

Fires in Arid Agroforestral Landscapes and Their Damage Assessment

Vadim Viktorovich Tanyukevich¹, Anastasia Vladimirovna Kulik¹, Olga Ivanovna Domanina²,
Sergey Vladimirovich Tyurin², Alexander Alexandrovich Kvasha²

¹Federal State Budgetary Scientific Institution, Federal Research Center for Agroecology of RAS
400062, 97, Universitetsky av. Volgograd, Russia

²Federal State Budgetary Educational Institution of Higher Education Don State Agrarian University,
346493, settl. Persianovsky, October district, Rostov region, Russia

*Corresponding Author's E-mail: tanyukevich.fbsi@bk.ru

(Received: May 29, 2019; Revised: June 20, 2019; Accepted: July 05, 2019)

ABSTRACT

Impact of shelter forest belts of *Robinia pseudoacacia* L. on spread of fires and the damage caused by them was investigated for arid agroforestral landscapes of Russia. For arid regions of the world, we have obtained a mathematical model according to which in habitats where shelter forest belts of 1st class life-state grow, the area of fires in agrarian lands varies by an average of 1.22 ha / hour, and as to plantations of 2nd and 3rd classes - up to 1.56 ha / hour. The forest belts could suffer low (a forest stand is not substantially damaged), medium (more than 10% of live trees) and severe (less than 10% of live trees) degree of damages by fire. The damage caused in this case amounts to US\$ 220, 853 and 2,210 / ha. The world community has been recommended a method for fighting fires in arid agroforestral landscapes "Don Fire Protection" developed at Don State Agrarian University. A new scientific direction "agroforestry pyrology" is substantiated; its research object is agroforestral landscapes exposed to wildfires, and the main task is to study the patterns of occurrence, behaviour and consequences of fires on forest-meliorated lands in order to develop fire-safe technologies of protective afforestation under global climate warming.

Key words: agroforestral landscape; fire; shelterbelt planting; damage assessment; agroforestry pyrology.