

Identifying Soybean Fields at Risk to Leaf-Feeding Insects

Sean Malone, Research Associate, Extension Soybean Specialist, Virginia Tech

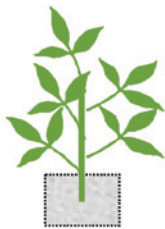
David L. Holshouser, Extension Entomologist; Virginia Tech

D. Ames Herbert, Jr., Extension Entomologist; Virginia Tech

Brian P. Jones, Research Associate, The Pennsylvania State University

What is LAI? Leaf area index (LAI) is the ratio of leaf area to land area. Soybean requires LAI values of at least 3.5 to 4.0 by early to mid-reproductive developmental stages to achieve maximum yield for that year and environment. A soybean crop that does not achieve adequate LAI could be at risk to yield loss from insect leaf-feeders, whereas, fields with high (4+) LAI can sustain significant insect feeding with little to no effect on yield. This publication will aid producers in evaluating soybean fields at risk to yield reduction from leaf-feeding insects.

Assuming that each trifoliolate in this example has a total leaf area of 1 ft², and the area within the dotted line represents a land area of 1 ft², the LAI values of these soybean plants are 5 and 3, respectively. This is for illustration only. Actual soybean plants need more than 5 or 3 trifoliate to obtain these respective LAI values.



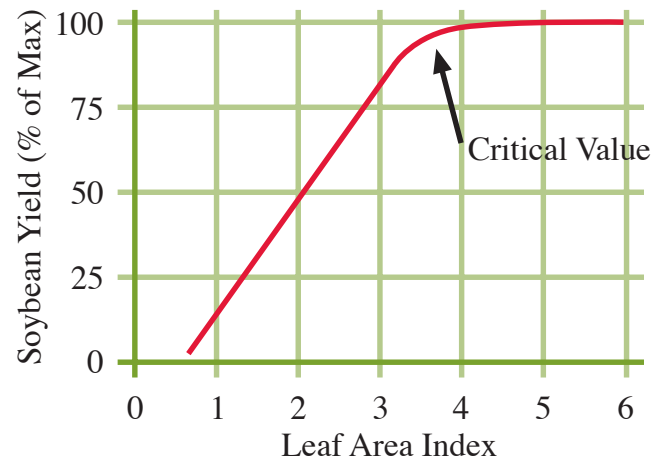
LAI = 5



LAI = 3

Based on recent research in Virginia, soybean plants that meet or exceed the critical 3.5 to 4.0 LAI level by R3 (beginning pod) to R5 (beginning seed) have potential to achieve maximum yield. Assuming a yield potential of 46 bu/acre, there is a 10 bu/acre yield loss for every unit decrease in LAI below a critical level of 4.0. Photographs on the reverse of this page can serve as a guide for identifying LAI values.

Theoretical Soybean Yield



Insect defoliators of soybean:



Green cloverworm



Bean leaf beetle



Mexican bean beetle



Japanese beetle

Plate 1. Leaf area index (LAI) values ranging from 2.25 to 4.75 in soybean with 15-inch row spacing. As a reference, the exposed area of the stake at the front of each plot is about 10-inches high.



LAI = 2.25



LAI = 2.5



LAI = 3.5



LAI = 4.0



LAI = 4.5



LAI = 4.75