



Aphid Banker Plants

Banker plants provide resources such as alternative food or hosts to sustain natural enemies such as *Aphidius colemani* in the greenhouse. When aphid banker plants are placed in your greenhouse as soon as crop plants arrive, you will have the natural enemies there to attack the first aphids that may be on your crops. (In addition, these mini-parasitic wasps will be much better at finding the first aphids than you will be!)

Wheat or winter barley plants support colonies of the bird cherry-oat aphid (*Rhopalosiphum padi*) which prefers feeding upon monocots such as grasses, cereals, and sedges. *R. padi* is not a pest of most spring greenhouse-grown crops, with the exception of certain ornamental grasses and other monocots such as orchids, iris, spring bulbs, onions and garlic. Some growers have noticed that bird cherry-oat aphids have moved onto Cordyline, Cyperus and Dracaena as well.

Overtime, the parasitic wasps will disperse throughout the greenhouse. New banker plants are continuously added to provide a continuous supply of fresh aphid parasites.

The host specific parasitic wasp, *Aphidius colemani*, parasitizes smaller aphid species such as green peach aphid (*Myzus persicae*) and melon or cotton aphid (*Aphis gossypii*). *A. colemani* is not effective against larger aphids such as the foxglove aphid (*Aulacorthum solani*) or potato aphid (*Macrosiphum euphorbiae*). The bird cherry-oat aphid is too small to support development of the parasitoid, *Aphidius ervi* that parasitizes the larger aphids such as foxglove or potato aphid. If larger aphids such as the foxglove aphid is present, use aphid banker plants to help support the generalist predatory midge, *Aphidoletes aphidimyza* that attacks these larger aphids.

Some advantages of using banker plants include populations of *A. colemani* reared on banker plants will have a higher percentage of females, are larger and live longer than the parasitoids received from commercial insectaries. Banker plants help stabilize natural enemy populations. You will also save on shipping costs, avoiding weekly shipments of parasitic wasps. You are building your own healthy breeding populations of aphid parasitoids.

Some disadvantages include the added time, labor, space to produce the banker plants during a busy time of the year. The aphid banker plants developed for *A. colemani* are not effective against the larger foxglove or potato aphids. However, aphid banker plants can be used to support generalist predators such as aphid midges that would attack these larger aphids.

Steps to Follow

Place orders for starter banker plants up to 6 weeks before you start spring production. This is a preventive approach. Place the aphid banker plants in the greenhouse as soon as you open up the greenhouses for spring crop production.



Figure 1: Starter Banker Plant. Photo by L. Pundt

Transplant the plugs or purchased “starter aphid colony” into larger pots (10 – 12 inch) so that the banker plants have plenty of room to grow and they are easy to keep moist. Some growers divide the starter plant, placing the sections in the middle of a larger pot with sown barley or wheat seed.



Figure 2: Planting Sections of the Aphid Banker Plants. Photo by L. Pundt

Wait one or two weeks for the bird cherry-oat aphids' populations to reproduce and build on the banker plants.



Figure 3: Bird Cherry-Oat Aphids on Aphid Banker Plant. Photo by L. Pundt

If grown in the greenhouse, you need to protect the banker plants from natural enemies (either established in the greenhouse or from naturally occurring natural enemies that may enter the greenhouse from outdoors) to successfully build up the population of the non-pest bird cherry-oat aphids before releasing *A. colemani*.

Protect your aphid banker plants with “aphid banker cages” that can be purchased online (Bug Dorms) or you can build your own cage. The cages should be double sealed and covered with small mesh such as thrips insect screening to ensure the needed ventilation without having parasitic wasps enter the banker cage. Some growers produce aphid banker plants at another site, for example, in their basements, under grow lights.



Figure 4: Aphid Banker Cage or "Bug Dorm". Photo by L. Pundt



Figure 5: Homemade Aphid Banker Cage. Photo by L. Pundt

Next, move the aphid banker plants (except starter banker plants) into the greenhouse and lightly distribute *Aphidius colemani* over the banker plants. Use the saved banker plant to make more banker plants.

