

# Pyrethroid Insecticide Comparison in Broccoli

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## **Abstract**

*Several pyrethroid insecticides were evaluated and compared for efficacy against lepidopterous insect pests in broccoli. Zeta-cypermethrin (Mustang®) was compared at two rates, tralomethrin (Scout X-tra®) formulations were compared, lambda-cyhalothrin (Karate®), and esfenvalerate (Asana®) were evaluated for efficacy against cabbage looper (*Trichoplusia ni*, CL). Following each of the applications, most of the treatments reduced the number of larger sized CL relative to the untreated check. The two rates of Mustang performed similarly as did the two formulations of Scout X-tra, emulsifiable concentrate versus gel.*

## **Introduction**

The pyrethroid insecticides have been an important component of vegetable crop insect pest management programs because of the efficacy against a spectrum of pests. Specific pyrethroid insecticides have demonstrated strengths against some pests or weaknesses against others. Pyrethroid insecticides have been included in tank-mix combinations for greater efficacy against certain pests. Chemically, many of the pyrethroid insecticides have been improved to be more active against pests at lower doses. Several pyrethroid insecticides have gained new registrations for use in a broader number of crops. This field test was conducted to compare rates, formulations, and efficacy of pyrethroid insecticides against cabbage looper (*Trichoplusia ni*, CL) in broccoli.

## **Materials and Methods**

A small plot field test was conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. Broccoli cv. Captain was direct-seeded into double rows on 40-inch beds on 12 Sep 1996 and furrow irrigated. Each treatment plot consisted of two beds measuring 40 feet long with two beds planted between each plot to provide a buffer. The test was established as a randomized complete block design with four replicates. All foliar applications were applied using a hand-held boom with four TX-10 hollow-cone nozzle tips spaced 20-inches apart and delivered in 21 gpa water pressurized with a CO<sub>2</sub> backpack sprayer at 45 psi. An adjuvant, Latron CS-7 at 0.25% v/v was added to all treatments. Initial treatments were applied on 25 Sep for flea beetle suppression only. The second applications were made on 23 Oct when broccoli was at the 5- to 6-leaf stage and temperatures were 78°F, with few scattered clouds, and a slight breeze. In the untreated check broccoli, precounts showed that there were an average of 1.2 small CL larvae/plant and 0.4 larger sized larvae/plant. The third applications were made on 07 Nov with broccoli at the 7- to 8-leaf stage and temperatures at 70°F with no wind and clear skies. The fourth application was made on 15 Nov with broccoli at the 7- to 10-leaf stage, temperature at 72°F, cloudy skies and winds gusting to 10 mph. Evaluations were made at intervals following each application by randomly selecting ten cabbage plants per replicate and counting all living small (1<sup>st</sup> and 2<sup>nd</sup> instars), medium (3<sup>rd</sup> instar), and large (>4<sup>th</sup> instar) larvae of CL.

## **Results and Discussion**

On 31 Oct, at 8 days after treatment (DAT) of the second application, all treatments showed a reduction in the total number of CL larvae/plant relative to the untreated broccoli (Table). Mustang at 0.04 lb AI/A and Scout X-tra EC had more larger sized larvae/plant than the untreated. At 15 DAT of the second application, fewer large-sized larvae were observed and small-sized larvae increased over the previous week. Following the third and fourth applications, larger sized larvae were significantly reduced relative to the untreated. Mustang at 0.05 lb AI/A generally had numerically fewer larger larvae than than the lower rate but the difference was not significant. Scout X-tra EC and gel performed similarly and differences were not observed. Asana and Karate controlled CL and on five observation dates, no larger sized larvae were detected.

Table. Pyrethroid Insecticide Comparison in Broccoli Study at UA\_MAC. (Umeda, Murrieta, and Stewart)

Treatment	Rate lb AI/A	Mean Number of Cabbage Looper/Plant														
		23 Oct small med/g	31 Oct small med/g	7 Nov small med/g	11 Nov small med/g	14 Nov small med/g	19 Nov small med/g	22 Nov small med/g	26 Nov small med/g							
Untreated Check	1.2	0.4	0.8	0.3	0.7	0.1	0.3	0.5	0.2	0.5	0.3	0.4	0.1	0.7	0.1	0.5
Mustang	0.04		0.1	0.4	0.4	0.1	0.0	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Mustang	0.05		0.4	0.1	0.7	0.2	0.6	0.1	0.3	0.1	0.2	0.1	0.0	0.1	0.0	0.1
Scout X-tra	0.02		0.5	0.4	0.6	0.2	0.5	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1
Scout gel	0.02		0.3	0.1	0.5	0.1	0.5	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1
Asana	0.05		0.6	0.1	0.4	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0
Karate	0.02		0.2	0.2	0.3	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0
LSD(p=0.05)			0.5	0.3	0.4	0.2	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2

Treatments applied on 25 Sep, 23 Oct, 07 and 15 Nov.