

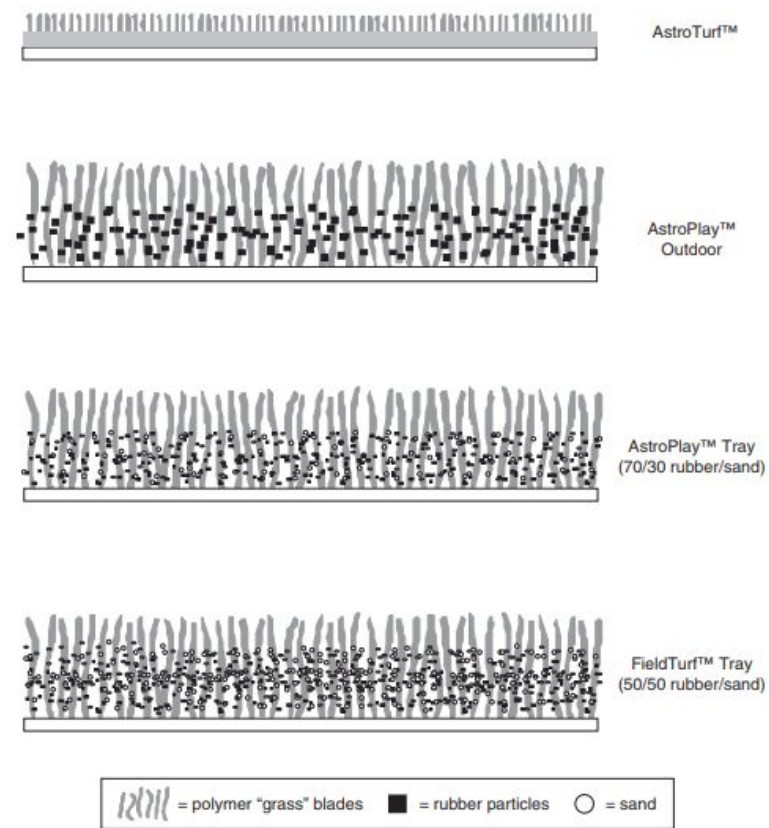


The Effect of 3G Artificial Turf and Natural Grass on Knee Injuries in High School Football

Introduction

3G artificial turf

- dominant turf in high school football
- Increased popularity
 - 22%-67% from 2007-2017(my survey)



(Livesay et al, 2006)

Introduction

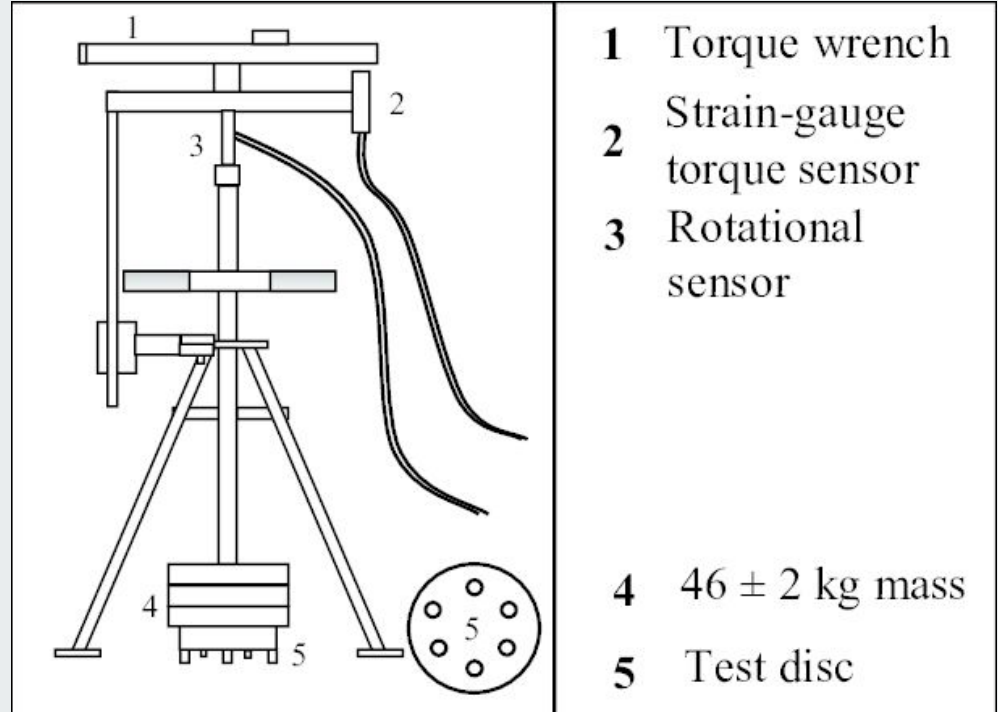
Natural Grass

- Kentucky Bluegrass
- Bermudagrass



Kinetics on Turf

- Common tests for grip resemble this image
- Grip affects the kinetics of the knee

