Residual effects of Incipio® insecticide (isocycloseram) on the survival of the predatory mites *Neoseiulus californicus* and *Phytoseiulus persimilis*

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Spider mites are important pests of California strawberries and can cause significant yield losses when populations reach damaging levels. Plinazolin® (isocycloceram) is a Group 30 insecticide with a novel mode of action that selectively targets invertebrate GABA-gated chloride channels. Although it provides a new option for mite management, information regarding its compatibility with predatory mites remains limited. This study evaluated the residual activity of Plinazolin in the federally registered formulation Incipio® on two predatory mite species commonly used in strawberry production, *Neoseiulus californicus* and *Phytoseiulus persimilis*. Strawberry leaflets were collected from field-treated plots at 5, 12, 20, 27, 34, and 41 days after treatment (DAT), and leaf-disc bioassays were conducted under laboratory conditions (Fig. 1). Predatory mites were exposed to field-aged residues for 48 hours, and mortality was recorded. Both predator species experienced elevated mortality shortly after application of Incipio. Mortality of *N. californicus* reached 79% and 59% at 5 DAT for the 2.1 and 3.1 fl oz rates, respectively (Fig. 2), while *P. persimilis* mortality reached 74% and 56% (Fig. 3). Residual toxicity generally declined as residues aged, although mortality remained higher in the Incipio treatments than in the untreated control and comparison treatments at several evaluation dates. Mortality in the Enervate 4 SC®, Agri-mek SC®, and untreated control treatments remained comparatively low throughout the study. These results indicate that Incipio residues may negatively affect predatory mites shortly after application, but toxicity generally decreases as residues age. Differences in susceptibility between predator species suggest that predator selection and application timing should be considered when integrating Incipio into strawberry IPM programs.



Figure 1. Representative leaf-disc bioassay arenas used to evaluate the residual toxicity of field-aged pesticide residues to predatory mites. Strawberry leaf discs collected from treated field plots were used to assess 48-h mortality of *N. californicus* and *P. persimilis*.

