Co-financed by Greece and the European Union

Development of a Textile with Silica coating for environmental friendly control of insects in Agricultural production

Deliverable [11]: *[Coated woven fabric]*

Version 1.0: first version delivered on 28/03/2019

Version 1.1: second version delivered on 28/11/2019 (*the results from test with insects are added*)

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Project Details:

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Deliverable Details

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Lead beneficiary: [Thrace NG]

Involved Partners: [Thrace NG, P&S]

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The current version was released after the evaluation of the effect of different types of silica nanoparticles or of screens covered with different types of silica nanoparticles on insect's mortality or knockdown.

Abbreviations:
ITA: Institut für Textiltechnik, Germany
UTH: University of Thessaly, Greece
ThraceNG: Thrace Nonwovens & Geosynthetics S.A.
P&S: Powder and Surface GmbH

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1. Summary

In this deliverable the production of coated woven nets is described. Initially, two type of yarns (multifilament and monofilament) were produced so as to be subsequently used for the construction of woven insect nets. After conducting weaving trials, the monofilament yarns were found to be suitable for the production of insect nets. Therefore, monofilament yarns were used for the production of three different types of woven nets. Specifically, 25, 40 and 50 mesh woven nets were produced in flat shuttle looms. The differences in the construction of the nets resulted in nets with different opening sizes and ventilation properties. The silica coated woven nets were produced with pilot plasma coating unit. In this process, the polymer is plasticized by a cold plasma jet. The silica particles are inject with a special distribution pump into the plasma jet and melted in the surface of the polymer. Therefore, no additional adhesive is need, which could destroy the nanostructure of the silica particles.
Coated textiles were analysed in microscopy for light transmittance as well as for air permeability and tenacity, as shown in Figure 1. It was shown that the coating of the textile does not have a negative effect on the tenacity, but does influence the air permeability and the light permeability. The biggest effect is thereby caused by the particle size, where bigger particles result in a bigger reduction.

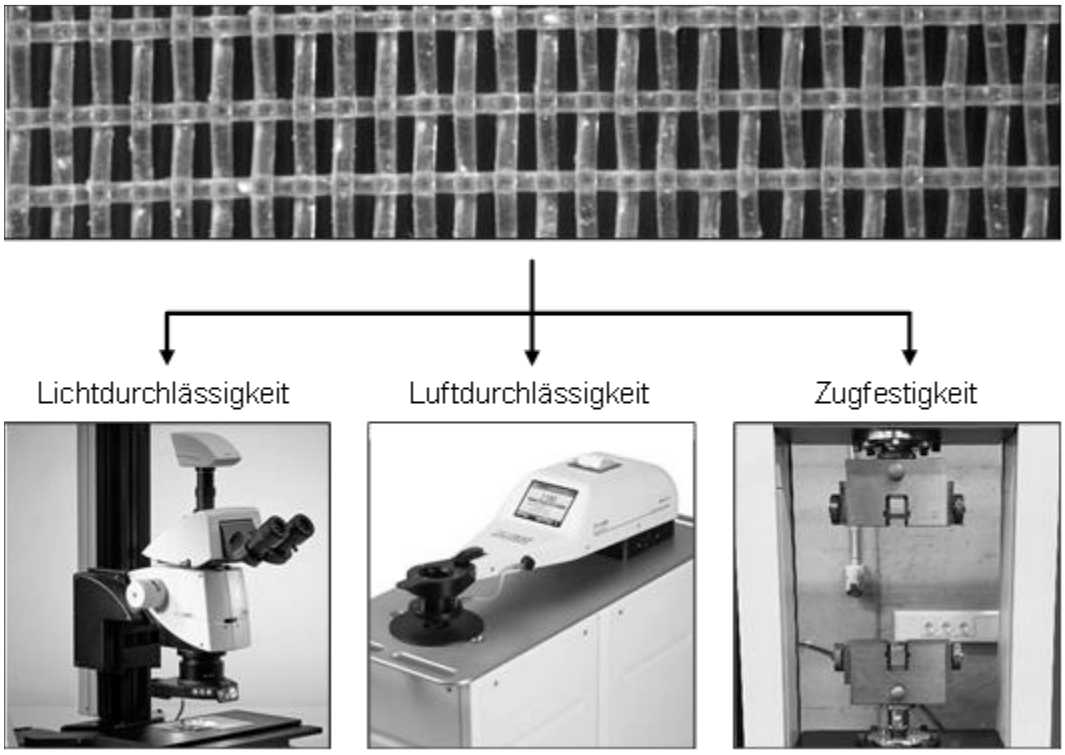

Figure 1: Testing methods for coated textile

The deliverable is available upon request

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