

Phosphate Nutrition Effects on Growth, Phosphate Transporter Expression, and Physiology of Alfalfa Cell Suspensions. (C02-cunningham122755-Poster)

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Abstract:

Phosphorus (P) deficiency reduces forage yield and stand persistence of alfalfa (*Medicago sativa* L.). We used suspension cell cultures to determine how P-availability influences cell growth, P-transporter expression, and physiology of alfalfa cells. Cells were sampled at 3-day intervals for 9 days while growing in media containing P concentrations ranging from 0 to 10 mM. Media P concentrations declined rapidly in all P treatments by Day 6, but in 0 and 0.1 mM P treatments, increased significantly by Day 9 as cells excreted P. Low media P concentrations (0, 0.1 and 0.5 mM) reduced cell growth rates when compared to high media P levels (2.5, 5.0 and 10 mM). Suspension cell cultures supplied 0.5, 2.5, 5.0 and 10.0 mM P had lower starch concentrations by Day 3 when compared to cells cultured in media containing 0 and 0.1 mM P. Cell sugar concentrations were reduced at Day 3 for all P treatments, and sugar concentrations in the media continued to decline over time with 2.5, 5.0 and 10.0 mM P treatments. Proteins and amino acids accumulated in cells under the slow growth conditions caused by low media P levels. Cell P levels did not decline significantly at low media P levels; although cell P concentrations increased with 10 mM P in the media.

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