



Using Pest Fighting Plants in High Tunnels

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<https://www.uvm.edu/~htunnel/>

Plant-mediated IPM Systems

Plant-mediated integrated pest management (IPM) systems use plants in combination with other suppression tactics (i.e., scouting, natural enemy releases, and spot sprays) to manage arthropod pests (Fig. 1). In high tunnel crops, they are commonly used against spider mites, thrips and aphids. These systems offer a low-cost approach to sustainably manage pests in protected environments to reduce the need for pesticide applications. These systems are developed primarily to:

- 1) Improve early pest detection (indicator or sentinel plants).
- 2) Attract pests off the crop where they are then targeted for management with biological control/natural enemies, chemical insecticides or by removing and destroying them (trap crop).
- 3) Provide habitat, food and shelter for biological control agents (habitat, insectary/banker/guardian plants).

Herein we describe a few systems used in high tunnel production.



Fig. 1. Combination planting of alyssum habitat plants and bush bean and marigold trap plants in tomatoes.

Bush Bean Trap Plants (Spider Mites)

Planting bush beans (i.e., Provider) within or around the crop can be an effective tool to detect spider mites early (Fig. 2). Plant at least 1/1,000 3 sq ft, especially around the edge of the tunnel, which can be hotspots for mites. As mites emerge from overwintering sites within the high tunnel, they are attracted to the beans. Predatory mites can be released on the beans to combat the pest early in the spring. Beans should be replaced periodically if they get too big. Large, mature plants are hard to scout and are less palatable to mites. Stippling (tiny white spots) on the leaf surfaces is a sign of mite feeding. Growers report that by managing spider mites early, they avoid problems over the summer. For additional information about using beans in production and as part of a biological control program, visit the [‘Tomato Guidelines’ from Applied Bio-nomics](#).

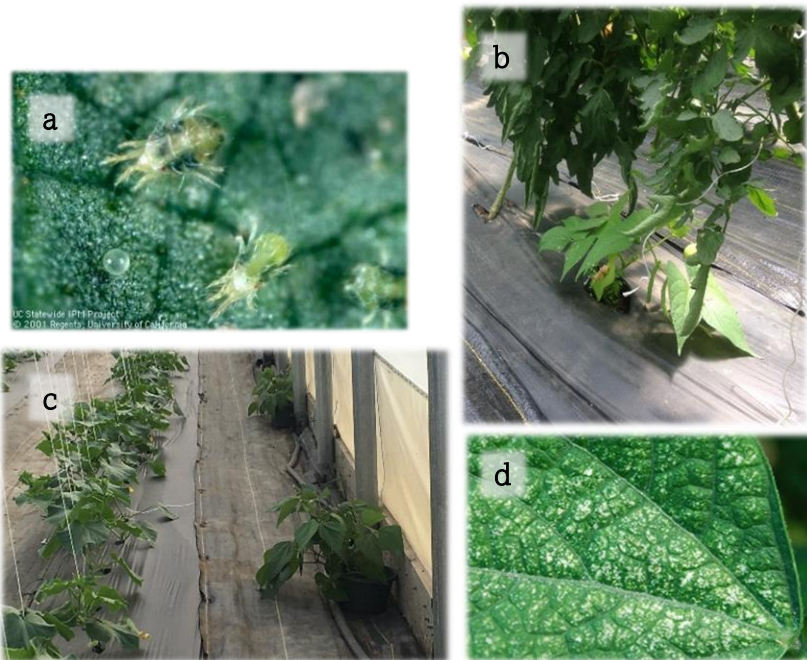


Fig. 2. Bush bean trap plants for spider mites (a) in tomato (b) and cucumber (c). Stippling and yellowing are key damage signs. Spider mite image by Jack Kelly Clark, UCIPM Program.

Marigold Trap & Guardian Plants for Thrips

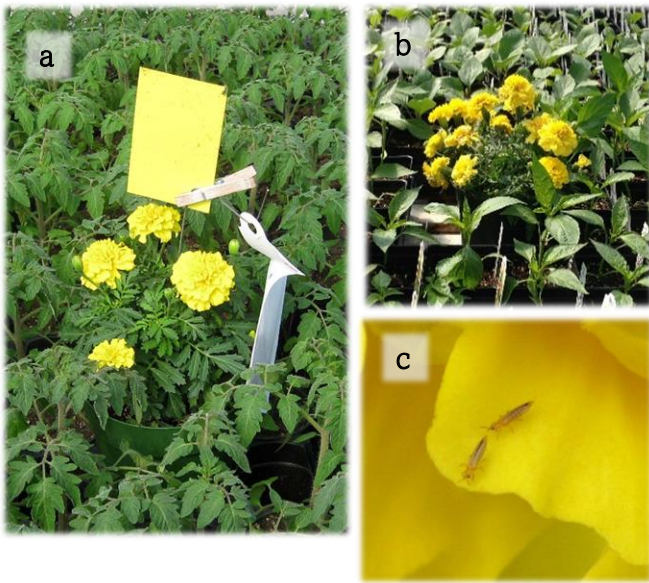


Fig. 3. Marigold guardian plant in tomato (a) and trap plant in pepper (b) propagation houses to attract thrips (c).

Yellow, French marigold varieties (i.e., Hero, Bonanza, Disco) are highly attractive to thrips when used in non-flowering crops (Fig. 3). Insects are generally attracted to yellow, which is why that color is commonly used for sticky traps. Thrips can be monitored by tapping the blossoms over a laminated piece of white paper. Predatory mites can be used on the foliage as a hanging sachet that provides thrips suppression for up to 6 weeks. *Orius*, a naturally-occurring and commercially available predator is also [attracted to and sustained](#) marigold guardian plant by marigolds. When using natural enemies within this system, it is sometimes called a 'guardian plant' because it 'guards' crops against pests. Using these systems takes planning in spring to ensure the plants are started early enough so they are flowering when needed in production houses.

Alyssum Habitat Plants to Support Natural Enemies

Alyssum is a popular habitat/insectary plant, that tolerates a wide range of environmental conditions (Fig. 4). It attracts many beneficials, including, syrphid flies which in the larval stage feed on pests; lacewings and parasitic wasps. Although the natural enemies that are attracted predate on a wide array of small-bodied pests, these plantings are used primarily to protect against aphids. They are used as [guard rows](#) in field crops and in [tunnels](#). They have also been included in [combination plantings](#) at the end of beds in tunnels. If trimmed occasionally, alyssum blooms throughout the growing season, providing a continual habitat for beneficials. Because it self-sows, growers have found that once established, it will return without the need to replant. In addition to supporting and attracting natural enemies, alyssum also attracts pollinators, such as bees, flies and beetles.

It is highly recommended to scout all of these plant IPM systems routinely to ensure they do not become a source of pests to the crops. Remove plants immediately if pest populations are causing extensive damage on the systems. Give this [scouting form](#) a try!



Fig. 4. Alyssum habitat plants in greens (a) and tomatoes (b). Common visitors to these plantings are syrphid flies (c) and minute pirate bugs (d). Pirate bug image by Jack Kelly Clark, UCIPM Program.