Scanning the Journals

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Synthetic Turf Performance

The popularity of synthetic turf surfaces is at an all-time high with the introduction of long pile fiber systems infilled with various combinations of crumb rubber and sand. Over 1,000 new synthetic turf systems were installed in 2003-2004 in the US.

The rapid popularity has lead to questions regarding surface performance relative to natural turf fields. Researchers at the Sports Turf Research Institute (STRI), Bingley, UK, measured several aspects of ball/surface (ball rebound, distance rolled, etc.) and player/surface interaction (traction, hardness, etc.) on eight synthetic surfaces and seven natural surfaces throughout England.

Ball rebound was measured by dropping a #5 FIFA approved soccer ball from 10 feet and measuring the percentage of rebound. Ball rebound on natural fields ranged from a low of 34 percent on a wet goal-mouth to 55 percent in the middle of a dry field. The lowest ball rebound on synthetic turf was 41 percent and highest of 54 percent. This suggests that the infilled systems perform similarly with regard to ball rebound. However, other measurements of velocity indicate the ball rolls significantly faster and further on synthetic turf than on natural turf.

The synthetic turf systems also proved surprisingly similar to natural turf fields regarding traction and hardness, leaving the authors to conclude that footwear selection is the governing issue with regard to traction. Surface hardness measures were not different.

Administrators and managers exploring synthetic turf options should keep in mind that synthetic turf systems require maintenance including grooming the infill, reducing static electricity by applying fabric softener and staph infection management by applying hydrogen peroxide. Of course there are well documented surface temperature differences with synthetic turf measuring temps as high as 150° F on a bright sunny 85° F day.

From: Baker, S.W. and A.R. Woollacott. 2005. Comparison of the playing performance of "third generation" artificial grass with natural turf used for professional soccer. ITRJ 10:15-26.

ACL Injuries and Field Measures

Anterior cruciate ligament (ACL) injuries are considered to be career-ending for many athletes. In fact, the Australian Football League (AFL) estimates that ACL injuries cost the league one million dollars (Australian) per year. There was some evidence that AFL players were hurt more often on fields outside of Melbourne, but no clear conclusion was drawn.

Ian Chivers of Racing Solutions Inc. collaborated with David Aldous of the University of Melbourne to determine specific field characteristics that could be linked with non-contact ACL injuries. No significant relationship was found to exist between ACL injury and surface hardness, moisture content or location. However, a significant relationship was found between injury and traction, especially with regard to amount of thatch and percentage of Bermudagrass. In essence, the more Bermudagrass present in the stand the more thatch, the more traction and consequently the more injury.

This study leaves many questions unanswered, especially for the northern sports turf manager. One thing is clear: as traction increases—either through improved field quality or more aggressively treaded footwear—the risk of ACL injury increases. Interestingly, the authors published a separate paper evaluating player perception of fields and looking at both data sets they concluded that the high traction fields that players prefer to play on are the ones on which they are most likely to incur an ACL injury.

From: Chivers, I.H., Aldous, D.E. and J.W. Orchard. 2005. The relationship of Australian Football grass surfaces to anterior cruciate ligament injury. ITRJ 10:327-333.