q&a

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If you can't take the heat . . .

Nearly all age levels for organized sports are now using rubber-infill-fields (RIF). Those that manage both synthetic and natural grass surfaces observe substantial improvement in their grass fields because of the option to move some activities onto the synthetic turf, especially during wet conditions.

Even though RIF fields are constructed with very repeatable materials they react differently as climate, season, and environmental conditions change. Just as with grass fields, temperature, rainfall, and humidity can effect the playing conditions on and above RIF fields. In most cases rainfall improves the playing surface conditions of RIF fields, yet most fields are constructed without irrigation systems that could be used to maximize playing quality.

I spent 20 days in August measuring temperature and humidity on RIF fields in Iowa, Colorado, Maryland, Oklahoma, and California. The footing and playability of RIF fields may remain consistent throughout changing seasons and regions; however the heat generated at the surface and in the playing space above the surface can substantially increase during the summer. Heat load to players is a concern among trainers especially during two-a-day practices in July and August. To reduce player heat load morning practice is usually held on the RIF field while afternoon practice is held on grass. Schedules often change, however, to fit weather conditions and coaching desires. In all cases it is best to have a synthetic option and a grass option to maintain flexibility in choosing the best playing surface for changing conditions.

Summer temperatures usually peak from 12-5pm. Three things were apparent from these summer observations: 1) Grass surfaces are much cooler than non-irrigated RIF surfaces; 2) non-irrigated RIF surface temperatures can be as high as 177°F; and 3) surface temperature of RIF fields can be reduced by 33 percent with proper use of irrigation cycling. Data in the table was collected at a high school athletic facility in San Diego. The Bermudagrass practice field had not been watered for five days before data collection and it was just beginning to show signs of moisture stress.

Measured field conditions from noon to 3pm on Sept 4, 2005 San Diego, CA

	Non-irrigated RIF		*Irrigated RIF*		*Bermudagrass*	
Location relative to surface	**Temp °F**	**RH%**	**Temp °F**	**RH%**	**Temp °F**	**RH%**
2ft above	92	20	87	23	89	21
1inch above	102	21	94	45	93	46
Surface	163	—	108	—	104	—
0.5 inch below in rubber or soil	138	—	102	—	84	—

At the Denver Broncos training facility the cooling effect of grass was even more noticeable. On a day when the local weather reported a high of 80 degrees, the measured peak surface temperatures for non-irrigated RIF, irrigated RIF, and well-watered Kentucky bluegrass were 150, 105, and 83 degrees, respectively. Watering the RIF reduced surface temperature by 30 percent while grass reduced surface temperature by 45 percent.

The best cooling effect occurred when 0.10 inches of water was applied each hour from 11 AM until 4 PM. Increasing wind and decreasing humidity enhanced the cooling effect but it also required more irrigation water. It shouldn't be too difficult to develop an irrigation strategy that will cool the field if you have an irrigation system that supplies multiple cycles during the day.

On one trial area we thoroughly soaked the RIF by running a hose on it for more than an hour. The water rapidly drains through the synthetic surface and

puddles disappeared in less than a minute, a real advantage of an RIF field. It was surprising, however, to note that some of the sand and rubber appeared to be hydrophobic and did not wet. The heavily watered test area soon dried out on the surface and temperatures quickly increased as the sun heated the dry surface.

For cooling to occur a film of water needs to be on the surface. Lick your finger and blow on it to get the idea of cooling the surface. There is much to learn about RIF fields and the January 2005 STMA conference in Phoenix has six hours of instruction dedicated to this topic.

After taking data on an RIF field for four hours it became evident that there is an undeniable heat load issue during the summer. At the professional, college, and high school level where trainers are involved it is likely that RIF field use will be limited when heat is a problem. A greater concern is for youth programs, summer camps, and contracted tournaments where events are less likely to be canceled and participants could dangerously overheat.

The heat load problem on RIF fields is manageable with irrigation, the problem is that most fields have been constructed without irrigation. The market is competitive and the cost of an irrigation system is not an attractive selling point by RIF contractors, but consumers need to know that synthetic turf without irrigation is an inferior product and in some situations a dangerous and liable commodity.

I spent my summer vacation watering rubber, sand, and fibers; it didn't grow but it did provide a better playing surface. If you are putting in a new RIF field listen to the companies that are trying to sell you irrigation, they are looking out for your bottom line. ST

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