The efficacy of anti insect nets against apple and peach pests in Italy: the first results from LIFE+ SUSAFRUIT project

Rosemarie Tedeschi

Università degli Studi di Torino
Dipartimento di Scienze Agrarie, Forestali e Alimentari (DISAFA)
2 orchards without mating disruption

**Peach orchard**
- Magliano Alfieri (CN)
- cv Royal Glory
- 3 years old

**Apple orchard**
- Cervignasco (CN)
- cv Brookfield (Gala Group)
- 12 years old

Realization of prototypes of insect exclusion nets for pest control in orchard (from January 2015 to June 2016).
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**Peach orchard**
- Cesena (FC)
- cv BigTop
- 12 years old

**Apple orchard**
- Cesena (FC)
- cv Cripps®
- 6 years old

Emilia Romagna (APOFRUIT + UNIBO)
3 photoselective anti-hail nets:
- Red
- Yellow
- Pearl

Mesh
2.4 x 4.8 mm

1 anti *Drosophila suzukii*
Mesh < 1mm²

4 kinds of nets → 3 cages/net → 12 cages/orchard

3 sets of three plants/orchard as control
Set up of the prototypes

Apple orchard

Peach orchard
Set up of the prototypes

Peach orchard
Set up of the prototypes

Apple orchard
Samplings

- **Pheromone traps**
  - 1 pheromone trap/cage for
    - *Grapholita molesta* and *Anarsia lineatella* (peach orchard)
    - *Cydia pomonella* and *G. molesta* (apple orchard)

  - 1 pheromone trap/orchard outside cages for
    - *Halyomorpha halis*

- **Tree-beating method**
  - 5 branches/tree for *Halyomorpha halys*

- **Yellow sticky traps**
  - 1 trap/cage for insect pests and predators and parasitoids
- **Food bait (DroskiDrink)**

  1 trap/cage for *Drosophila suzukii*

- **Visual inspections**

  - 10 shoots/cage for leafrollers, leafminers, aphids and their natural enemies
  - At harvest: visual inspection to evaluate the damage on fruits (100 fruits/cage)
Action C1 – Monitoring of environmental impact of the project

- **Knock-down treatment with a pyrethroid**
  
  **On 3 plants outside the cages**
  (before the set up of the net cages)

- **Pan traps**
  
  **3 repetitions outside cages** for pollinator diversity and abundance
  (during flowering period)
Preliminary results (Piedmont)

- **Knock-down treatment with a pyrethroid**

  **Coleoptera:** Chrysomelidae, Curculionidae, Attelabidae, Staphylinidae, Carabidae, Dytiscidae, Coccinellidae, Nitidulidae, Cantharidae, Bostrichidae;

  **Diptera:** Sciariidae, Tipulidae;

  **Hymenoptera:** Apoidea, Formicidae, Braconidae, Chalcidoidea;

  **Mecoptera:** Panorpidae;

  **Hemiptera:** Anthocoridae;

  **Acarina:** Trombidiidae.

  (... species determination in progress)

- **Pan traps**

  Hymenoptera: Apoidea → **Apis mellifera**

  Diptera: Syrphidae

  (... counts and determination in progress)
Peach orchard

- **Pheromone traps for G. molesta:**
  - higher captures of *Grapholita* spp. in the control followed by red, yellow, pearl and anti-*D. suzukii* nets (Piedmont)
  - *Grapholita* spp. captured only in the control (Emilia Romagna)

- **Pheromone traps for A. lineatella:**
  - only 2 specimens of *A. lineatella* under anti-*D. suzukii* net; several *Acontia trabealis* (Piedmont)
  - *A. lineatella* not found (Emilia Romagna)

- **Pheromone trap and tree-beating for H. halys:**
  - *H. halys* not found (Piedmont and Emilia Romagna)

- **Visual inspections:** no aphids; shoots damaged by moths in particular in the control (Piedmont)

- **Yellow sticky traps:** ... counts and determination in progress

- **Food bait (Droskidrink):** ... counts and determination in progress
  - Up to now *Drosophila* sp. found only in the control (Piedmont)
Fruit damage by *Grapholita molesta*

- Higher percentages of damaged fruits in the control (10.5%), followed by pearl, red, yellow and anti-*D. suzukii* nets (Piedmont)

- Higher percentages of damaged fruits in the control (5.8%), followed by red, yellow and pearl nets. No damage under anti-*D. suzukii* net (Emilia Romagna)
Fruit damage by thrips

- Fruits damaged by *Taeniothrips inconsequens* in particular under yellow net (6.6%); very low incidence under the other nets (Piedmont)

- Higher percentages of fruits damaged by *Frankliniella occidentalis* under pearl (4.1%) and yellow (3.4%) nets. No damage under red and anti-*D. suzukii* nets (Emilia Romagna)
Fruit damage by *Forficula auricularia*

- Higher percentages of fruits damaged by *Forficula auricularia* in the control (3.2%), followed by yellow, red and anti-*D. suzukii* nets. No damage under pearl net (Emilia Romagna)
Fruit damage by *Monilinia* spp. in the field

Higher percentages of fruit damaged by *Monilinia* spp. in the control (11.8%), followed by yellow, red and pearl nets. Lower values under the anti-*D. suzukii* net.

Fruit damage by *Monilinia* spp. in post-harvest

Higher percentages of damage by *Monilinia* spp. in the fruits collected under the pearl net (37.6%)
The different types of net do not seem to influence the quality of the fruits (weight, hardness, DA-meter and ° Brix analyses)
Apple orchard

- **Pheromone traps for *C. pomonella***: up to now only 1 specimen of *C. pomonella* under the red net. Several specimens of *Synanthedon myopaefomis* (higher number in the controls) (Piedmont). A few specimens of *C. pomonella* only in the controls (Emilia Romagna).

- **Pheromone traps for *G. molesta***: 2 specimens of *G. molesta* in the controls and under the yellow net (Piedmont).

- **Pheromone trap and tree-beating for *H. halys***: *H. halys* not found (Piedmont and Emilia Romagna).

- **Visual inspections**: some aphids on the shoots (mainly *Aphis pomi*). Several leaves with *Dasineura mali* (Piedmont).

- **Yellow sticky traps**: ... counts and determination in progress

- **Food bait (Droskidrink)**: ... counts and determination in progress
  Up to now *Drosophila* sp. found only in the controls (Piedmont)
Low pesticide IPM in sustainable and safe fruit production

Duration: 42 months
Total project budget: 1,839,378 €
EU contribution: 901,938 €

PARTNERS

The LIFE+S.U.S.A.FRUIT project aims to reduce the extensive use of pesticides by implementing IPM strategy in both field and postharvest conditions in Croatian and Italian fruit production chain. Alternative practices to pesticides will be evaluated in twelve demonstration fields against pests and pathogens.

Main expected outcomes:
1. Reduction of chemical pressure
2. Reduction of agricultural costs
3. Reduction of fruit losses
4. Increase in competitiveness of European horticulture

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