GROWTH ANALYSIS OF LONGSPINE SANDBUR. Leandro D. Perugini, Phillip W. Stahlman, and J. Anita Dille, Graduate Research Assistant, Department of Agronomy, Kansas State University, Manhattan, KS 66502, Professor, Kansas State University Agricultural Research Center, Hays, KS 67601, and Assistant Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66502.

A greenhouse experiment was conducted to evaluate the effect of shade on the growth and development of longspine sandbur. Three treatments consisted of no shade [382 µmol m^{-2} s^{-1} photosynthetic photon flux density (PPFD)], continuous 65% shade (134 µmol m^{-2} s^{-1} PPFD), and no shade for 16 days after emergence (DAE) until three tillers were present followed by continuous 65% shade. Plants were harvested at 18, 35, 50, and 62 DAE. The effect of shade was greater for dry weight than for leaf area. At 62 DAE, individual plant dry weight and leaf area decreased 70 and 24%, respectively, for plants subjected to delayed shading compared to 89 and 62% reductions, respectively, for plants subjected to continuous shading, all compared to plants growing with no shade. Plant dry weight and leaf area were subjected to natural logarithm transformations and used to calculate several growth parameters. Shade and its duration markedly increased the leaf area ratio (LAR), leaf weight ratio (LWR), and specific leaf area (SLA) of plants over time compared to no shade. Increased LAR, product of LWR and SLA, of longspine sandbur plants with shading was due mainly to increased SLA, a measure of surface area per unit leaf dry weight typical shading response. Conversely, shading decreased net assimilation rate (NAR). The increase in LAR in response to shading suggests longspine sandbur increased distribution of new biomass to leaves more than stem. Thinner leaves, lower leaf area, and dry weight results confirm that longspine sandbur is a weed species highly susceptible to shading.

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