

Windthrow is a major constraint to profitable forestry in Ireland.



## Managing forests and predicting WINDTHROW risk in Ireland

windthrow in forest stands in Ireland. Instead subjective assessments of risk are used to guide decisions regarding thinning and rotation length.

In 1999, COFORD funded a study, the objective of which was to devise a windthrow risk model for Ireland which would yield estimates of the probability of windthrow for a combination of site and silvicultural factors. Data were collected for a range of Sitka spruce (*Picea sitchensis* (Bong.) Carr.) stands growing on a variety of sites in Ireland. Of the fifteen factors examined, five were shown to contribute significantly to the probability of windthrow:

**D**amage to trees by strong winds (windthrow) is one of the most serious hazards in forestry in Ireland. Windthrow can happen before trees reach commercial maturity and this is a major constraint to profitable forestry. During the period 1971 to 1993 an average of 85,000 cubic metres of timber were windthrown on an annual basis – about 9% of the harvest. Volume losses from are expected to increase as forests established under recent public and private afforestation programmes reach heights where they are susceptible to windthrow.

Research has identified that a range of stand, site and silvicultural factors

influence the occurrence of windthrow. Site factors including soil, site elevation and slope, and silvicultural factors such as ground preparation (including drainage), as well as thinning type, have all been shown to play a role in windthrow.

A number of classification systems have been developed to assess the risk of wind damage to forests in Ireland and Great Britain. However, these models have tended to be deterministic, ranking the relative risk on different sites and/or from silvicultural treatments but not assigning a probability to the likelihood of damage. No model is currently used to assess the risk of

- top height of the stand - the taller the trees the more likely they are to blow over;
- the location of the stand in the country - stands located in the south-west, where wind speeds are greater and gusts more frequent, are more likely to blow over than those in the midlands, while those in the east coast are least likely to blow over;
- the soil type on which the stand was established - the risk of windthrow is greater in stands on wet soils such as gleys and blanket peats while it is lowest on well-drained brown earth and brown podzolic soils;
- the altitude of the site - higher windspeeds are recorded at higher altitudes hence the risk of windthrow is greater at higher altitudes;
- whether or not the stand had been thinned - opening up the canopy by thinning increases the risk of windthrow.

A model was developed that includes these factors and provides estimates of the probability of windthrow occurring in a stand. A user-friendly interface for the model has recently been developed and this will shortly be available on the COFORD website ([www.coford.ie](http://www.coford.ie)).

**For further information, contact Dr Áine Ní Dhubháin, School of Biological and Environmental Science, UCD Dublin, Belfield, Dublin 4, Ireland. Phone +353 1 7167755; Fax +353 1 7161104; Email: [aine.nidhubhain@ucd.ie](mailto:aine.nidhubhain@ucd.ie)**

