Estimating soybean defoliation

by Marlin Rice, professor, Department of Entomology

Estimating the amount of defoliation in soybean caused by insects can be a frustrating, and very inexact, process. I find that many field scouts typically overestimate leaf injury, which leads to unnecessary insecticide applications.

Defoliation on these soybean plants is approximately 20-25 percent.

Enlarge

Leon Higley, editor of the Handbook of Soybean Insect Pests, writes, "Unlike many crop species, soybean has a remarkable capacity to withstand much insect injury without significant yield loss. It accomplishes this by both tolerating and compensating for injury. For example, soybean plants can tolerate large levels of leaf feeding without ill effect. Yield losses are prevented because soybean plants typically produce excess leaves. In addition, when leaf loss becomes too great, plants can help compensate for losses by retaining older leaves and maintaining high levels of photosynthesis. Soybean also can compensate for stand losses. Usually, gaps in soybean stands are filled by additional growth and branching of the remaining plants. In this way, soybean yields are maintained despite substantial reductions in plant population. These tolerance and compensatory traits of soybean reduce the need for pesticides or other management tactics in many situations."

To help field scouts accurately estimate defoliation, six leaves with defoliation in 5 percent increments are shown below. This injury was caused by bean leaf beetles. Consider treatment of soybean if leaf-feeding insects (grasshoppers or bean leaf beetles) are present and defoliation reaches 20 percent in the pod-forming and pod-filling stages. Reductions in yield can occur during any crop stage and pod-forming and pod-filling stages are at greater risk than other plant stages. A 40 percent leaf loss during any vegetative stage will result in only a 3-7 percent yield reduction. Defoliation of 20 percent during the pod-forming and pod-filling stages will result in similar yield reductions.

Estimates of soybean defoliation.

Enlarge

Note: a printable version of this estimation guide is available here (PDF).

This article originally appeared on pages 153-154 of the IC-488(19) -- July 29, 2002 issue.

Updated 10/05/2007 - 11:10am