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Testing Roots and Shoots

Specification

A leading Dutch University wanted to improve the yield and quality of a gluten-free cereal crop named Teff (Eragrostis tef). Teff is an ancient grain that originates from Ethiopia and is now grown in Europe. Teff grains and flour do not contain gluten. This makes it an interesting product for the health food market, in particular people with Coeliac disease. Ethiopian grown teff on the world market is scarce and initially the cereal did not grow very well in Europe. Researchers at Wageningen University identified that a major factor limiting the yield was the lodging or permanent displacement of plants. To identify the underlying causes of lodging several field trials were conducted.

Static Torque Screwdriver

Torque screwdriver in casing in field trial

Solution

The University of Manchester supplied the centre for Crop Systems Analysis with a Mecmesin torque measuring device to perform tests in the field.

In these tests, whole intact plants were measured and then the three biggest individual shoots were cautiously removed from the plant. The centres of gravity of the whole plant and of separate shoots were determined by balancing them on a thin, smooth metal tube and measuring the distance between the balance point and their base end. The gravitational moment of plants, shoots and panicles under 0, 3, 45 and 60 degrees was established with a custom-constructed lodging meter built from a sensitive Mecmesin digital torque screwdriver reading up to 1.5N.m in 0.0001N.m intervals.

Mecmesin equipment was used because it had been recommended by colleagues at Manchester University.

Testimonial

“The Mecmesin digital torque screwdriver was simple and straightforward to operate and it was very helpful that the user guide pdf was on the net.”

Sander H van Delden, Teacher/Researcher at the Department of Plant-Soil Interaction, HAS den Bosch/Wageningen University.

System

- Static torque screwdriver (not recommended for torque applications that exceed 180 degree rotation).
- Advanced torque gauge.

Academic Paper

For more information about this research, please see, “Analysing lodging of the panicle bearing cereal teff (Eragrostis tef)” in the New Phytologist by SH van Delden, J Vos, AR Ennos and TJ Stomph.

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