

Flower strips: a tool for pest control in greenhouses

Problem

In greenhouses, pests are very often responsible for yield and quality losses. Control methods implemented by producers, like prophylaxis, biocontrol with mass releases of natural enemies, and approved pesticides, are sometimes insufficient. One reason for this is that natural enemies often require not only pests as prey but also other resources, such as nectar and pollen, to survive and reproduce, which are often in limited supply in greenhouse crops.

Solution

Establishing flower strips in greenhouses can support introduced and native natural enemies, thereby improving biological pest control in vegetable crops. When suitable plant species are selected and established at the appropriate time and place, this can provide the right resources for a diverse community of natural enemies.

Impact

Flower strips enhance the survival and reproduction of natural enemies and support an active community of natural enemies in greenhouses, contributing to better, more reliable pest control and reducing dependence on expensive external inputs (reared beneficial insects, approved pesticides).

Practical recommendations

Some plant species have proven to be very suitable for their support of natural enemies of specific pests:

- For spider mites, *Tuta*, and whiteflies: marigold (*Calendula officinalis*), in picture 1. This plant is attractive for *Macrolophus pygmaeus*, a predatory bug, both for feeding and for depositing eggs.
- For Aphids: Yarrow (*Achillea millefolium*) in picture 2, sweet alyssum (*Lobularia maritima*) in picture 3, oxeye daisy (*Leucanthemum vulgare*), brown knapweed (*Centaurea jacea*), birdsfoot trefoil (*Lotus corniculatus*). The latter two species are good food plants for ladybirds, the others also for hoverflies, lacewings, and parasitic wasps.

The outer edges of greenhouses are non-productive and therefore a good location for establishing flower strips. Selected species can be planted as patches at the poles or tightly planted (every 20 cm) to prevent weed development. Between 5 and 10 marigold plants per 100 m² can host enough of the predatory bug *Macrolophus* to protect tomato crops from *Tuta*.

Another possible location to establish a flower strip is within the production rows. Annual flowers, such as sweet alyssum, can be transplanted directly from the nursery and removed after harvest.

The best periods for planting flower strips are autumn (for annual and perennial species) and spring (for annual species). Flower seedlings for the establishment of flowers strips can be propagated using lettuce or cabbage seedling trays. Seedlings should be transplanted 1 to 1.5 months before planting the main crop.

Applicability box

Themes

Horticulture, protected cultivation, disease and pest control

Keywords

Greenhouse crops, plant protection, pest control, integrated pest management, natural enemies

Geographical coverage

France and Mediterranean countries

Application time

Permanent

Required time

4h/1000m² of crop

Period of impact

Spring-summer

Equipment

Seed, seedling trays



Picture 1 (left): Marigold is a good host plant for *Macrolophus*. Source: Lambion (GRAB)

Picture 2 (middle): Yarrow as a living mulch. Source: Lambion (GRAB)

Picture 3 (right): Sweet alyssum patch planted on the outer edge of the greenhouse. Source: Lambion (GRAB)

Further information

Video

- Innovative production in the greenhouse: flower strips, mixed crops, plant mulch: <https://www.youtube.com/watch?v=XiuLCz5dANY&t>

Further readings

- Greenresilient technical factsheet: Flower strips: a tool for pest control in greenhouses: <https://orgprints.org/38705/>

Weblinks

- GRAB website for more practical recommendations: <http://www.grab.fr>
- French Greenresilient experimental site: <https://www.greenresilient.net/experimental-sites/france.html>

About this practice abstract and Greenresilient

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