

CHARACTERIZING SHADE-AVOIDANCE RESPONSES IN SUGARBEET

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Low red:far red light ratio reflected from neighboring vegetation can be detected by plants and can trigger irreversible physiological changes known as shade-avoidance responses. These responses are suspected to determine the onset of crop-weed interaction before competition for resources occurs, and have been documented to cause yield losses in corn and soybean. Because of the biennial character of sugarbeet, the outcome of shade-avoidance responses in this crop could be different. Several studies were conducted to determine the effect of light quality on sugarbeet development and final yield. Pot experiments were conducted in Laramie and Lingle, WY under non-limiting resource conditions using weed species commonly found in irrigated Western crop systems. Sugarbeet was either grown surrounded by weeds or by bare soil. Weeds were removed at different timings between cotyledon and twelve true-leaf stages of sugarbeet development. Sugarbeet was harvested at two different times at Lingle and three different times at Laramie. At each harvest, leaf and petiole length, root diameter, length and weight, leaf area, canopy angle and above ground biomass were measured. Field and pot studies using colored plastic mulch as a way to change light quality environment were also conducted. We evaluated R:FR ratio and length of weed exposure correlation with all parameters measured.