

DESICCATING SOYBEAN



Desiccating Soybean for Harvest in Louisiana

Certain herbicides are often applied in Louisiana to attain increased harvest efficiency due to late season weed pressure or soybean plants that are inefficient in dropping their leaves at harvest time.

Follow the Herbicide Label

It is important to follow the label when applying any pesticide, including those labeled for harvest aid in soybean. Some restrictions found on harvest herbicide labels include soybean growth habit (indeterminate versus determinate), growth stage, percent mature pods and percent leaf drop. It is important to follow restrictions on spray volumes and preharvest intervals. Table 1 list herbicides that are labeled for preharvest application in soybean.

Soybean Growth Stage

It is crucial that the soybean plants have matured enough before applying a defoliant/desiccant herbicide to retain yield and seed quality. If a defoliant/desiccant herbicide is applied prior to the R6.5 growth stage, the seed can lose dry matter which could reduce yield and seed quality. Soybean pods are considered at the R6.5 growth stage when the white membrane has detached from the seed and pod and clear seed margins are visible (Figure 1).

For indeterminate soybean varieties, when all pods have reached the R6.5 growth stage, the plant will likely have entered the R7 growth stage (at least one pod located anywhere on the main stem has turned its mature color) and have begun to drop leaves. Figure 2 shows soybean plants where approximately 65% of the pods that have turned their mature color and have dropped some leaves.



Figure 1. Soybean seed within pods showing, from left to right, youngest to oldest. The pod where the white membrane has detached with clear seed margins would be considered at R6.5 growth stage.

Preharvest Herbicides

It is important to select the correct herbicide to fit the specific preharvest need. Some chemistries are more effective on broadleaf weeds while others are more effective on grassy weeds. The effectiveness of the herbicide can also be influenced by environmental conditions and plant stress. Defoliant/desiccant herbicides are more effective during sunny, hot and humid conditions. In addition, the efficacy will be better if there is not a rain event soon after application. Soybean plants that are stressed from abiotic or biotic conditions may not dry down effectively, even after applying a defoliant/desiccant herbicide.

Research has shown that paraquat can be the most effective and economical option. However, there are strict restrictions that can negate the use of paraquat. Alternative herbicides for harvest aid in soybean can be found in Table 1.

How do defoliant/desiccant herbicides affect soybean yield and seed quality?

Research from the LSU AgCenter has indicated soybean yield and seed quality is not negatively impacted by applying defoliant/desiccant herbicides if all pods have reached at least the growth stage R6.5 growth stage. Unfortunately, no defoliant/desiccant herbicide is currently labeled for use in R6.5 growth stage soybean. Generally, the plants will be in the R7 growth stage or later before a defoliant/desiccant can be applied according to the label. If a defoliant/desiccant herbicide is applied to soybean plants prior to all pods reaching the R6.5 growth stage, a significant reduction in yield can be expected. The amount of yield loss would depend on how many pods had not yet reached the R6.5 growth stage.

Campos et al. (2022) reported that mature soybean seed can retain seed quality within approximately 20 days after the seed reaches 13% moisture regardless of applying a defoliant/desiccant herbicide. In addition, results from a growth chamber study indicate defoliant/desiccant herbicide applications and temperature do not negatively affect seed quality. However, exposure to high relative humidity often observed with late season tropical weather events prior to harvest will negatively affect seed quality within 96 hours of continuous exposure.

Late Growing Season Considerations

Redbanded stinkbugs (RBSB) pose a significant threat to soybean fields, with the potential to cause extensive damage even



Figure 2. Soybean plants where approximately 65% of the pods have turned their mature color and the leaves have begun dropping.

after the seeds have matured. As the growing season progresses, their population can multiply rapidly. The LSU AgCenter strongly recommends control of RBSB if the populations are at threshold until harvest. Therefore, insecticides may be necessary when applying a desiccant. There are important things to consider before tank mixing an insecticide and a harvest herbicide:

1. Sodium chlorate can't be mixed with an insecticide.
2. The annual rate limitation and preharvest interval of a pesticide must be followed. See the article "[Protect Soybeans From Redbanded Stinkbugs Until Maturity](#)" from the LSU AgCenter.

