University has published a good visual guide to soybean growth stages that can be used to help make application timing decisions.

To determine the growth stage of a soybean field, randomly collect pods from the top 1/3 of plants throughout the field and examine the pod and seeds to determine if all of them meet the criteria for an application as specified by the product label.
## Table 1. Recommendations for the use of some harvest aid products for soybean.

<table>
<thead>
<tr>
<th>Product</th>
<th>Timing</th>
<th>Rate/A Pre-harvest Interval (PHI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roundup WeatherMAX®</strong></td>
<td>Genuity® Roundup Ready 2 Yield® Soybean</td>
<td>22 fl oz/A</td>
</tr>
<tr>
<td></td>
<td>Soybean - After pods have set and lost all green color.</td>
<td>PHI 14 days¹</td>
</tr>
<tr>
<td><strong>Roundup WeatherMAX®</strong></td>
<td>Non-glyphosate tolerant soybean - Pods have set and lost all green color.</td>
<td>44 fl oz/A, 3.3 qt/A – ground</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHI 7 days¹</td>
</tr>
<tr>
<td><strong>Gramoxone® SL</strong></td>
<td>Indeterminate Seed Products - at least 65% of pods are a mature brown color or when seed moisture is 30% or less. Determinate Seed Products - seeds are fully developed, 1/2 leaves have dropped and remaining leaves are yellowing. Immature soybeans will be injured.</td>
<td>8 - 16 fl oz/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHI 15 days²</td>
</tr>
<tr>
<td><strong>Sharpen® (powered by Kixor® Herbicide)</strong>*</td>
<td>Indeterminate Seed Products - greater than 65% brown pods and greater then 70% leaf drop or when seed moisture is 30% or less. Determinate Seed Products - seeds are fully developed, greater than 50% leaf drop and remaining leaves are yellowing.</td>
<td>1 - 2 fl oz/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHI 3 days²³</td>
</tr>
<tr>
<td><strong>Aim® EC</strong></td>
<td>Crop is mature and grain has begun to dry down. To defoliate and/or desiccate troublesome broadleaf weeds e.g. morningglories, pigweeds, and velvetleaf that may be present at harvest.</td>
<td>1 - 1.5 fl oz/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHI 3 days²¹</td>
</tr>
<tr>
<td><strong>Clarity®</strong></td>
<td>Pods have reached mature brown color; at least 75% leaf drop has occurred.</td>
<td>8 - 32 fl oz/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHI 7 days²¹</td>
</tr>
</tbody>
</table>

¹See label for grazing, hay, or fodder preharvest interval.
²Do not graze or feed treated soybean fodder/forage to livestock.
³Do not apply to soybean grown for seed production.

### Summary

In summary, application of chemicals prior to harvest in Table 1 can be used to help manage late-season weeds that could interfere with harvest efficiency. Additionally, these products can be used to help desiccate above ground green soybean tissues to also improve harvest efficiency. The type of herbicide used, weed species present, and application timing are all factors that can affect harvesting efficiency.

### Sources
9. Loux, M.M. 2009. Preharvest soybean herbicide use guide. University of Illinois, Urbana. For additional agronomic information, please contact your local seed representative. Individual results may vary, and performance may vary from location to location and from year to year. This publication was developed in partnership with Technology Development & Agronomy by Monsanto. Monsanto Company is a member of Excellence Through Stewardship® (ETS). Monsanto products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Monsanto’s Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. This product has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship®. Roundup Technology® includes Monsanto's glyphosate-based herbicide technologies. Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup Ready technology contains genes that confer tolerance to glyphosate, an active ingredient in Roundup® brand agricultural herbicides. Agricultural herbicides containing glyphosate will kill crops that are not tolerant to glyphosate. Tank mixtures. The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Monsanto has not tested all tank mix product formulations for compatibility or performance other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance. Genuity®, Roundup Ready 2 Yield®, Roundup Ready®, Roundup Technology®, Roundup WeatherMAX® and Roundup® are registered trademarks of Monsanto Technology LLC. Gramoxone® is a registered trademark of a Syngenta group company. Some of the product(s) discussed herein are restricted use pesticide(s) and may not be registered in all states. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or product representative for the product registration status in your state. All other trademarks are the property of their respective owners. ©2016 Monsanto Company 0805615CRB