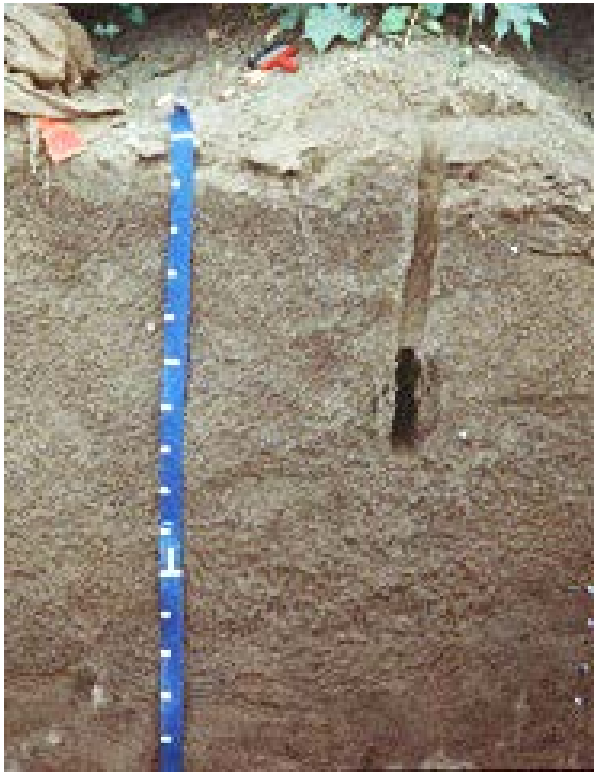
Soils and Soil Management

California Board of Food and Agriculture

October 7, 2014



Summary (part 1)

- Soils are three dimensional. They occupy area and depth.
- Soils are highly variable within the three-dimensional soil individual and across landscapes.
- Physical properties contribute to soil quality and “soil health”. Soil is more than the organic matter in the upper horizons.

Summary (part 2)

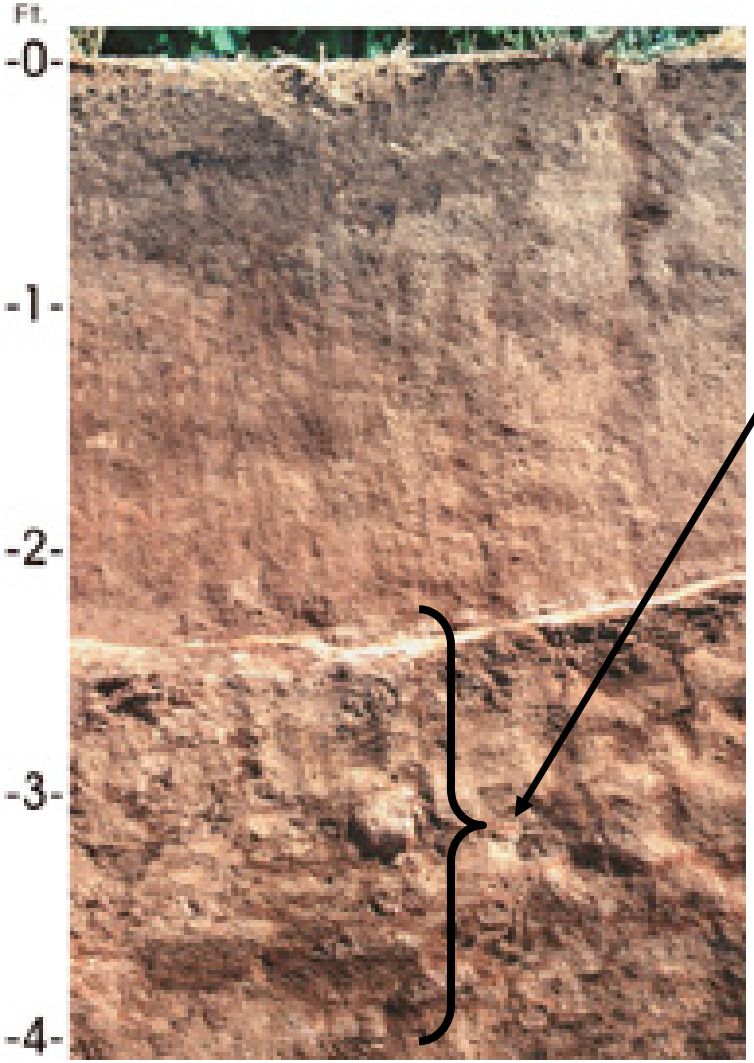
- Management of the physical attributes of soil is an important part of quality soil management.
- Management implies maximizing both on site and off site benefits.
  - On site may be yield or product quality.
  - Off site may be environmental impact.

