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DEFOLIATING INSECTS IMPACTS ON FOREST ECOSYSTEMS

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Abstract

The impact on forest ecosystems caused by insect has two components, one ecological and one socio-economical. Ecological component relates to the effects of environmental parameters overview of the stands, with direct results in time on individual trees, as on the other components of ecosystems. The socio-economical component of the impact shows how these effects influence the forest resources including the productive ones and the aesthetic recreational ones. While the socio-economic value is expressed in units of currency/unit area (euro/ha), the environmental impact can be expressed in terms like: modifying the composition stands, reducing density, reducing annual growth rate or period etc. Each of these two components of the impact can be treated after the effect of time on the ecosystem, namely: long or short. At the level of forest ecosystems, with a complexity and objectives of management different, the concept of short or long term, is quite relative, so that below will not be explicit reference to the mode of action in time of the defoliators effects but only on each component of the forest ecosystem.

Key words: *forest, defoliating insects, ecosystems, types*

INTRODUCTION

The trees, like the main components of the forest ecosystem, following the loss of foliage primary due to defoliating insects, they become forced to produce a new line of foliage at the expense of reserve substances accumulated in previous years. This additional power consumption leads to depletion of reserve substances and debilitating the trees body, as biological unit. This presents some morphological and physiological changes with direct implications on the assimilatory trees. Amid these physiological weakening trees become more sensitive and vulnerable to various pathogens [37-41] attacks (*Oidium, Armillaria, Fomes*) which start the stress before the defoliating rushing dieback. At the same time it is created propitious conditions to mass propagation of various secondary pests already present in the ecosystem endemic with pests such as bark or wood fructification.

In these circumstances it lowers the productive capacity of the ecosystem to significant reductions in the increase in radial and axial tree and also by the fierce competition in air and ground, specific floor trees being advantaged trees species that are not hosts or that are defoliation, usually less valuable economically. In these circumstances it can capture additional growth of these trees that are not hosts, on the whole, does not cover losses in value of defoliated trees.

MATERIALS AND METHODS

Through gradual depletion of defoliated trees repeatedly reduce their reproductive capacity and default fructification. Seed production decreases quantitatively, by thinning the year fructification and reduce the abundance and quality, reducing seed germination by potency or attack of various fructification pests. In this way stand capacity for natural regeneration diminishes or becomes impossible.

On repeated defoliation, produced by chaining various defoliation gradations, stand density decreases on account of the species of trees dry in time the preferred tree species by defoliation. In this way, it contributes in printing the defoliation direction and rate of vegetation succession in the ecosystem and first floor of the trees [3-7, 35].

However, due to changes in environmental conditions within the forest (more light and

heat), it produces changes in the undergrowth structure. Under these conditions, floor undergrowth can fade over time or can be replaced with special light, with serious implications on the stability of the ecosystem and biodiversity [10-17, 32-34].

RESULTS AND DISCUSSIONS

At the herbaceous forest also occur significant changes in coverage soil composition and is dominating one or another species. Usually species of forest flora signs are replaced with perennial grasses with high coverage, which makes it impossible to bring the tree to natural regeneration.

Photo 1. Pheromone traps in combating defoliators Ord. Coleoptera (Original photo)

In such conditions, the pressure is intensifying in grazing and in the forest increase the risk of burning, with the most disastrous effects.
The other component of forest ecological communities, fauna and entomofauna - suffering obvious changes in the general economy with negative effects on the ecosystem as a whole [18-23]. Thus, hunting target quantity diminishes through migration or natural enemies fall easy prey, but also by lack of proper food quality and intensifying the consangvinity phenomenon [22, 32]. Amend also the specific game by focusing the temporary composition of predators, who are doing well in a stand more rare.
The worsening of nesting, in such conditions lowers useful bird populations and even some insects [24-31]. Also worsen conditions species nests of ants of the genus Formica. In such conditions gradations decreases resistance to various pests forest ecosystem, which develops more frequently and more intensely.
In establishing relationships between components of biota affected by defoliation and structural changes of this, they have an important transformations role that occur in the stationary factors (biotype), the interconnections with biota. Inside ecosystem under the defoliators impact produced on the first floor of trees, the amount of heat and light grows, intensifying air movements and also the air components, decreases the amount of heat and light increases, it intensify air movements and also the composition of the air decreases the atmospheric humidity and increase the bioactive length. Edaphic factors also suffer changes with further implications on biota, reduce organic horizon quantitatively (thickness) and quality by reducing the humification process soil content changes in nutrients and trace elements, it changes the pH of the soil under the impact of caterpillar excrement, worsening soil structure and porosity directly related to grazing. Increasing temperature and increasing the light intensity at ground level has direct influence on increasing evapotranspiration and even intensifying breathing roots.
Surface water from reservoirs (lakes, ponds, rivers, etc.) inside forests affected by defoliation, suffer transformations evident by increasing temperature and pH, the unfavorable influences on plankton and aquatic fauna.
The most important method to determine the presence and evolution of insect biological control method using pheromone traps. This method consists in using different race types (panel, funnel tetratrap) provided with bait containing specific pheromone synthetic defoliator [7,14,20].

Photo 2. Pheromone traps in combating defoliators Ord. Lepidoptera (Original photo)

The installation of these types of pheromone traps is made all spruce and fir stands of these species or mixed with beech, spruce and fir that provide over 30%, no matter the age stands. The location field racing takes place before the flight, this time differs from one area to another, depending on altitude and latitude forests monitored.

CONCLUSIONS

Socio-economic impact, although difficult to ascertain, involves considering the following:
-reducing the increase in volume of defoliation tree remained in the biotope [2,8,36],
-loss produced by extracting prematurely dried trees, taking into account the inferior varieties gathered,
-loss produced by forced promotion of quantitatively lower essences.
-the costs of artificial regeneration mandatory in such conditions [1,9], (without stand wounded fruition, grassy ground) or ecological reconstruction of these arboreta,
-the costs of additional work for screening, prognosis, quarantine and various gradations combat new pests,
-the costs for creating and implementing new technologies for the management and care of such arboreta.
In addition to economic considerations listed above, the social impact is hard to quantify defoliators and requires consideration of establishing the protective role played by this stand, as well as diminishing their aesthetic and recreational role.

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