



Aphid Biocontrol

with Fava Bean/Pea Aphid Banker Plants

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Background

Banker plants provide resources for arthropod natural enemies when target pests are scarce, enabling in-greenhouse reproduction of the natural enemies for continuous production and reducing or eliminating the costs of otherwise-required weekly natural enemy shipments. There are banker plant systems for small aphid pest species (e.g., green peach aphid, melon aphid using the parasitoid wasp *Aphidius colemani*) and for large aphid pest species (e.g., foxglove aphid, potato aphid using *Aphidius ervi*). But they both use barley plants and are not compatible. They cannot be used in the same greenhouse simultaneously. This fact sheet describes a different banker plant system, using pea aphids (a large aphid) on potted fava bean, *Vicia faba* (also known as broad bean) plants as a host for *A. ervi* reproduction. This new banker plant system for *A. ervi* makes it possible for both *A. colemani* and *A. ervi* to co-exist, reproduce, and provide successful biocontrol of nearly all common greenhouse aphid pests.

Fava Bean Plants

Sow 1 to 4 fava bean seeds per 6-inch pot and grow for 2 weeks, until they have 4 to 5 or more pairs of leaves, before infesting with pea aphids. Place 1 or a group of 2 pots every 1,000 sq.ft. or so throughout the greenhouse. A simple stake or trellis can be used to support the fast-growing plants. 'Vroma' variety may be sturdier than 'Windsor'. Place the pots in their final spot in the greenhouse *before* adding any aphids, because carrying the pots through the greenhouse will cause aphids to fall off the plants. Replacement pots can be sown every 2 weeks and placed next to existing plants in the greenhouse once they have 4 to 5 leaf pairs.

Greenhouse Banker Plants for *Aphidius ervi*

Fava beans infested with pea aphids can be used as banker plants to support in-greenhouse reproduction of the aphid parasitoid wasp, *Aphidius ervi*, for use against larger aphid pests such as foxglove aphid or potato aphid. The system is compatible with banker plants for *A. colemani* used for smaller aphid pests.

Introducing the pea aphids

Pea aphids (*Acyrtosiphon pisum*) can be purchased from a supplier (e.g., IPM Laboratories, Locke, NY). Place the aphids carefully onto the fava bean foliage in the banker plant spots in the greenhouse. Use a fine brush to apply a very small amount of the aphids to the foliage, perhaps 20 aphids or so, taking care to avoid their falling off the leaves. The aphids can reproduce rapidly and too many aphids can quickly kill a plant. Once the aphids are reproducing on the plants, do not disturb the plants or pots. The slightest bump can cause the aphids to drop off the plant. To avoid disturbing the aphids with overhead watering, be sure to bottom-water the banker plant pots. Some growers grow pea aphids on fava bean plants kept in a fine mesh cage as a source of aphids for future introductions to their banker plants during the season. It is crucial to keep the *A. ervi* wasps out of this cage. For unknown reasons, often the aphids will disappear from some banker plants but not others. To solve this problem, some growers

reinfest their banker plants weekly with aphids from their aphid production cage. Pea aphids will infest leguminous plant species, such as sweet peas, garden peas, or lupines. If these plants are being grown, place them far away from the banker plants, or ideally, in a separate greenhouse.

Introducing the *Aphidius ervi* wasps

Allow 1 week for the aphids to reproduce before releasing the wasps. If there are plenty of aphids per pot, 10 to 20 wasps per pot will probably be enough to establish an effective population of wasps. To check that the banker plant system is working, as new banker plants are added, or additional aphids are added to the banker plants, look for new aphid mummies that the wasps have parasitized. Likewise, careful scouting for aphid mummies in your crop is essential.

Important considerations

Fava bean banker plants can be susceptible to thrips and other greenhouse pests. To

avoid killing the wasps, insecticides should not be applied to the plants. Predatory mites (e.g., *Amblyseius cucumeris*) can be applied to the pots via a mini sachet per pot or sprinkled on the foliage weekly.

If a colony of pea aphids is desired to periodically reintroduce additional aphids to banker plants, it is essential to prevent wasps from entering the colony cage.

The pea aphids are remarkably sensitive to any jostling or disturbance. *Do not try to move banker plants.* Bottom water the banker plants to avoid disturbing the plants and causing the aphids to fall off.

Monitor for new mummies on both the banker plants and the crop to be sure that the system is producing wasps.

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