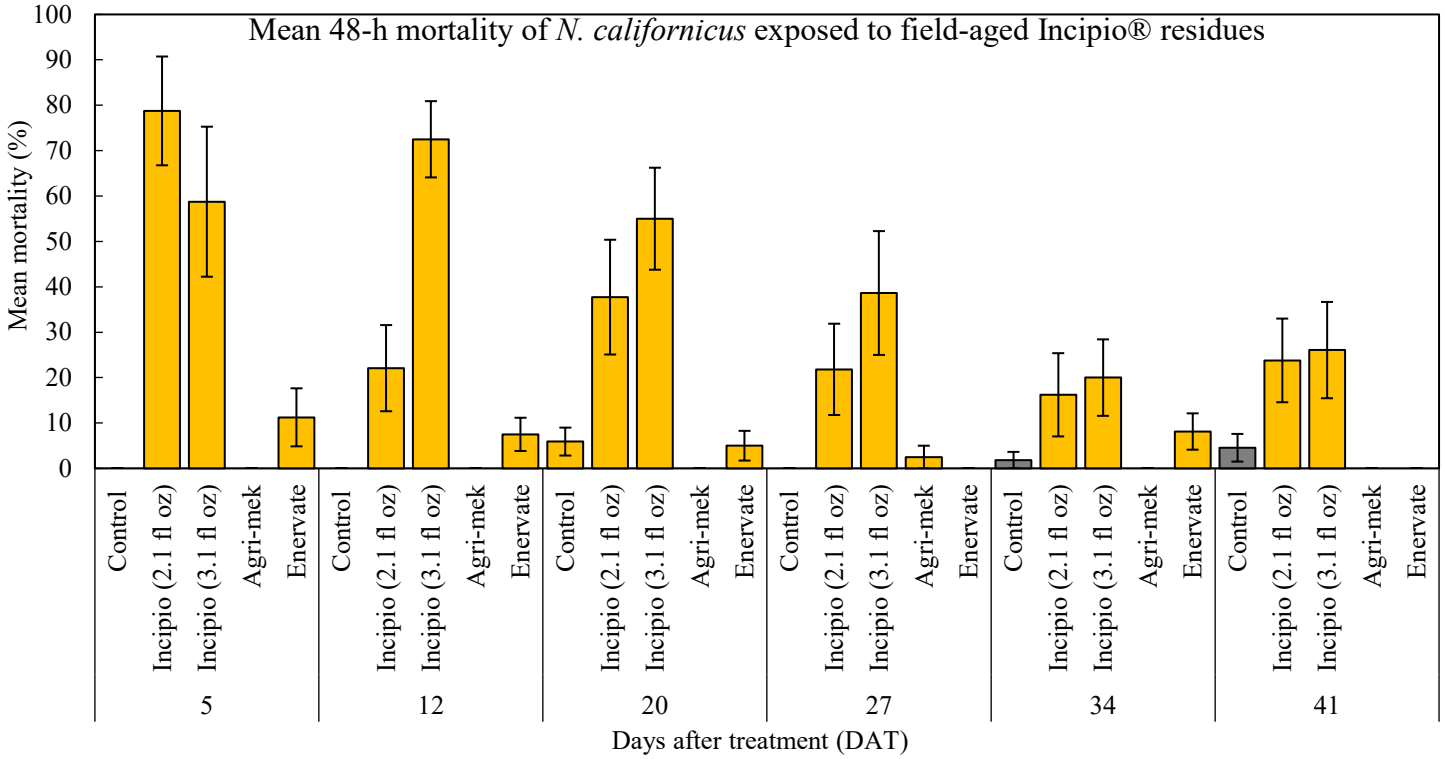


Figure 2. Mean (± SE) 48-h mortality of *Neoseiulus californicus* following exposure to leaf discs collected from strawberry plants treated with Incipio® (2.1 and 3.1 fl oz), Agri-mek®, Enervate®, or left untreated (Control). Leaf discs were collected at 5, 12, 20, 27, 34, and 41 days after treatment (DAT).

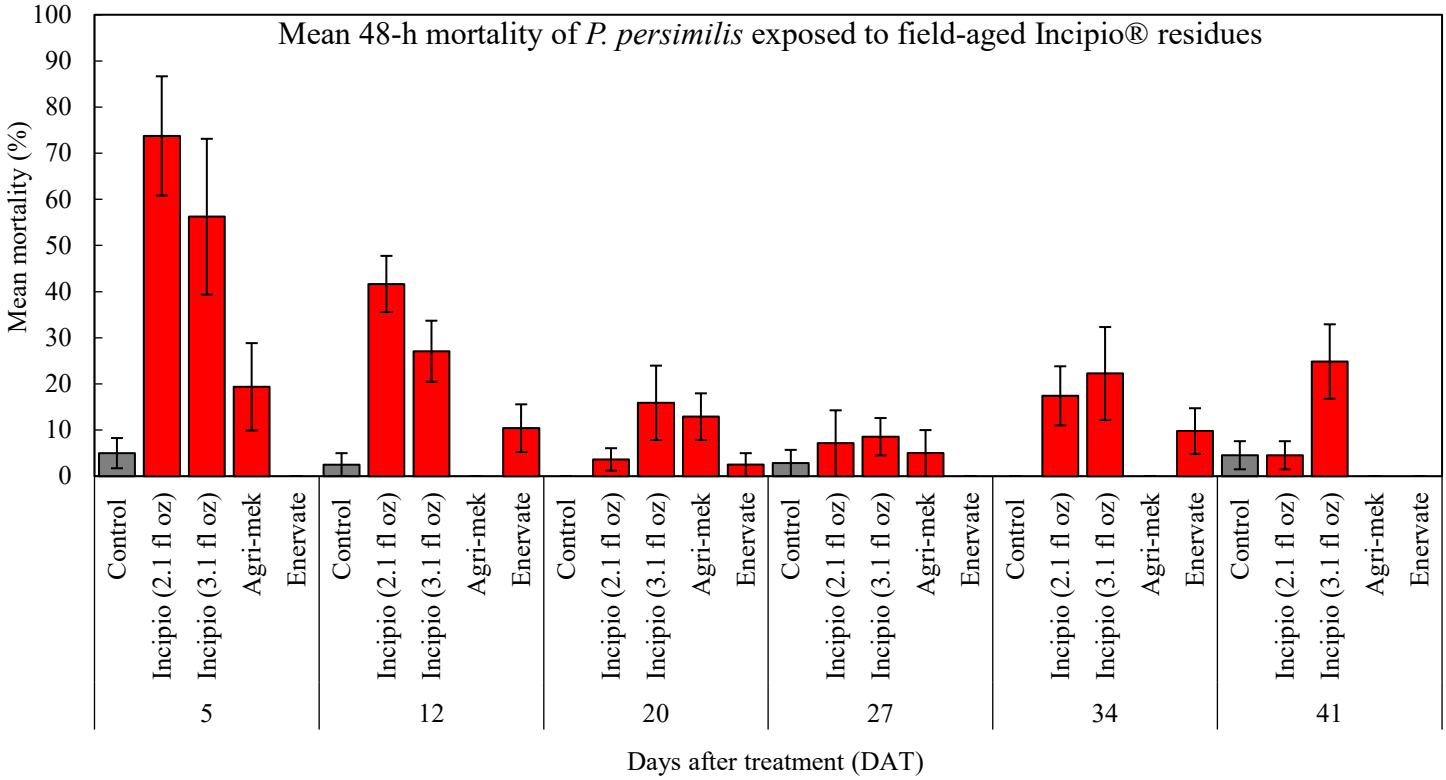


Figure 3. Mean (± SE) 48-h mortality of *Phytoseiulus persimilis* following exposure to leaf discs collected from strawberry plants treated with Incipio® (2.1 and 3.1 fl oz), Agri-mek®, Enervate®, or left untreated (Control). Leaf discs were collected at 5, 12, 20, 27, 34, and 41 days after treatment (DAT).