Check aphid banker plants weekly and look for newly parasitized aphids (“aphid mummies”), which indicate that the parasitoids are establishing on the banker plants.



Figure 6: Aphid mummy (left), young aphid nymph on right. Photo by L. Pundt

Continue monitoring your crops for aphids and aphid mummies. If you do not see aphid mummies, check the aphid species.

Aphidius is very mobile, so you may see some adults on your sticky cards.

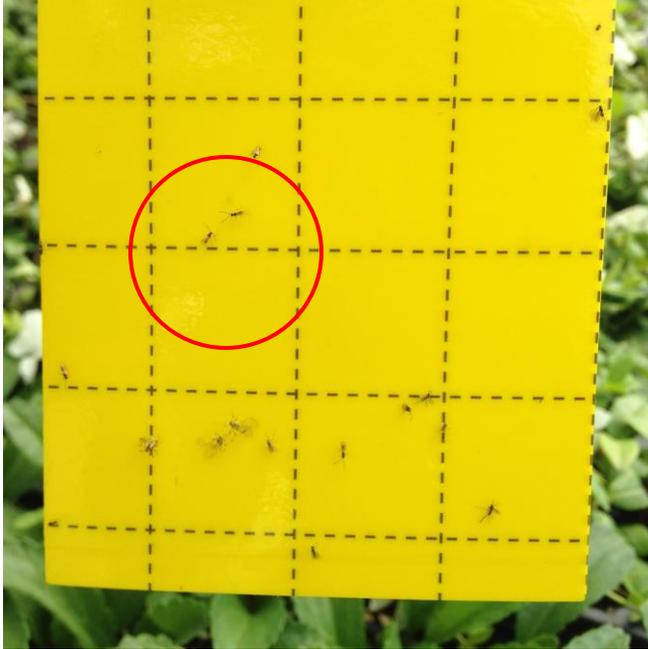


Figure 7: *Aphidius colemani* (within circle) and winged aphids on sticky card. Photo by L. Pundt

Start new banker plants regularly since they decline and die within a few weeks. Be sure to prevent them from drying out.

Seed new pots weekly or biweekly and continue starting new banker plants until mid-summer.

Inoculate new banker plants by physically transferring aphids from old banker plants onto new ones every 2 weeks.

Recent research from North Carolina University has shown that wheat or barley perform better than oats or rye as cereal grains used for aphid banker plants. In spite of the common name, bird cherry-oat aphid, *R. padi* does perform well on oats. More aphids died when they were grown on oats and they did not reproduce well. The fewest mummies developed on oats. The aphids survived longest and reproduced the best on wheat. Rye plants produced fewer female *Aphidius* than males who do not parasitize the aphids.

Placement

Place banker plants along walkways and at the ends of benches. Some greenhouse growers place banker plants at hanging basket level with drip irrigation to ensure that the banker plants are well irrigated and fertilized without inadvertently washing the aphid natural enemies off the banker plants. Place aphid banker plants near the crops you will be growing. This helps *A. colemani* become attracted to those plants.



Figure 8: Aphid Banker Plant in the Greenhouse. Photo by L. Pundt

Recommended rates vary according to the size of greenhouse, types of crops, suppliers, and natural enemy you are trying to support. More is always better! Suppliers suggest rates ranging from one to 10 per 10,000 sq. ft. Add new banker plants to the greenhouse weekly, especially in larger greenhouses. If you are supporting aphid predatory midges, *A. aphidimyza* for use against the foxglove aphids, more banker plants are needed.

Destroy aphid banker plants at the end of the season to avoid the buildup of hyperparasites (a parasite whose host is another parasite, in this case, *A. colemani*). The parasite exit hole of aphid mummy is jagged and uneven if hyperparasites are present.

Make sure the seed you purchase has not been treated with any pesticides. Do not treat banker plants with pesticides including insecticides, fungicides or plant growth regulators. Remove banker plants before any spot sprays are applied in the greenhouse.

Aphid banker plants can help support healthy *A. colemani* breeding populations in your spring production greenhouses.

By Leanne Pundt, Extension Educator, UConn Extension, 2018

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