



California Garlic and Onion Symposium 2008

Evaluation of Insecticides for Thrips Control in Onions

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Thrips

Thrips are very small, slender insects best seen with a hand lens.

Onion thrips are about 1.3 mm long and flower thrips are slightly larger at 1.5 mm long.

Thrips have two pairs of wings that are fringed with long hairs. Adults are pale yellow to light brown in color.

The immature stages have the same body shape as adults but are lighter in color and are wingless.

You may have been told that Western flower thrips adults have red-colored pigment in their eyes and onion thrips eyes are gray, but this is not reliable.



Thrips Identification



Onion thrips
(*Thrips tabaci*)

Look at the specimen from above. Western flower thrips has a row of hairs along both the upper and lower margin of the prothorax (first segment behind the head). Onion thrips has hairs on the lower, but not upper margin. This characteristic is visible with a 10X hand lens (and good eyes), but is easily seen with a good dissecting microscope visible



Western flower thrips
(*Frankliniella occidentalis*)

Developed by
Bob Hammon,

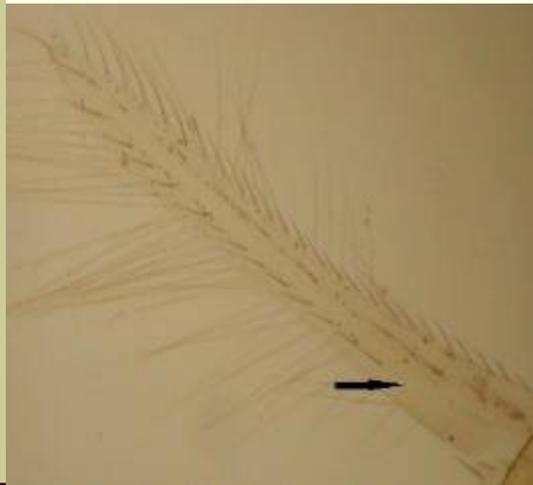
Colorado State University, Agricultural Experiment Station,
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Thrips Identification

Focus on the rows of setae (hairs) along the center of the rib of the forewing.

Western flower thrips have two continuous rows of setae, while there is a gap in at least one row of setae in onion thrips. A dissecting microscope is necessary to see this

characteristic



Onion thrips
(Thrips tabaci)



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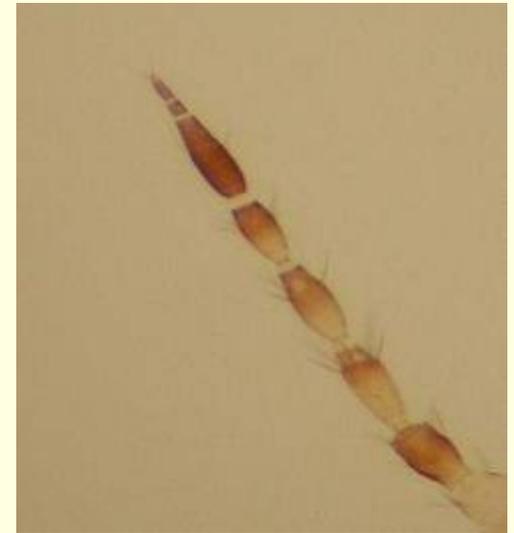
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Thrips Identification



Onion thrips
(*Thrips tabaci*)

The terminal antennal segment of onion thrips is not as sharply pointed as that of Western flower thrips. This characteristic is best observed when the two species are observed side by side. A dissecting microscope is necessary to see the characteristic in enough detail to be useful.



Western flower thrips
(*Frankliniella occidentalis*)

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Thrips Damage

- Both onion thrips and western flower thrips have extensive host ranges, including cereals and broadleaved crops.
- Onion thrips are more injurious to onions.
- Onion thrips thrive in hot, dry conditions and are more damaging where these climatic conditions prevail for most of the production season.
- High populations of thrips can reduce both yield and storage quality of onions. Thrips are most damaging when they feed during the early bulbing stage of plant development.
- Both adults and nymphs cause damage. When foliage is severely damaged, the entire field takes on a silvery appearance. Only onion thrips transmits *Iris yellow spot virus* (IYSV)



Onion field heavily infected with IYSV.

