

How Porous Amendments Work

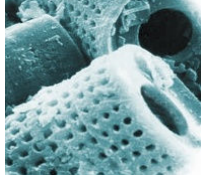
Physical properties of porous soil amendments, how they work, and what works best.

Porous Amendment Internal Structures

Manufacturer's Labels; *Curtis & Claassen, Crop Science, 2008

Calcined Diatomaceous Earth (D.E.)

Magnified: 6,000 X



EP Minerals, LLC

82% Porous
24 lbs./ cu.ft.*
27 C.E.C.

90% SiO₂
7% Al₂O₃
2% Fe₂O₃

Calcined Clay

15,000 X



Agronomic Design Systems

72% Porous
41 lbs./ cu. ft.*
33 C.E.C.

74% SiO₂
12% Al₂O₃
5% Fe₂O₃

Zeolite

>15,000 X



St. Cloud Mining Company

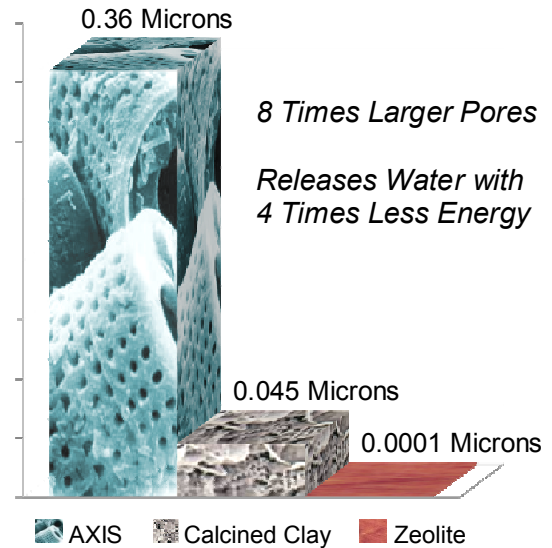
52% Porous
58 lbs./ cu. ft.*
95 C.E.C.

65% SiO₂
13% Al₂O₃
2% Fe₂O₃

Different amendments make similar claims. Porous, lightweight products solve physical soil problems like compaction, drainage, and permeability more effectively by virtue of superior physical properties.

Median Pore Size - Microns

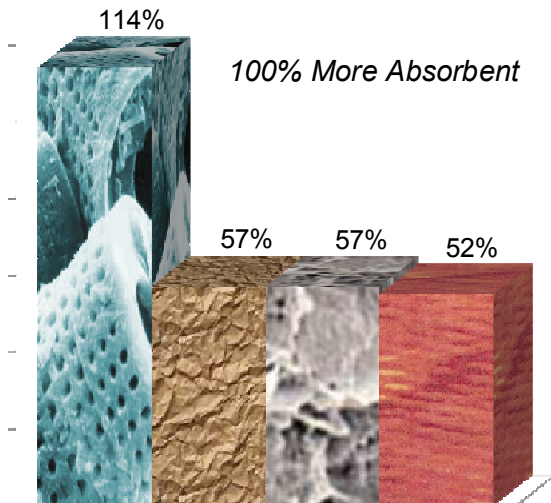
Manufacturer's Labels; McCoy, Ohio State, 1995



Our larger internal pores absorb more water and release it much easier. As soils dry, larger pores release water earlier for plants, increasing available water, reducing plant stress and irrigation.

Absorption - % Weight in Water

Manufacturer's Labels; Independent Testing

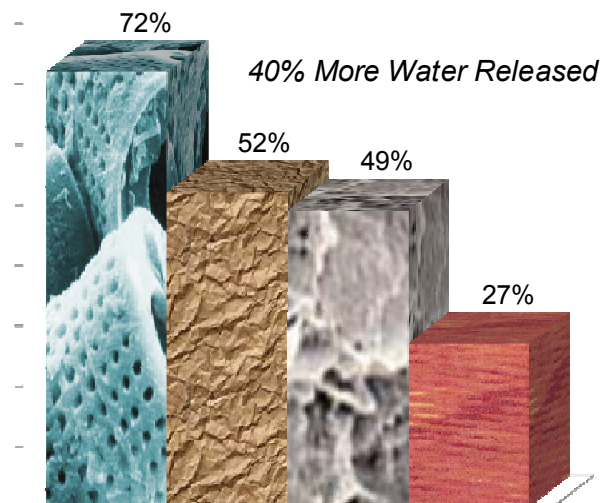


AXIS Cal. D.E. & Vol. Ash Calcined Clay Zeolite

Absorption is a function of porosity. Porous soils are more absorbent and have better infiltration. Absorption reduces puddling of athletic field soils, increases water holding, and reduces runoff.

Water Released from Internal Pores - %

Curtis & Claassen, Crop Science, 2008

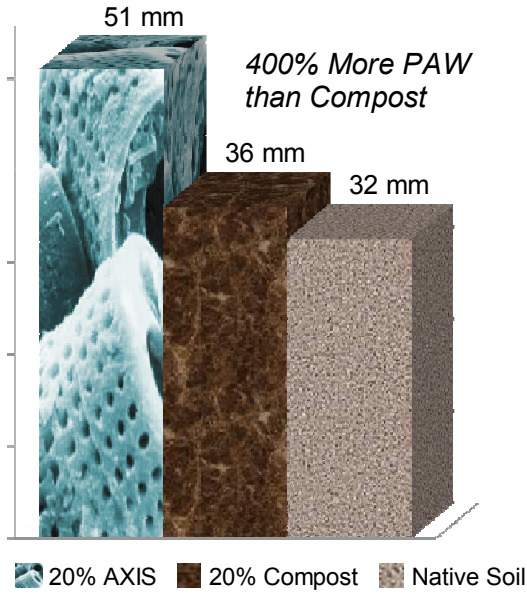


AXIS Cal. D.E. & Vol. Ash Calcined Clay Zeolite

Larger pores release more water. As water is released, it is replaced with air. Each cycle absorbs and releases more completely, dramatically increasing the volumes of air and water exchanged in soils.

