



Thrips Control in Onions: Evaluation of Insecticides in California's Low Desert

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**Supported by
CA Garlic and Onion Research
Advisory Board**

2012 Thrips Control Efficacy Studies at UC Desert Research & Extension Center

A thrips control efficacy studies was started in 2011 and completed in 2012.

Two thrips species were present in the onion plots:

Western Flower Thrips (WFT); *Frankliniella occidentalis* (Pergande)

Onion thrips (OT) *Thrips tabaci* Lindeman

The objective: evaluate efficacy of insecticides for control of onion thrips and western flower thrips on dehydrator onions under desert growing conditions.

Onion (White Creole) direct seeded in 6 seedlines per 40" beds on 19 Oct 2011; plots were 4 beds (13.3 ft) wide by 50 ft long and bordered by one untreated bed.

Insecticides were applied using a Lee Spider Spray Tractor 4-row sprayer with three TJ-60 11003VS nozzles per row, a total of 12 nozzles that delivered 50.3 gpa at 25 psi.

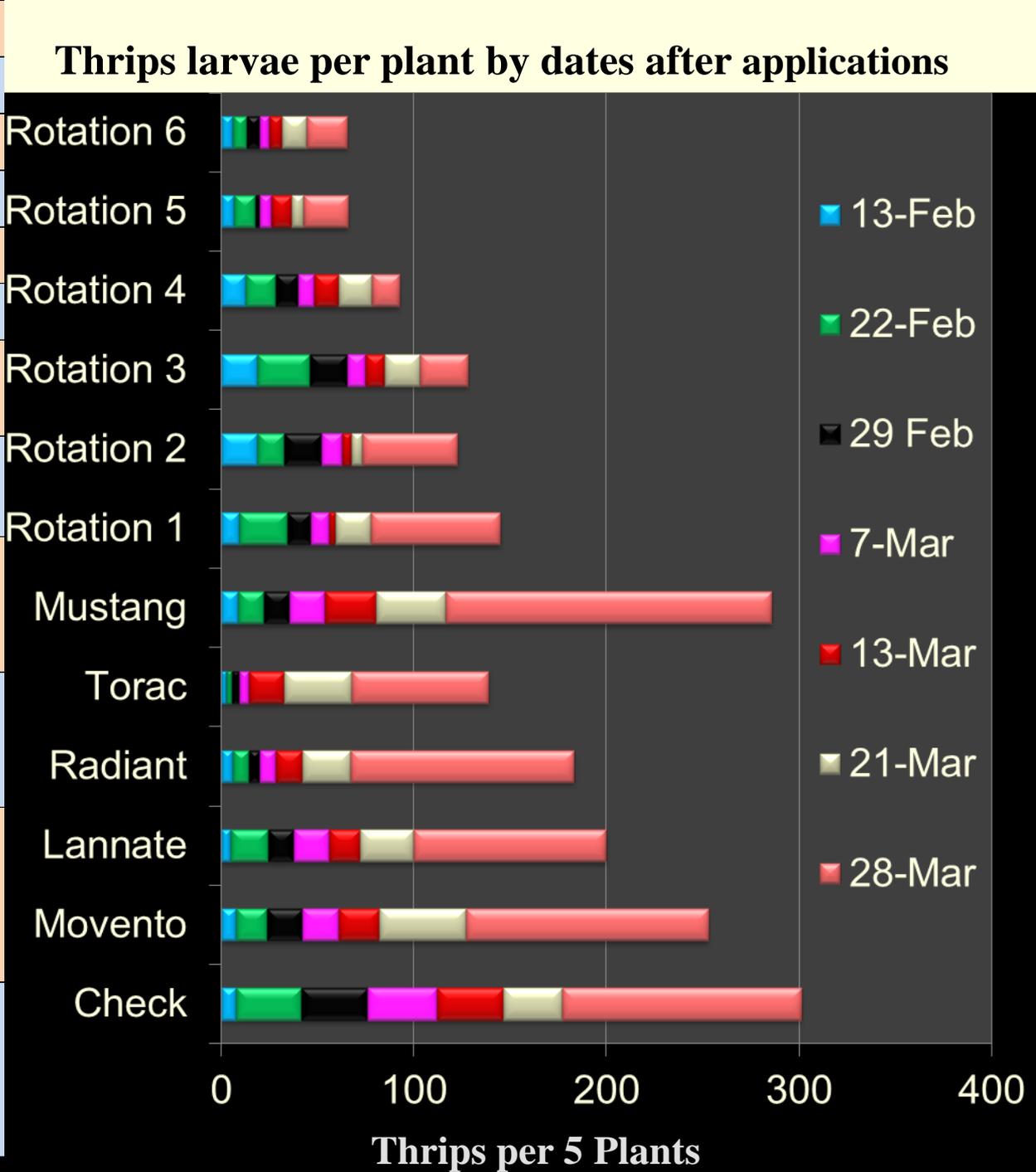
The adjuvant, DyneAmic (Helena Chemical Co.), was added to all insecticidal spray mixtures at 0.25% vol/vol.

