



# In-season control of navel orangeworm

Joel Siegel and Spencer Walse

USDA/ARS, San Joaquin Valley Agricultural Sciences Center, Commodity Protection Unit, Parlier, CA 93648



## Introduction

In recent years several narrow spectrum insecticides (insect growth regulators, anilinic diamides) have been registered for use in almonds and pistachios to control navel orangeworm (NOW) *Amyelois transitella*. Multiple control strategies for this insect are currently being evaluated as part of the Areawide Program to Control NOW in Almonds, Pistachios, and Walnuts. Our interest is evaluation of activity against all life stages of NOW, duration of control provided by insecticides currently registered for use in almonds and pistachios, and spray coverage. Insecticide trials were conducted in Fresno and Madera counties, in consultation with Barat Bisabri, Byron Sleugh, Gary Braness, Manuel Jimenez, Mike Strmiska, Gary Weinberger, and Thomas Wang. These trials complement the research of Bradley Higbee at Paramount Farming Company (Poster). We also are collaborating with the spray drift and deposition research of Ken Giles, Franz Niederholzer, and Jim Markle (Poster). Adult toxicity was determined by placing bagged adults (3 per bag) in trees immediately before application and removing them 24 hours later. The duration of control was determined by removing treated split nuts from the field at intervals and challenging them in the lab with eggs. Spray coverage was evaluated using spray cards placed at two foot intervals on pvc pipe and in some trials the card were paired with eggs. .

## Objectives

1. Determine adult activity of selective insecticides;
2. Determine insecticide duration of control on nut surfaces;
3. Determine spray coverage

Treatment	Mortality	Adults
Control	0%	132
Delegate 6.4 oz	88.89%	108
Delegate 3.2 oz + Intrepid 12.8 oz	49.59%	123
Altacor 4 oz	16.67%	138

Table. 1 Adult activity of Altacor, Delegate and Intrepid

## Results

Duration of Control of selective insecticides in Almonds

Insecticide	Day after spray	Percent Mortality	Percent Reduction	Eggs
<b>Belt (4 oz) Carbomin Zinc 7.5% (20 oz), First Choice Narrow Range 415 Spray Oil (20 oz)</b>	<b>6</b>	<b>98.60</b>	<b>84.01</b>	<b>1,000</b>
<b>Belt (4 oz) Carbomin Zinc 7.5% (20 oz), First Choice Narrow Range 415 Spray Oil (20 oz)</b>	<b>9</b>	<b>97.47</b>	<b>71.58</b>	<b>950</b>
<b>Belt (4 oz) Carbomin Zinc 7.5% (20 oz), First Choice Narrow Range 415 Spray Oil (20 oz)</b>	<b>14</b>	<b>99.28</b>	<b>91.78</b>	<b>1,800</b>
<b>Altacor (4.5 oz) Carbomin Zinc 7.5% (20 oz), First Choice Narrow Range 415 Spray Oil (20 oz)</b>	<b>14</b>	<b>99.83b</b>	<b>98.06</b>	<b>600</b>

