

Surface Hardness Measurements for Bermudagrass and Kentucky Bluegrass Grown on Four Root Zone Construction Types

A study conducted for Brock International to establish
baseline values for natural turfgrass surface hardness
characteristics

by

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Materials and Methods



Surface Composition

1. Kentucky bluegrass (cool-season) turfgrass on USGA Specification root zone
2. Bermudagrass (warm-season) turfgrass on USGA Specification root zone

Surface Root Zone Construction

1. ASTM Sand Specification
2. Silt Loam Native Soil
3. 6-inch Sand Cap system
4. USGA Sand Specification

Results



Surface Composition

- Turfgrass species main effects for surface hardness determined that bermudagrass had significantly harder surface conditions for both F 355 and Clegg surface hardness measurements (Fig 1. A & B)

Surface Root Zone Construction

- USGA Specification sand had significantly higher F 355 surface hardness measurements compared to the other three soil types (Fig 2. A)
- The native silt loam soil had significantly higher Clegg surface hardness measurements compared to the three soil types (Fig 2. B)

Fig 1. Clegg Surface Hardness main effects for Bermudagrass and Kentucky Bluegrass. Knoxville, TN Fall 2012

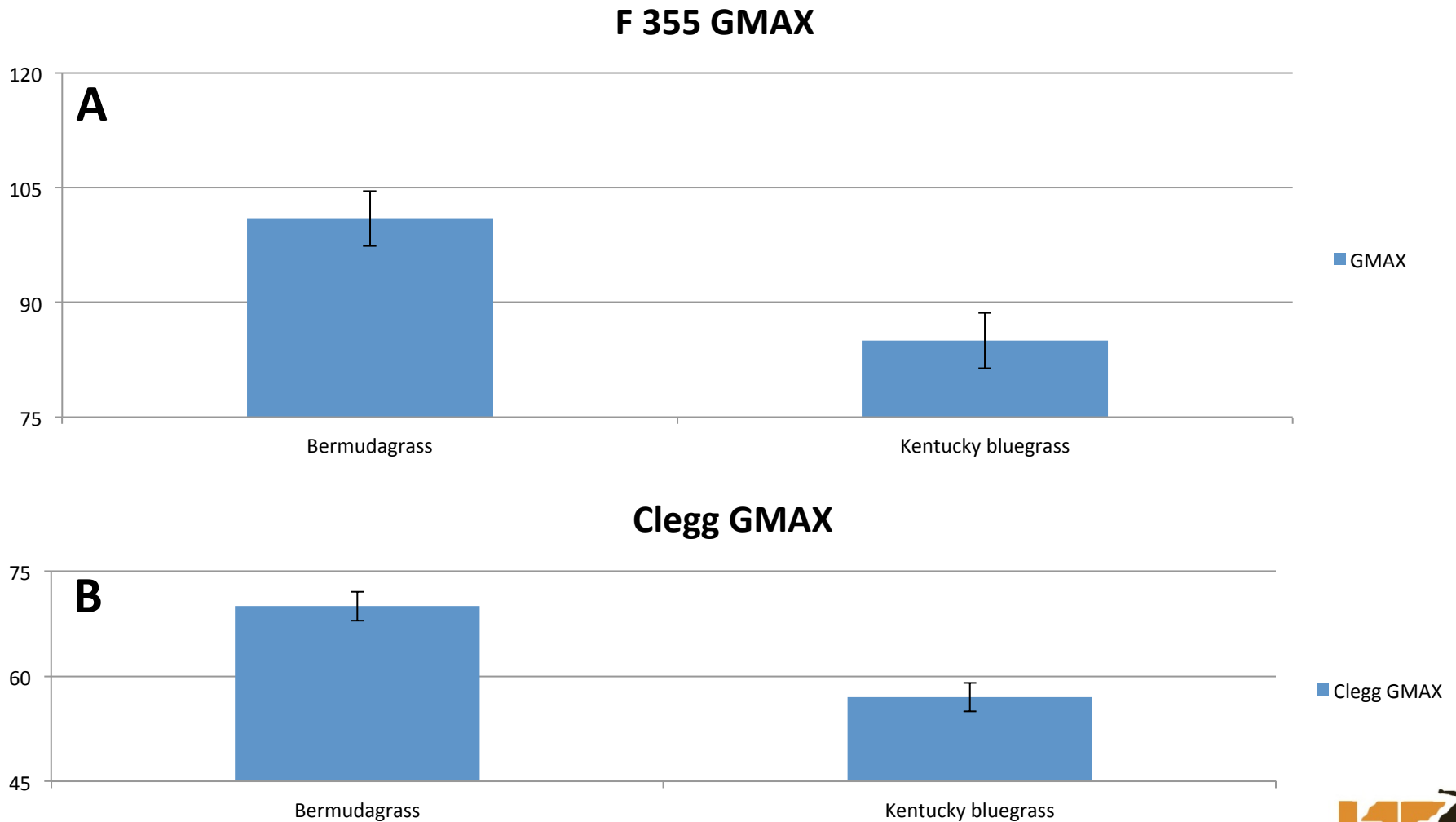
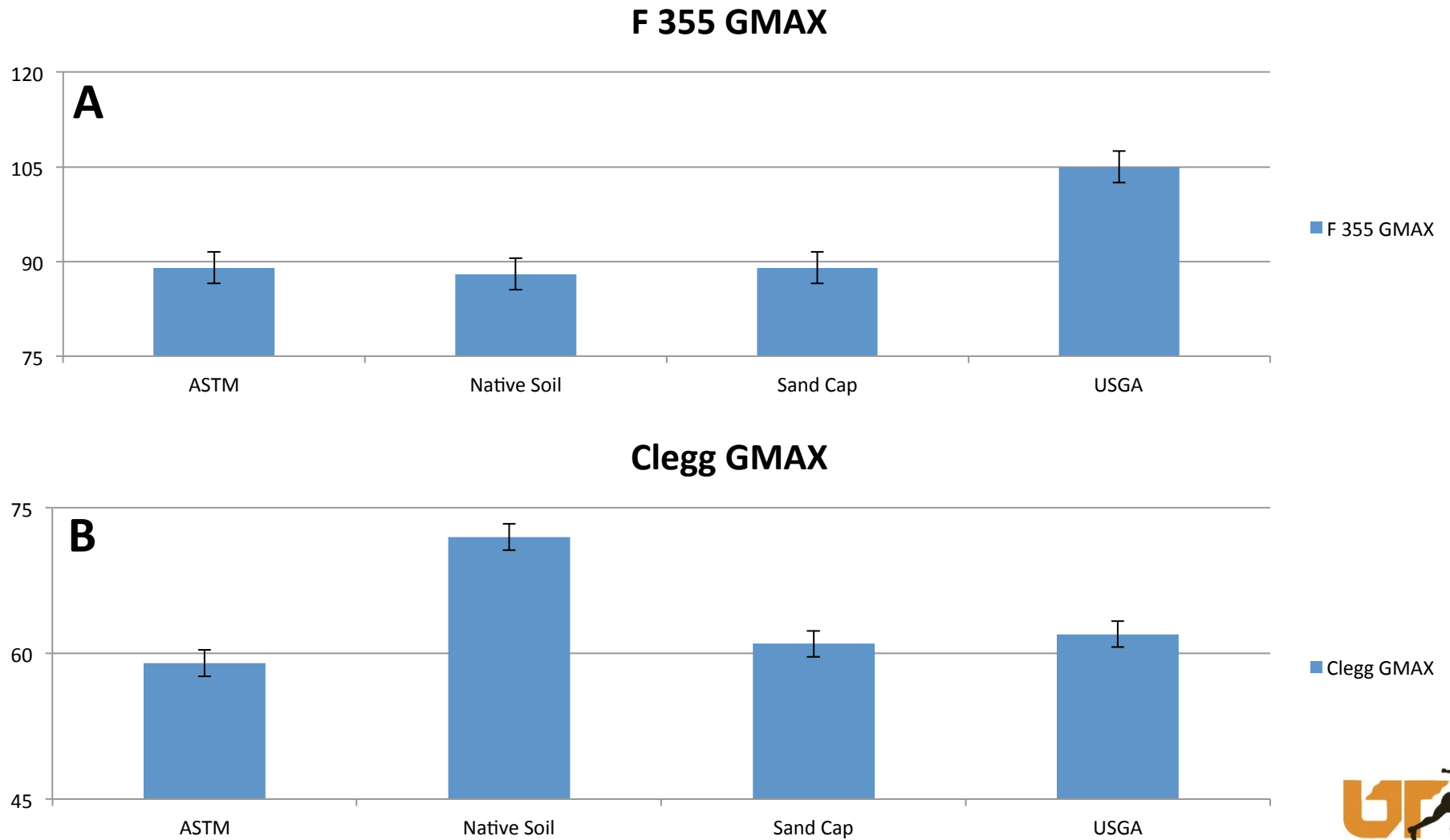


Fig 2. F 355 Surface Hardness main effects for Root Zone Construction Type. Knoxville, TN Fall 2012



