MODEL OF TREES WIND STABILITY WITH EFFECT OF INTERACTIONS BETWEEN NEIGHBOURS

N.V. Filenkova, V.G. Soukhovolsky, Yu.V. Zakharov, N.F. Ovchinnikova

1 Siberian State Technological University, 82 Mira Ave, Krasnoyarsk, 660049, Russian; e-mail: yu.zakharov@mail.ru
2 Siberian State Aerospace University? 31, Krasnoyarsk Rabochy, Krasnoyarsk, 660014, Russia
3 V.N. Sukachev Institute of Forest SB RAS, 50 Akademgorodok, Krasnoyarsk, 660036, Russia

Abstract

This paper the theoretical analysis of trees wind stability with effect of interactions between neighbours is considered. The wind stability of tree and stand are depended from the interactions between neighbours and the presence of cooperative effects. Besides for description the influence of interaction between trees on the wind stability of stands two types of stand characteristics are considered. The first one is vertical parameter that characterized the projection stand on vertical plane. And the second ones are horizontal parameters that characterized the projection on horizontal plane. The characteristics each have concept and parameters which to described peculiarities of wind stability.

The effect of horizontal and vertical characteristics of tree interaction with neighbouring trees we have considered with taking into account competitive and cooperative effects by using the function of partial ecological utility. The function of partial ecological utility of tree is showing the probability of tree survives. Using the field’s data the corroboration of the theoretical dependence for the probability of windthrown tree to the number of neighbouring trees and the relative height of tree over the stand canopy was got. The independence of these cooperative effects from the place and conditions vegetation was shown.

Key words: forest stand, windthrown, stability, modeling

References

Н.В. Филенкова и др.: Кластерная модель ветроустойчивости деревьев с учетом ближайших соседей


