USING SOYBEAN HARVEST AIDS EFFECTIVELY

Using Soybean Harvest Aids Effectively

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Summary

- Harvest aids can be used to improve soybean harvest efficiency.
- Early planting, fungicides, variety genetics, and reduced fruit load may be associated with green stems and retained foliage in soybean.
- It is critical to monitor pod development and not leaf drop when making soybean desiccant timing decisions.
- Soybean pods can be safely desiccated when pods begin losing some of their green color and the membrane in the pod begins separating from the bean and pod wall.
- Always follow label directions when applying soybean harvest aids.
- Harvest aids can reduce grain moisture, decrease deductions for foreign matter and moisture at the elevator, and increase net yields.

Introduction

Soybean harvest efficiency can be reduced by several factors including late-season weed pressure, soybean plants that retain green leaves despite having mature pods, and soybean plants with tough green stems and/or green pods. In these situations, soybean

harvest aids may be used to improve harvest efficiency.

What Causes Green Stems?

Much debate exists in the scientific community regarding the actual causes of green stems in soybeans. Most would agree that multiple factors can play a role. For example, early planting dates are often viewed as a critical factor to achieving high yields but can also increase the incidence and severity of green stems especially with some varieties (Figure 1).

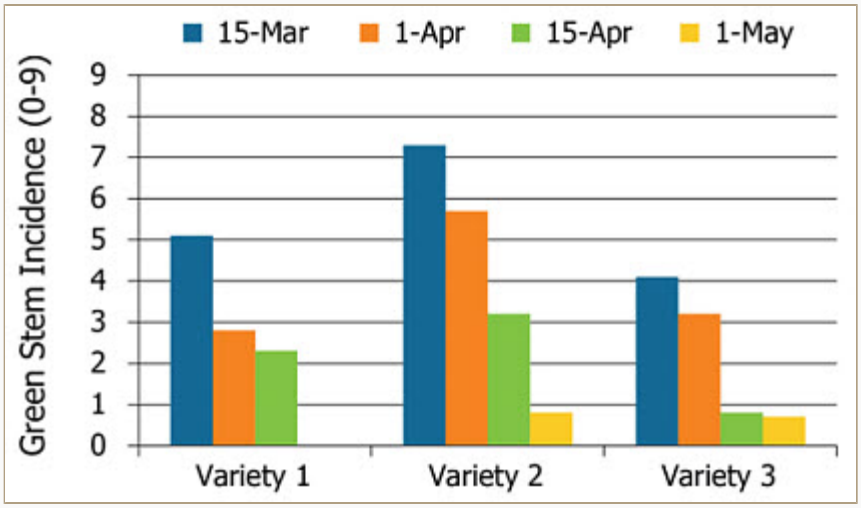

Figure 1. Effect of planting date and soybean variety on incidence of green stems near Stoneville, MS in 2007 (Unpublished data Mississippi State University, 2007).

In early-planted soybean fields, where plants retain green foliage, it is extremely important to monitor pod development and not leaf drop as an indicator of maturity. Early-planted soybeans in the Southern U.S. mature when temperatures are high and seed can deteriorate rapidly if allowed to weather in the field.

Foliar fungicides protect foliage from disease and allow plants to retain leaves longer which often leads to increased yields. However, foliage in some fungicide-treated plots can be retained after pods have reached maturity (Figure 2). Harvest aids are often used to defoliate and desiccate plots that have retained foliage.

Figure 2. Soybeans with no fungicide treatment in foreground vs. fungicide-treated in background (Stoneville, MS 2007).

Any event that reduces soybean plant fruit load or causes damage to the pods can also increase the incidence and severity of green stems. One such event may be pod damage caused by piercing-sucking and pod feeding insects. In a 2007 Mississippi State University study, insecticide applications reduced green stem incidence compared to the non-treated control (Figure 3). Also note that the insecticide application offset the level of green stems caused by the fungicide application alone. Severe drought, heat, and certain foliar diseases like late-season *Cercospora* are other stresses that can increase the severity and incidence of green stems.

