Physical barriers *vs* Pest

Laboratory for quality control and evaluation of agrotextiles

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Rocío María Oliva Molina

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PEST

Bemisia tabaci

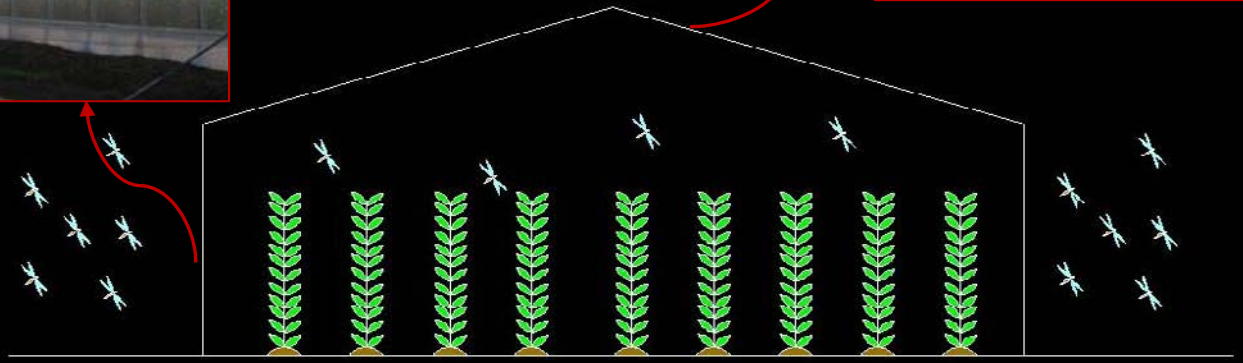
Aphis gossypii

Trialeurodes vaporariorum

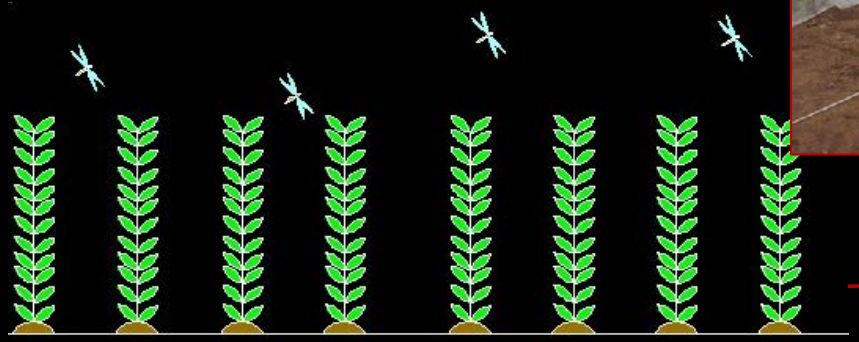
Drosophila suzukii

Frankliniella occidentalis

Greenhouses…



Outdoor crops…



Major problems

- Wide variety of screens with different densities and geometric of pore.
- There are not standards.
- Use fraudulent of terminologies (anti-thrips) that they do not meet with the expectations generated to the farmers.
- The design criteria followed to the manufacturer is not enough. There are other variables that have influence on the efficacy (air velocity, temperature and sex ratio).
- Wrong use causes climate problems inside of greenhouse.

Efficacy against *F. occidentalis*

No effective screen

Efficacy against *B. tabaci*

53% (Effective > 90%)

