

COTTAGE CHEESE (ACID) WHEY EFFECTS ON THE AGGREGATE STABILITY OF SODIC SOIL

by

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Abstract: Whey may be an effective amendment to reclaim sodic soils. The objectives of our greenhouse study were to determine (1) aggregate stability (AS) response to whey additions, and (2) the profile depth to which surface-applied whey affected AS below the A_p horizon. The objective of a companion field study was to determine the effects of whey applications and flood irrigations on AS. In the greenhouse, lysimeters packed with a Freedom silt loam (*Xerollic Calciorthid*) received either 0, 25, 50, or 100 mm of whey. After drying, the surface 15 cm was removed, mixed, and replaced. After barley (*Hordeum vulgare* L. 'Ludd') was planted, irrigated, and harvested, AS via wet sieving was measured. In a field of Declo silt loam (*Xerollic Calciorthid*) 2 x 2 m basins each received 0, 25, 50, or 100 mm of whey, followed by 100, 75, 50, or 0 mm of water, respectively. One week later, each basin was cultivated (to z = 10 cm) and smoothed. After four 150-mm flood irrigations were made, AS was measured on the 0- to 1-, 1- to 5-, and 5- to 15-cm depth increments. Results from the greenhouse study indicated that AS increased significantly with whey additions, though only in the tilled 0- to 15-cm depth increment. Field study results revealed that whey increased AS in the basins, as well. In the upper 5 cm of soil, AS increased linearly from 33 to 75% with whey additions up to 5 cm. Cottage cheese whey improved the AS of sodic soil horizons into which it was incorporated.

Key words: organic amendments, soil physical properties, salt-affected soils, dairy wastes, reclamation.

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