

## Harvest Aid Products for Soybean

- Later-than-normal canopy closure can lead to weedy soybean fields.
- Harvest aid herbicides are used to preserve seed quality and protect yield potential by drying above ground green tissue (pods, stems, leaves) and potentially controlling weeds that may interfere with soybean harvest operations.
- Harvest aid products should be applied after soybean plants have reached maturity.

### Harvest Aid Products

Knowing some characteristics of the product prior to harvest can help in the selection and application processes:<sup>1</sup>

- The advantages of using a harvest aid product include potentially better harvested seed quality, earlier harvest, and/or increased harvesting efficiency.
- Pre-harvest herbicides do not speed up maturity, or make soybean seed dry down faster, they only serve to drop remaining leaves and dry out green tissue. A harvest aid may facilitate the drying of pods, making them easier to harvest.
- Desiccants, such as paraquat, can kill green vegetation but do not help remove excessive moisture from the seed. The addition of sodium chlorate to a desiccant can help to remove excessive moisture from green soybean tissue and/or seed, and provide control of weeds.
- If possible, avoid applying a desiccant just before a rain.
- Harvest the desiccated soybean crop as the harvest aid label allows.
- Weeds that are drought stressed may not be desiccated effectively.
- Crop and weed drydown may be slowed during periods of cool and wet weather. Additional time beyond the pre-harvest interval may be needed to dry down large weeds.

### Time of Application

The commonly used harvest aid products have specific instructions regarding application timing (Table 1). Once soybean plants reach the R6 growth stage it's a good time to begin sampling fields in preparation for a harvest aid application (Figure 1). 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.<sup>3</sup> Once seeds turn yellow, they begin to separate from the white membrane of the pod, indicating that seed filling is reaching completion and an 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 and the approximate time interval between reproductive growth stages for various soybean maturity groups and environmental conditions that can be used to help make application timing decisions.<sup>2</sup> 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.

### Pre-Harvest Aid Herbicides

Roundup WeatherMAX®, Gramoxone Inteon®, Clarity®, and Aim® EW 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 Inteon®, a contact herbicide, 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, such as Roundup WeatherMAX® or Clarity®, tend to have slower speed of activity but generally



Figure 1. Soybean plants at R6 stage of growth. Photo courtesy of Howard F. Schwartz, Colorado State University, bugwood.org.

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provide more complete weed kill. Tank mixtures may be needed to 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

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) at harvest reduced cylinder and combine speed.<sup>7</sup> The amount of foreign material nearly doubled, while damaged soybean seed and soybean 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.<sup>5,6</sup> 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.<sup>5</sup> 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.

In summary, prior - to - harvest chemicals in Table 1 can be used to help in desiccating above ground green tissues, which can improve harvest efficiency. Additionally, these products may kill weeds that could interfere with the harvest. Type of herbicide used, weed species present in soybean field prior to harvest, and timely applications are factors that can affect harvesting efficiency. The latter factor is important to help avoid crop damage and desiccation of the crop within pre-harvest intervals.

### Sources:

<sup>1</sup> Heatherly, L.G. 2011. Using harvest aids for soybeans. <http://mssoy.org> (verified 8/07/2013); <sup>2</sup> Koger, T., et al. 2010. Guide to soybean growth stages and growth stage predictor. Mississippi State University Publication 2588; <sup>3</sup> McWilliams, D.A., et al. 2004. Soybean growth and management quick guide A-1174. North Dakota State University; <sup>4</sup> Griffin, J.L., et al. 2008. Harvest aids in indeterminate and determinate soybeans – application timing and value. Louisiana State University; <sup>5</sup> Hager, A. 2009. Preharvest herbicide applications. University of Illinois, The Bulletin, no. 22; <sup>6</sup> Davis, V.M. 2012. A review of glyphosate use for preharvest weed control. University of Wisconsin Crop Manager; <sup>7</sup> Ellis, J.M., et al. 1998. Soybean (*Glycine max*) seed quality and harvesting efficiency as affected by low weed densities. Weed Technology 12: p 166 - 173.

**Table 1. Recommendations for the use of some harvest aid products in soybean.**

Product	Crop	Timing	Rate/acre	Pre-harvest Interval
Roundup WeatherMAX®	Genuity® Roundup Ready 2 Yield® & Roundup Ready® Soybeans	After pods have set and lost all green color.	22 fl oz/A	14 days
Roundup WeatherMAX®	Soybean	After pods have set, and lost all green color.	44 fl oz/A by air or up to 3.3 qt/A by ground	7 days, see label for grazing, hay, or fodder PHI.
Gramoxone Inteon®	Soybean	At least 65% of pods are a mature brown color or when seed moisture is 30% or less.	8 - 16 fl oz/A	15 days, do not graze or harvest for hay or fodder.
Clarity®	Soybean	After pods have reached a mature brown color and at least 75% leaf drop has occurred.	8 - 32 fl oz/A	7 days, do not feed soybean fodder or hay.
Aim® EW	Soybean	Crop is mature and grain has begun to dry down.	1 - 2 fl oz/A	3 days

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