Plant Available Water vs. Compost - mm

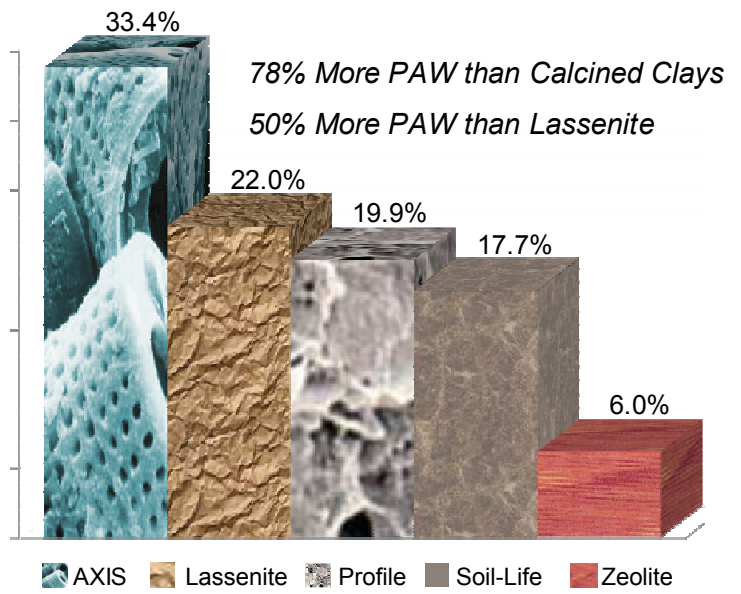
Caltrans Reduced Irrigation Report, 2008, (mm / 1/2 M depth)



AXIS increases plant available water more than compost and is more effective to reduce irrigation and conserve water. AXIS does not decompose, works continually, and is very uniform in quality.

Plant Available Water vs. Inorganics - % of Volume

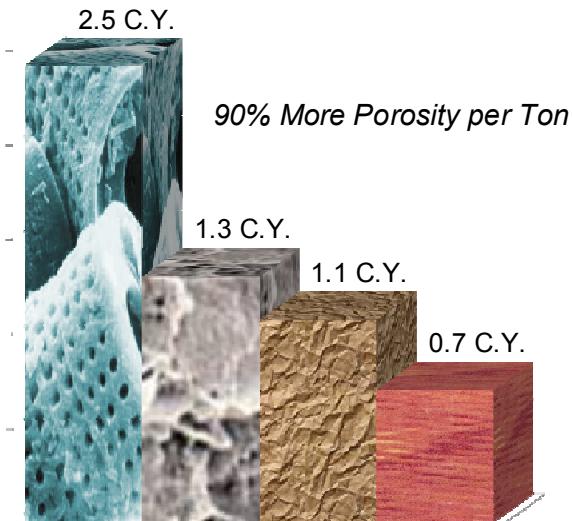
Curtis & Claassen, 2008; McCoy, Ohio State, 1995



AXIS has unique physical features to increase plant available water, reduce irrigation, increase watering efficiency, and increase plant survival. AXIS acts as an additional reservoir of available water in the soil.

Pore Space per Ton - Cubic Yards

(% Porosity X Cubic Yards per Ton)

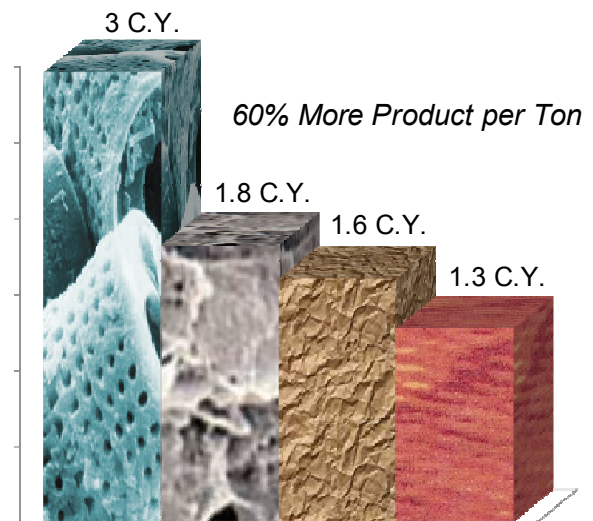


AXIS Calcined Clay Cal. D.E. & Vol. Ash Zeolite

Porosity increases the soil's capacity to move air and water. Our products are effective at low rates because they have the highest porosity, largest pores, most absorption, and lowest bulk density.

Product per Ton - Cubic Yards

Curtis & Claassen, Crop Science, 2008



AXIS Calcined Clay Cal. D.E. & Vol. Ash Zeolite

More product treats more soil, and reduces the number of tons you need to buy. Lighter products also reduce compaction better. Buying, shipping and handling fewer tons saves time and money.