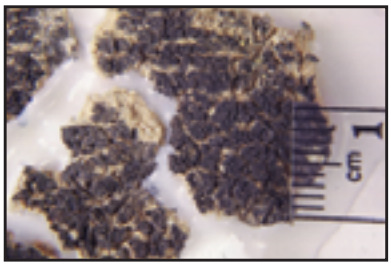
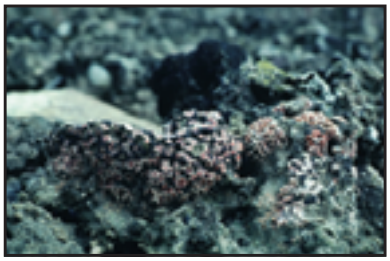
Table 1.1 (continued)

Morphological Group		Description and Representative Taxa
LICHENS:		
crustose lichen		crust-like growth tightly attached to the substrate *(Lecanora muralis)*
gelatinous lichen		blackish, jelly-like when moistened *(Collema coccophorum)*
squamulose lichen		discrete flakes that are round or ear-shaped, convex or concave, and often have lobed margins *(Psora decipiens)*
foliose lichen		"leafy," tending to be flattened with definite upper and lower surfaces *(Peltigera occidentalis)*
fruticose lichen		three-dimensional, ropey or branching, without definite upper and lower surfaces *(Aspicilia hispida)*

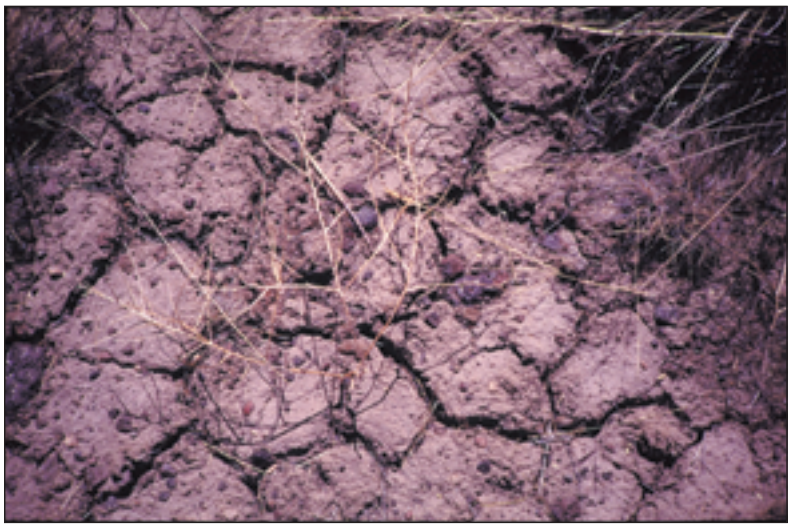


Figure 1.3 *Physical soil crusts. Vascular plant establishment is limited to cracks between polygons on physically crusted areas due to an impenetrable surface layer.*

aggregates by compacting them into a comparatively impermeable surface layer. These compacted surfaces have reduced infiltration rates and increased surface runoff. In this sense, they function hydrologically in a manner similar to raindrop-induced crusts.

Physical crusts may form on soil of almost any texture except coarse sandy soils containing very low silt and clay (Lemos and Lutz 1957). Soils especially susceptible to crusting are those with low organic matter and high silt, sodium, or calcium carbonate content. These characteristics are all related to soils with low structural and aggregate stability. Organic matter increases aggregate stability (through gluing of particles and moderation of forces that reduce aggregate stability), and places where plant residues are incorporated generally become planes of weakness, decreasing crust strength. Silts form strong bonds on drying, thus forming a hard crust. Silts also have low swelling and shrinking properties, so that the crust does not crack or disintegrate by itself.

Intensive grazing is often used to break up physical crusts. However, this result is short-lived, as the soil surface is resealed after the first minutes of an intense rainstorm. To effectively address a physical soil crusting problem, livestock grazing systems must promote greater soil aggregate stability (Thurow 1991). Therefore, management systems that promote soil surface protection (through plant and biological soil crust cover) and increase soil organic matter are the only lasting solution to physical soil crust reduction (Blackburn 1983).