NEIKER fells pine trees to study their wind resistance

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Technicians of the Basque Institute for Agricultural Research and Development NEIKER-Tecnalia have in recent days been felling trees to simulate the effect of the wind in mountains in the Bizkaia locality of Artzentales. Forestry experts of the French Institute for Agricultural Research INRA together with technicians from NEIKER-Tecnalia and the Chartered Provincial Council of Bizkaia felled radiata pine specimens of different ages in order to find out their resistance to gales and observe the force the wind needs to exert to blow down these trees in the particular conditions of the Basque Country. This experience is of great interest for the managers of forests and will help them to manage their woodlands better and incorporate the wind variable into decisions like the distribution of plantations, or the most propitious moment for felling the trees.

Professionals like timber growers in the forestry sector, foresters, forestry technicians and researchers gathered to witness the simulation from close quarters. The trees were felled with steel cables that act as the wind force and which were fitted with sensors to measure the force need to bring the trees down. Each radiata pine had been fitted with three tilt meters that recorded the degree of tilt according to the force exerted on the tree. That way it was possible to determine the resistance of the roots and the strength of the trunk, two essential parameters to find out the capacity of the tree to withstand the thrust of the wind.

The experience carried out this morning is part of the seminar 'FORRISK: Wind damage risk in forests', which took place in the

Bizkaia Aretoa in Bilbao, and was organised by NEIKER-Tecnalia in collaboration with the Chartered Provincial Council of Bizkaia, HAZI and the Atlantic Regional Office of EFI (European Forest Institute). The seminar is part of the European project "FORRISK- Network for innovation in silviculture and integrated systems for forest risk management". This initiative has been co-funded by the ERDF and by the Sub-Ministry for Agriculture, Fisheries and Food Policy of the Government of the Basque Autonomous Community (region). The seminar took place in Bilbao because of its status as European Forest City 2014.

The seminar was used to present the detailed map of the characteristics of the wind in the Basque Country, which timber growers and forestry managers can now avail themselves of.The map has been produced by researchers at INRA, the French Institute for Agricultural Research, who have used information from the 57 meteorological stations equipped with anemometers in the network of the Basque Meteorological Authority, Euskalmet.

A tool for estimating wind damage

Those attending the seminar also had the chance to get to know the ForestGALES computing tool that allows managers to estimate the probability of wind damage in forests. ForestGALES was originally created for Britain and has been adapted to the characteristics of the Basque geography by INRA, NEIKER-Tecnalia and HAZI technicians. This innovative application is of great use in specifying concrete actions (for example: spacing, silvicultural interventions like clearing or thinning) bearing in mind the probability of wind damage on each plot.

To get the most out of this tool, it is necessary to know the resistance of the roots and strength of the trunks of the relevant species, as well as the characteristics of the wind where the trees are growing.So today's

simulation and the Basque wind map are two fundamental components for developing the ForestGALES model.

Increase in extreme winds owing to climate change

Cyclones like Klaus (2009) and Xynthia (2010) brought down over 200,000 cubic metres of timber as they passed through the Basque Country, owing to gusts of winds in excess of 228 kilometres per hour. Predictions indicate that the frequency of extreme phenomena like these is set to increase owing to climate change. So the forestry sector needs to have information and tools that will enable it to tackle the risks resulting from the wind.

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