

The Silverleaf Whitefly

Bemisia argentifolii

The Silverleaf Whitefly's destructive campaign first began when its believed migration occurred around the 1986-1990s from the plant trade. This insect of possible middle-eastern origins has afflicted crops throughout the continents (excluding Antarctica) ever since. The whitefly's reign has been aided by ornamental plant trade between countries by serving as a vessel for the parasite's 80-100 eggs, the amount laid in a female's lifetime. This inadvertent transfer of the destructive insect has led to \$500 million worth of damage being caused in California attributed to the whitefly; whether it is caused by its disease vectoring or its parasitic methods of acquiring nutrients. In the U.S, the whitefly mainly resides in southern states. Kentucky, California, Florida, and North Carolina all possess a whitefly problem, mainly in agriculture.

The whitefly sabotages plants by sucking vital nutrients from crops, damaging the plant and causing uneven ripening. The whitefly may also promote and spread insect-borne disease and mold that grows from its honeydew excrement. Crops that are affected by the whitefly include melon, broccoli, squash, cabbage, cotton, and ornamental species such as poinsettias. Although the real environmental damage inflicted is unknown, this destructive behavior is responsible for \$1 billion worth of damages to the U.S, which has been reflected in the loss of jobs and sales in the country.

Despite having no real estimations of the biological damage of the whitefly, its parasitic nature has affected many plants in the area, even non-agricultural plants. Disease carried by these vectors have caused a decrease in biodiversity in affected areas by killing off plant species; the whitefly also uses competitive exclusion to acquire nutrients in plants that other organisms cannot access. The whitefly's feeding activities have caused numerous defects and damage to plants including the formation of chlorotic spots, weakening of leaves and stalks, and premature leaf dropping; which all leads to plant death. However, some species of fungi such as *Ascoersonia* and *Verticillium* attack parasites. This could help plants fend off parasitism from the whitefly.

This parasitic activity, however, can be combated using both conventional pest control methods (pesticides and manual removal) and the introduction of predatory and protective species in areas where the whitefly is a proven problem. The parasitoid wasp species *Encarsia formosa* is a well-known counter against whiteflies, as well as the species *Eretmocerus eremicus*, which deals with infestations in a similar manner. The use of *Encarsia formosa*,

however, has been disregarded by the University of Massachusetts due its lackluster results. *Eretmocerus eremicus* is thus used for protection as it guarantees a high rise in mortality rate for the whitefly (UMass recorded a 99.1% rate). This method is both safe for the environment and cost effective (\$10.50 for a thousand pupae), depending on the concentration of usage. This price range leaves protection costing \$0.53-\$1.50 per plant (depending on usage).

This small, .82 millimeter fly, is responsible for \$1 billion in damages due to plant death and defects in the U.S, caused by its disease transmission and its harmful feeding methods. This menacing, harmful insect proves that evil can come in any size.

Citations

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