The Soil Individual

Redding Series

Yolo Series

The state soil



Duripan =
cemented layer

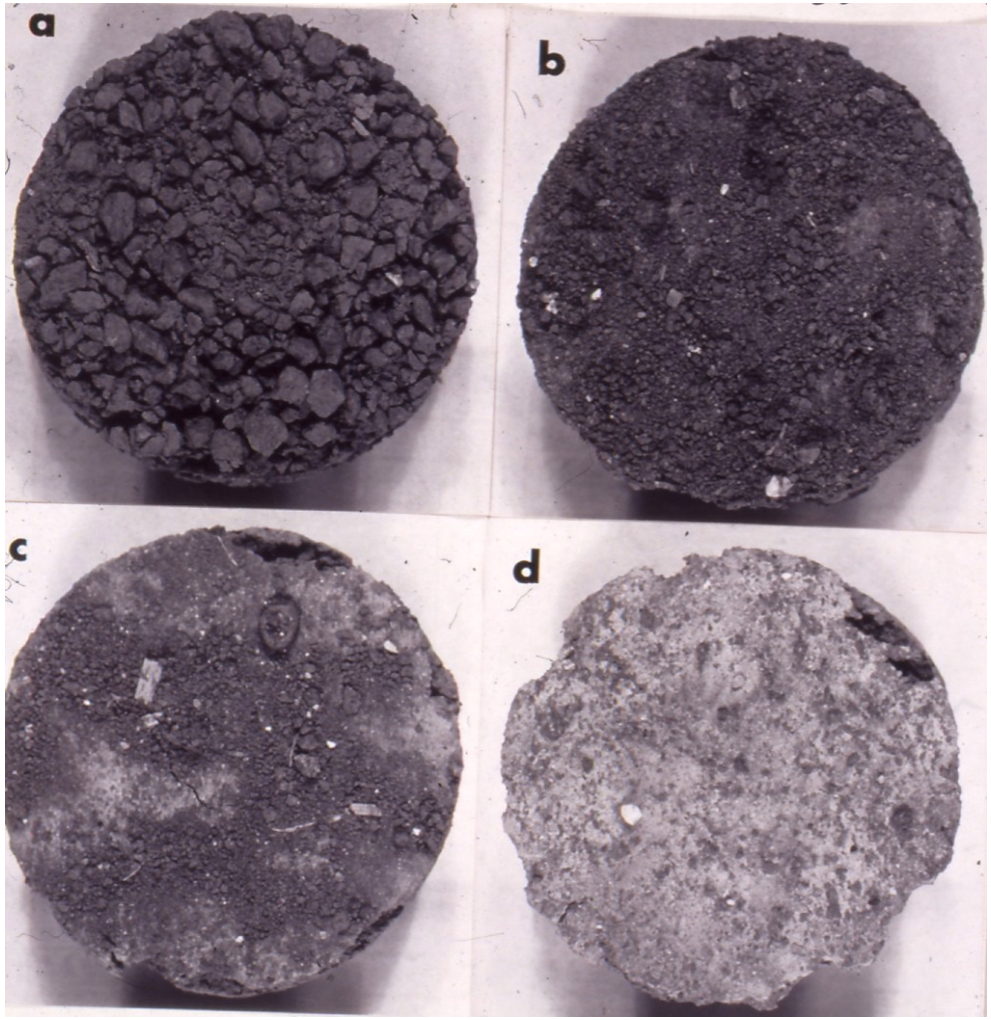
Management/Soil Crusting

Crust disrupted

Crusted

Soil Crusting

O minutes



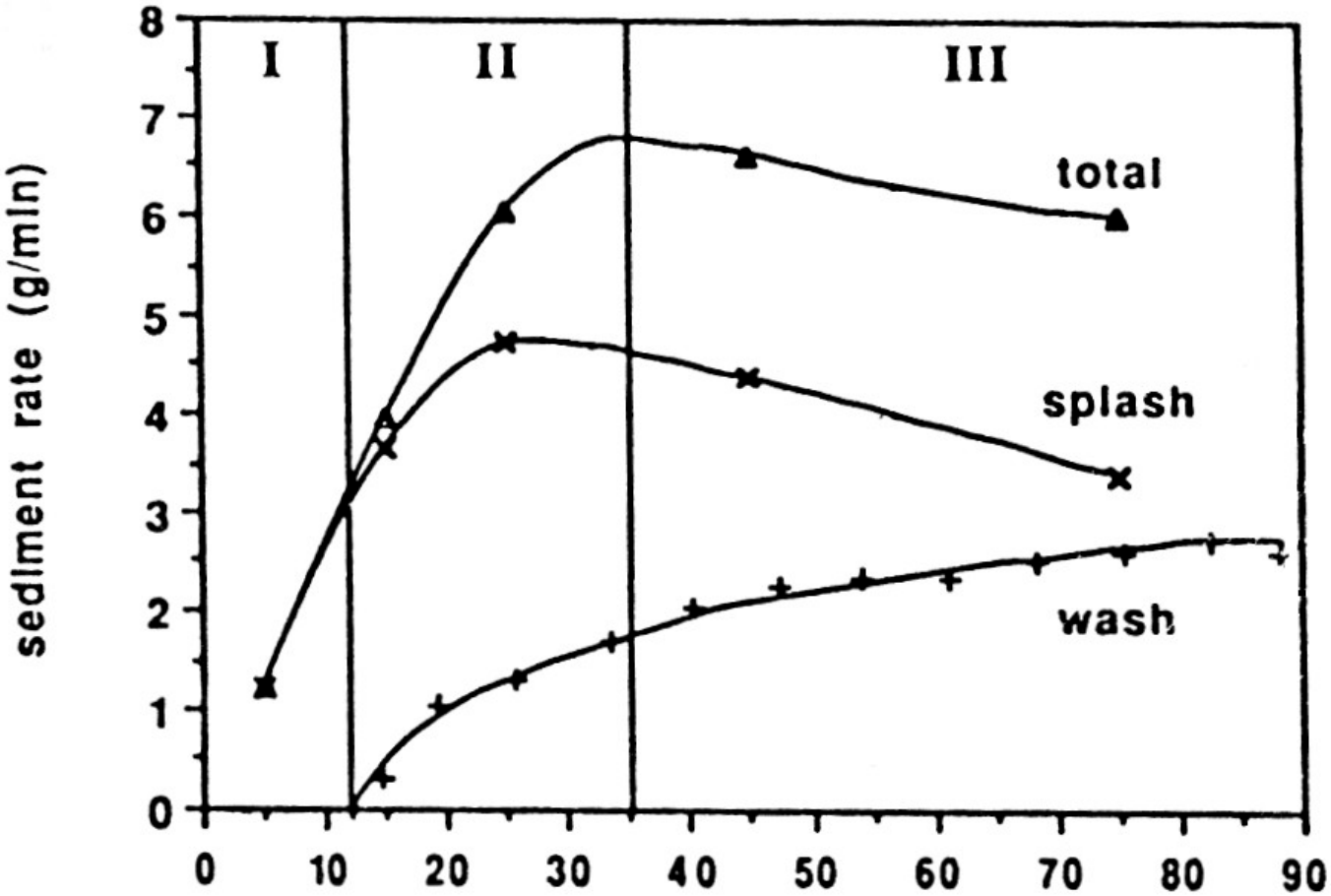