Photo by Grant J. Poole.

THRIPS MANAGEMENT

- **Don't plant onions near grain.**
- **Overhead irrigation suppression of thrips populations.**
- **Control thrips before the early bulb. Onions can tolerate higher thrips populations near harvest.**
- **Randomly sample entire onion plants by pulling leaves apart and counting all thrips using a hand lens, on the inner leaves near the bulb well as those under the leaf folds.**
- **Sample at least 5 plants from 4 separate areas of the field. A threshold of 30 thrips per plant mid-season (lower for very young plants and higher for larger mature plants) to time treatment with an insecticide.**

Thrips Insecticide Efficacy Trial On Onion Brawley, California, 2006.

2006 Trial

Control (untreated)

Vydate 2 L @ 64.0 fl

Lannate LV + Mustang 1.5 EW @ 36.0 fl + 3.8 fl

Success + Aza-Direct @ 6.0 fl + 48.0 fl

Carzol 92 SP @ 16.0 dry

Assail 30 SG @ 4.0 dry

Assail 30 SG @ 5.4 dry

Success + Prev-Am @ 6.0 fl + 0.4% v/v

Mustang + Prev-Am @ 6.0 fl + 0.4% v/v

Tesoro 4EC @ 8.0 fl

Tesoro 4EC @ 11.2 fl

NNI-0101 20 SC @ 19.0 fl (pyrifluquinazon)

FujiMite 5 EC @ 32.0 fl

NAI- 2302 15%EC @ 14.0 fl (tolfenpyrad)

NAI- 2302 15%EC @ 21.0 fl

Silwet L77 @ 0.6 ml/2L added to foliar spray mixtures.

Application Dates: 14 Feb, 6, 14, 30 Mar, 19 Apr 2006

Thrips Insecticide Efficacy Trial On Onion Brawley, California, 2007.

2007 Trial

Control (untreated)

