

# Evaluation of New Insecticides for Aphid Control in Green Leaf Lettuce

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## Abstract

*New soil injected and foliar insecticides were evaluated for their efficacy towards potato aphids in green leaf lettuce. The soil injected insecticides, Platinum and V10066, both appear to be viable alternatives to Admire, providing effective aphid control through harvest or ca. 90 days post-planting. Two foliar applications of Acetamiprid or Aphistar timed ca. 14 days apart beginning at the onset of aphid colonization provided superior aphid control over Provado or Fullfill, and control similar to that of the soil injected insecticides.*

## Introduction

Aphids are a primary contaminant of lettuce grown for spring harvest. Currently, most growers use Admire 2F (imidacloprid) applied below the seed line at planting to manage aphids. Although this prophylactic tactic has proven extremely effective, during years when aphids are not numerous its cost effectiveness is questionable. Some growers prefer to curatively treat aphids foliar insecticides. However, during years similar to 1999 when aphid populations are extremely high, foliar treatments are sometimes less reliable than soil applied treatments and may result in higher expenses. There is no easy answer when choosing whether or not to manage aphids using prophylactic treatments. Over the past few years several agri-chemical companies have been developing new insecticides with potential for controlling aphids in lettuce. In this trial, we report the efficacy of new soil applied and foliar insecticides relative to Admire 2F and Provado 1.6F to aphids in green leaf lettuce.

## Materials and Methods

Green leaf lettuce, 'Royal Green' was direct seeded into double rows on 42-in beds on 9 December 1998 at the Yuma Valley Agricultural Center, Yuma, AZ. Plots were 4 beds X 50 ft, bordered on each side by 2 blank beds and on each end by 5 ft alleys. The test was a randomized complete block design, with 4 replicates. Soil applied treatments included Admire 2F (imidacloprid) at 16 oz/ac, Platinum 2SC (thiamethoxam) at 2.36 and 5.7 oz/ac, and V10066 50WG at 8oz/ac. Foliar insecticides evaluated included Provado 1.6F (imidacloprid) at 3.75 oz/ac, Aphistar 1.4EW (triazimate) at 12 oz/ac, Fullfill (pymetrozine) 50WG at 2.75 oz/ac, and Acetamiprid 70WP at 0.57 and 1.14 oz/ac. All foliar treatments included the non-ionic surfactant Kinetic at 0.1% v/v.

Soil injected treatments were injected 1.5-2.0 inches below the seed line just prior to planting in 10 gallons per acre total solution. Foliar treatments were sprayed using a tractor mounted sprayer. The boom covered 4 rows, with 3 hollow cone TXV-4 nozzles per row, one centered over the bed and two on angled drops on each side of the bed. The sprayer was calibrated to deliver 20 gallons per acre at 40 psi. The tractor traveled at 3 mph. Treatments were applied on 15 February and 3 March.

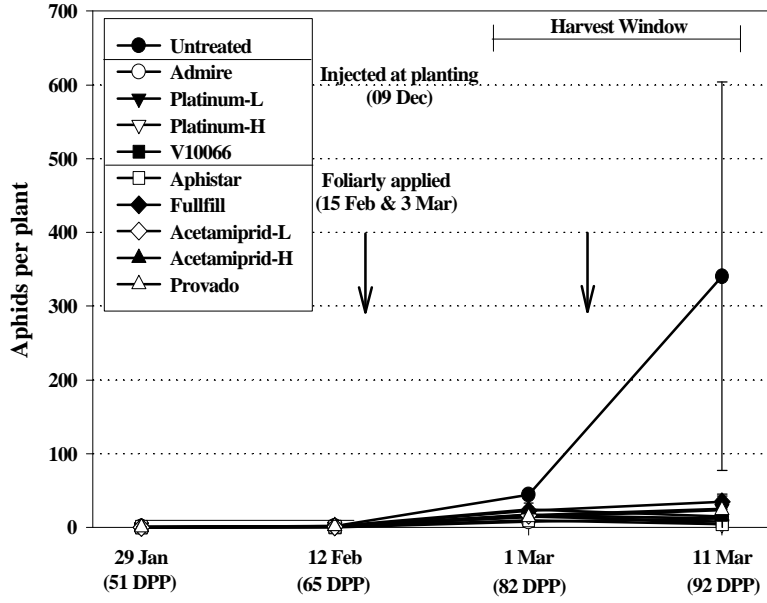
Aphids densities were estimated by counting their number on 5 plants per plot. Evaluations were made on 29 January, 12 February, and 11 March. On 11 March the percentage of plants with harvestable portions contaminated by aphids was also estimated.

