Influence of UVB light distribution and soybean leaf angles on leaf exposures. (A03-bawhey110833-Poster)

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Abstract:

The effects of ultraviolet-B (UVB) light distribution on the heliotropism of soybean leaves for three soybean cultivars - Williams 82, Bay and York - were examined to determine the proportional dose exposure characteristics between direct and diffuse UVB irradiance on the leaves. The locally measured broadband horizontal UVB irradiance data were partitioned into diffuse and direct components using spectral irradiance data from the USDA monitoring network. The soybean leaf angles were incorporated with the irradiance data and anisotropic sky radiance distribution model to determine the incident diffuse and direct UVB exposure for the top trifoliate of each cultivar during the 2001 growing season. Data were compared between greenhouse plants (no UVB), greenhouse plants (enhanced UVB) and field plants (ambient UVB). Of the total irradiance incident on the cultivars, the proportion of diffuse irradiance on the central leaflets was 71% for the Williams 82 cultivars, and 91% and 93% for York and Bay cultivars respectively. This higher degree of heliotropism shown by the Williams 82 cultivars was evident in the greenhouse studies where the Williams 82 cultivars had shown a greater tolerance to UVB exposure than either the Bay or York cultivars.

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