Tassel Deformation in Corn Following Early-Season Defoliation


Yield losses in corn (Zea mays L.) from early-season defoliation are usually negligible compared with losses that result from defoliation during the late vegetative and reproductive stages (NCIS, 2015). Early-season defoliation of corn can reduce vegetative growth, shorten plant height, delay anthesis and silking, and shorten the duration of pollen shed (Mangen et al., 2005). Severe hail injury can also result in stunted and sterile tassels (Monsanto Company, 2014). However, there is limited information in the literature documenting this effect. In a recent multistate study (Illinois, Minnesota, and Ohio; unpublished) evaluating multiple defoliation events on grain yield, defoliation at V8 (Abendroth et al., 2011) resulted in tassel deformation at one of the three sites (Fig. 1 and 2). Deformed tassels had a skeletal appearance and were smaller than tassels of plants that were not defoliated. Spikelets were usually absent from the deformed tassels. To determine if differences in timing and severity of defoliation influenced tassel deformation, tassel appearance at VT/R1 was visually rated and tassel branch number and length measured. Since tassel deformation in defoliated corn was not observed in Illinois and Minnesota, the findings reported from here on pertain only to the Ohio study.

Field experiments were conducted at the Ohio State University research farm at South Charleston from 2014 to 2016. Each plot measured 10 ft by 10 ft and was planted in a randomized complete block design with four replications. All locations were managed to minimize pest pressure, and followed local soil fertility recommendations. Each location was planted in 30-inch rows at a seeding rate of 36,000 seeds acre⁻¹. The hybrids planted in Ohio, Illinois, and Minnesota were DKC61-88VT3Pro, DKC62-09RIB, and DKC53-78RIB, respectively. One nondefoliated control (NDC or untreated check) and 12 defoliation treatments were imposed at three stages of development—V8, V13, and VT/R1 (Table 1). Defoliation treatments consisted of either 100% or 50% leaf area removal. The 50% removal treatment involved cutting 60% of the total length off the distal edge of every other leaf (based on prior measurements of leaf area relative to leaf length) and stripping the leaf area from one side of the midrib on the remaining leaves. Subsequent leaf removal only treated leaves that were not previously damaged.

Tassel appearance of plants in the center two rows of each plot was visually assessed at VT/R1 in 2014 through 2016 using a 1-to-3 rating scale (Fig. 2) with 1 = normal tassel, 2 = tassel with some