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'Shoes will melt.' Hot turf may pose risk for athletes

Maya Earls, E&E News reporter • Published: Friday, July 19, 2019

Franco Escobar (left) of Atlanta United FC challenged Kyle Duncan of the New York Red Bulls in a match last week on the turf field at Mercedes-Benz Stadium in Atlanta. Rich von Biberstein/Icon Sportswire DKB

Synthetic turf fields are cropping up all over the country. For athletic associations, the benefits are numerous: They last year-round and don't require water or landscaping.

But turf fields can get hot — dangerously hot. On a clear, sunny day, the surface temperature of turf can soar 60 degrees Fahrenheit above that of grass.

Researchers at Pennsylvania State University's Center for Sports Surface Research have logged turf surface temperatures as high as 175 degrees at Penn State. Others in Utah have recorded even higher temperatures.

"At these temperatures, water bottles will melt; shoes will melt," said Andrew McNitt, director of the Penn State center.

Experts say artificial turf's potential to reach those temperatures underscores the dangers to athletes of a warmer world. They are urging states to put in place policies to protect athletes — particularly those in high school — from risks associated with extreme heat.

There are 12,000 to 15,000 synthetic turf fields in the ground in the United States, according to Dan Bond, president and CEO of the Synthetic Turf Council. Stadiums that use turf fields include Mercedes-Benz Stadium in Atlanta; Yale Bowl at Yale University in Connecticut; and Tropicana Field in St. Petersburg, Fla.

Heat is mostly concentrated on the surface of synthetic turf fields, McNitt said. Still, the air above can feel 5 to 10 degrees warmer. That's enough to potentially contribute to the risk of heat stress for athletes and fans, said University of St. Thomas thermal sciences professor John Abraham. Left unchecked, heat stress can lead to heatstroke.

Heatstroke is one of the leading causes of sudden death in secondary school athletes. Last year's Annual Survey of Football Injury Research **found** 64 football players have died from heatstroke since 1995. Out of that number, 47 were high school athletes.

It is unclear how many deaths occurred after athletes played or practiced on turf fields. That's because there are no known studies on the amount of heat stress episodes on synthetic turf as compared to natural grass, according to Abraham.

He said everyone in charge of player safety should be mindful of heat, regardless of whether a field is synthetic turf or grass.

"It's not a future problem," Abraham said. "It is already something that has manifested."

Researchers have warned that the risks of heatstroke are rising with climate change. An estimated 60% of the world will experience temperature records every year by the end of the century if greenhouse gas emissions don't decline, according to a recent study in the journal *Nature Climate Change* (***Climatewire***, June 18). Several records have been broken already this year, including in Anchorage, Alaska, which hit 90 degrees July 4.

Bond said members of the Synthetic Turf Council are taking climate change into account and are working on new cooling technologies for turf fields such as alternative infill.

"The technology is advancing, and there will be more options three to five years from now than there are right now," he said.

Phoenix has two synthetic turf fields within the city's Parks and Recreation system. Public Information Officer Gregg Bach said in an email that the city picked turf because it can sustain activity seven days a week. He said some sports, such as field hockey, prefer the synthetic material over natural grass.

The amount of time athletes can spend on the fields is limited in the summer, when temperatures in the city regularly hit the triple digits.

"During those times of the year, those fields don't generally get used before 6 p.m.," he said.

Despite the warnings about public health risks associated with extreme heat, several states do not require high schools to change team practices or games when it gets too hot.

The Korey Stringer Institute at the University of Connecticut **ranks** states based on their high school sports safety policies. The institute gets its name from the Minnesota Vikings player who died after suffering from heatstroke during training camp. Colorado, California, Wyoming, Iowa and North Dakota were among the lowest-ranking states, and they all lacked mandated heat modification policies.

"It's very sad," said institute CEO Douglas Casa. "Some of the most simple things you can imagine states don't have to protect athletes."

He recommends using devices that measure wet bulb globe temperature, which takes into account heat, humidity and cloud cover at the field. Other recommendations include mandating cold water immersion tubs and letting players acclimate to the heat by adjusting practice schedules and limiting the amount of equipment worn.

Casa said some states lack heat policies because they don't want to change tradition. Some schools have two-a-day or three-a-day workouts at the start of football season as a "rite of passage."

Other times, Casa said, there is an ignorance of just how important the policies are. He said some schools have said that temperature monitors or cold water immersion tubs are too expensive.

"If you can't spend $150 on an immersion tub, then I think you shouldn't have an athletic program," Casa said.

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