Duration of Control of in Pistachios

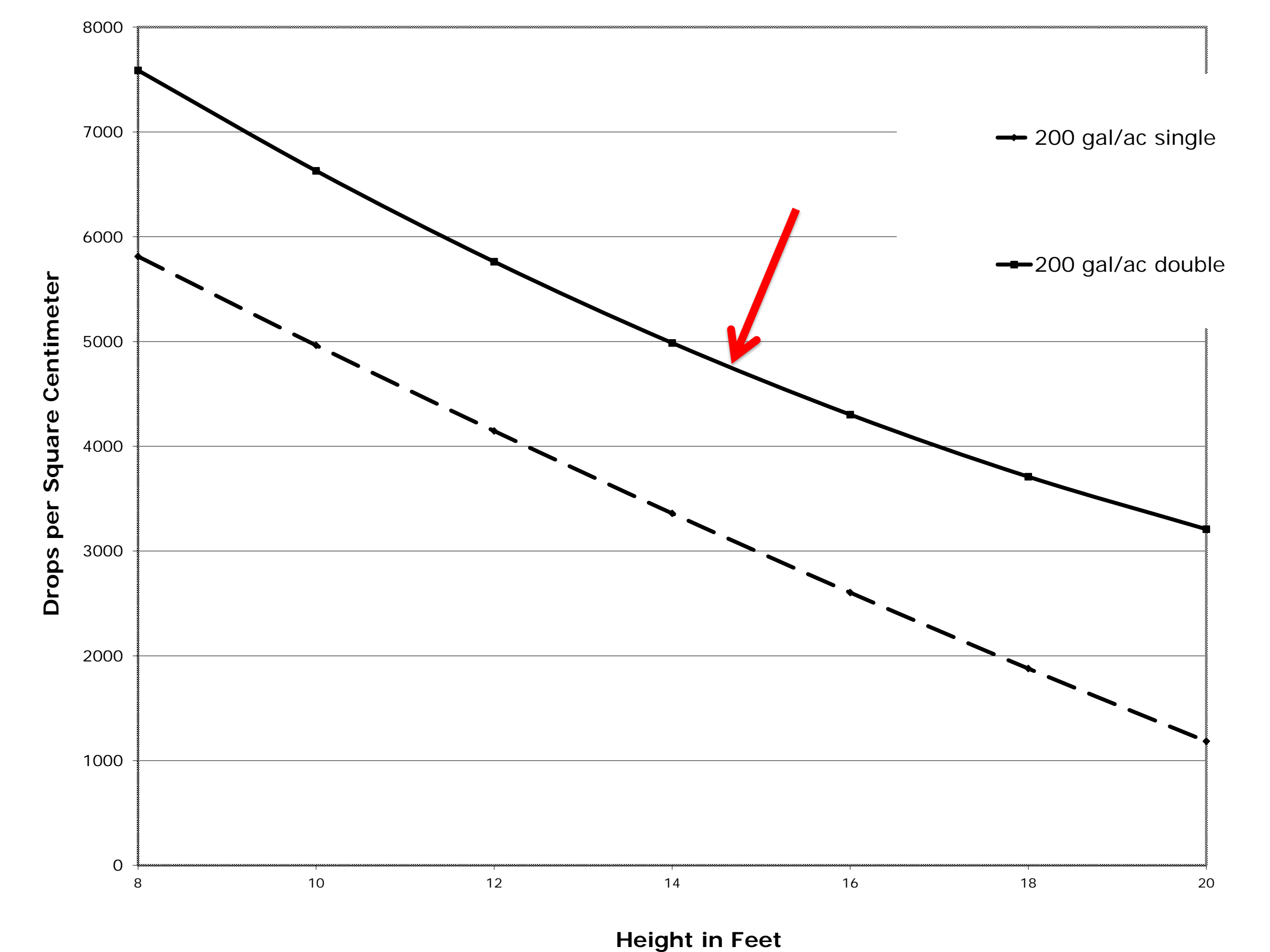
Insecticide	Percent Mortality	Eggs
<b>30 Days after Exposure</b>		
Belt 4 oz + Warrior II 2.5 oz	97.25 a	800
Intrepid 24 oz	95.83 a	600
Proclaim 4.5 oz + Warrior II 2.5 oz	95.67 a	600
Intrepid 18 oz + Lambda Cy 5 oz	94.38 a	800
Intrepid 18 oz + Warrior II 2.5 oz	93.88 ab	800
Voliam Xpress 10 oz	92.50 ab	800
Intrepid 8 oz + Warrior II 2.5 oz	92.00 b	800
Bifenture EC 10 oz	91.25 b	800
Proclaim 4.5 oz	89.83 b	600

Means followed by different letters differ at  $P < 0.05$

Importance of using two nozzles per position in order to get improved spray coverage



PTO 36 inch fan, 2 mph, 200 gal/acre, Large Almonds, Fresno County



Coverage with 2 nozzles per position is marked by the red arrow