Results



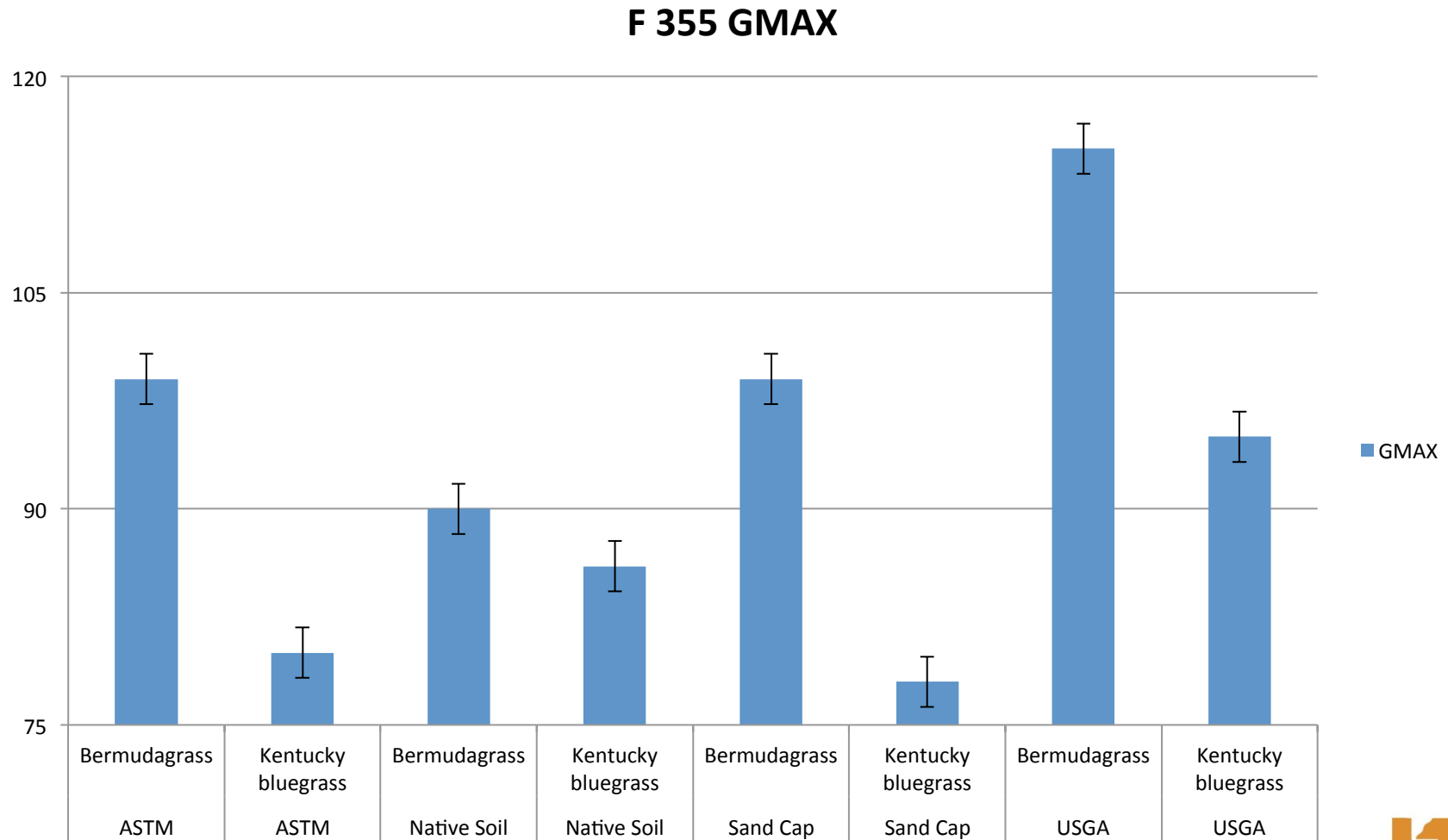
F 355 Interaction (Fig 3.)

- Bermudagrass grown on a USGA Specification sand root zone had significantly higher surface hardness than Kentucky bluegrass grown on the same root zone
 - However, Kentucky bluegrass grown on USGA Specification sand was not different than bermudagrass grown on the ASTM sand or the sand cap root zones
 - Conversely, there was no difference in surface hardness for bermudagrass grown on any root zone with sand
- Kentucky bluegrass grown on the ASTM sand and sand cap root zones had lowest surface hardness measurements

Hardest to softest

BG (USGA) > BG (ASTM) = BG (cap) = KBG (USGA) > BG (native) > KBG (native) > KBG (ASTM) = KBG (cap)

Fig 3. F 355 surface hardness for turfgrass type by root zone construction type interaction. Knoxville, TN Fall 2012



Results



Clegg Interaction (Fig 4.)

- Bermudagrass grown on a native soil root zone had the highest surface hardness, but was not different than Kentucky bluegrass grown on the same root zone (Fig 4.)
 - However, Kentucky bluegrass grown on the native soil was not different than bermudagrass grown on the sand cap or USGA Spec root zones
 - The aforementioned treatments were all significantly harder than the native soil bermudagrass which was harder than the native soil Kentucky bluegrass
- Kentucky bluegrass grown on the ASTM sand and sand cap root zones had lowest surface hardness measurements followed by Kentucky bluegrass grown on the USGA sand

**Fig 4. Clegg surface hardness for turfgrass type by root zone construction type interaction.
Knoxville, TN Fall 2012**

Clegg GMAX

