

**HOW MUCH FIELD AREA DOES YOUR CORE CULTIVATION PROGRAM ACTUALLY IMPACT?**

<http://turfgrass.hort.iastate.edu/extension/core.pdf>

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Use the following tables to determine how much of the field area is actually being impacted by your coring program. Did you realize that using a 3/4-inch hollow tine more than doubles the area of the field that is impacted compared to a 1/2-inch tine? Let's suppose that your goal is to remove 50% of the field area to a depth of your aerifier tine. The field is predominately clay and you want to begin to remove it from the field and replace it with sand. If you remove cores on 3-inch centers, it will require 22 passes over the field using 1/2-inch hollow tines in order to meet your goal of removing 50% of the clay soil. At two corings per year this would require 11 years and that might be too long to wait. By using 3/4-inch tines you can achieve the same goal in 10 passes over the field. If you increase your aerification and topdressing to three times per year you can achieve your goal of replacing 50% of the surface in nearly three years.

In the case of soil modification, the most effective modification, greatest change in physical properties with the least amount of added sand, has been obtained from sands in the very coarse to coarse size range. Rounded sands that are narrowly graded and have coefficient of uniformity less than 2 are preferred. Select a uniform coarse sand (80% of the particles between 1.0 and 0.5 mm and 90% between 2.0 and 0.5 mm) to maximize large pore space when modifying native soil fields high in silt and clay. Mixtures of predominately coarse and medium sand, with some fine sand, are best for amending native soils. Adding very fine sand or silt and clay does little to improve soils already high in silt, clay, and very fine sand. Golf course topdressing sands containing at least 60% in the medium and fine category are acceptable for topdressing sport fields. Avoid using sands high in the fine and very fine range since they do not contribute to increasing macropore space.

**Amount of sand required and area impacted for various coring and topdressing programs.**

Core space in.	Holes per sq. ft.	Tine dia. in.	Tine depth in.	sand needed to fill holes + leave some on surface (ton/1000sqft)			% area removed each pass	Number of passes with aerifier to impact a given area of the field		
				+1/8"	+1/4"	+1/2"		50% removed	25% removed	10% removed
2	36	.5	3	1.22	1.78	2.89	5.0	10	5	2
			8	1.76	2.87	4.00				
			.75	3	2.04	2.60				
3	16	.5	3	.85	1.41	2.53	2.2	22	11	5
			8	1.34	1.9	2.93				
			.75	3	1.22	1.78				
4	9	.5	3	.72	1.28	2.40	1.3	40	20	8
			8	.99	1.55	2.68				
			.75	3	.93	1.49				
6	4	.5	3	.63	1.19	2.31	0.5	90	45	18
			8	.75	1.31	2.42				
			.75	3	.72	1.28				
8	2.25	.5	3	.60	1.16	2.28	.31	161	81	32
			8	.68	1.22	2.35				
			.75	3	.65	1.21				
No coring topdress only				.56	1.12	2.24				

\*Assume sand weighs 1.45 ton/cu. yd. and there is 100% efficiency on subsequent passes with aerifier.

**Topdressing and amending sands for “native soil” athletic fields.**

Size	Sieve Size (mesh)	Particle Diameter (mm)	Ideal % by wt.		Acceptable %by wt.
Gravel	10	2.0 -3.4			20% max, with 3% max from gravel
Very Coarse Sand	18	1.0 -2.0		90% min	
Coarse Sand	35	0.5 –1.0	80%min		
Medium Sand	60	0.25 - 0.50			60% min
Fine Sand	100	0.15 - 0.25	none		20% max
Very Fine Sand	270	0.05 - 0.15	none		5% max
Silt		0.002 - 0.05	none		5% max
Clay		<0.002	none		3% max

**CULTIVATION GOALS**

There are many cultivation methods available for sports turf management. The best method of cultivation can be selected when specific cultivation goals have been determined.

Cultivation Goal	Hollow tine 4-inch	Solid tine 4-inch	Hydroject	Shatter tine 4-inch (Aera-Vator)	Shatter blade (AerWay)	Vertidrain	Floyd McKay drill & fill	Slicing Koro Topdressing/recycler	Small slicing/spiking	Vertical mower
<b>Cultivation between playing seasons</b> (no activities scheduled on the field)										
Change soil type in top 4 inches by removing soil and back filling with amendment	x							x		
Create large and deep holes or channels that can be back filled with a soil amendment							x	x		
Remove surface soil layer that was attached to sod during sand-based field construction	x							x		
Promote deep rooting, 8 inches or more			x		x	x	x	x		
Maximum removal of water puddles					x	x	x	x		
Aggressive fracturing of hard ground (surface to 6 inches deep)				x	x	x				
<b>Cultivation during playing season</b>										
Increase initial water infiltration rate with minimal disturbance to surface	x	x	x	x	x	x			x	
Plant seed with minimal disturbance to grass and soil stability		x		x						
Encourage lateral growth of sod forming grasses									x	x
Fracture hard skin infield, drag surface, and begin play				x						
Fracture hard grass fields				x	x	x				
Fast operation over field					x					