

Natural playing surfaces effect on athletic performance

2013 Research Update

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Purpose of Project:

To determine how playing surface type affects athletic performance and the magnitude of the resultant energy returned to the athlete to optimize performance and minimize injury potential. The objectives of this study are to:

1. Determine the effects of playing surface type on ground reaction forces produced during various dynamic and isometric movements.
2. Assess the impact of playing surface type on power production of athletes and the magnitude of forces returned to the athlete.
3. Analyze the effects of different playing surface types on biomechanics of landing after a jump.

Experimental Treatments:

Fifty men and women will be recruited for this study. Subjects will be asked to come in and perform a series of exercises on three different turf surfaces. Trials will be randomized to avoid potential training effect and each trial will be separated by a minimum of 48 hours.

The testing will be performed on natural and synthetic playing surfaces. The treatments are: 1) 85:15 sand/peat root zone mix, 2) sandy loam soil, and 3) a synthetic infill artificial turf. These root zones were constructed using portable Green Tech ITM modules (44.5" X 44.5"). Three replications of each playing surface were constructed totaling 9 modules. The natural playing surface modules were established using washed Kentucky bluegrass (*Poa pratensis* L.) sod.

Subjects will be asked to perform a series of athletic movements including a three-repetition vertical jump, a one-legged hop for 3-repitions, and running in place for 30 seconds. Dartfish Software (Alpharetta, GA) will be used to analyze 2-dimensional differences in knee valgus and plantar flexion upon ground impact. Module construction is complete and testing will begin February 1st.