



Summary of Recent Developments

USGA Approves AXIS for Putting Green Construction

By The USGA Green Section Staff

Inorganic and Other Amendments: Porous inorganic amendments such as calcined clays (porous ceramics), calcined diatomites, and zeolites may be used in place of or in conjunction with peat in root zone mixes, provided that the particle size and performance criteria of the mix are met.

Ohio State University Quantifies Water Savings with AXIS

Noted soil physicist Dr. Ed McCoy determines reduction of irrigation requirements and reductions in irrigation frequency with AXIS in a USGA constructed rootzone at 10% by volume at 7 different locations in the United States.

Wyoming DOT Survival Rates of Non-Irrigated Roadside Plantings

70 to 99% Survival of Native Trees & Shrubs w/ 15% Diatomaceous Earth in the backfill vs. 20 to 25% survival without. Data from 5 sites, 1 to 5 years post planting.

European Laboratory “Labosport” Establishes Available Water

Labosport confirmed that our “Regular” grade absorbs 114% of it’s weight in water. Testing revealed that 94% of that is available to plants. Each pound of AXIS provides one extra pound of available water.

Major Leading Agricultural University Confirms AXIS

Research will soon be released confirming that AXIS has the highest water release characteristics and provides the most Plant Available Water compared to an unrefined diatomaceous earth, calcined clays, and super absorbent polymer.

34% Increase in Available Water

Ohio State University, 2004, as part of our Water Savings Research, with AXIS at 10% by volume in USGA sand, Available Water increased 34%. Interestingly, the increase in available water was identical in either fine or coarse USGA sand.

32% Increase in Available Water

Average of Several Physical Soil Tests conducted to compare the use of AXIS at 10% by volume in a variety of USGA sand and soil blends. See entire reports below.

Laboratory Results Provide Performance Trends – Control vs. AXIS as 10% at 6 locations

Location	Bulk Density g/cm3		Capillary Pore Space %		Non-Cap. Pore Space %		Total Porosity %		Infiltration Rate in./hr.		WHC Saturation %		WHC 1/10 Bar %		WHC 1/3 Bar %	
	Control	AXIS	Control	AXIS	Control	AXIS	Control	AXIS	Control	AXIS	Control	AXIS	Control	AXIS	Control	AXIS
Melbourne	1.33	1.21	19.0	20.2	23.7	28.8	42.7	49.0	4.4	20.5	32.2	40.6	14.3	16.7	6.48	8.28
<u>New Jersey</u>	1.54	1.16	23.6	31.8	11.7	15.4	34.7	47.2	0.4	6.4	22.6	40.7	15.1	27.4	10.3	16.8
New Jersey	1.40	1.26	15.1	18.3	23.2	29.3	38.3	47.6	16.2	29.5	29.5	35.5	11.9	12.5		
Utah	1.64	1.38	24.0	28.6	9.1	10.7	33.1	41.7	0.02	0.37	20.2	28.5	14.6	22.3	12.4	20.7
Washington	1.33	1.12	35.0	33.6	6.8	12.7	41.9	46.4	0.95	3.82	31.5	41.3	26.3	30.0	13.8	18.9
<u>New Jersey</u>	1.68	1.37	16.5	22.1	16.2	21.0	32.8	43.1	8.66	10.4	19.5	31.5	9.84	16.2	4.62	10.2
% Change																
Melbourne		-9		6%		21%		14%		365%		26%		17%		27%
<u>New Jersey</u>		-24		34%		31%		36%		1.5k%		80%		81%		63%
New Jersey		-10		21%		26%		24%		82%		20%		5%		
Utah		-16		19%		17%		26%		17k%		41%		52%		66%
Washington		-16		-4%		86%		11%		300%		31%		14%		37%
<u>New Jersey</u>		-18		34%		29%		31%		17%		61%		64%		120%
AVERAGE		Minus 15%		20%		27%		23%		191%		40%		36%		55%

Underlined samples were golf course sands, all other samples were native soils.