

# Growth Stages of Louisiana Soybeans

Study Aims To Pinpoint The Best Time To Use Desiccants

**BETTY VALLE GEGG-NAEGER**  
MidAmerica Farmer Grower

**ST. JOSEPH, LA.**

The growth stages of soybeans and the use of desiccants as a harvest aid were discussed recently by Dr. Jim Griffin, professor of weed management with the LSU AgCenter in Baton Rouge. Griffin walked through the stages all the way from R-1 to R-8.

"We've done quite a bit of work looking at timing of application and the value of harvest aid, and we have been able to harvest beans seven to 10 days earlier by desiccating the beans," he said.

He also spoke of the issues with green plants, with leaf retention, and how that's been almost eliminated by use of harvest aid. The plant dries down faster, significantly increasing the quality of the grain.

"We think there is definitely a value in using desiccants, but the value is probably more related to being able to harvest the beans earlier and improve efficiency," he added. "Then, the question is 'when should I time the application?' The Gramoxone Inteon label is very specific as to the growth stage for appli-

**Dr. Jim Griffin, Professor of Weed Management with the LSU AgCenter in Baton Rouge, La. discusses growth stages of soybeans and desiccants as a harvest aid.**

Photo by John LaRose, Jr.



cation. "We have to abide by that label that specifies application at 30 percent defoliation, but the important thing is applying the material as early as you possibly can without damaging the seed."

If applications are made too early and the leaves are removed before there's maximum pod fill, then the seed size is going to be smaller, the weight of the seed is going to be less and yield is going to be reduced. So Griffin wants to teach consultants and growers when is it safe to remove the leaves. This is also important in fungicide application and late season insect management.

"The same type principles apply in either case," Griffin said. "It doesn't matter if it's indeterminate varieties or determinate varieties. The most immature seed will be present in the top of the plant, so you always look at the four uppermost nodes and inspect the seed development in the pods. Seeds in the pods will increase in size and then begin to shrink from the pod wall. At this time seed have reached their maximum dry weight and from this point forward will lose moisture. At this growth stage soybean seed are at physiological maturity and are around 60 percent in moisture. It is very important that all seed in the top of the plant have reached physiological maturity before harvest aid is applied, otherwise seed will be shriveled and weight will be reduced. From this point on seed continue to lose moisture and soybean is harvested around 15 percent moisture. "If you base application strictly on the amount of defoliation, application can be delayed and the benefit of early harvest missed. So, how can a producer decide when it is safe to apply a harvest aid?"

"What I've told growers is to randomly collect pods from the top of soybean plants across the field and shell the pods just like you would shell peas," he suggested. "Once beans fill up the pod cavity they will begin to shrink from the pod and they are easy to shell. You should clearly see the white membrane that surrounds the seed in the pods and seed separation from the pod wall.

Once it starts to separate, then that seed is at physiological maturity. You can remove all the leaves at that point without affecting the size or weight of seed. The key here is that all seed are at least at physiological maturity. "If you knock off the leaves too early and seed have not matured, seed weight and yield will be reduced."

Some of the work on the timing of application of Gramoxone Inteon has already been published. Griffin has data on indeterminate and determinate varieties and, in tests, applications were made starting at average seed moisture of 60 percent on down to 20 percent.

"We did that by collecting pods from the top four nodes of plants of the plant, shelling the pods and drying the seed to calculate seed moisture" he explained. "We know 60 percent moisture is too early but we needed that to show the yield loss with an application too-early. We were getting somewhere around 30 percent yield loss when we applied too early. Application of harvest aid at an average seed moisture around 40 percent was ideal for both indeterminate and determinate varieties. At that timing leaf defoliation was less than 30 percent. I think the original paraquat label was written to desiccate weeds rather than the crop and soybean leaf defoliation was necessary for weed coverage with harvest aid."

Once 50 percent of the leaves have fallen off of plants, the value of harvest aid to speed up harvest is lost. "We're working on a joint project with entomologists and plant pathologists on the green plant malady," he said. "Some people call it the green bean problem, but the problem is actually the presence of green leaves, green stems, and/or green pods when soybean seeds are mature and ready to harvest. Since we know that the problem will occur in most years rather than waiting until we see the problem, we make the harvest aid application as early as possible. This helps speed up the maturation process resulting in plants that can be easily and efficiently harvested in a timely manner. We see more uniformity in maturity across the field resulting in reduced foreign material and seed moisture.

"Many growers are just figuring on using a desiccant as a standard part of their program, they just figure that in," he said. "It can provide a much cleaner harvest, a seven-day earlier harvest and in some years with excessive rainfall this can be very valuable. It's all in the timing, it's all in scouting the fields and knowing exactly where the crop is maturity wise." Δ

**BETTY VALLE GEGG-NAEGER: Senior Staff Writer, MidAmerica Farmer Grower**