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A transforming soil water retention technology that eradicates drought and increases crop resilience to changing climates

Increasing demands for producing sustainable food and cellulosic fiber supplies on small and large farms has become the grand challenge for the 21st century. Soil water deficits rank among the highest stress limitations to plant production. Although supplemental irrigation, increasing fertilization and manure applications to highly permeable soils may increase seed and biomass production, during the short term, these management practices are simply not sustainable due to elevated leaching losses including nutrients, pesticides, pathogens and animal endocrine and human causmetic disrupting compounds to groundwater supplies. New plant biotechnologies combined with water conservation and prescription nutrient technology provide long-term sustainable crop productivity while improving soil quality. Doubling the water and nutrient holding capacities in plant root zones sustain high productivity of nutritious food crops and biomass on marginal sandy and Oxisolic soils. Installation of subsurface water retention technology (SWRT) membranes in the upper 50 to 75 cm of sandy soils increase both above ground biomass and food production by 40% to 400% with substantial reductions of irrigation water. Today's new manually and mechanically installed SWRT membranes convert sandy soils into sustainable plant production regions that transform lives and communities. This presentation summarizes how these amazing SWRT membranes increase soil water and nutrient contents in plant root zones and require less irrigation water to double and triple maize, cotton and horitcultural crops in Iraq, Iran, China and the USA. This new SWRT Solutions approach is patented and prepared to save water while gardening or farming to feed everyone in rural and urban locations.

Biography

Alvin J M Smucker is working as a Professor of Soil Biophysics at Michigan State University. He has received the 2005 Distinguished Faculty, a double recipient of the Alexandar von Humboldt research award in Germany, he is a fellow in five national and international scientific societies, a visiting Professor at the Scottish Agricultural College, visiting Research Scientist at the Argonne National Laboratories, Chicago and the Distinguished MacMaster Research Fellow, CSIRO, Australia. His water conservation research received the 2015 MSU Innovator award. He has over 326 publications on plant water use efficiency, root dynamics and rhizosphere ecology. He is the recipient of many patents for agriculture.

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