Forster, B.; Knížek, M.; Grodzki, W. (eds.) 1999: Methodology of Forest Insect and Disease Survey in Central Europe. Proceedings of the Second Workshop of the IUFRO WP 7.03.10, April 20–23, 1999, Sion-Châteauneuf, Switzerland. Birmensdorf, Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) 80-83.

PEST STATUS AND RECENT INSECT OUTBREAKS IN PINE FORESTS OF LITHUANIA

Paulius Zolubas

Lithuanian Forest Institute, Girionys, 4312 Kaunas, Lithuania

Forests cover about 32% of Lithuania territory, but they are not evenly distributed over the state. Scotch pine (*Pinus sylvestris*) stands dominate in Lithuania and prevail in the sandy soils, mostly located in southern and eastern part of republic. Pine forests cover 702 thousand ha (37.2% of all forests) and this area has been increasing slightly during recent years (Lithuanian Forest Statistics 1998). Annual forest monitoring show improvement of pine tree condition: amount of damaged (rating crown defoliation) trees decreased from 25-27% (1989-95 data) to 15-16% in 1997-98 (Ozolincius 1998). Total area of forests, damaged by insect pests, was not large recently, if compared to that some years ago when massive outbreaks of defoliators in pine and bark beetles in spruce forests took place (Survey ... 1998, 1997). However, problems with insect pests in pine stands occur continuously and need persistent alertness and control measures.

The insect species, considered to be important forest pests and monitored constantly, are all divided into three groups: 1) young tree and seedling pests, 2) defoliators and 3) bark beetles. Weevils (pine weevil *Hylobius abietis* dominating) are causing the main problems in planted forests, and the importance of these beetles has been increased very much in last years. Forest area damaged by this species started to expand in 1996 (1192 ha), and despite all extensive preventive and control measures increased from few hundred hectars (long term average) to 2182 ha in 1998. This should be attributed to the improved breeding base - enlarged number of stumps in the expanded sanitary clearings following outbreaks of pine defoliating insects and spruce bark beetle disaster (fig.1).

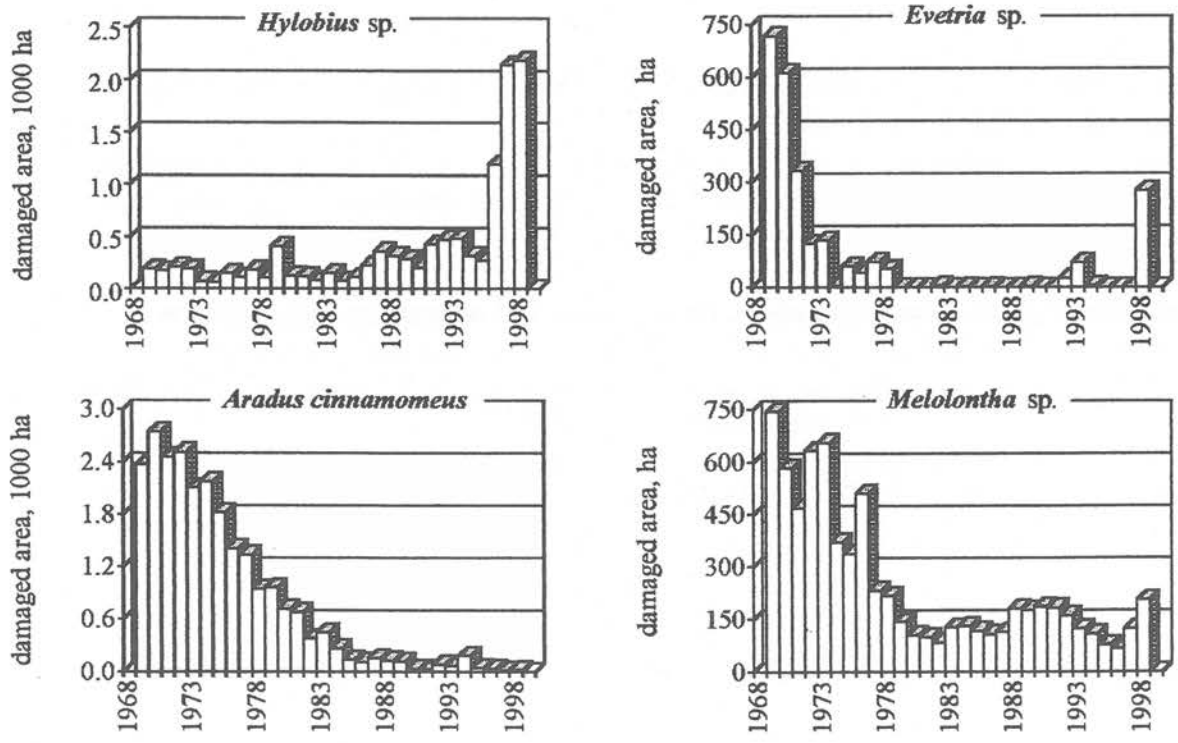

Fig. 1. **History of imamture forest pest damage** (data of Forest Protection Station)