1O minutes

25 minutes

9O minutes

Moore and Singer, 1990 Soil Science Society of America Journal 54:1117-1123

Capay Results



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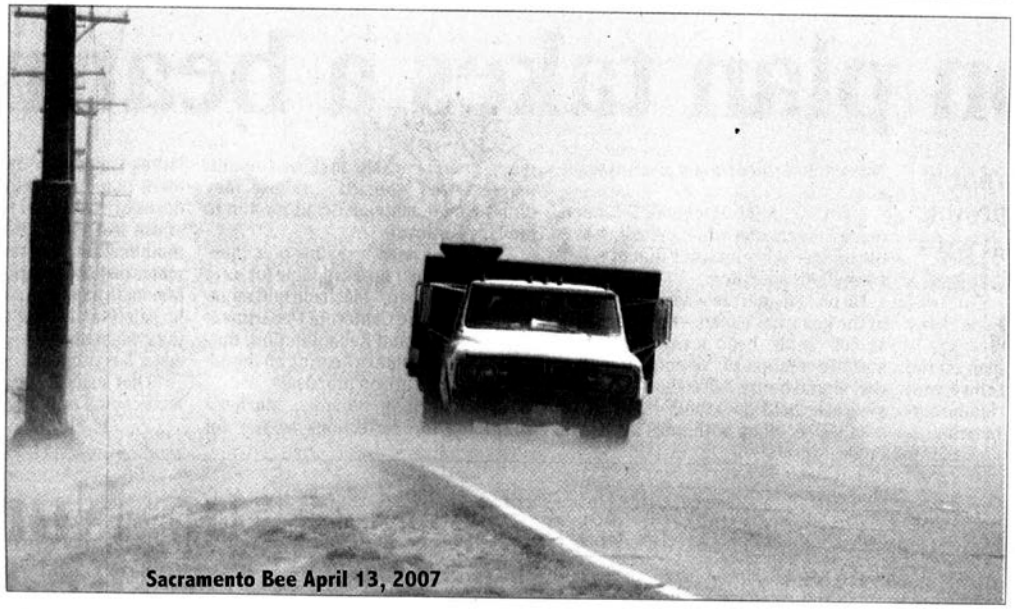
Quality Soil Management

