

## WITH UP-TO-DATE SOYBEAN PRODUCTION INFORMATION

### USING HARVEST AIDS FOR SOYBEANS

Desiccants are commonly used harvest aids to remedy problems that may interfere with efficient soybean harvest. Desiccants can kill green weeds and green tissue (leaves, stems, pods) on soybean plants.

Purposeful desiccation prior to soybean harvest is an option to consider

- In ESPS plantings in the midsouthern U.S. where an earlier open canopy allows weed resurgence before soybean maturity and subsequent harvest
- When soybean plants have green leaves and stems but pods are mature and ready for harvest. Any event, such as pod damage caused by piercing-sucking/pod feeding insects, that reduces fruit load or causes damage to seeds in the pod can increase incidence of green stems that may require a desiccant to hasten dry-down.

A preharvest desiccant will be needed if weed densities are high enough to lead to

- Increases in soybean seed moisture and damaged soybean seed
- More foreign material in the harvested seed
- Decreased combine speed and subsequent decreased harvest efficiency.

A preharvest desiccant will not be needed or should not be used if

- Weeds that are present at maturity emerged late in the growing season and their size will not interfere with harvest or result in increased foreign matter in the harvested seed.
- Weeds that are present have not produced mature seeds that will contaminate the grain.
- The desiccant cannot be applied sufficiently ahead of harvest so as to ensure that targeted weeds are dry at harvest, or that preharvest interval (PHI) restrictions in the harvest aid label can be met. This may be the case in the high temperature, low humidity conditions common to August when the time between maturity of soybean, or 95% mature pod color, and harvest maturity may be as little as 5 to 7 days and the required interval between desiccant application and harvest is 7 to 15 days, depending on the desiccant.

Important points to consider if a preharvest desiccant is used are

- A desiccant will not dry down a “butter bean”; it will merely dry the pods, making them easier to harvest.
- Weeds that are drought stressed will not be desiccated effectively.
- Desiccants such as Gramoxone [paraquat] are excellent for killing green vegetation, but do not 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, as well as from weed vegetation, especially grassy weeds.
- Be prepared to harvest soybean as soon after desiccation as allowed by the desiccant label [click [here](#) and [here](#) for research results].
- Do not desiccate soybeans just before a rain if possible. This is especially critical if sodium chlorate is used because the label states that it should not be applied if rain is expected within 24 hours.
- Using preharvest desiccants will not result in a yield increase for soybeans. The advantage comes from better quality of harvested seed, less dockage at the elevator, earlier harvest, and/or increased harvesting efficiency.

Results from research conducted by Joseph M. Boudreaux and James L. Griffin at Louisiana State University is reported in an article titled “[Application timing of Harvest Aid Herbicides Affects Soybean Harvest and Yield](#)”. These results provide a definitive guide for when a desiccant can be applied to soybeans so as not to reduce yield, effect earlier harvest, and provide the required PHI as stipulated by the desiccant label (see following summary).

- Soybean yield was not reduced when harvest aid was applied at 40% or lower average seed moisture content.
- Applying a harvest aid at 40% seed moisture content resulted in earlier harvest that was generally outside the PHI stipulated on the desiccant label.
- The 40% seed moisture content roughly coincides with stage R6.5, which the authors describe as “pod cavities have completely filled and all seed are separating from the white membrane inside the pod”. This is pictorially shown in slide 14 of “[Harvest Aids in Soybean—Application Timing and](#)

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[Value](#)”, and on p. 2, frame 10 of “[Guide to Soybean Growth Stages](#)”.

- Waiting until 30% seed moisture content to apply Gramoxone Inteon as stipulated on its label (see below) did not allow the required 15-day PHI to accommodate early harvest, and waiting until the end of the PHI did not result in earlier harvest.

Results from the above LSU studies are corroborated by research results reported [here](#) by Drs. Jeremy Ross and Tom Barber of the Univ. of Ark.

The most recent [budgets](#) for ESPS soybean in Mississippi include a desiccation application of paraquat + sodium chlorate at a cost of about \$20/acre. Therefore, presence of the above conditions that will justify this input should be determined to ensure the application is cost-effective without a yield increase. Deleting the sodium chlorate will reduce the cost of desiccation by a little more than \$5/acre.