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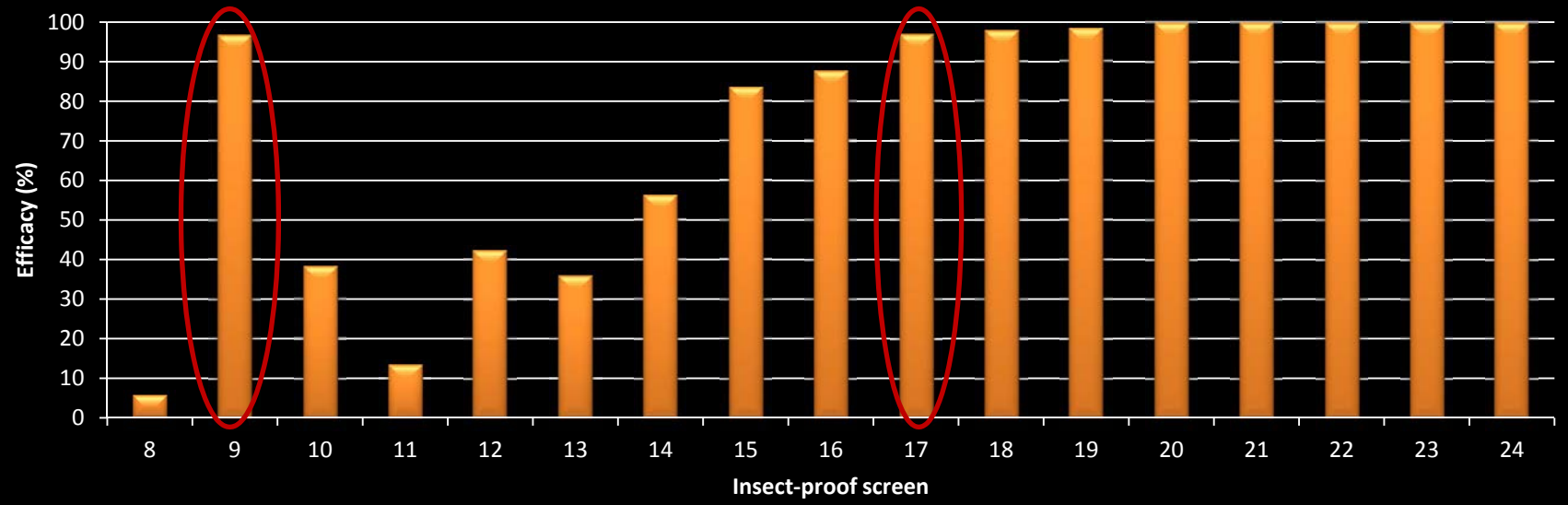
Efficacy against *B. tabaci*

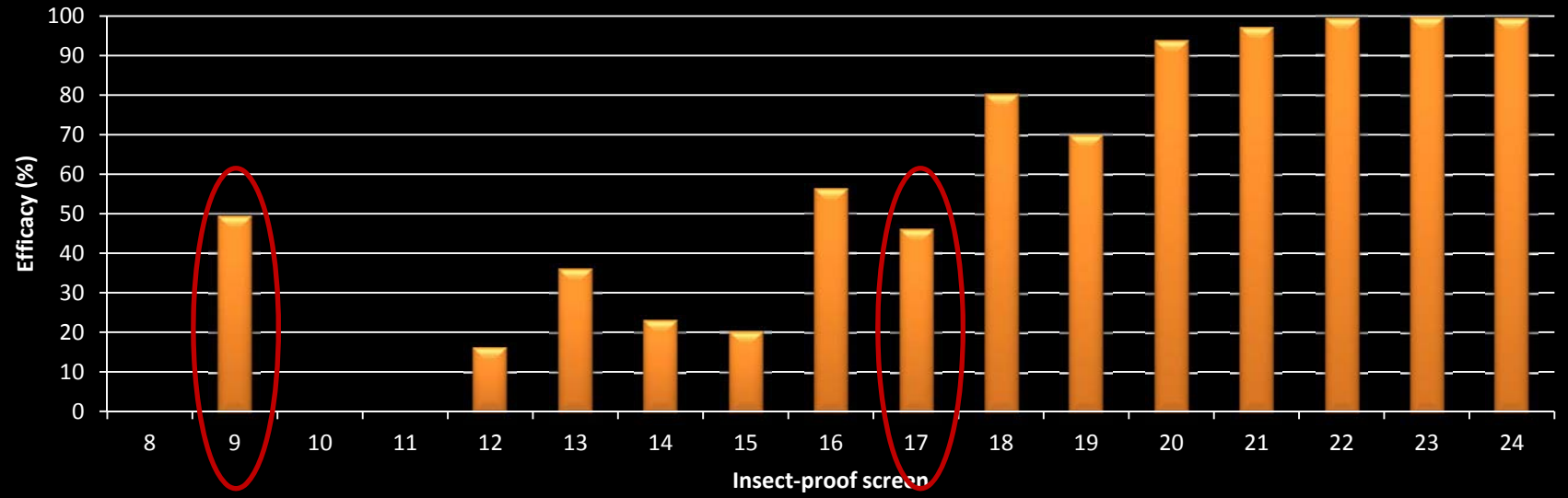
Calm (0 m s^{-1})

