

Rose Crop Recommendation

By Applied Bio-nomics Ltd.

OVERVIEW:

Biological control in roses has been attempted for many years in Europe and North America. Results have ranged from fair to poor, despite active research on the part of growers and researchers. Recent research has shown the devastating effect of burning sulfur on parasitoids. This research confirms the biological control industries' strong belief that the burning of sulfur is not complementary to the use of biological controls, especially in the case of *Encarsia formosa*.

PLANTING OUT

Fungus gnats are an economical pest. The larvae effectively prune the fine, new root hairs; reducing the growth rate of the plant and its vigor. For roses grown in loose soil such as coco fiber, *Stratiolaelaps scimitus* should be applied to each pot at the time of planting. The rate should be 10 per pot, or 250 per 10 square feet, whichever is less. In an established crop, *Atheta coriaria* should be added for control at a rate of 0.1 per 10 square feet, just once.

CROP MANAGEMENT

The use of Monitoring, trapping, and/or banking plants is essential in rose production. The typical host plants are eggplants, bush beans and marigolds.

Eggplant is best for general use. Eggplant is considerably more attractive to most pests than roses. The eggplant should be used at a rate of at least 1 for every 0.25 acres. They should be grown in the main aisle of the house so that they can be easily accessed.

Bush beans are also great for general use. Bush beans are very attractive to spider mites, whitefly and thrips. In the case of spider mites, they show damage only a few days after initial contact, effectively becoming an early warning system. Bush beans should be placed in strategic locations, such as near heating pipes and perimeter walls. They can also be used in temporary locations, such as hot spots, to dilute the pest pressure and

become banking plants for future dispersal with a *Phytoseiulus persimilis* application.

“Hero” Marigolds are great for thrips management. In potted roses, this technique is indispensable. Providing flowering targets will actually draw the thrips out of the roses, onto the marigolds. The marigolds should have high levels of *Amblyseius cucumeris* maintained on them, as well as high levels of *Stratiolaelaps* in the soil to handle pupating thrips. In cut roses, this technique also has some merit, especially during the summer when thrips pressure is highest. In clean houses, they serve as monitoring devices; alerting you to an arrival of a pest. As the pest level builds up, the pest can be physically removed. In the case of whitefly, they can be vacuumed daily using a “dustbuster” type unit.

Once trapping becomes unreasonable, the plants can be turned into banker plants by focusing the release of biological controls at the eggplant. These banker plants can generate large amounts of beneficial insects, while continuing to attract the pests out of the roses.

Extreme care must be taken to avoid spreading the crawling pests, such as spider mite. Employee movement is a major method of spider mite dispersal. Employees should enter a mite infested area last, and then leave directly. The coveralls should either be sprayed down with soapy water, or frozen overnight. I have seen air hoses work well for blowing mites off of employees.



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European cut Rose houses tend to be one variety only, while in North America, most houses (if not all of them) grow as many varieties as they can. Experience has shown us that some varieties are more susceptible to various pests than others. A log book should be kept to note when and where the various pests occur.

There is some indication that fungicides are having a negative impact on some biological controls, especially Encarsia. Always attempt to complete your fungicide treatments before the application of the beneficials. Also, please attempt to correlate pest increases with fungicide treatments about 1 month prior. This will help us determine if and/or which fungicides are having a negative impact.

SPIDER MITE

Employees should be trained to spot spider mites and use a flagging system to identify their location. The section affected with mites should become the last section visited during the day.

Amblyseius fallacis should be used preventatively throughout the greenhouse, at a rate of 2 mites per 10 square feet, just once for the life of the plant. The fallacis will control all known species of spider mite and will not interfere with the persimilis, which should be directly applied to the hot spots. The typical release rate is 1 to 100 (predator to pest), for control within 2 weeks.

When a hot spot is discovered, push a bean seed into the affected pot or pots, or bring in a pre-grown bean plant. If the spider mites are two-spotted, they will move onto the beans and take some of the pressure off the roses. Persimilis should then be added to the beans to create a banking system. If the banking system is active, leaves can be harvested from it and used elsewhere in the greenhouse for other hot spots.

WHITEFLY

Whitefly is an insidious pest. It only takes a few females laying 300 eggs to create a significant outbreak. The illumination of burning sulfur has helped with whitefly control, but roses still remain one of the toughest crops in which to manage whitefly. This is due to the density of the foliage and possibly negative interactions with

fungicides. Based on our observations, we suspect that fungicide sprays are significantly impairing Encarsia performance.

If a whitefly hot spot develops, the honey dew tends to repel the small parasitoids (such as Encarsia). These hot spots are the whitefly's offensive strategy, and are best dealt with by applying *Delphastus catalinae* preventatively. Delphastus is a small beetle that specializes in whitefly. The adult actually prefers eggs; so once released in a hot spot, they will tend to migrate throughout the crop and attack future potential hot spots. It should be applied monthly, at a rate of 0.1 beetles per 10 square feet. In severe cases, the rate should be doubled by introducing 0.1 every two weeks.

Extreme hot spots should either be chemically treated, or alternatively with a concentrated release of *Aphidoletes aphidimyza*. Release up to 1,000 midges per 10 square feet (just once) directly at the site.

APHIDS


Aphids can cause considerable damage in roses. During aphid season, weekly releases of Aphidoletes should be made at a rate of 3,000 per 2.5 acres. Aphidoletes control and eliminate all species of aphids. They are excellent flyers and can find even just one aphid rapidly. If there is a high aphid population, care must be taken to release the preventative Aphidoletes in a "neutral" location, away from known aphid hot spots. This will force the Aphidoletes to disperse. The hot spots should be directly treated with additional Aphidoletes and *Aphidius matricariae*, a parasitic wasp.

The eggplant will help considerably with aphid control. Eggplants will attract many of the incoming aphids, seen as winged aphids.

THRIPS

The problem of thrips in roses has drastically been reduced since de-budding has become popular. Thrips can still come in a big way and can cause considerable damage, but they won't persist in the crop if all of the flower buds are removed from the house and Stratiolaelaps is present in the root zone, interrupting thrips pupation.





Cucumeris works well on roses, feeding on the first and second instar larvae. One application of cucumeris per month will maintain a constant level in the crop. Release rates are dependent on the level of contamination, ranging from 100 to 1,000 per 10 square feet. Slow release bags can also be used, but care must be taken to ensure that the bags are removed after 6 weeks to prevent the bran mite from causing damage in the buds.

Strategically placed, flowering “Hero” Marigolds have been very effective trapping plants for thrips. During periods of significant thrips outbreaks, marigolds should be placed throughout the house. Keep the marigolds “topped up” with *Stratiolaelaps* in the soil and cucumeris on the leaves. If the plant becomes overwhelmed with thrips, carefully place the plant in a plastic bag and remove it from the house.

Yellow or Blue sticky traps should have a cotton ball placed on them to absorb vanilla or almond extract. These aromatic compounds can be very attractive to thrips, and can increase trapping by a factor of 10.



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