

Land Conditions Affect the Weather

Bare Ground Causes Drought

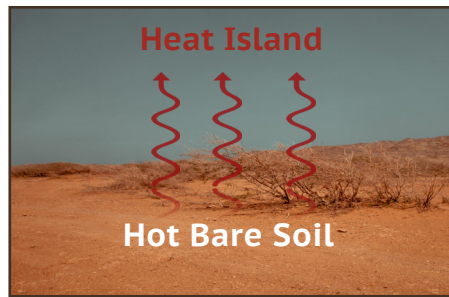
“It’s not drought that causes bare ground, it’s bare ground that causes droughts.”
~ Allan Savory



Dry and Dusty Bare Soil

No Living Soil Structure

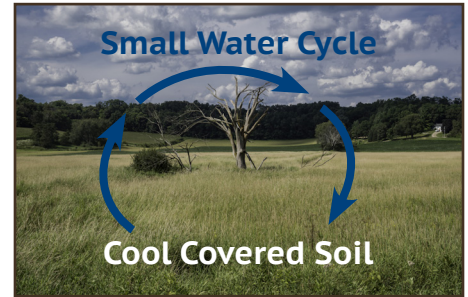
Disturbed or compacted soil, exposed by tilling or altered in other ways, loses the cohesive sponge-like structure created by plant roots and soil microorganisms. Moisture evaporates from bare soil very quickly, leaving a dessicated surface that repels water and creates dust. Dust particles in the air attract water vapor, but cannot coalesce it into large enough drops to form rain. This results in humid haze that holds heat and limits cooling.



Hot Bare Soil

Heat Island Effect

Bare soil heats to extremely high temperatures and re-radiates heat energy, similar to the effect felt near roads and buildings. The intense heat creates a high-pressure heat island that causes low-pressure moisture systems to move around the area, perpetuating hot, dry conditions. Rain not only brings the moisture necessary for life, it clears the air of particles that create the humid hazes and allows the earth to release heat and cool over night.



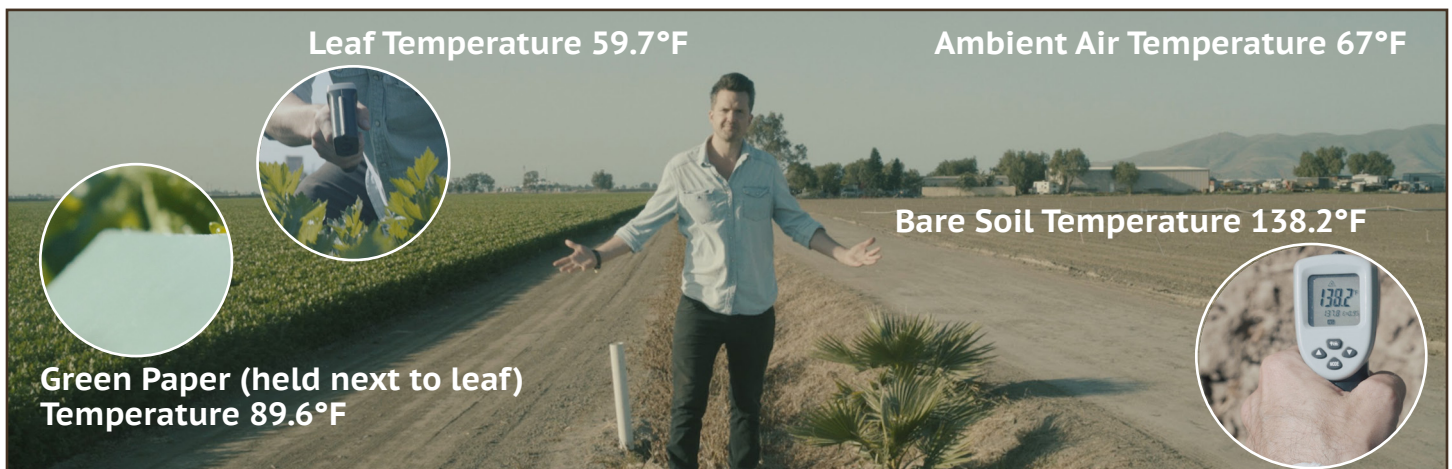
Cool Covered Soil

Water is Retained

Through photosynthesis, plants feed soil microorganisms. These microbes create a sponge-like soil that absorbs, holds, and filters water. As plants transpire, they release moisture slowly and more consistently than bare soil. They emit natural aerosols and beneficial bacteria that support the formation of clouds and rain drops. These processes create low-pressure areas that aid the inflow of moisture and influence local water cycles.

Plants Cool - Bare Soil Heats

Vegetative cover significantly reduces dust emissions, humid haze, and radiant heat. In addition to natural shading, plants have a cooling effect through photosynthesis. Plants and soil microorganisms also help retain soil moisture.



Leaf Temperature 59.7°F

Ambient Air Temperature 67°F

**Green Paper (held next to leaf)
Temperature 89.6°F**

Bare Soil Temperature 138.2°F

Finian Makepeace, co-founder of Kiss the Ground, illustrates the temperature extremes between vegetation and bare ground. Recording temperatures on a mild day in California, he discovered that the sun-baked soil was 78.5°F higher than leaf temperature. Under these hot, dry conditions beneficial microbes in the soil cease to function effectively. This lifeless soil remains parched as water runs off, compounding the heat-island effect. It increases drought cycles and turns fertile land to desert.

Biologically active soil with vegetative cover allows water to infiltrate rapidly. This living soil sponge reduces flooding, increases resilience to drought and wildfires, and improves water availability and quality. Land management practices that minimize bare soil will improve natural water cycling and reduce global heat dynamics.

Actions

Consider soil health in land management decisions.

Apply soil health principles to build biologically active soil:

- Maintain diverse plant cover
- Minimize soil disturbance and compaction

Support farmers and ranchers who practice these principles.