Water Release from Cross-linked Polyacrylamide

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Abstract. Cross-linked polyacrylamide (CLP) has a number of well-established industrial and household uses due to its high water absorbency. Over the past decade, CLP has been promoted by industry as a soil amendment purported to serve as a storage reservoir for plant available water and helpful in alleviating plant stress during periods of drought. Though it is clear that CLP absorbs water, the purpose of this research is to verify that the absorbed water is, in fact, plant available. An initial study was completed to quantify the moisture retention properties of CLP over a wide range of soil water potentials. Sandy loam soil was amended with varying rates of CLP and, following saturation, subjected to a sequence of decreasing soil water potentials. Soil water content was measured at each potential. The CLP resulted in a significant increase in saturation water content, but did not increase the apparent plant available water (the difference between the water contents at -0.01 and -1.5 MPa of water potential). Though water contents above those at -0.01 MPa are not traditionally considered plant available in porous media (due to rapid drainage loss) the possible slow release of water from CLP may be plant available at these levels of potential. Additional work is underway to characterize the rate of water loss from CLP at high water potentials (greater than -0.01 MPa). Results of the CLP moisture retention, and water release rate studies will be discussed.