53% (Efficacy > 90%)



(3 m s^{-1})

30% (Efficacy > 90%)



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http://www.fomesafruitech.net/Calidad/Varied
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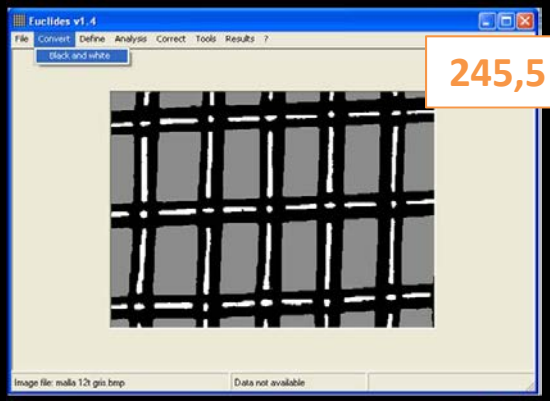
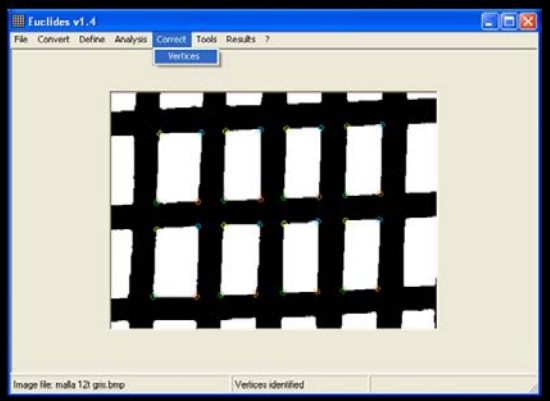
des/Enfermedades/Botrytis_cinerea.htm

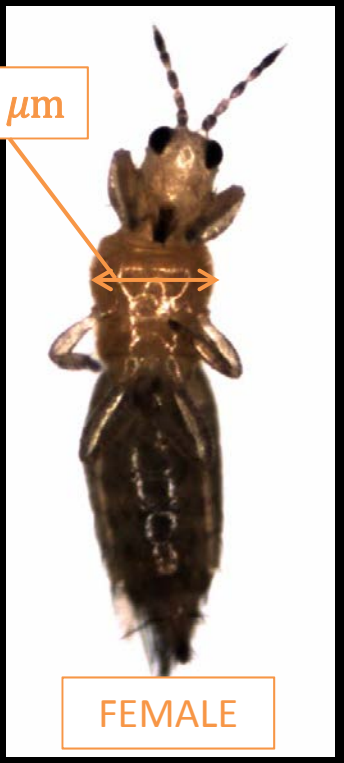
http://www.lagranepoca.com/archivo/32558-patente-tomate-monsanto-
resistente-botrytis-es-fraude-sostienen-opositores-su-recurso.htm

Selecting a suitable insect-proof screen

- Morphometric study of the insect pest (T_x and T_z)
- Determination of the geometric characteristics of the agrotextiles (L_{px}, L_{py}, d_{hx} y d_{hy}).
- Analysis of the uniformity of the agrotextiles.
- Determination of the theoretical efficacy ($T_x \leq L_{px}$)
- Test to evaluate the efficacy of the insect-proof screen in laboratory conditions. These tests allow controlling the air velocity and temperature.

