Identifying the Earliest Stage to Detect Endophyte Presence in Tall Fescue Seedlings Using Molecular Markers

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Tall fescue is an important cool-season grass that is commonly used for forage in livestock operations around the world. Tall fescue has a symbiotic relationship with a fungal endophyte, *Epichloe coenophiala*. The endophyte provides protection for the grass against biotic and abiotic stressors. The endophyte produces alkaloids that are toxic to mammals. Breeders have created commercials cultivars that replaced the toxic endophyte with a non-toxic endophyte. Whether for breeding or commercial purposes, early detection of endophytes is important. Early detection allows breeders to move forward with only desired material sooner, saving time and space. In a commercial situation, identifying the infection levels in the seed or alkaloids early is critical. The standard test for the tall fescue endophyte is through an immunoblot assay, but there has been interest in alternative molecular methods for detection. Several genes involved in the pathways of the alkaloids synthesis by the endophyte have been identified. PCR can be a less expensive and more efficient method of identifying the presence or absence of the endophyte. Here we utilize a novel marker for the *lolF* gene to identify the earliest stage after germination that the endophyte can be detected via end-point PCR. We find that 28 days post germination is the earliest time to test for endophyte presence in which enough tissue can be sampled from individual plants for DNA extraction.