



Electromagnetic Water Content Sensors: A Quest for Testing and Performance Standards

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The growing number of new electromagnetic-based water content sensors across the globe is creating a market filled with confusing choices for consumers and decreasing market share for producers. Without informed consumer choices, product price point may be controlled more by advertising advantage than by product performance and quality. Sensor performance and quality assessments have been carried out over decades with mixed testing approaches and a commensurate measure of mixed results. Confusion over sensor-function, -failure and value grows as testing employs moving targets such as locally-available non-standard, non-homogenous materials that are unavailable globally, thereby adding to the confusion. In addition to environmental impacts on sensor circuit performance, there are secondary effects arising from the material under test including, temperature and electrical conductivity, interfacial polarization and dielectric relaxation to mention a few. In order to develop an international electromagnetic (EM) sensor testing methodology, a body of engaged experts is needed to address two key issues, 1) sensor performance evaluation and 2) material under test standardized definition and characterization. Industry and consumer buy-in is important as the implementation of standards will require agreement among producers and consumers that standards add value to sensors. Although a few attempts have been made to standardize testing, more work and research is required before an international standard can be adopted. This project is financed by the Polish National Agency for Academic Exchange.