Vydate 2 L @ 64.0 fl

Lannate LV + Mustang 1.5 EW @ 36.0 fl + 3.8 fl oz

Lannate LV + Warrior @ 36.0 fl oz + 3.5 fl oz

Success + Aza-Direct @ 6.0 fl oz + 48.0 fl oz

Radiant 120 SC @ 8.0 fl oz

Keynote @ 0.5% v/v

Keynote @ 1.0% v/v

Keynote + Success @ 0.5% v/v + 0.094 fl oz

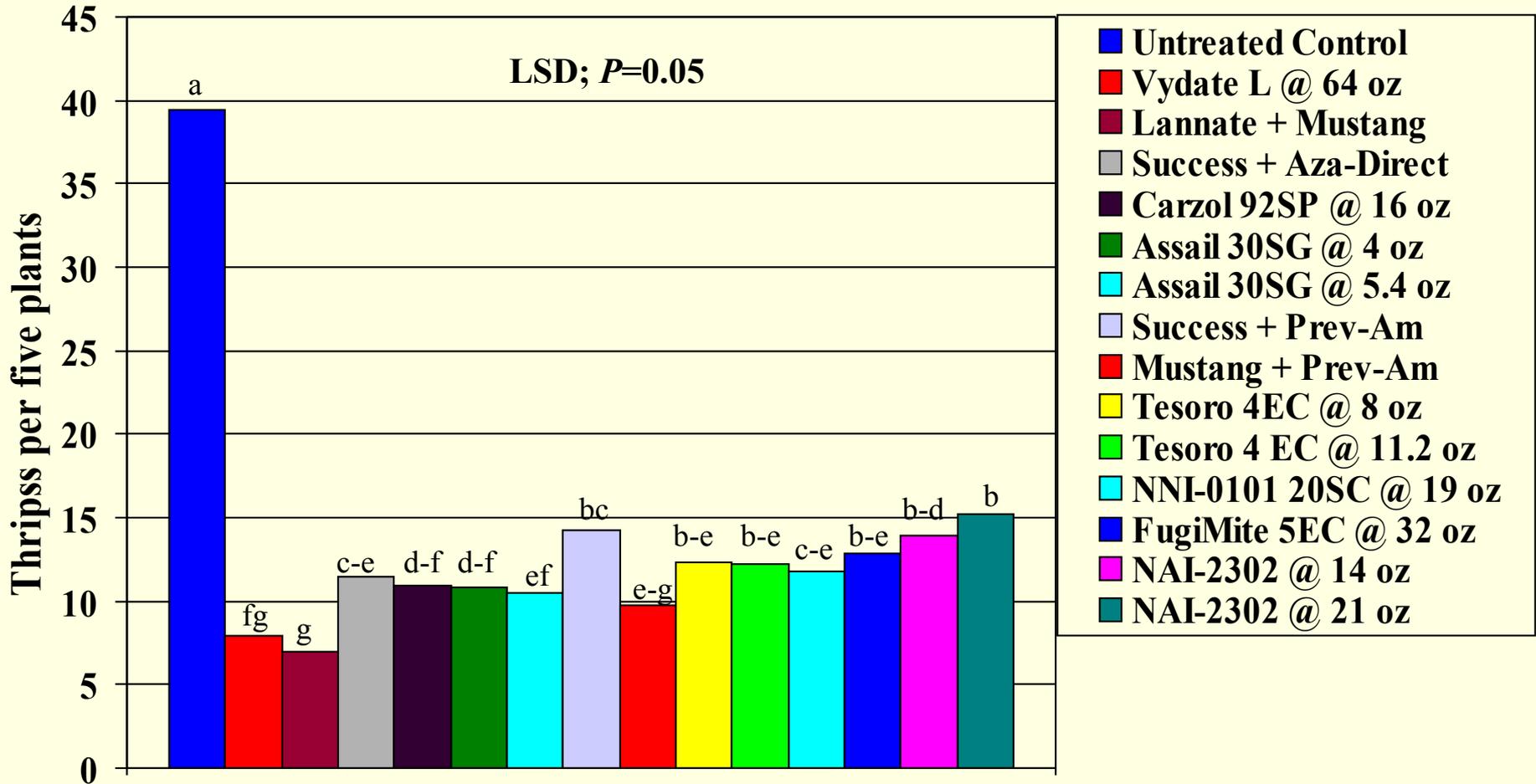
Keynote + Lannate LV @ 36.0 fl oz

Kinetic @ 1.2 ml/2.5L added to foliar spray mixtures.

