SUSTAINABLE AND RESILIENT CROPPING SYSTEMS TO MITIGATE WIND EROSION FOR THE ENHANCEMENT OF HUMAN HEALTH

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ABSTRACT

In the Texas High Plains, regenerative cropping practices in a predominantly conventional farming area can be used to prevent further depletion of topsoil by wind erosion. This loss of topsoil can cause a decrease in agricultural productivity and form dust storms that can be detrimental to human health causing a rise in hospitalizations of chronic lung damage, cardiovascular disorders, and diseases contracted by inhalation. Using regenerative farming practices, both the number and size of dust storms may be mitigated to sustain agricultural productivity and improve human health in this semi-arid environment. We seek to provide a full range assessment of dust properties to enhance human health and agricultural productivity. To achieve this, paired sites of conventional and conservation are implemented in seven counties (Randall, Cochran, Hale, Lubbock, Terry, Dawson, and Martin) to create a transect of this region. Each of these sites contained dust collectors, providing a full assessment of microbial communities, nutrient composition, and provide an estimate of topsoil lost per month within the site. In combination with dust collection, soil cores are taken for soil health fluctuations and analysis throughout the year. Soil moisture will be monitored using a lab calibrated CPN 503 neutron probe, highlighting the differences between cropping systems and stored soil moisture. This project will allow us to identify losses in the system and contribute to calculating a dollar amount eroded each year, and enhance human health by reducing particulate matter inhalation.