

Early Season Soybean Leaf Malformation

Leaf malformation in soybeans can take on several appearances and be caused by several factors. Herbicides, such as chloroacetamides or plant growth regulators (PGRs) are often blamed for this injury; however, environmental conditions may be the actual cause.

Symptomology

Soybean leaf malformation, also called the drawstring effect or leaf strapping, has been noticed in various soybean fields this spring. The first trifoliolate essentially shows a knick at the tip (Figure 1). It almost appears as though the main vein that runs down the center of the leaf has stopped growing while the surrounding leaf tissue continued to expand. The symptomology can often be transient and newly developed trifoliolates are unlikely to be affected.

Cause of the Injury

This type of injury can occur when the level of plant hormones that control growth at meristematic areas gets altered. These plant hormones occur naturally in the plant, but are also the basis for synthetic plant hormones that are found in PGR herbicides including 2,4-D or dicamba. Therefore, this symptomology is often associated with exposure to PGR herbicides. Additionally, leaf strapping is also commonly associated with injury from chloroacetamide herbicides such

Figure 1.
Soybean leaf
malformation in a
field near
Flanagan, IL.
5/31/2011



as Harness®, Degree®, Dual®, etc.

Leaf strapping can also occur under adverse environmental conditions and in the absence of herbicide exposure. Genuity® Roundup Ready 2 Yield® soybeans depicted in Figure 1 were planted the 2nd week of April 2011 and have not received any herbicide applications nor were surrounding fields treated with PGR or chloroacetamide herbicides. However, soil temperature at planting was 45° F and excessive amounts of rainfall (9.78 inches) between planting and first trifoliolate (June 1st) contributed to challenging environmental conditions that adversely affected soybean growth. Additionally, large air temperature fluctuations between planting and the first trifoliolate may have triggered the onset of leaf strapping (Figure 2). These adverse environmental conditions likely triggered a hormonal response in the plant, resulting in the drawstring injury. No herbicides (pre-emergence or post-emergence) had been applied to the field and no significant insect damage was observed.

Effect on Yield Potential

The effect on yield potential is dependent on several factors, including the timing and extent of injury. The yield response when leaf strapping is seen early in the growing season is likely minimal. If the symptoms are seen during the reproductive phase, there is a greater risk for yield loss¹.

Sources:

¹ Hager, A. and D. Nordby. July 2, 2004. Soybean leaf cupping. University of Illinois. The Bulletin.

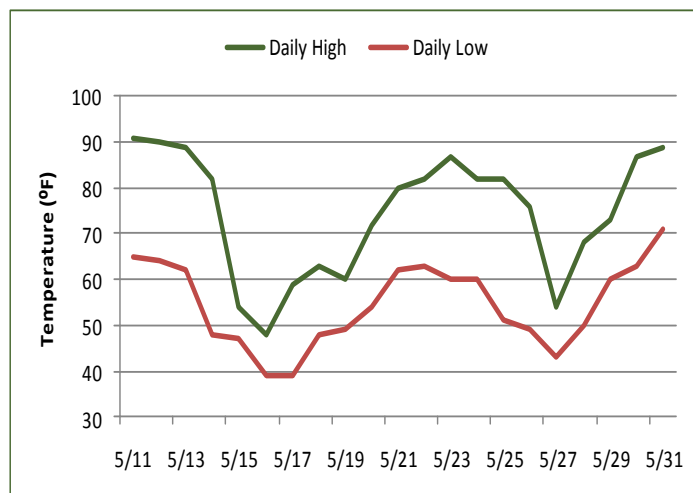


Figure 2. Daily high and low temperatures for Pontiac, IL, near where the photo was taken.

Data courtesy of Midwest Regional Climate Center; 06-07-2011.

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