

DAMAGE CAUSED BY OAK PROCESSIONARY CATERPILLAR IN OAK STANDS IN SAXONY-ANHALT

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A mass propagation of oak processionary caterpillar (*Thaumtopoea processionea*) in the Elbe Havel region in the northeast of Saxony-Anhalt in connection with extreme weather conditions led to strong damage in oak stands.

Starting in 1995, oak processionary caterpillars occurred in this area and struck preferentially thin oak stands in field peripheral locations. In 1996, the infestation intensity reached its highest level. On an area of 800 hectares, strong defoliation by *Thaumtopoea processionea* has been registered. 250 hectares of total defoliated oak stands were observed, among others also these forest districts described here in particular.

According to literature, the larval development of *Thaumtopoea processionea* lasts between 66 and 87 days. In 1996, the larvae hatched in the first week of May. The feeding period, due to this late hatching date already expanding into July, has additionally been extended by damp and cool weather. As a result of this prolonged feeding period, oak shoot regenerations were constantly and repeatedly destroyed. The unexpected temporal expansion led to the result that trees remained completely defoliated until August. Then, intensive sprouting started in the formerly defoliated stands. Sprouting and shoot regeneration occurred until the first November week. This long lasting growth of sprouts and shoots, favoured by mild and damp weather, prevented the necessary formation of frost hardness in oaks. After some root-damaging soil frosts at the end of November, the temperatures fell permanently under zero. With lowest values reaching -20°C , the spell of frost lasted until the middle of January 1997. In this time strong, however not yet obvious frost damages within the phloem area of the trunk occurred. This was shown after sample fellings. These damage were intensified by night and soil frosts in the time of earlywood formation of the oaks as well as by strong late frosts at the beginning of June 1997.

Oaks essentially limit their water transportation to the last earlywood ring. As a substitute the latewood of the last years can fulfil this function (BLANK, 1997). Due to the strong stress situation on these stands, however, no considerable latewood proportion was formed for years. The physiological function of earlywood was lost to a large extent because of the strong late frosts in 1997. On particularly exposed locations, many oaks were not able to sprout because frost damages had finally destroyed the normal vital functions of the trees.

So far, two phases of damage development have become obvious in this area. In 1997, acute dying of trees as described before characterized the initial phase of damage. This especially occurred in pre-stressed, totally defoliated stands in field peripheral locations. Later and until now, surviving trees of these stands have been attacked by oak buprestid beetles (*Agriilus biguttatus*, *A. sulcicollis*) leading to considerable damage, again.

Extreme damage occurred in the forest districts of Fiener, Altenplathow and Magdeburgerforth. The following table gives an outline of damaged stands and the amount of timber which had to be felled for sanitary reasons. On the basis of these figures, it becomes visible that on some locations the stand structure became sparse and was finally resolved.

Table: Extent of necessary sanitary fellings

	forest district	damaged area (ha)	extent of sanitary fellings		
			total (m ³)	mean (m ³ /ha)	maximum (m ³ /ha)
1997	Altenplathow	62,47	1991	31,9	97,9
	Fiener	70,35	1933	27,5	162,4
	Magdeburgerforth	44,17	1383	31,3	64,2
1998	Altenplathow	35,34	1366	38,7	46,6
	Fiener	71,09	1335	18,8	46,6
	Magdeburgerforth	48,58	868	17,9	160,0
1999	Altenplathow	54,88	1490	27,1	52,1
	Fiener	16,43	249	15,2	43,8

The local forest personnel was made familiar with the strategy of sanitary fellings necessary here to become able to limit the further propagation of oak buprestid beetles effectively. Taking off all recently died or moribund oaks, respectively, is recommended in order to reduce further losses caused by buprestid beetle attack.

Some of the damaged stands were selected for further investigations concerning the infestation of the remaining stock by wood-destroying borers (*Platypus*, *Xyleborus* etc.).

Defoliation by *Thaumatopoea processionea* represents a special threat for oak stands on exposed locations. It is important to be able to predict the potential infestation intensity by this species. A prognosis scheme according to that for the green oak moth (*Tortrix viridana*) attack in Germany seems to be suitable. In February, branches should be taken out of the upper part of oak canopy (e.g. 10 branches of 50 cm per tree). These branches can be searched for available clutches of eggs (high scoring error due to overlooking) or inserted into so called 'Photoektors' to count the hatching larvae. The extent of endangering results from the relation of the number of vital buds versus the number of hatched *Thaumatopoea* larvae. Critical numbers which are an indicator of acute threat are not well-known for the oak processionary caterpillar. They might be smaller, however than the values of 30 to 50 larvae per 100 buds determined empirically for *Tortrix viridana*.

Reference

BLANK, R., 1997: Ringporigkeit des Holzes und häufige Entlaubung durch Insekten als spezifische Risikofaktoren der Eichen. *Forst und Holz* **52**, 235-242.