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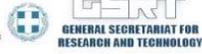
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Development of a **Textile** with **Silica** coating for environmental friendly control of insects in **Agricultural** production

Deliverable [20]: [Report on the evaluation of screen materials in the field: effects on insects and microclimate under cover]

This project is co-financed by the European Union and Greek national funds through the bilateral Greece-Germany S & T Cooperation Program, Competitiveness, Entrepreneurship & Innovation (EPANEK) (project code: T2DGE_0120).



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Abbreviation:

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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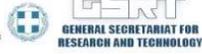


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Summary

According to the technical description of the project, the goal of the present deliverable is to report the results of the evaluation of screen materials in the field concerning their effect on insects' infestations and the microclimate variation under cover. All experiments performed within the framework of the project under both laboratory and field conditions are presented herein.

The following experiments took place during the period of the project in lab and field conditions:

1. Lab experiments with silica nanoparticles and screens on stored-product insects
2. Lab experiments with silica nanoparticles against *A. fabae*, *S. oryzae*, and *T. confusum*
3. Lab experiments with insect screens against *A. fabae*, *S. oryzae*, and *T. confusum*
4. Field experiments with insect-proof screens coated with SiO₂ against greenhouse insects
5. Mechanical, optical and aerodynamic properties of the screens

A detailed description of the methodology and the results of the experiments is given in this deliverable followed by an extended discussion comparing the results of our study to those available in literature.

The following journal publications resulted from the work performed in the experiments described herein

- Faliagka, S., Agrafioti, P., Lampiri, E., Katsoulas, N., Athanassiou, C., 2020. Assessment of different inert dust formulations for the control of *Sitophilus oryzae*, *Tribolium confusum* and *Aphis fabae*. Journal of Stored Product Research, 137: 105312, <https://doi.org/10.1016/j.cropro.2020.105312>
- Agrafioti, P., Faliagka, S., Lampiri, E., Orth, M., Pätzelt, M., Katsoulas, N., & Athanassiou, C. G. Evaluation of silica-coated insect proof nets for the control of *Aphis fabae*, *Sitophilus oryzae*, and *Tribolium confusum*. Nanomaterials, 2020 10(9), 1–12. <https://doi.org/10.3390/nano10091658>
- Faliagka, S., Katsoulas, N., 2022. Silica coated insect proof screens for effective insect control in greenhouses. Biosystems Engineering, 215, 21-31 <https://doi.org/10.1016/j.biosystemseng.2022.01.003>.

In addition, the following announcements have been done in International scientific symposia

- Faliagka, S., Germani, R., Agrafioti, P., Xidas, P., Athanassiou, C., Katsoulas, N., 2021. SiO₂ applications as an alternative to insect control in greenhouses. 1st International Electronic Conference on Agronomy. <https://doi.org/10.3390/IECAG2021-09720>
- Faliagka, S., Germani, R., Agrafioti, P., Xidas, P., Athanassiou, Ch., Katsoulas, N., 2022. SiO₂ applications as an alternative to insect control in greenhouses. Biology and Life Sciences Forum 2021, 3, 32. <https://doi.org/10.3390/IECAG2021-09720>



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The deliverable is available upon request

Please send e-mail to the project coordinator: nkatsoul@uth.gr

D [10]: [Data of the fiber's characterization]

