

Alternative Options for Aerial Soybean Desiccation

Paraquat (for example, Gramoxone® 2SL) is a popular choice in Mississippi soybean production as a burndown herbicide application and harvest aid. Studies conducted at Stoneville, Mississippi, during 2016 and 2017 demonstrated that paraquat applied alone was not only the most effective desiccant, but also the most cost-effective option as a soybean harvest aid (Orlowski 2018). In July 2021, the Environmental Protection Agency (EPA) placed aerial application limitations on paraquat to 350 acres per applicator per 24-hour period. These limitations have potential to cause major issues in areas of moderate to large soybean acreage if field conditions are less than ideal as soybeans approach later maturity stages. When facing wet conditions that are not favorable for ground harvest-aid applications or when trying to avoid scenarios that can lead to shattering or pod rot in late-season beans, aerial desiccation options other than paraquat are available.

Paraquat is generally applied at 8 to 6 fluid ounces per acre and has a preharvest interval (PHI) of at least 15 days. If aerial limitations have been met for that day, or if time is of the essence, Sharpen® (saflufenacil) can be applied at 1 to 2 ounces per acre when 50 percent leaf drop has occurred. Sharpen® can desiccate broadleaf weeds that can cause harvest complications and has a 3-day PHI. Methylated seed oil (MSO) at 1 percent v/v and AMS at 1 percent v/v are encouraged with the use of Sharpen®. Defol® 5L (sodium chlorate) is another option for aerial application. Sodium chlorate is recommended at a rate of 4.8 quarts per acre when using a 5-pound product and 8 quarts per acre when using a product with 3 pounds of active ingredient per acre. Sodium chlorate formulations are recommended for spraying at 5 gallons per acre when applied aerially. Both formulations provide some weed control in species that can complicate harvest. Sodium chlorate has a PHI of 7 to 10 days. Aim® 2EC (carfentrazone) is a less commonly used harvest aid in Mississippi soybean production systems, but it is a suitable alternative at 1.5 fluid ounces per acre when the crop is mature and grain is already drying down. Aim® has a 3-day PHI and provides broadleaf weed control. Crop oil concentrate or MSO adjuvants should be used with Aim® at 1 percent v/v.



Natural senescence in a soybean trial before Sharpen was applied as a harvest aid.



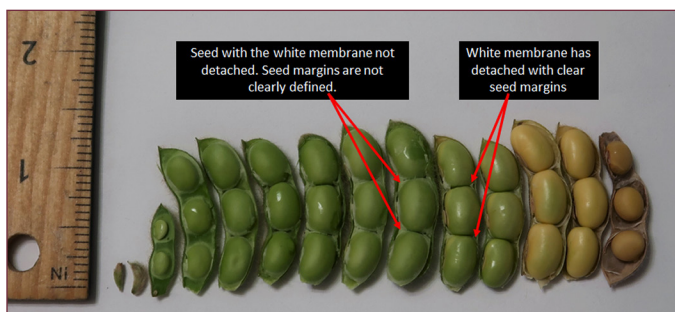
Soybeans 3 days after Sharpen application.



Soybeans 7 days after Sharpen application.

Soybean at the R6.5 and R7.0 growth stages have matured and will not be negatively affected after desiccation applications (Boyd and Antos 2019). Figure 1 shows yields of each desiccation option. Soybean at the R6.5 stage is considered physiologically mature and occurs when the white membrane inside the pod have separated and seed margins are clearly defined (Moseley et al 2021).

In conclusion, aerial desiccant options for soybeans in Mississippi in the absence of paraquat include Sharpen® at 1 to 2 ounces per acre, Defol® 5L at 4.8 quarts per acre, Defol® 3L at 8 quarts per acre, and Aim® at 1.5 ounces per acre. Their respective PHIs are 3 days, 3 days, and 7 to 10 days, respectively. The optimal time for soybean desiccation application is between R-6.5 and R-7.



Soybean reproductive stage distinctions (Moseley et al. 2021).

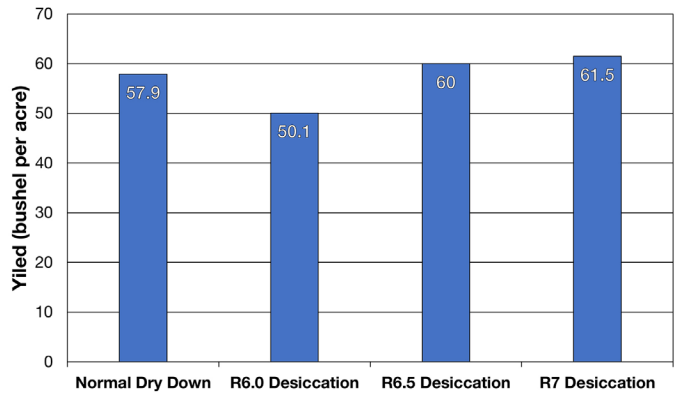


Figure 1. Impact of Defol® 5L on soybean yield at different soybean growth stages (Boyd and Antos 2019).

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