Chitinase in Birdsfoot Trefoil. (C06-benedict142427-Oral)

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Abstract:

Birdsfoot trefoil (Lotus corniculatus; BFT) is a perennial pasture legume that readily develops root- and crown-rot. New types of birdsfoot trefoil produce rhizomes that can aid persistence. Initial reports indicate that rhizomatous birdsfoot trefoil (RBFT) may also produce higher levels of defense proteins, such as chitinase, an antifungal hydrolase associated with disease resistance in other crops. The objective of this study was to determine chitinase concentrations in grazed pastures of 'Norcen' BFT and 'ARS-2620' RBFT. A secondary objective was to relate concentrations to plant persistence under grazing. BFT and RBFT were grazed from 1998 to 2000, and plant density was recorded. Plant samples were collected and analyzed for chitinolytic isoforms using activity SDS-PAGE. Activities of two isoforms visible on the gels were quantified digitally. RBFT contained ten times more of each chitinolytic isoform than BFT ($P < 0.05$). Initially, BFT stands were more densely populated than RBFT stands. By 2000, however, the opposite was true. These findings provide additional evidence that chitinase concentration in birdsfoot trefoil may be related to plant persistence.

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Presentation Information:

Presentation Date: Thursday, November 14, 2002
Presentation Time: 9:00 am

Keywords:

chitinase, Lotus corniculatus, disease resistence, persistence