ASSESSMENT OF AUXIN-INJURED COTTON USING VEGETATIVE INDICES TO PREDICT YIELD PENALTIES

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Abstract

Synthetic auxin drift in sensitive cotton cultivars have impacted many producers and their management decisions across the U.S. Cotton Belt. Determining yield loss from auxin damage often must wait until harvest which can impact crop insurance and civil argument results as there is currently no system in place to accurately predict yield losses from auxin damage in season. Experiments were conducted in 2019 and 2020 in Grand Junction, TN to (1) determine if remotely sensed reflectance data collected in-season following an auxin event correlates to yield losses incurred and (2) to create a more accurate and objective method for prediction of yield loss following auxin damage of cotton. Applications of 2,4-D or dicamba were made to cotton cultivars of the opposite technology at 1X, 1/4X, 1/16X, 1/64X, 1/256X and 1/1024X rates at either matchhead square (MHS) or two weeks after first bloom (FB+2WK). Auxin applications made at MHS resulted in higher injury levels observed compared to FB+2WK applications. The NDVI index provided some level of success in mirroring injury levels observed after MHS applications but not for FB+2WK applications. The NDVI index became saturated and was unable to differentiate between application rate and injury levels. Cotton response to auxin applications varied between years pointing to the impact that the environment around the time of an auxin hit plays on crop recovery. More in-depth evaluations of vegetative indices will be conducted to determine if there is an index or specific wavelength that is more dependable in predicting yield penalties due to auxin drift events.