Few species of tip moths *Evetria* sp. has been damaging about few thousand hectares of young pine forests annually in late sixties - early seventies, following expanded reforestation and plantings of new forests, but later these pests lost their importance and in eighties recorded damage was very low. However, rise of population was detected in 1998 and further increase of damage is anticipated as areas of planted pine forests has increased considerably in few last years. Still, no effective control means are generally used. The same pattern follow the history of forest damage by bug *Aradus cinnamomeus*, which injuries young pine trees starting from 8-10 year old, and recently was damaging only some tens of hectares per year. Rise of this pest should be predicted in few years when large areas of recently planted pine seedlings will enter risk stage. Larvae of cockchafers (*Melolontha* sp.), damaging roots of seedling, have had more significance in seventies, dominating in pine reforestation. Later damage decreased (fig.1), but still they are causing nuisance to foresters and time to time require control measures in limited areas, especially planting pine in former agricultural lands.

Tree defoliating pest list is long, but species differ in their extent and are the most difficult to predict. There are species, for example, *Neodiprion sertifer, Panolis flammea* with single recorded outbreaks in Lithuania since 1969; these unexpected flashes make serious damage (fig.2). However, recent pest survey show signs of another increase of *Panolis flammea* population; slight defoliation is predicted in some areas after twenty years of depression.

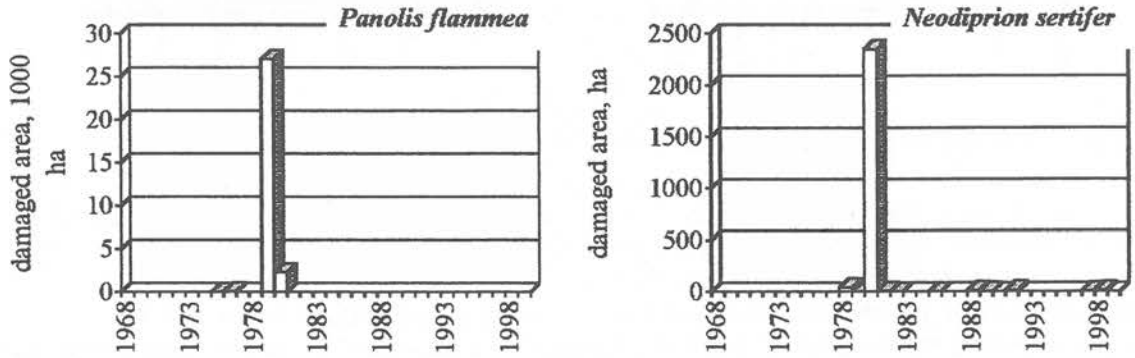

Fig. 2. **History of defoliating pest damage** (data of Forest Protection Station)

Pine webspinning sawfly *Lyda nemoralis* for the first time was noted in 1973 (fig.3) and since then two widescale outbreaks have been recorded in compact area in the pine forests of north-eastern Lithuania. Last years population is beeing low, because this species have facultative diapause which make it very hard to predict.

Nun moth *(Lymantria monacha)* currently is considered to be one of the main defoliating pine pests in Lithuania. Outbreak of this pests in 1979-83 was supressed by massive use of conventional chemicals five years in turn. Nevertheless damage was recorded in few thousand hectares annually during outbreak. During recent outbreak only in 1993 more than eleven thousand hectares were damaged. In 1994, despite aerial application of bacterial insecticide Foray 48, some ten thousand hectares suffered heavy defoliation. Outbreak ended in 1995 and in few recent years no damage is recorded (fig. 3).

Pine moth *(Dendrolimus pini* L.*)* has been known as common moth species in Lithuania, but only in 1994 outbreak occurred, starting predominantly in pine stands weakened by droughts and slight pine sawfly injuries, and in 1995 damage was projected to extend to 28.0 thousand hectares. Foray 48 was applied in 11450 ha, but still damage was recorded in the area of 16.55 thousand hectares in 1995 (Survey ... 1995). Next year outbreak ceased and pest population dropped to almost undetectable level now.

