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Evidences of large soil losses in soils with low LS&K factors in central Israel

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Over the last decade significant soil losses have been observed in orchards and row crops fields that are managed by conventional tillage practices. These soil losses occur due to high frequency low intensity rain fall events which over time result in large amount of soil losses. This process is commonly ignored because cultivation erases any evidences of erosion. This study focus on soil losses occur at low LS (less than 1) and K factors (USLE factors) of brown loamy sand to sandy loam soils in central coastal aria of Israel. The present of swelling clay (less than 5%) combined with coarse particle cause to weak structure and sensitivity to sealing formation, which accelerate the erosion processes of those soils.

Three main processes have been identified at this region: (1) Unpaved service roads used by farmers become conduit of concentrated runoff and sediments from the fields. Often you can find these roads more than 1 m below the level of the adjacent field. (2) A cumulative long-term erosion process (around 30 years) observed in orange orchards, where the trees cover about 40-50% of the soil surface. The rest of the soil surface is exposed (weeds controlled mainly by herbicides) to the rain drops impact. Over the years, incised channels 1 m deep and 4 m wide formed in the middle of orchard with catchment area of less than 1 hectare. (3) Soil erosion from row crops fields (mainly potatoes and carrots) occur as soil is left crumbled and bare during the first rain events of the season. This process increases as land cover changes from orchards to rows crops result in large amount of sediments mobilized from the fields to the channel network.

Making farmers to adopt soil conservation practices is a big challenge as the low profit threshold on the one hand and low awareness on the soil loss on the other. Several practices for reducing the large soil loss show limited success and some other tested in those days.