



## Wear Tolerance in Kentucky Bluegrass

by Doug Brede, Ph.D.



Wear study at Rutgers University

Would you pay extra for turf with better wear tolerance? If you would, you're not alone. More and more seed customers these days are asking for varieties with improved wear tolerance for use on sports fields or golf courses.

The benefits are self-evident. Wear tolerant grass takes more abuse before it thins out. It also may be the fastest to recover after traffic damage.

Turf researcher, J. Scott Ebdon and his colleagues at the University of Massachusetts, wanted to know what makes one variety tolerant of wear and another one sensitive? Their research shed light on the structural components of a variety that helps it tolerate wear and tear. The researchers found:

- Increased shoot density provides more tissue (cushioning or resiliency) available to absorb the impact of the injury caused by wear.

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## New 4<sup>th</sup> Generation Ryegrass: 'Monterey 4'

by Susan Samudio, MSc.

**Monterey 4** is Jacklin Seed's latest release from our Monterey series of fine-leaved perennial ryegrasses. This attractive grass will be making its market debut this summer.



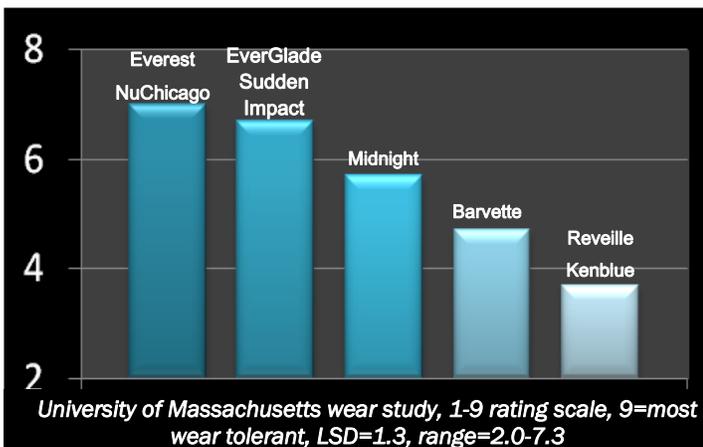
Monterey 4 breeder seed block growing near Spokane, Washington in 2009.

**Monterey 4** has been grilled for endurance in company turf trials in Maryland, Ohio, California and Idaho since 2007 where it has consistently ranked among the top entries. It performs well under diverse weather conditions from hot/humid summers to cold winters and grows well in the Transition zone. **Monterey 4** is adaptable to mowing heights from golf course putting greens and fairways for winter overseeding to the higher cutting heights of 2+ inches (50 mm) for parks and home lawns.

The dark green color and high density of **Monterey 4** make it a good choice for overseeding dormant bermudagrass. Initially tested in company overseeding trials in Palm Desert with positive results, we placed **Monterey 4** in the University of Arizona's *Continued p. 2*

*University of Arizona winter overseeding trial on dormant bermudagrass, performed October 2010 through June 2011 by Dr. David Kopec*

| Entry             | Color      | Density    | Texture    |
|-------------------|------------|------------|------------|
|                   | 12/11/2010 | 4/25/2011  | 4/25/2011  |
| <b>Monterey 4</b> | <b>6.5</b> | <b>8.3</b> | <b>7.8</b> |
| JR-521            | 6.3        | 7.8        | 7.8        |
| Nitro             | 5.8        | 7          | 7.3        |
| Pizzazz 2-GLR     | 5.8        | 8.3        | 7.5        |
| LSD               | 0.9        | 1          | 0.7        |



**Wear tolerance, continued**



Wear simulators come in many shapes. The device above at Rutgers University is a modified parking lot sweeper, known as the "Slapper." The British Sports Turf Research Institute (right) uses a differential slip device to compact and wear.



- Greater total cell wall components enable plants to withstand pressure (bending and crushing) compared to thinner-walled plant cells.
- Greater leaf cell

wall content can lead to higher leaf tensile strength and decreased leaf elasticity (flexibility).

- Greater leaf blade tensile strength (leaf rigidity) and a coarser leaf appearance may provide plants with greater resistance to tearing under traffic.

They went on to report that "by understanding wear mechanisms, selection criteria can be developed to aid breeders in developing improved turfgrass for sports turf."

The researchers chose Langara as a case study of a traffic-sensitive variety. "Langara is a wear-intolerant Kentucky bluegrass with an average wear rating of 4.4 (1 to 9 scale). Wear-intolerant genotypes such as Langara have a more horizontal leaf orientation, lower total cell wall content and higher shoot moisture content."

In a parallel study, the Massachusetts researchers found wear tolerance in **Everest**, **NuChicago**, **EverGlade**, **Sudden Impact**, and **Beyond** Kentucky bluegrass (see graph page 1). All were significantly better than Texas

hybrid bluegrass or common Kentucky (Kenblue).

Bradley S. Park and his colleagues at Rutgers University studied the seasonal nature of wear tolerance. Depending on the sport, traffic may occur in any of the four seasons. Park urges that "the season of play be considered when selecting Kentucky bluegrass cultivars for sports fields."

To reach that conclusion, the researchers inflicted fall, spring, or summer wear, using a custom-designed wear simulator known as the Slapper (see photo). Unlike metal-crest-based wear simulators, the Slapper wears out the foliage without damaging the roots. Using this device, the researchers found that **EverGlade**, **Sudden Impact**, **Nu Destiny**, **Award**, **Solar Eclipse**, **NuChicago**, and **Impact** maintained greater than 50% ground coverage after a severe slapping (see graph below).

In the same study, they found that "Bedazzled, Brooklawn, and Eagleton were very susceptible to wear damage during summer and fall in both years, ranking among the cultivars with the lowest canopy fullness. Langara, Bedazzled, and Touchdown had poor wear tolerance and recovery during all seasons."

Kentucky bluegrass often gets the reputation of being the little sister when it comes to wear tolerant sports turf. Not so, claims retired Nebraska extension specialist, Bob Shearman. Shearman wrote his doctoral thesis on wear tolerance at Michigan State University while studying under Jim Beard.

In a groundbreaking 1975 article on wear tolerance, the research duo concluded that turfgrass species do indeed differ in wear tolerance -- but maybe not the way you think. Their investigation showed that Kentucky bluegrass was the species most tolerant of foot traffic, followed by perennial ryegrass and tall fescue. Perennial ryegrass was the most tolerant of vehicular traffic, followed by a tie between tall fescue and bluegrass. Chewings fescue, Italian ryegrass, and roughstalk bluegrass were considered traffic intolerant. 🏠

**Monterey 4, continued**

2010-11 overseeding trials. **Monterey 4** ranked among the top of the trial (see table, page 1).

Many sites experiencing salt issues or that use gray water for irrigation will find **Monterey 4** is a good choice. **Monterey 4** had great performance in our Utah salinity trials (see November **NewsFlash**) that had salt levels in the 10 dS/m range. To fine tune just how much salt it could handle we entered **Monterey 4** in a University of Rhode Island greenhouse salt study which used salt levels from 12 to 27 dS/m. For reference, sea water is 45 dS. At 16 dS **Monterey 4** maintained 98% ground cover and at 20 dS it maintained 63% cover, outscoring many popular varieties.

**Monterey 4** is adapted for golf courses, sports turf, home lawns, parks, and industrial and school sites. 🏠