## Results and Discussion

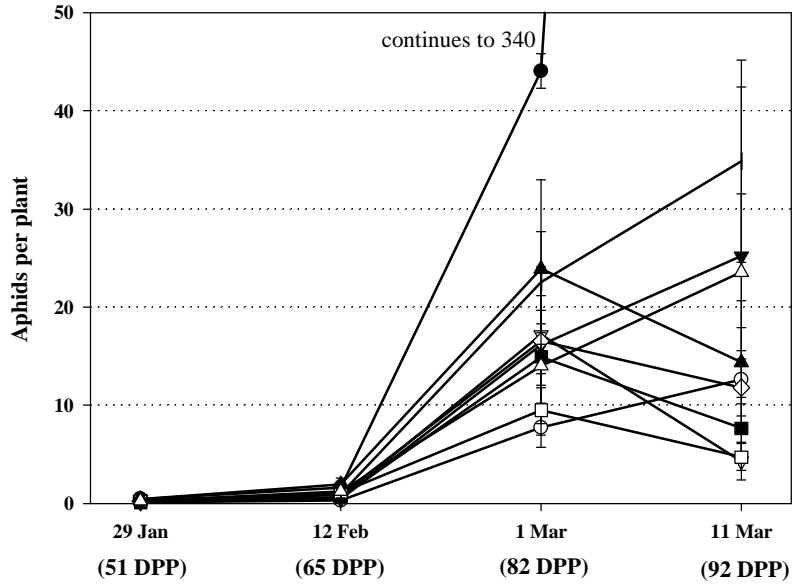
Aphid populations were low until late February. Green peach, *Myzus Persicae* (Sulzer), was the predominate species until mid-February when potato aphid, *Macrosiphum euphorbiae* (Thomas), began to dominate. By March, potato aphids became very numerous, very few green peach aphids could be found, and although lettuce aphids, *Nasonovia ribinigri*, were encountered in this field, their numbers were very low. In mid-February, potato aphids were beginning to colonize many of the plots that had not been treated with soil injected insecticides, thus triggering the first application of foliar insecticides on 15 February. At 82 days post-planting (DPP) and 14 days after foliar treatments (DAFT), aphid populations began to increase across all treatments (Figure 1). At this time, all the insecticides treatments contained significantly fewer aphids than the untreated plots. Among the insecticide treatments, Admire and Aphistar contained the fewest aphids closely followed by both rates of Platinum, V10066, the low rate of Acetamiprid, and Provado. Fullfill and the high rate of Acetamiprid appeared slightly weaker (Figure 2).

Because aphid populations continued to increase following the first foliar application, the foliar insecticides were applied again on 3 March (16 days after the first application). On 11 March, 92 DPP, 24 DAFT (app. 1) and 8 DAFT (app. 2), the aphid populations stabilized or were reduced in most of the insecticide plots, but continued to rapidly increase in the untreated (Figures 1 and 2). All of the soil injection treatments were similar in efficacy, not differing statistically. Of the foliar materials, both rates of Acetamiprid and Aphistar were superior treatments relative to Fullfill and Provado, and provided aphid control equivalent to Admire and the other soil injection treatments (Figures 1 and 2). Results were similar when evaluating contamination of harvestable portions. All treatments were similar in effectiveness with the exception of Fullfill and Provado which were statistically less effective (Figure 3).

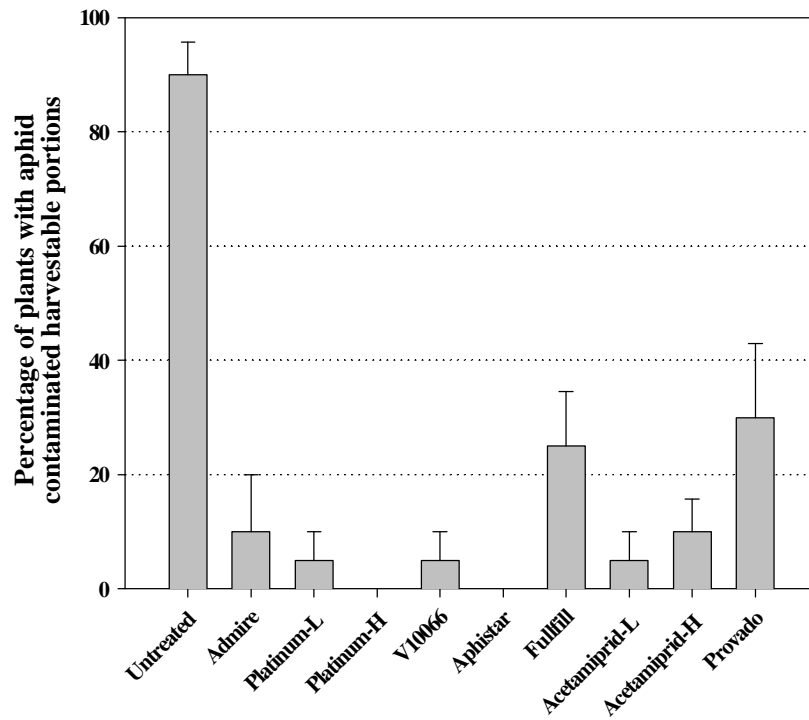
In conclusion, Platinum and V10066 both appear to be viable alternative to Admire as soil injected insecticides for aphid control in green leaf lettuce. Two foliar applications of Acetamiprid or Aphistar timed ca. 14 days apart beginning at the onset of aphid colonization provided superior aphid control over Provado or Fullfill, and control similar to that of the soil injected insecticides.



**Figure 1.** Seasonal development of aphid populations (mean  $\pm$  SEM) per plant in green leaf lettuce treated with soil injected and foliar insecticides.



**Figure 2.** Same data as Figure 1., but is a more detailed view of insecticide treatments.



**Figure 3.** Percentage of plants with aphids infesting harvestable portions on 11 March 1999.