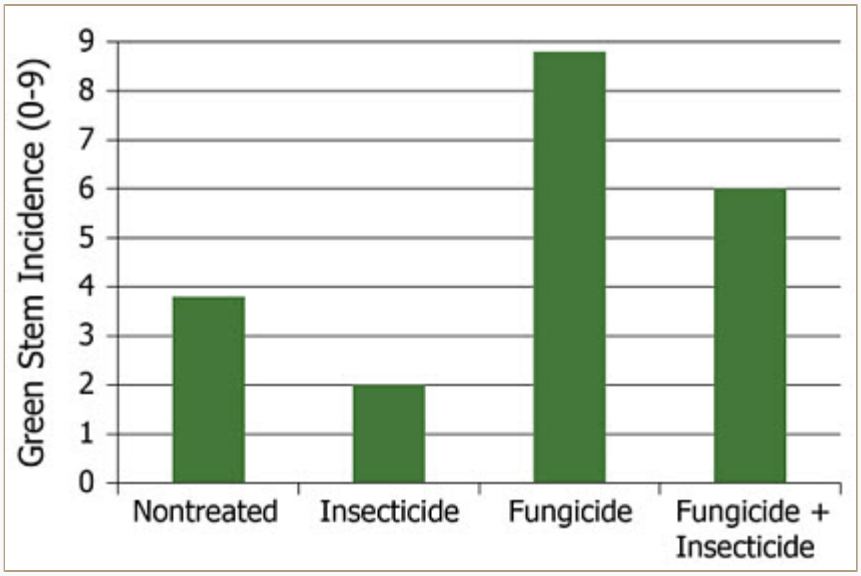

Figure 3. Effect of fungicide, insecticide and fungicide + insecticide treatments on incidence of green stems in soybean near Stoneville, MS in 2007. (Unpublished data Mississippi State University, 2007).

When Should I Apply a Harvest Aid?

Timing of soybean harvest aids is dictated in large part by label restrictions and guidelines

(Table 1). In many cases, soybean maturity is not uniform in any given field and growers and consultants have to make harvest aid timing decisions in situations where they are dealing with plants of different stages of maturity (Figure 4). Differences in plant age or development are often associated with variance in seed emergence times, premature death of some plants, or stressed areas in the field that mature earlier or later than the rest of the crop. Deciding when to apply harvest aids is perhaps most difficult when you have scattered green plants mixed with a large number of brown mature plants. In this situation, you must decide how long to wait for the green plants to mature before seed in mature plants begin to deteriorate or shatter. Well-timed harvest aids in this situation may help facilitate a more uniform harvest of all plants in the field.

Figure 4. Soybean plants exhibiting different stages of maturity in the same row drill.

Based on studies conducted at Louisiana State University by Dr. Jim Griffin, indeterminate soybean plants can be safely desiccated with paraquat-based treatments when seed moisture from pods in the top 4 nodes of the plant averages 20 to 50%. For determinate varieties, he suggests it is safe to apply when seed from the top 4 nodes is 40% or less.

For early-planted soybeans, it is especially important to monitor soybean pod development and not leaf drop. It is not uncommon for early-planted soybeans to have retained foliage in the top of the plant when pods are nearing harvest or ready to harvest (Figure 5).

Figure 5. Soybeans with some retained foliage near Stoneville, MS in 2004. Some pods are mature and others are beginning to lose their green color.

Monitoring seed development is critical when making timing decisions for soybean desiccants. Soybeans are past physiological maturity when the white membrane inside the pod begins to separate from the seed and pod wall. Soybeans will not gain any dry matter after this point. Consequently, desiccation at this growth stage should not reduce yield. Seed size can be reduced in pods that are desiccated prior to this growth stage. Additionally, seed from pods desiccated prematurely may remain green as they dry down.

Table 1. Some commonly-used soybean harvest aids.*

Product	Rate/A	Application Timing	Pre-Harvest Interval (grain)
Gramoxone Inteon®	8-16 fl oz	Indeterminate varieties: Apply when at least 65% of pods have reached a mature brown color or when seed moisture is 30% or less. Determinate varieties: Apply when plants are mature: i.e. beans are fully developed, ½ half leaves have dropped, and remaining leaves are yellowing.	15 days
Defol® 5	4.8 qts	Apply 7-10 days before anticipated harvest when beans are mature and ready for harvest.	Not specified
Sharpen®	1-2 fl oz	Indeterminate varieties: Greater than 65% brown pods and greater than 70% leaf drop or when seed moisture is 30% or less. Determinate varieties: Beans are fully developed, more than 50% leaf drop, and remaining leaves are yellowing.	3 days
Aim®	1-1.5 fl oz	Apply when the crop is mature and grain has begun to dry down.	3 days
Roundup WeatherMAX®	22 fl oz	Roundup Ready or Roundup Ready 2 soybeans: Apply for weed control prior to harvest and after pods have set and lost all green color. Non-glyphosate resistant varieties: Apply when pods have set and lost all green color.	14 days

*Always read and follow label directions

What Are The Benefits of Soybean Harvest Aids?

Soybean harvest aids can improve harvest efficiency and reduce header loss in fields class="img-responsive" style="margin: 0px; padding: 0px; border: 1px solid #b09f83;" that

are infested with weeds especially vining weeds like morningglory (Figure 6a, 6b, 6c, 6d). Harvest aids can result in higher net yields at the elevator because foreign matter is reduced and moisture is often lowered (Figure 7). Yields can also be improved in weed free fields where soybean plants have mature pods but stems remain tough and green. Yield increases gained from use of harvest aids are often high enough to offset treatment cost and increase profits as was the case in the experiment outlined in Figure 8.