Table 1. Herbicides labeled for use as a desiccant in soybean. (Adapted from the LSU AgCenter 2023 Louisiana Suggested Chemical Weed Management Guide)

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
carfentrazone @ 0.016-0.023 lb/A	Aim 2EC @ 1-1.5 oz/A; Add 1% v/v COC	Better on morningglories than pigweed, sicklepod, etc.	Apply after crop has matured and grain has begun to dry down. More effective on annual vines. Do not apply within 3 days of harvest. Apply in 10 gal. by ground, 5 gal. by air.
saflufenacil @ 0.022-0.045 lb/A	Sharpen @ 1-2 oz/A; Add 1% v/v MSO + 8.5 lb/100 gal AMS	Morningglories and other broadleaf weeds	Apply once soybean has reached physiological maturity (all pods and seeds have no green color). Indeterminate varieties: 65% brown pods, more than 70% leaf drop, 30% or less seed moisture. Determinate varieties: more than 50% leaf drop and remaining leaves are yellowing. Preharvest interval is 3 days.
paraquat @ 0.13-0.25 lb/A	paraquat (2 lb/gal formulation) @ 8-16 oz/A; paraquat (3 lb/gal formulation) @ 5.4-10.7 oz/A; Add 0.25% v/v NIS; see label	Desiccation of weeds and soybeans only	Indeterminate varieties: 65% of pods are mature or moisture content is 30% or less. Determinate varieties: 50% leaf drop and remaining leaves are yellow. Some drought stressed weeds will not be desiccated. Do not graze or harvest for hay. Apply in 20 gal. by ground or 5 gal. by air. Preharvest interval is 15 days. Immature soybeans will be injured.
sodium chlorate @ 6 lb/A	6 lb/gal formulation @ 1 gal/A; 5 lb/gal formulation @ 1.2 gal/A; 3 lb/gal formulation @ 2 gal/A	Desiccation only. Level of weed control is affected by environmental conditions.	Apply 7-10 days before harvest. Apply in 20 gal. by ground, 5 gal. by air. Check label for environmental conditions most favorable for desiccation. Apply under high temperatures and humidity.

References

- Boudreaux, J.M., Griffin, J.L. 2011. Application Timing of Harvest Aid Herbicides Affects Soybean Harvest and Yield. *Weed Technology*. 25:38-43
- Campos, P., Miller, D., Copes, J., Netterville, M., Brown, S., Price, T., Moseley, D., Gentimis, T., Egbedi, P., & Parvej, R. 2023. Influence of harvest aid on soybean seed quality affected by delayed harvest and environment in Louisiana. *Crop, Forage & Turfgrass Management*, 9, e20221. <https://doi.org/10.1002/cft2.20221>
- LSU AgCenter. 2023. Louisiana Suggested Chemical Weed Management Guide. PUB1565 1/23 Rev. https://www.lsuagcenter.com/~media/system/d/9/c/6/d9c65025862a52032feaf01c7f510f5a/p1565_la_suggestedchemicalweedguide_rev1b0123pdf.pdf
- Stephenson, D., Miller, D., Brown, S., Moseley, D. 2021. Applying Harvest Aids in Louisiana Soybean. *Louisiana Crops Newsletter*. LSU AgCenter. <https://www.lsuagcenter.com/articles/page1628783805876>
- Villegas, J., Davis, J.A., Towles, T. 2022. Protect Soybeans From Redbanded Stinkbugs Until Maturity. LSU AgCenter. <https://www.lsuagcenter.com/articles/page1663767685378>

Authors:

David Moseley, Assistant Professor, Dean Lee Research Station
Daniel Stephenson, Professor, Dean Lee Research Station
Donnie Miller, Professor, Northeast Research Station
James Villegas, Assistant Professor, Dean Lee Research Station



Visit our website: www.lsuagcenter.com

Matt Lee, LSU Vice President for Agriculture
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Louisiana Cooperative Extension Service
LSU College of Agriculture

P3885 (Online) 7/23

The LSU AgCenter and LSU provide equal opportunities in programs and employment.