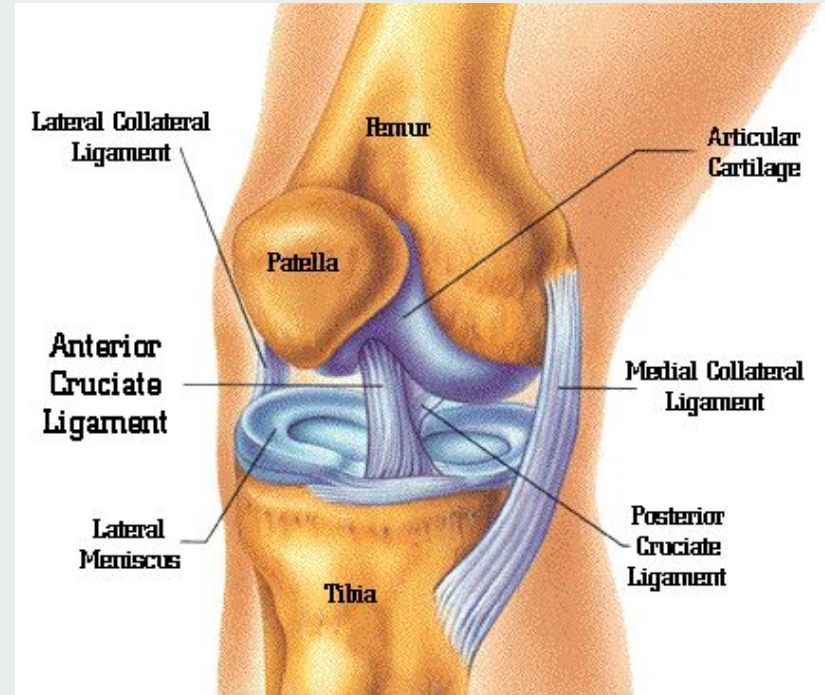


(Webb et al, 2014)

Knee Physiology

Most Common Injuries

- ACL
- MCL



Purpose

- To understand if there is a correlation between the playing surface and knee injuries
 - 3G artificial turf
 - Natural Grass

Hypothesis

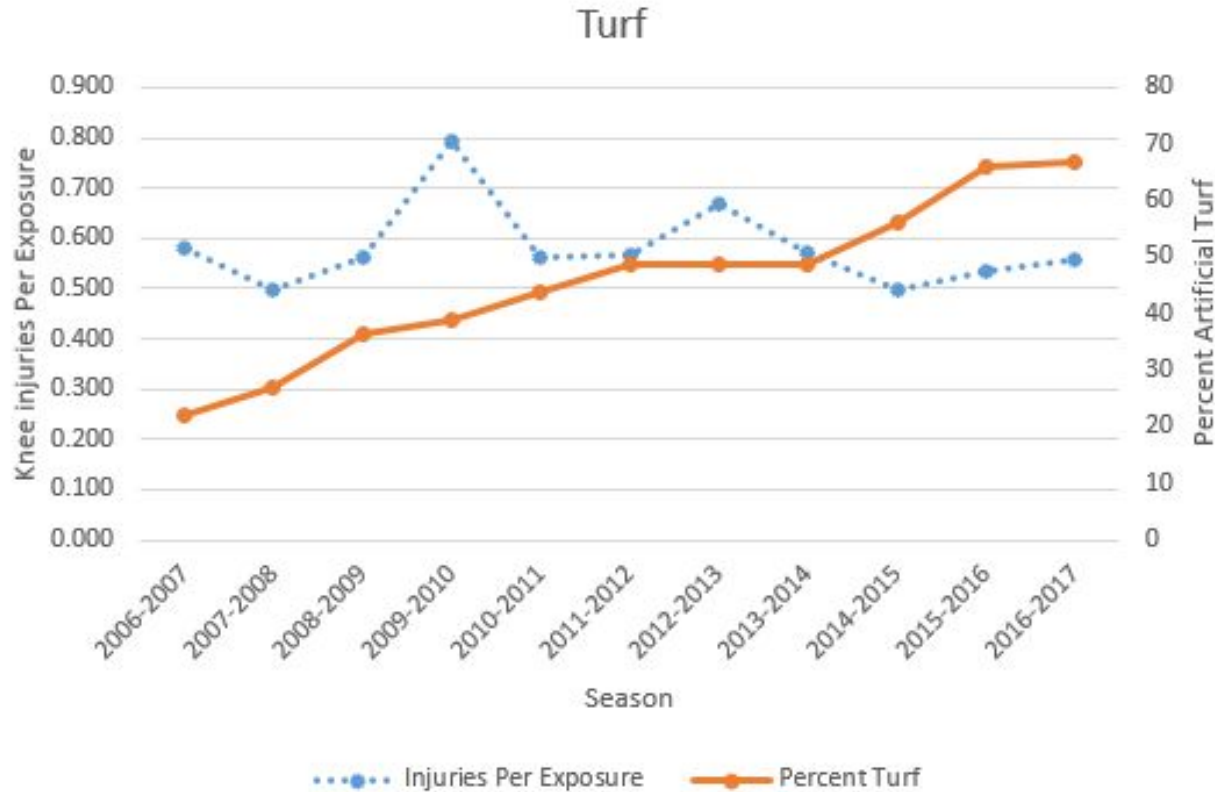
Alternate: 3G artificial turf will result in a higher knee injury rate

Null: There will be no change in knee injury rate from 3G turf to natural grass

Methods and Materials

- RIO Dataset
- Total knee injuries from 2005-2017
- Email survey of AP Capstone schools
- Year installed and type of field

Results



Discussion

- The data shows that there is no correlation between artificial turf and knee injury.
- Slight negative correlation
 - Games (-.138066949)
 - Practices (-0.2495359489)

Cost Comparison

Total

- Natural Grass: \$570,000
- Fieldturf: \$750,000

Cost Per Hour of Use

- Natural Grass: \$91.20
- FieldTurf: \$25.07

Conclusion

- No risk of more injury on Turf
- Slightly safer (negative population correlation coefficient)

Further Work



- Test non contact injuries only
- Test common shoe types from season to season and analyze in accordance to the injuries per exposure
- Analyze the non contact injuries cause by common movements

Acknowledgements



Dr. Nikki Malhotra, Tasha Beaudoin, Dr. Paul Fleming, the CSUCI library, the staff at Thousand Oaks High School, and the Center for Advanced Studies and Research Parent Network, and Dr. Harry Saunders

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