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## **Effect of rainfall temperature on the erosion of clayey soils different in clay amount: experiments with a laboratory rainfall simulator**

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As previously foreseen, it seems like climate change effects have begun to take their toll on the environment globally, but especially in the Eastern Mediterranean-Middle East (EMME) region where a hot climate already prevails. Some of these effects include higher temperatures during summer season, greater heat stress, longer summers, lower soil moisture, greater water scarcity, more intense rainstorms, longer duration between rainstorms, reduced air quality due to greater pollution and more. Rainfall temperature is also a variable that potentially will be affected by changes in climate regime.

These alterations in climate regime might play an even greater role in soil erosion which has already become a concern on a global scale due to its impairing effects on human activity. Although, soil erosion variables have been studied extensively on various levels, very little has been researched on the effects of rainfall temperature on the soil. A few years ago, comparative research with a laboratory rainfall simulator was conducted on two soils, a clayey soil and loamy soil from Israel, in dry and wet conditions, under different rainfall temperature regimes. The researchers concluded that rainfall temperature has an impressionable effect on runoff and soil erosion that must not be ignored, and which is more pronounced in the clayey soil. Recently, and in accordance with these findings, follow-up research was conducted on two pre-wetted clayey soils, 43% and 64% clay content, respectively. The Terra Rosa soils were chosen from different locations in Israel and are similar to each other in salt concentration, organic matter content and land use (plots between olive trees in an olive grove), yet are different from one another in clay content, and possibly in clay-mineral type as well. The soils were pre-wetted and allowed to drain to field capacity state, and then were exposed to 21 mm/hr rainfall events at 3 different temperatures: 2, 20 and 35 degrees Celsius, respectively. Runoff and soil samples were collected throughout the experiments. Temperature was monitored at water tank, nozzle, soil surface and soil subsurface with thermocouples and a thermal camera. Each experiment was repeated 4 times on 2 different soils with 3 different temperatures, rendering a total of 24 experiments.

In this presentation, I will demonstrate our theory for the potential of rainfall temperature as an important variable on soil erosion and will present our initial findings based on our recent experiments.