Management/Wind Erosion



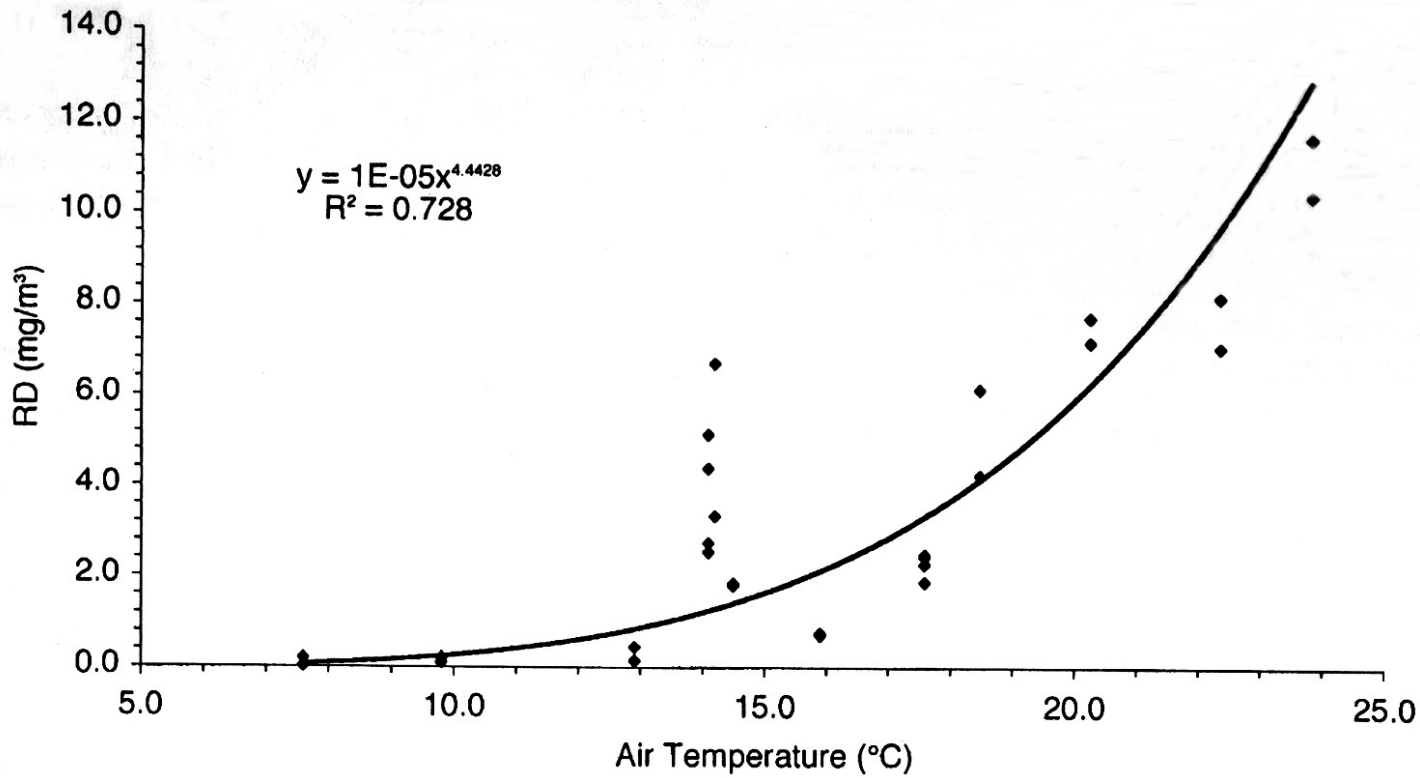
South state sandstorms impaired visibility Thursday on roadways, including this one in Lancaster. The storms caused a multi-vehicle pileup on Interstate 40 that killed two people and injured six, the California Highway Patrol said.