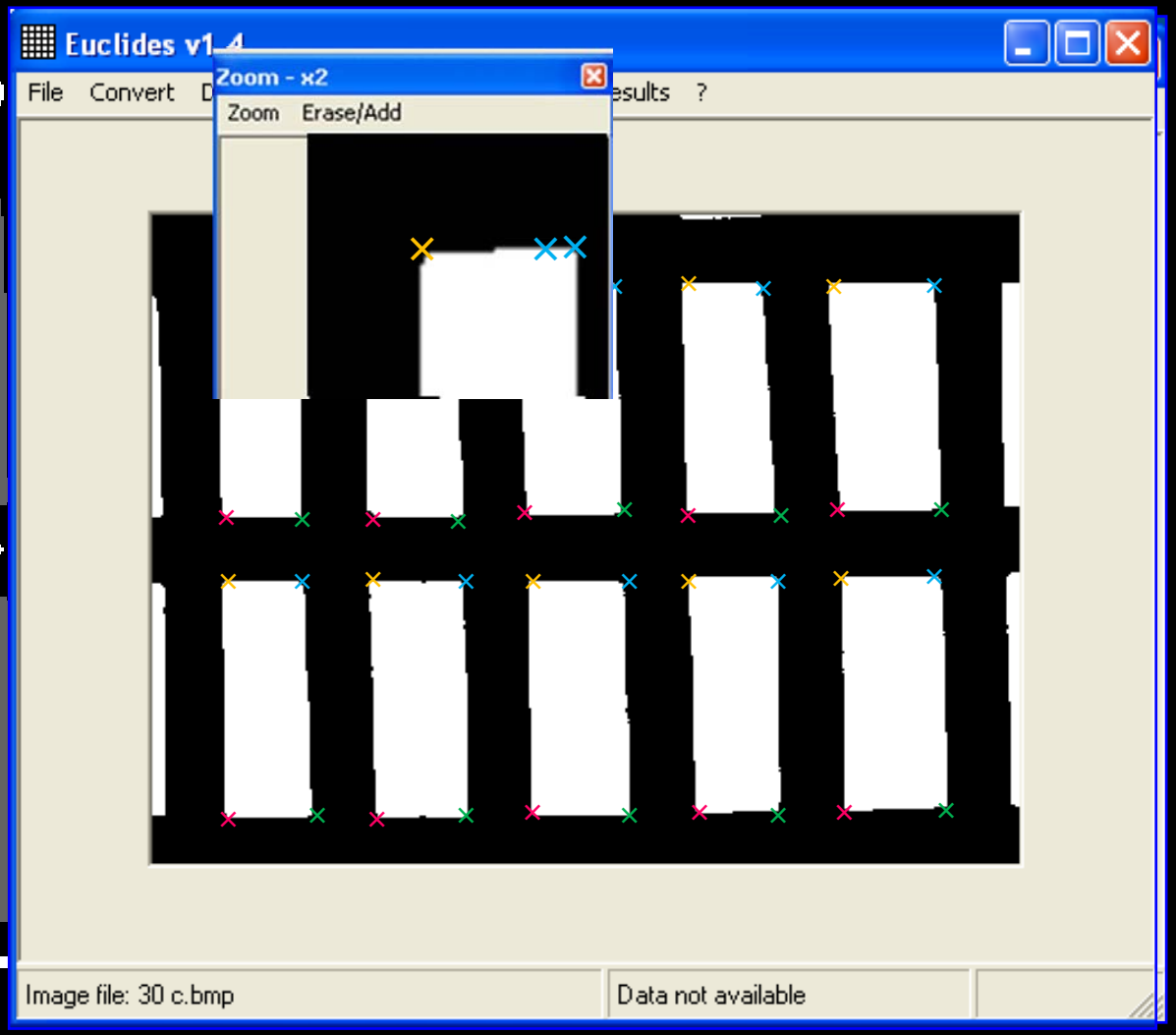