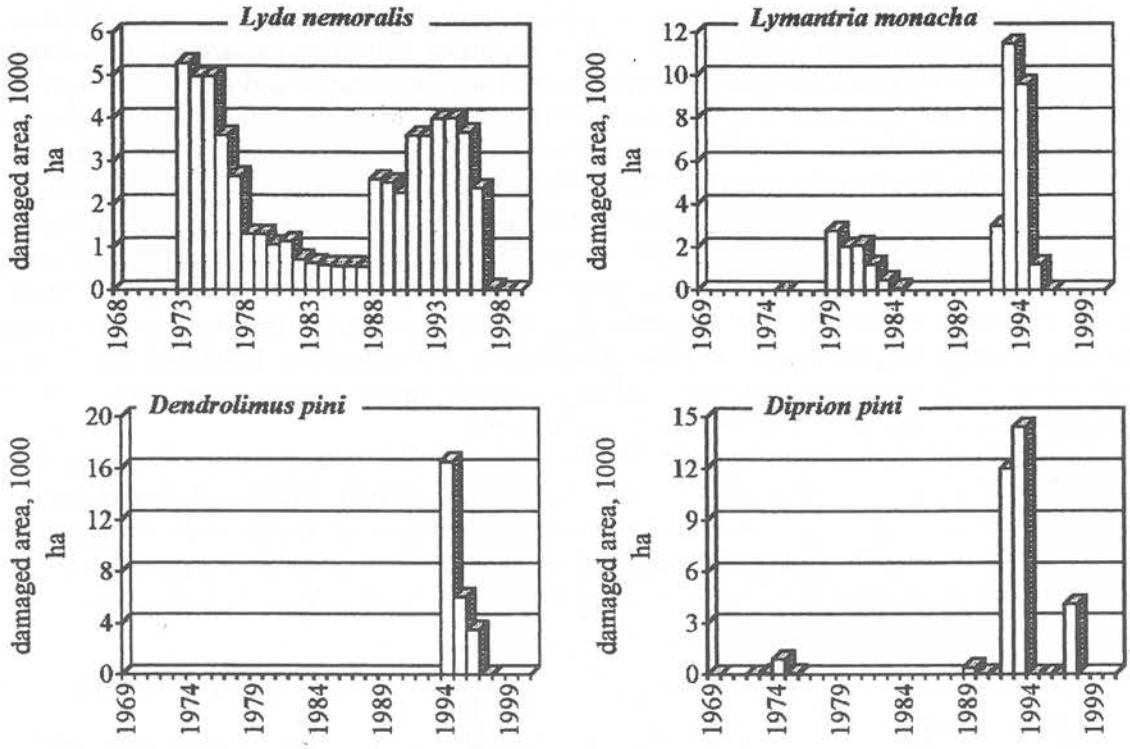

Fig. 3. **Recent outbreaks of defoliating insects** (data of Forest Protection Station)

Pine sawfly *(Diprion pini)* is also a serious pest in Lithuanian pine forests. Chemical control measures succesfully have been applied and have stopped the ascenting outbreak in seventies - damage had not exceeded hundreds of hectares per year. In nineties ecological and economical situation (public awareness, lack of financing and absence of effective microbial preparations) led to the case when sawfly damaged 12-15 thousand hectares of pine forests per year (fig. 3). However, further monitoring revealed high potential of natural enemies - pine sawfly population was supressed by parasites following peak defoliation and no significant damage occurred in 1994-96. Situation repeated when pine sawfly damage was encountered in the area of 4110 ha in 1998. Application of chemicals was already scheduled during the second generation of the pest, but had to be cancelled - surveys revealed that major part of cocoons were parasitised by braconid vasps.

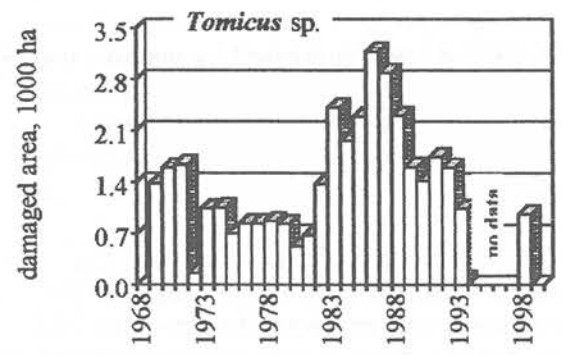

Fig. 4. **Damage of pine bark beetles** (data of Forest Protection Station)

Pine bark beetle population *(Tomicus piniperda* and *Tomicus minor)* does not fluctuate so extremely as in defoliating insects. Still their damage is recorded each year in all areas with pine stands and sanitary fellings are needed constantly over the whole territory of the state. There was a long lasting outbreak in eighties when damaged area reached 3175 ha in 1986. Now the situation has stabilised, damage reached approximately one thousand hectares in 1998. Constant monitoring is implemented and necessary bark beetle control measures (sanitary fellings and trap log deployement) are applied. Generally bark beetles are not so dangerous insect pests as defoliators in pine forests of Lithuania.

Acknowledgements

My special thanks to the staff of the Lithuanian Forest Protection Station for the permission to use their data in this report.

References

Ozolincius R. 1998. Conifers in Lithuania: transformations of morphological structure and factors inducing them. Lutute, Kaunas: 218-240.

Lithuanian forest statistics. 1998. VMI, Kaunas: 71 p.

Survey of sanitary conditions in state forests of Republic of Lithuania. 1995. Forest protection station, Girionys: 122 p.

Survey of sanitary conditions in state forests of Republic of Lithuania. 1997. Forest protection station, Girionys: 104 p.

Survey of sanitary conditions in state forests of Republic of Lithuania. 1998. Forest protection station, Girionys: 133 p.