

Keys to Effective Aphid Management in Leafy Vegetables

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For vegetable growers to successfully compete in the fresh market, they must be able to produce high quality, insect-free crops. This is particularly challenging for growers of leafy vegetables where damage by aphids can seriously reduce yield and quality. In many areas that produce lettuce, aphids are considered the most economically important insect pest found on the crop.

A number of aphid species are known to infest and damage leafy vegetables. Among them, the green peach aphid, *Myzus persicae*, is generally considered the most significant because of its broad host range, propensity for insecticide resistance, and tendency to rapidly infest plants. Other species such as foxglove aphid, *Aulacorthum solani*, and lettuce aphid, *Nasonovia ribisnigri*, are considered important aphid pests of lettuce in the western United States. Because of their small size (1-6 mm) and high reproductive potential (> 20 generations per year), aphids often go undetected until they build up to damaging levels.

Aphids feed by piercing leaves with needlelike mouthparts and removing plant juices. Excessive feeding by heavy infestations can stunt plant growth, and some aphid species can vector viruses that are pathogenic to many leafy vegetables. However, it is the contamination of harvestable plant material (e.g., lettuce heads, celery hearts) by the aphids themselves that makes them economically important. Contamination of leafy vegetables with just a few aphids, will often downgrade quality, or even render the product unmarketable.

Because aphids have the potential to rapidly contaminate plants, preventing their establishment is critical for the production of quality crops. Below I discuss several management tips that growers might consider when dealing with aphids in leafy vegetables.

Start with Prevention

Potential aphid problems can sometimes be avoided with preventative cultural practices. Destruction and removal of crop residues immediately after harvest can minimize the spread of aphids to adjacent plantings. Aphids can also be abundant on weeds, so proper sanitation and thorough weed control in and around crops may help prevent aphid buildup and dispersal.

Natural enemies including common lady beetles, lacewings, syrphid flies, and many parasitic wasps can help suppress aphid populations infesting leafy vegetables. Cultural practices such as planting “companion crops” (i.e., alyssum) that conserve and enhance natural enemy populations can also be helpful in keeping aphids from colonizing crops.

Cultural management and natural enemies can’t always prevent aphid colonization though, and insecticides may be required to prevent contamination.

Scout Fields Thoroughly

In anticipation of aphid infestations, PCAs should begin scouting soon after stand establishment. Pay close attention to windward edges of fields. Infestations are often found first along the field margins nearest the direction of prevailing winds.

Aphid colonization begins with the movement of a few winged females into fields that give birth to live nymphs. Many of these offspring will become mature, wingless aphids that in turn will deposit more live nymphs. It is typically these wingless nymphs that cause problems with contamination. Infestations can develop quickly when weather conditions are favorable, and fields should be scouted frequently, at least 2-3 times per week.

When sampling for aphids, inspection of the whole plant is important. The distribution of wingless nymphs within plants will vary among aphid species. In lettuce, green peach aphids tend to colonize the older frame leaves, whereas foxglove and lettuce aphids will preferentially infest the young terminal plant growth deep within the heads or hearts. Understanding the distribution of the aphids can also aid in their identification.

Aphid Identification is Important

When winged aphids initially begin dispersing into a growing area, they typically move from crop to crop until they find a suitable host to colonize. However, the presence of winged aphids on a lettuce or celery crop does not necessarily mean you should expect an aphid infestation to eventually develop. For example, in the western U.S., winged aphids that colonize small grains (i.e., corn leaf aphid) or alfalfa (i.e., pea aphid), but not lettuce, can often be found on lettuce plants in the fall. After these winged aphids determine that lettuce is not an acceptable host, they will move on, and growers need not worry about controlling them.

Proper identification can save growers money, and prevent unnecessary insecticide applications. Most crop consultants and university Extension Specialists can provide an accurate aphid ID. Once wingless aphids are found colonizing plants, aphid identification can also be important for determining control measures. Insecticide performance in the field varies from product to product, but can also vary depending on the aphid species you are targeting.

For example, neonicotinoid insecticide treatments applied as either a foliar spray (e.g., acetamiprid-Assail® 30SG) or via soil application (e.g., imidacloprid -Admire Pro®) are very effective in controlling green peach aphids in lettuce. However, these same insecticides are generally not very effective against foxglove and lettuce aphids. Some aphid species are inherently less susceptible to certain classes of insecticides.

Apply Insecticide Sprays Early

When cultural practices and natural enemies alone are not able to prevent aphid infestations, insecticides can be a reliable option for controlling aphids. Research has shown that foliar insecticides are most effective when applied early in aphid colonization, or specifically, when the presence of a few wingless nymphs are first detected on plants. In iceberg lettuce, it is recommended that foliar sprays be applied based on a nominal action threshold; sprays should be initiated when an average of 10% of lettuce plants sampled have at least a single aphid colony (4-5 nymphs) present. Fields should be re-sampled 3-7 days following sprays and re-treated if the threshold is exceeded again. This approach has resulted in reduced insecticide usage, and improved protection of lettuce heads at harvest. This approach has also been used successfully in other leafy vegetables.