

FIRST RESULTS OF NEEM APPLICATION BY TREE INFUSION AND TRUNK-PAINTING AGAINST LEAF DESTROYING INSECTS

MANFRED LEHMANN

Landesamt für Ernährung und Landwirtschaft Frankfurt (Oder) - Pflanzenschutzdienst - Ringstraße
1010, D - 15203 Frankfurt (Oder), Germany

Test applications under use of NeemAzal-insecticides have been carried out since 1995 in tree avenues, urban tree stocks in squares and on solitary trees against leaf destroying caterpillars and larvae of other arthropods in the Land Brandenburg. Besides the employment of ground-based machines the efficacy of trunk-painting and infusions into the trunk were tested to control the target organisms *Thaumetopoea processionea* on *Quercus robur*, *Yponomeuta malinellus* and tortricids (*Olethreutes variegana*, *Hedia nubiferana* and *Spilonota ocellana*) on apple trees, *Phyllonorycter leucographella* in *Pyracantha coccinea*, *Lymantria dispar* on *Quercus rubra* and other large trees and *Euproctis chrysorrhoea* on several deciduous trees. We made further trials of Neem against the "leaf-rolling wasp" *Blennocampa pusilla* on roses in a botanical garden and against an undetermined gall mite on *Tilia cordata*.

The infusions of Neem were carried out under use of injection needles with a medical infusion set. We kept the infusion-solution in glass bottles of 300 ml content fixed to the trees by a wire. 2 mm needles were put into 2,5 mm holes in bark and wood of the trees. The bottles were filled with a 1 % water - Neem active substance mixture filtered with a paper filter or unfiltered. According to the diameter of the trunks the lime tree carried 4 bottles and the oaks one bottle. One application (oak and lime 1999) and three applications (lime 1998) were carried out.

The second test on the lime tree resulted in bud drop and leaf deformation following low temperatures. Depending on the time of application the infusion took 4 to 14 days. The favoured moment of infusion seems to be the stage of "small bud". Effects were detectable but not satisfactory. Side effects may happen, especially using the unfiltered Neem solution and under influence of frost.

Tab. 1: Results of NeemAzal tests 1995-1999 in public green areas of Land Brandenburg

Target organism	mode of application	NeemAzal concentration in water	NeemAzal formulation	efficacy in %
<i>Lymantria dispar</i> *	spraying	0,5%	T/S	50 ... 60%
<i>Lymantria dispar</i>	trunk-painting	50% in 100 ml each tree	T/S	15%
<i>Lymantria dispar</i>	infusion	3 grams/300 ml/tree	conc. active substance	15%
<i>Euproctis chrysorrhoea</i> *	spraying	0,5%	T/S	50 ... 60%
<i>Yponomeuta malinellus</i>	spraying	0,5%	T/S	73 ... 94%**
Tortricids	spraying	0,5%	T/S	80%
<i>Thaumetopoea processionea</i>	spraying	0,5%	T/S	0 ... 67% **
<i>T. processionea</i>	trunk-painting	10%	T/S	67...70%**
<i>T. processionea</i>	spraying	1,0%	T/S	33 ... 87%**
<i>Phyllonorycter leucographella</i>	spraying	0,5%	T/S	> 90%
Gall mite	infusion	1 or 3 x 10 grams in 1 l a tree	conc. active substance	extremely variable
<i>Blennocampa pusilla</i>	spraying	0,5%	T/S	uncertain

Notice: *under supervision of S. Haase 1995/96; ** depending on the mode of evaluation: i.e. number of infested trees, degree of defoliation, number of surviving target organisms.

The Neem-painting was applied by a brush with a NeemAzal-T/S-water-mix (1:10, 1:1) at the trunk 1 m above the ground. The effects were varying but detectable. Application should be carried out before the caterpillars begin to hatch.

The effects were compared to untreated and/or to other, chemical or biological, insecticides registered for use on ornamental plants or ornamental trees and in forestries. The efficacy of sprayed NeemAzal-T/S was satisfactory and nearly as high as compared with other insecticides. Neem infusion and Neem trunk-painting show some effects, but the results are uncertain and the efficacy is too low. The provisional technical solution of infusion is non-commercially manufactured. The way of impact to the tree organism and the transport ways inside the tree should be tested in connection with radioactive labelled compounds.

The favourable effects of NeemAzal-T/S - low risk to beneficial arthropods (spiders, hymenopteres, beetles) and non-target organisms, low smell pollution, no or low hazard to humans, soil and water organisms - can be improved by infusion and trunk-painting.

The slow impact to the target organisms, an extremely small sector of effective period and, sometimes, no visible short-time reaction by the target organisms, are typical for Neem-infusion and trunk-painting.

Tests planned for 2000:

- Trunk injection on *Aesculus hippocastanum* against *Cameraria ohridella*.
- Trunk painting in tree nurseries on ornamentals against aphids, gall mites and/or spider mites
- Spray application by helicopter against *Thaumetopoea processionea* on *Quercus robur*