Application Dates: 8, 15 Feb, 1, 29 Mar, 10, 24 Apr, 14 May 2007

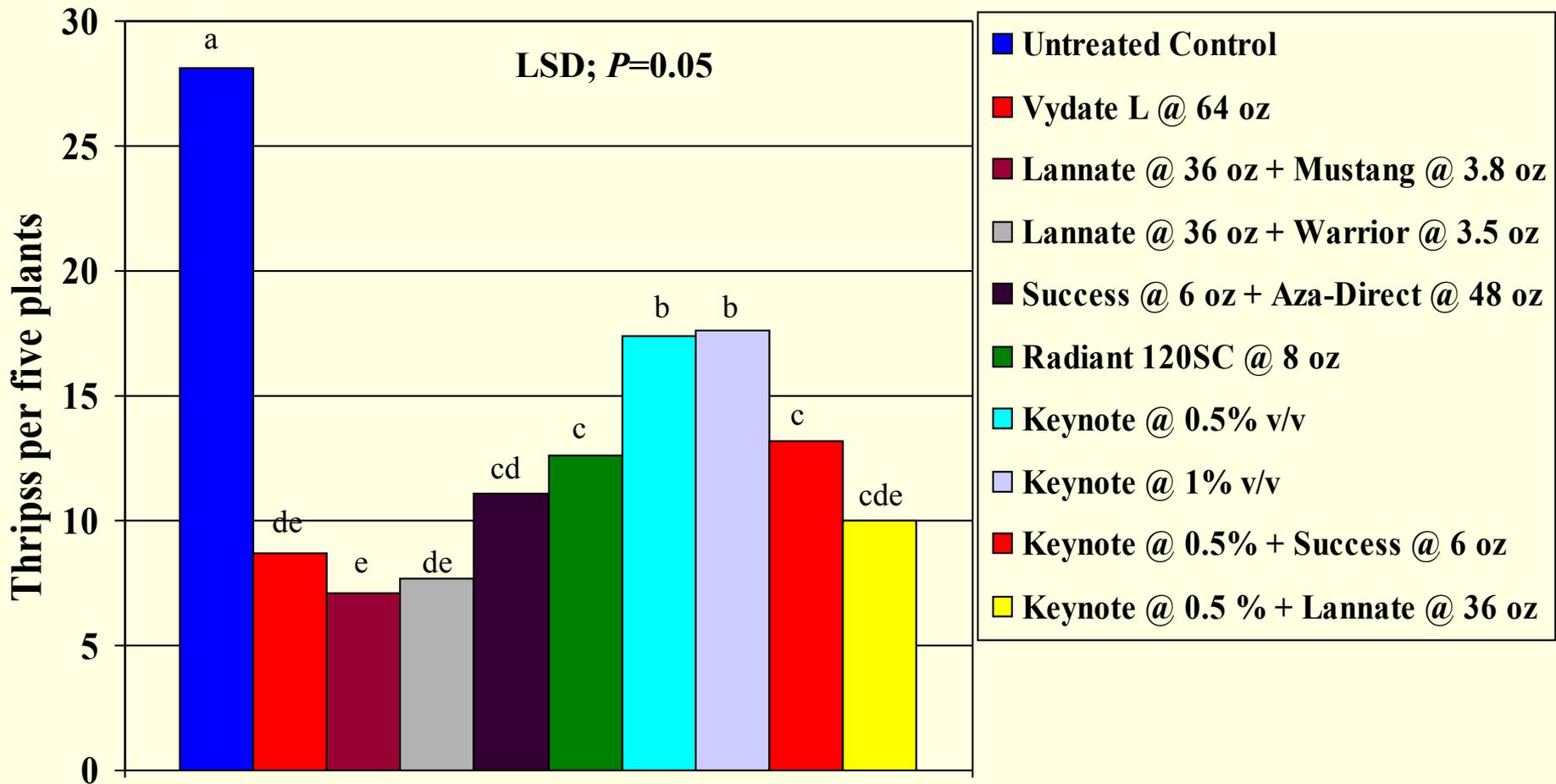
Post Treatment Thrips Means On Onions

Brawley, CA 2006



Post Treatment Thrips Means On Onions

Brawley, CA 2007



Effect of Insecticide Treatments for Thrips Control on Incidence and Severity of Iris Yellow Spot-Symptoms on White Creole Processing Onions . Brawley, CA. 2007.

<i>Treatment^z</i>	<i>oz/acre</i>	<i>IYSV plants/15 ft</i>	<i>Severity Rating^y</i>
Untreated	-----	19.50 b	1.25
Vydate L	64.0	8.00 cd	1.20
Lannate LV + Mustang 1.5EW	36.0 + 3.8	11.50 bcd	1.15
Lannate LV + Warrior	36.0 + 3.5	5.50 d	1.25
Success + Aza-Direct	6.0 + 48.0	15.75 bcd	1.30
Radiant 120 SC	8.0	32.50 a	1.40
Keynote	0.5% v/v	16.75 bc	1.10
Keynote	1.0% v/v	16.00 bc	1.25
Keynote + Success	0.5% v/v + 6.0	16.50 bc	1.30
Keynote + Lannate LV	0.5% v/v + 36.0	11.75 bcd	1.10
		LSD =10.37 (<i>P</i> =0.05)	NS

^z Severity of IYS-symptoms on plants symptomatic plants on 10 May was rated as follows:

1 = 1 – 20 % of plant with IYSV symptoms

2 = 21 – 40 % of plant with IYSV symptoms

3 = 41 – 60 % of plant with IYSV symptoms

4 = 61 – 80 % of plant with IYSV symptoms

5 = 81 – 100 % of plant with IYSV symptoms

CONCLUSIONS:

- **Although we were able to demonstrate that Lannate, Mustang, Warrior, Vydate, Assail, Success, Radiant SC and other insecticides provide various levels of thrips control, none of the insecticide treatments were able to suppress onion thrips populations to levels that prevented IYS-symptom expression.**