

DYNAMIC ANALYSIS OF MOISTURE STRESS IN TALL FESCUE (FESTUCA ARUNDINACEA) USING CANOPY TEMPERATURE, IRRADIATION, AND VAPOR DEFICIT

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Dynamic canopy temperature and transpiration rates of tall fescue (*festuca arundinacea*) were studied under well-watered and moisture stress conditions, using step increase and decrease levels of irradiance. These studies were performed in a high irradiance plant growth chamber under controlled conditions. The fescue canopy was modeled using Laplace transfer functions, with plant temperature, irradiance, and vapor pressure deficit as input variables. Well-watered plants tended to respond as a second-order model, with a critically damped response for most levels of step irradiance inputs. Moderately stressed plants approached critical and under-damped response conditions. Severely stressed plants tended to respond closely to a first order model. The results illustrate the complex nature of plant feedback mechanisms as the plant anticipates moisture stress conditions.