Associated Press/ Jeff Goldwater

Sacramento Bee April 13, 2007

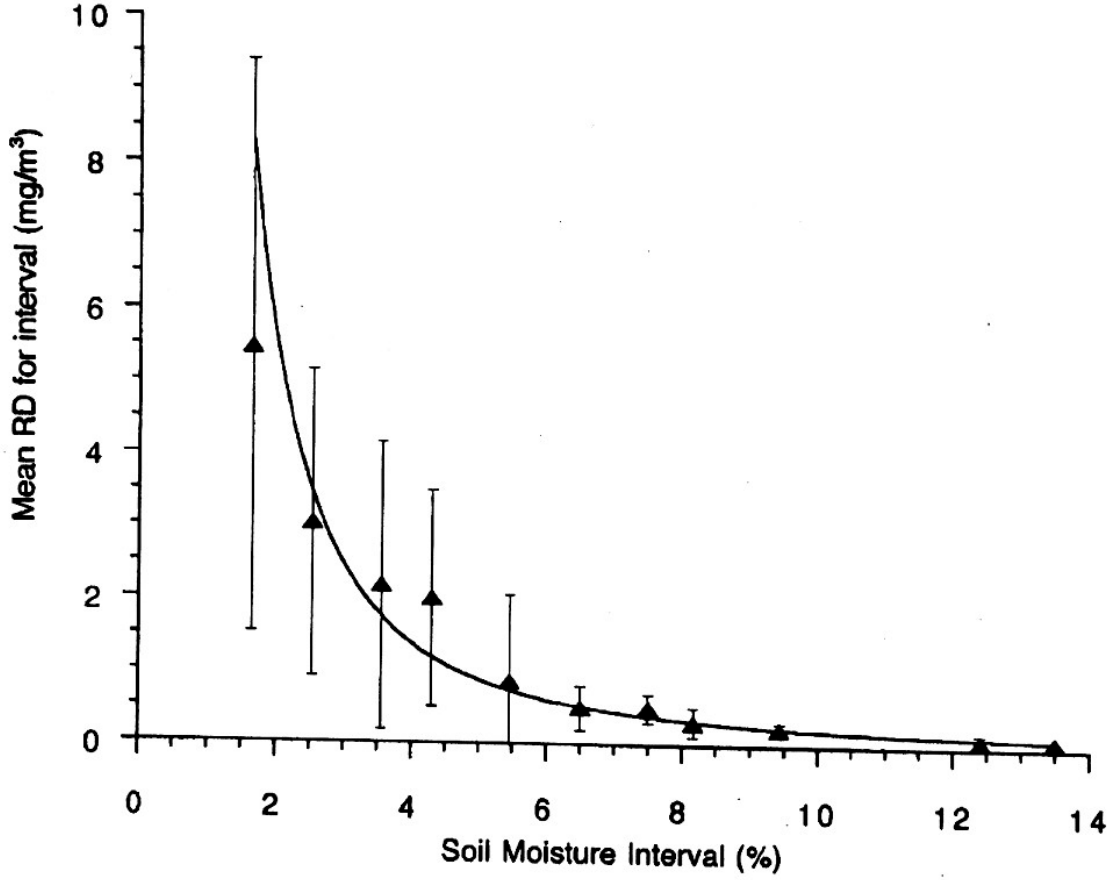
Activity	Respirable dust production (mg/m^3)
Land planing	13.5
Ripping	9.5
Corn harvest	6.5
Plowing	6.3
Finish disking	4.0
Tomato harvest	3.5
Stubble disking	3.0
Mowing vetch	1.6
Listing	1.5
Seeding	1.2
Wheat harvest	1.1
Cultivation	1.0
Harrowing	0.7

Quality Soil Management



H. Clausnitzer and M.J. Singer 2000. Atmospheric Env. 34:1739-1745.

Quality Soil Management



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- Physical properties contribute to soil quality and “soil health”. Soil is more than the organic matter in the upper horizons.

Summary (part 2)

- Management of the physical attributes of soil is an important aspect of quality soil management.
  - Examples are managing soil crusting and timing of farming operations to reduce wind erosion.
- Management implies maximizing both on site and off site benefits.
  - On site may be yield or product quality.
  - Off site may be environmental impact.

Thank you

San Joaquin Soil Series—The State Soil

Fine, mixed, active, thermic Abruptic Durixeralfs