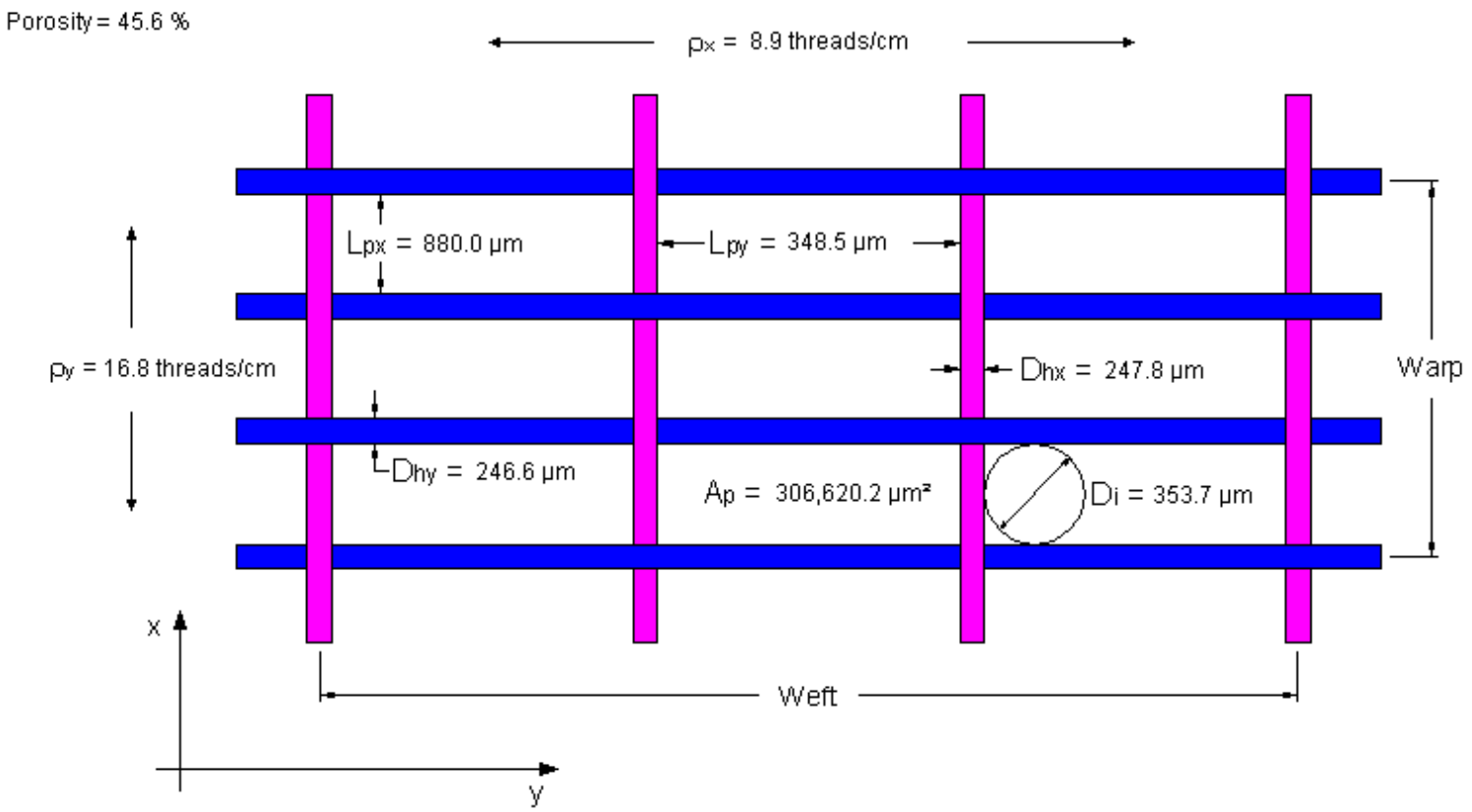
Determination of the geometric parameters