Desiccant products and their rates of application that can be used are listed in the most recent [Mississippi Weed Control Guidelines](#). Also, see the [MCS blog post \[Aug. 19, 2017\]](#) for details about some of the more common harvest aids [Aim EC, paraquat, Sharpen, and sodium chlorate] that are applied to soybean.

Dr. Dan Poston, former DuPont Pioneer Agronomy Research Manager, has compiled a detailed treatment of the harvest aids subject in an article titled “[Using Soybean Harvest Aids Effectively](#)”. Some important additional points from that article follow.

- It is important to monitor pod/seed development rather than leaf appearance or leaf drop as an indicator of the proper stage to apply a desiccant.
- Harvest aids can improve harvest efficiency and reduce header loss in fields that are infested with weeds, especially vining weeds such as morningglory. This may result in higher net yields at the elevator because foreign matter in the harvested grain is reduced.
- Less deductions at the elevator will often increase net returns above harvest aid costs (click [here](#) for a list of discount schedules).

There are years when late-season insects such as redbanded stink bug will be present at injurious levels until near or at R7. These infestations may justify

adding an insecticide to a desiccant that will be applied at R6.5 or later. See the [MCS blog post \[Aug. 22, 2017\]](#) for issues related to the mixing of insecticides with soybean desiccants in order to legally provide insect control as late as desiccation timing.

Results from MSPB Project No. 57-2017 titled “Evaluation of multiple agronomic considerations with harvest aid use in Mississippi soybean production” can be used to guide desiccant use in soybeans. Activities in and results from that research follow.

- Studies were conducted at Stoneville, Miss. in 2016 and 2017 to: 1) Investigate the effects of different adjuvants on harvest aid performance; and 2) Investigate the effects of harvest interval after harvest aid use on soybean yield, seed moisture content, and shattering.
- Harvest aid products used were Gramoxone, sodium chlorate (Defol), and Sharpen [saflufenacil] applied alone or with adjuvants that included either crop oil concentrate (COC), methylated seed oil (MSO), or nonionic surfactant (NIS).
- The following major results accrued from this project.
- **The harvest aid products used in this study and applied alone did not affect soybean seed yield in either year when compared to each other and the untreated control (UTC).**
- **Yield results from this 2-year study indicate that Gramoxone applied alone and with no adjuvant is the most effective product to use for defoliating soybeans prior to harvest.**
- **Gramoxone applied alone resulted in the most cost-efficient and effective defoliation in both years.**
- **Yield losses from delayed harvest in this study were not significant until well after the end of the PHI for Gramoxone that can be applied at R6.5 to R7.**
- **Of the products used in this study, Gramoxone has the longest PHI of 15 days. If this product is applied at the earliest allowed time to prevent yield loss (R6.5—R7), then this 15-day waiting period will end soon after R8 or maturity. Thus, a properly timed application of Gramoxone as a harvest aid will allow harvest of the crop before any yield loss from delayed harvest will normally occur.**



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Click [here](#) for an article that provides results from MSPB-funded research Project No. 32-2019/2020 about using paraquat as a harvest aid.

### SEP 2024 UPDATE

An article titled “[Impact of application volume and spray droplet size on soybean harvest aid efficacy](#)” by McNeal et al. appears in Crop Forage & Turfgrass online journal, and provides the following information about how harvest aid spray applications affect efficacy of applied harvest aid materials.

- In 2019 and 2020, field experiments were conducted at three locations in Miss. to evaluate the impact of application volume and spray droplet volume mean diameter [VMD] on the efficacy of soybean harvest aids that included paraquat, saflufenacil [Sharpen], and sodium chlorate.
- The efficacy of applied harvest aids was not affected by application volumes of 5 and 20 gal./acre.
- Desiccation efficacy of paraquat was superior to that of the other two harvest aids used in the study.
- Small differences in efficacy did occur among VMD's of 200, 500, and 800  $\mu\text{m}$ , but the differences were deemed inconsequential by the authors.
- Soybean seed yield did not vary due to any combination of harvest aid, VMD, or application volume.
- The authors recommend that paraquat be used as a component of a harvest aid that may be applied to soybean.
- **According to these results, applications of soybean harvest aids are not sensitive to the application volumes or spray droplet sizes used in this study. These results also confirm that paraquat is the most effective harvest aid product to apply to soybeans.**

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