PHOTOTROPISM IN SOYBEAN PLANTS: LONG DISTANCE ELECTRICAL SIGNALING.

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Action potentials in higher plants might be the information carriers in intercellular and intracellular communication in the presence of environmental changes. We found that illumination of soybean plants at 450 nm, 670 nm, and 730 nm induces action potentials. Phototropism, the growth of a stem or a root toward or away from light is one of the best known plant tropic responses. A phototropic response is a sequence of three different processes: (1) reception of the directional light signal; (2) transformation of the signal to a physiological response (transduction); and (3) the production of directional growth response. The speed of propagation of the action potential does not depend on the location of the working electrode in the stem of the plant or in the leaves, nor is it dependent on the distance between the working and reference electrodes. Action potentials play an active role in the expedient character of response reactions of plants as a reply to external effects.