We obtain digital images and process it to black and white



Determination of the geometric parameters

Results



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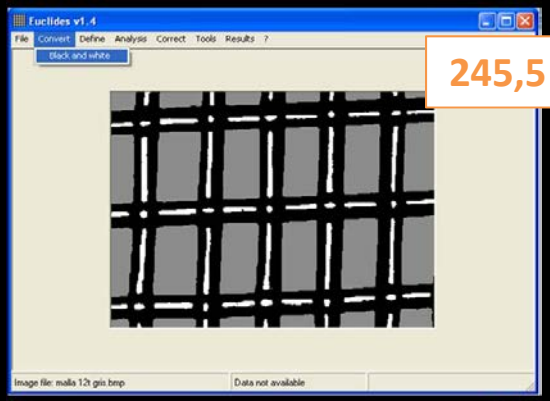
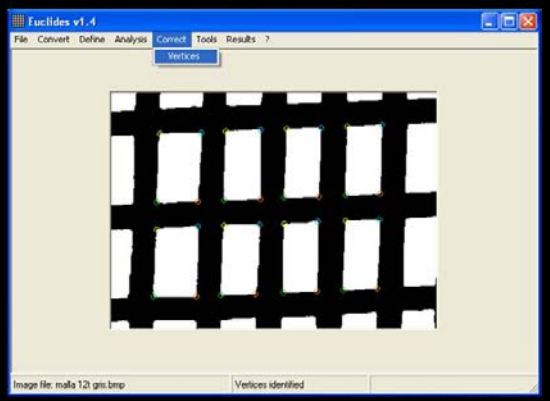
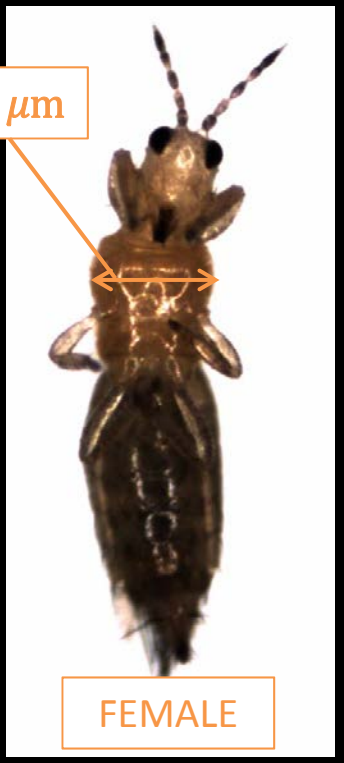
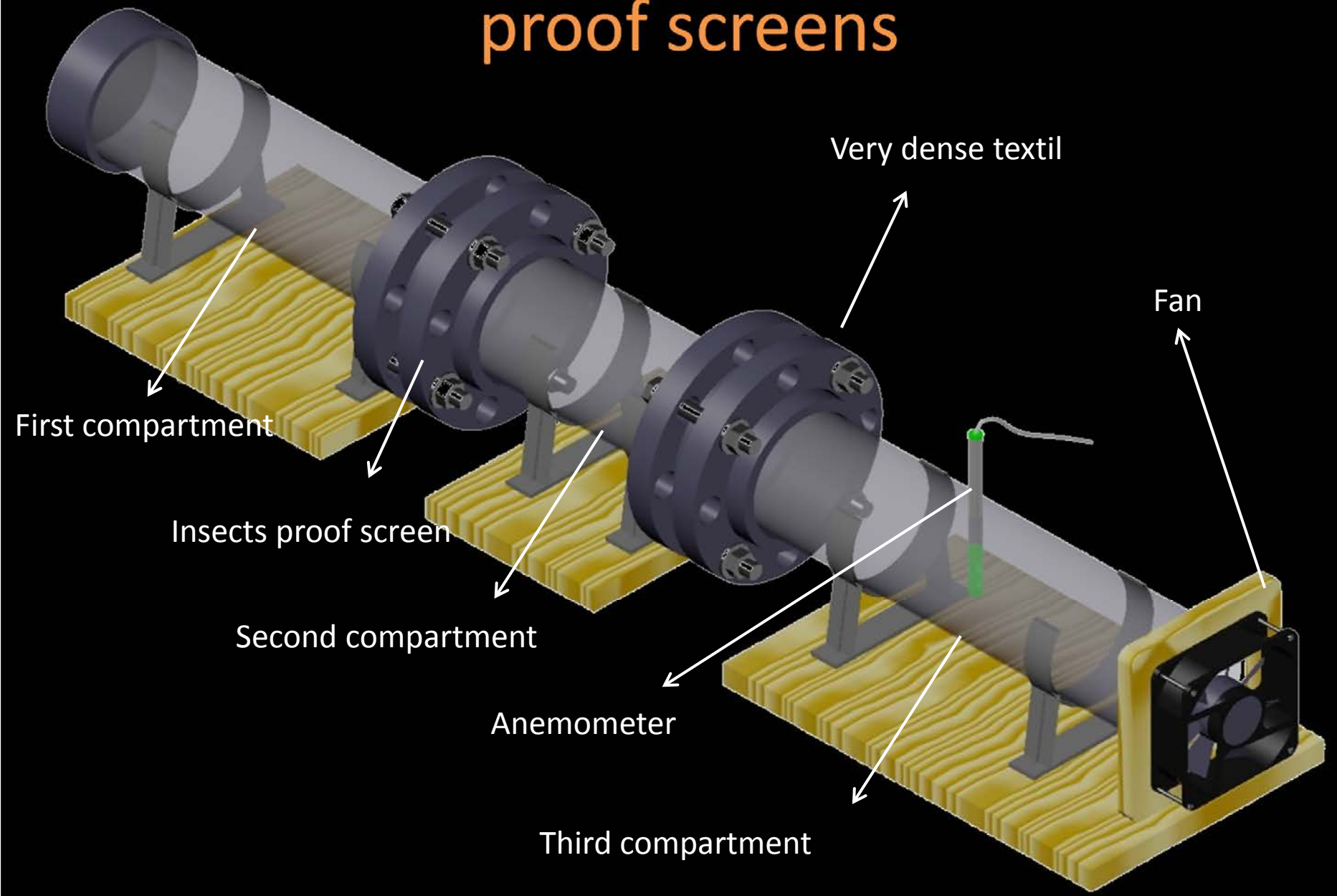
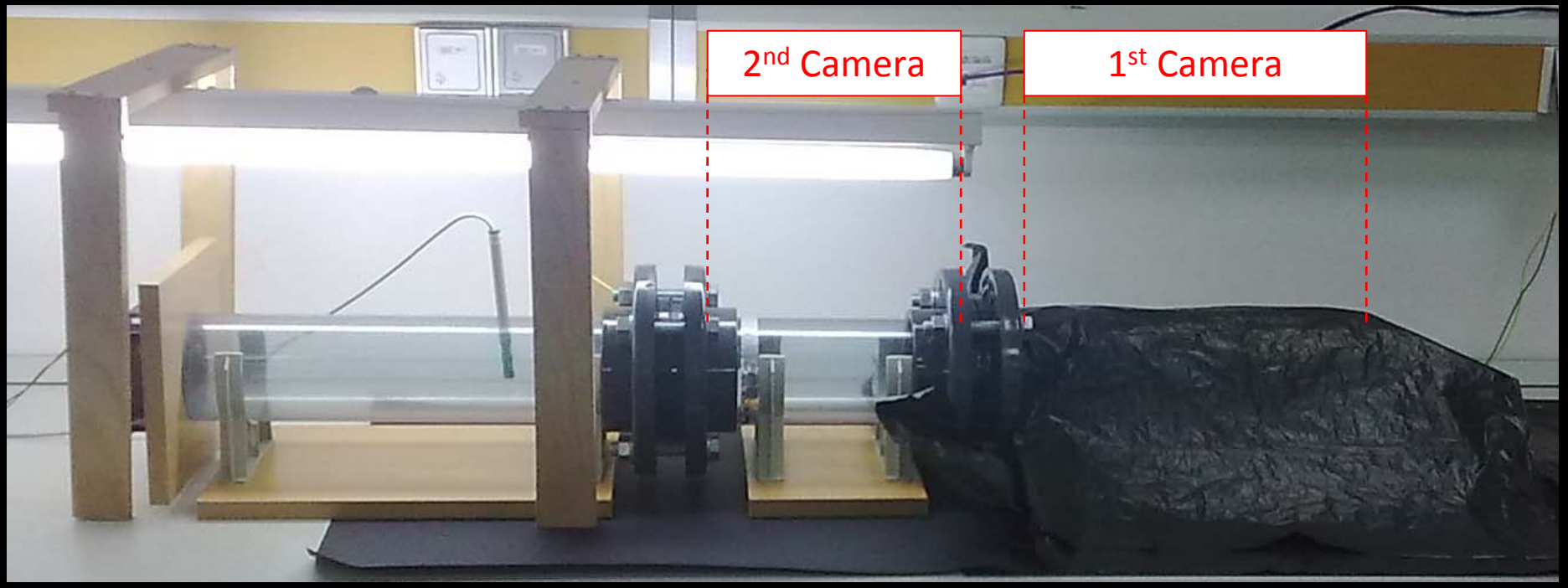


