

# The Compatibility & Contribution of Natural Enemies in Western U.S. Alfalfa Management

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The alfalfa system relies heavily on insecticides as its primary pest management tool. The ability for alfalfa producers to suppress pests has become increasingly difficult not only because the overuse of active ingredients has led to insecticide resistance for alfalfa weevil and aphids, but also because regulatory pressure at the federal level has led to the ban of once widely used products (i.e., carbofuran and chlorpyrifos). Moreover, the most widely used insecticides are broad-spectrum and harm beneficial arthropods including pollinators, predators, and parasitoids. Natural enemies (i.e., predators and parasitoids) provide an important ecosystem service of natural pest suppression. Economic thresholds exist to guide producers in the decision to apply insecticides, however, these are outdated and the value of natural enemies is underappreciated in the decision-making process for alfalfa management. Our **specific objectives** are to:

- 1) Determine the implications of applying current insecticide classes on the strength of biological control
- 2) Evaluate the relationship between western landscapes and environmental factors affecting pest outbreaks and natural enemy communities associated with alfalfa production
- 3) Establish economic thresholds for alfalfa pests in the West and incorporate the value of natural enemies for decision-making
- 4) Develop and disseminate a regional IPM strategy that utilizes natural enemies for decision-making through Extension programming