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Role of soil properties in controlling the spatial variations of soil water content in varied fields

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Statement of the Problem: Many remote sensing data from satellites can provide frequent globe coverage of soil water content (SWC) over a large area of earth surface, but they are almost all at a relatively course resolution (>9 km). There are numerous efforts to further downscale these products from the generally coarse resolution of (9×9 km) to field scale (~0.5 km) based on the characterization of vegetation, soil, land surface, topography and rainfall that influence the variability of SWC at the field scale. This intensive soil water content (SWC) data will enable strides in weather and climate prediction, agricultural management and improve our understanding of hydrological processes and land-surface interactions.

Methodology & Theoretical Orientation: This field investigation offered key information about SWC and soil physical constitution from 52 agricultural lands to evaluate the impact of soil organic carbon (SOC) and other physical properties such as soil textural class on soil water content over a 12 week period. Cropland averaging SWC over the period of the investigation was projected in an optimum way by integration of soil texture class and SOC in every field moisture status.

Findings: In spite of that both %Clay and SOC explained approximately 80% of variance in SWC over all cropland, respectively, soil organic carbon explained larger variation in soil water content than its other physical properties in desiccation situation.

Conclusion: The strong association of SWC with SOC shows soil organic carbon may be a good parameter in downscaling the estimate of SWC from satellite data in particular where SWC information are unavailable or unreliable.

Biography

Qu Jili has his expertise in Engineering Geology and Geotechnique, as well as Environmental Protection. His prestigious research on soil modification of earth surface and detailed prediction of soil water content based on organic content and clay content creates a new pathway for improving the downsizing of remote sensing materials. He has been involved in this aspect of research for many years, being rich in experiences. The research foundation is based on the field investigation, related historic materials and compound statistic techniques. The results of his research have been used in effective land arrangement, soil modification, accurate interpretation of remote sensing data from satellites, etc.

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