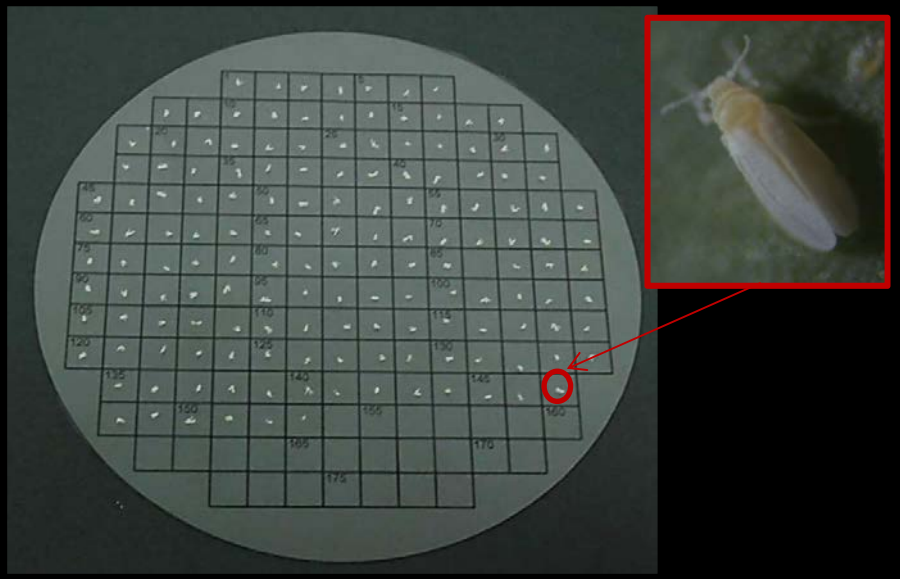




The exclusion capacity of insect proof screens







Percentage of exclusion

$$e = \left(\frac{n_p}{n_t} \right) \times 100$$

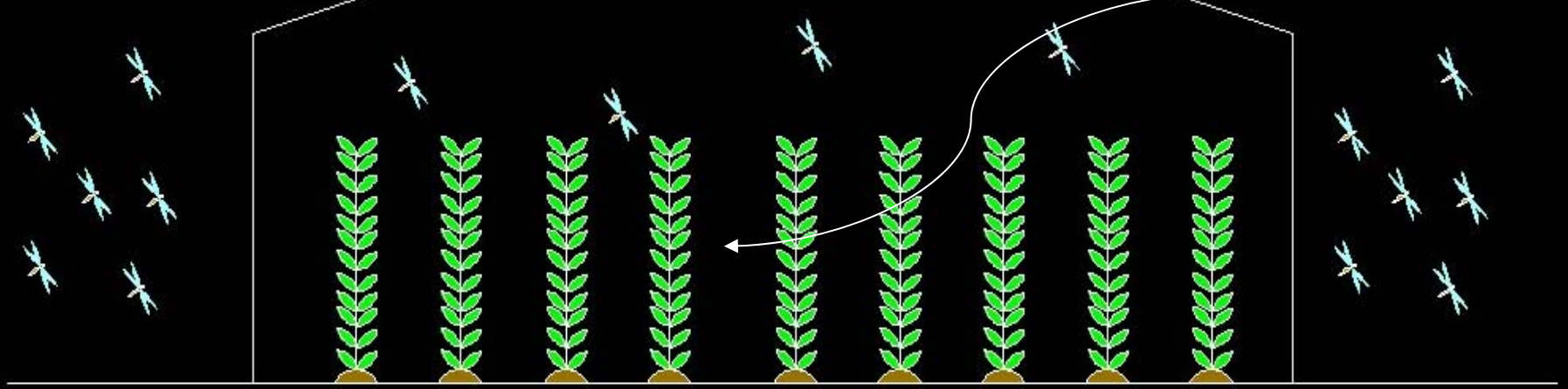
SEX RATIO

Future

- Creating standards (CTN 40/GT9 “Agrotextiles”).
- Development of specific screens against a insects pest target.
- To improve the use of the insects-proof screens. Reduce the pressure on insects (more and more smaller).
- The use of the insect-proof screens have a direct relationship with the climate conditions inside of greenhose and the biosystem (natural enemy (predator or parasite)-crop-pest).

NATURAL ENEMY-PLANT-PEST

Temperature
Humidity



Evaluate the influence of the use of these agrotextiles in this biosystem

Physical barriers vs Pest

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