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FLORENCE - ITALY

16th International
Conference on
Wind Engineering



Wind on crops and trees

Summary outline:

Tornado climatology and risk in sparsely populated areas can be difficult to accurately assess. The Enhanced Fujita scale (EF-scale) relies on observable damage indicators to rate the intensity of a tornado. Therefore, areas of low population density lead to sparse structural damage (and therefore, a lack of damage indicators) in many events. This has led to a large research effort to use treefall and crop damage to help improve EF-scale estimates. Crop lodging especially can have a significant economic impact with a disproportionate effect on low and middle-income countries, as lodging can increase yield loss and harvest costs, while reducing grain quality and nutrient density. From a scientific perspective, the lodging of crops and trees is characterized by its multidisciplinary nature, coupling fluid dynamics through the modelling of severe wind events such as tornadoes, and agricultural studies through the description of natural canopies such as crops & trees by using simple harmonic motion models. The aim of this mini symposium is to introduce and examine this multidisciplinary field where wind engineers have a leading role to play. Whilst research in this area has been undertaken for over 20 years, the subject has tended to be at the margins of the community. However, the impact that wind engineers are making in this area and the importance of multidisciplinary research has ensured that this is rapidly changing.

The following key areas will be explored:

- The wind induced forces on natural canopies.
- The interaction of non-synoptic winds with natural canopies.
- The usage of remote sensing techniques to detect and characterize damage to crops and trees.
- Using tree and crop fall patterns to understand the structure of the wind and enhance post-disaster assessment of severe wind events.

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