Figure 6a. Weed-free soybeans near Stoneville, MS in 2003.

Figure 6b. Weed-free soybeans treated with a desiccant near Stoneville, MS in 2003.

Figure 6c. Soybeans with 1 pitted morningglory plant per row foot near Stoneville, MS in 2003.

Figure 6d. Soybean plants with 1 pitted morningglory plant per row foot treated with a desiccant near Stoneville, MS in 2003.

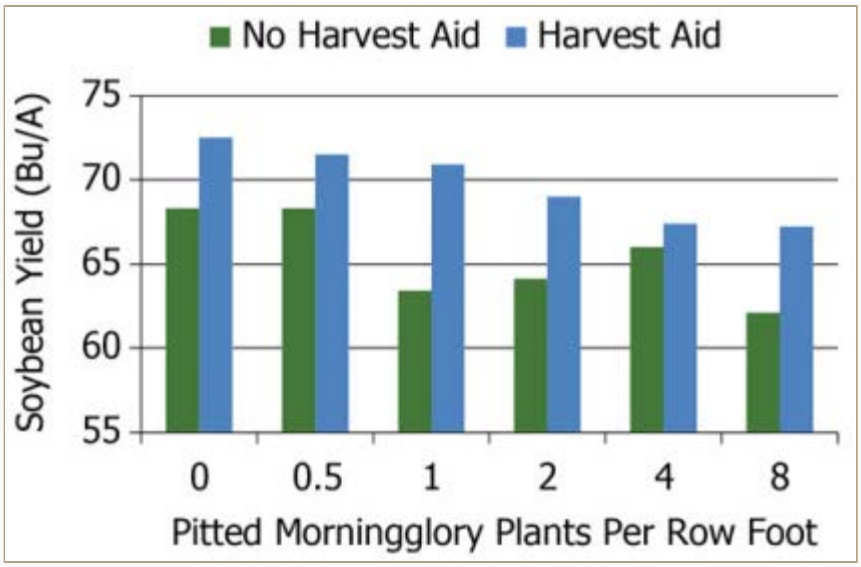

Figure 7. Effect of harvest aids on final soybean yield after elevator deductions from soybean plots with varying levels of pitted morningglory infestation near Stoneville, MS in 2003.

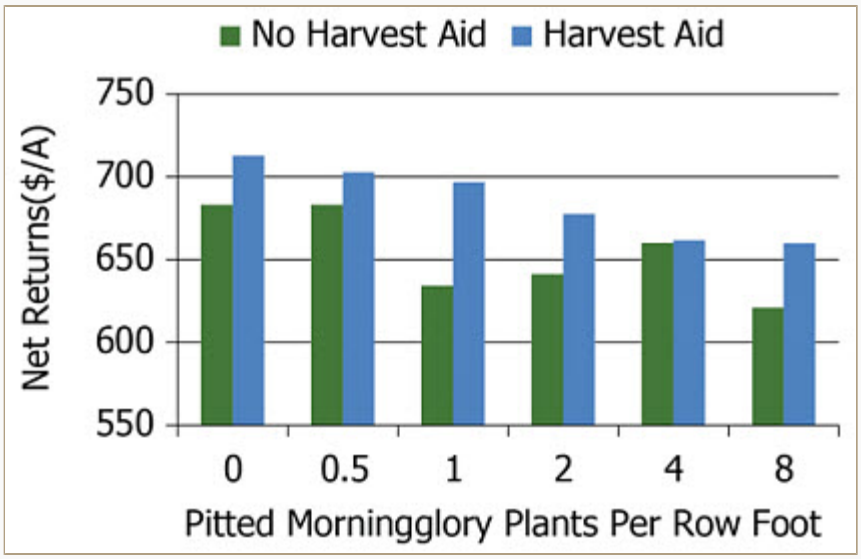

Figure 8. Effect of harvest aids on net returns above harvest aid costs for soybean plots with varying levels of pitted morningglory infestation near Stoneville, MS in 2003. Returns assume $10/bu soybean selling price and $12.40/acre cost for harvest aid treatment and application.

Conclusions

Soybean harvest aids can be used effectively to defoliate and desiccate foliage and stems on soybean plants and weeds facilitating a quicker and more efficient harvest. Increased yields and less deductions at the elevator often increase overall net returns.

References

Griffin, J. and J. Boudreaux. 2013. Gramoxone Inteon / Paraquat use as a soybean harvest aid: Application timing.

Eubank, T. W., D. H. Poston, and C. H. Koger. 2005. Remote sensing as a decision-making tool for desiccation of Mississippi soybean. Proc. South. Weed Sci. Soc. 58:46.

Harvest aid information in Table 1 reflects current label guidelines at the time of publishing (September 2016). Always refer to product labels for current product use guidelines.

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