Potential Rotation Partners for Insecticide Resistance Management

Trade Name	Active Ingredient	IRAC MO Code
Movento	Spirotetramat	23
Lannate LV	Methomyl	1A
Radiant SC	Spinetoram	5
Torac	Tolfenpyrad	21A
Mustang	Zeta-Cypermethrin	3A

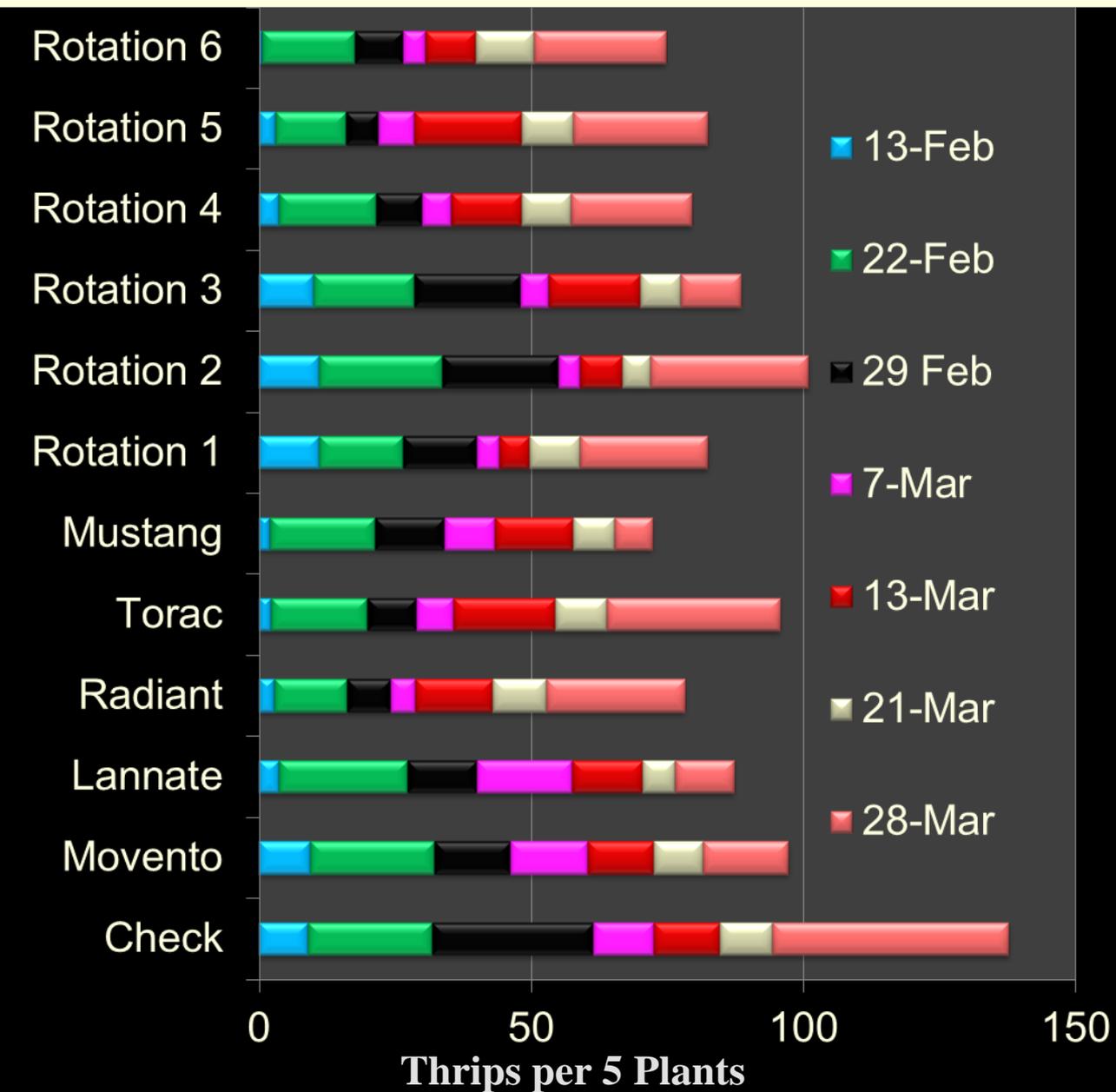
Treatment	fl oz/acre	Application date
Check	-----	-----
Movento	5.0	6, 22 Feb
Lannate LV	36.0	6, 22 Feb
Radiant SC	8.0	6, 22 Feb
Torac	24.0	6, 22 Feb
Mustang	4.0	6, 22 Feb
Movento r/w	5.0	6, 22 Feb
Radiant SC	8.0	29 Feb, 8 Mar
Movento r/w	5.0	6, 22 Feb
Lannate LV	36.0	29 Feb, 8 Mar
Movento f/b	5.0	6, 22 Feb
Lannate LV f/b	36.0	29 Feb
Radiant SC	8.0	14 Mar
Mustang f/b	4.0	6, 22 Feb
Lannate LV f/b	36.0	29 Feb
Radiant SC	8.0	14 Mar
Radiant f/b	8.0	6 Feb
Torac 15 EC f/b	24.0	22 Feb
Lannate LV f/b	36.0	29 Feb
Torac	24.0	14 Mar
Torac 15 EC + Lannate LV f/b	24.0 + 36.0	6 Feb
Radiant f/b	8.0	22 Feb
Mustang f/b	4.0	29 Feb
Torac 15 EC + Lannate LV	24.0 + 36.0	14 Mar

Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b Mustang f/b Torac 15 EC + Lannate LV	24.0 + 36.0 8.0 fl oz 4.0 fl oz 24.0 + 36.0



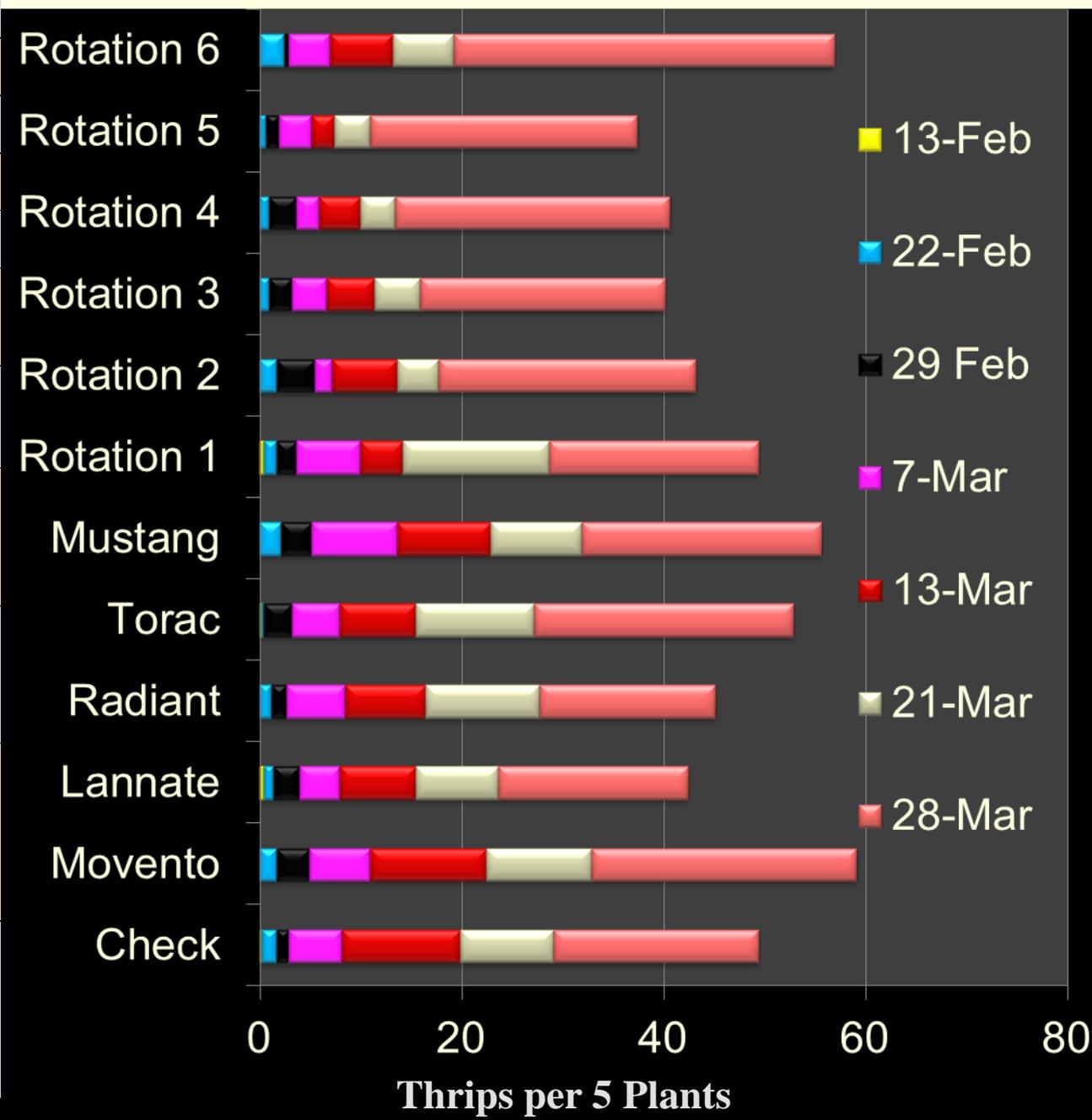
Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b	24.0 + 36.0 8.0 fl oz
Mustang f/b Torac 15 EC + Lannate LV	4.0 fl oz 24.0 + 36.0

Western flower thrips adults per plant following treatments



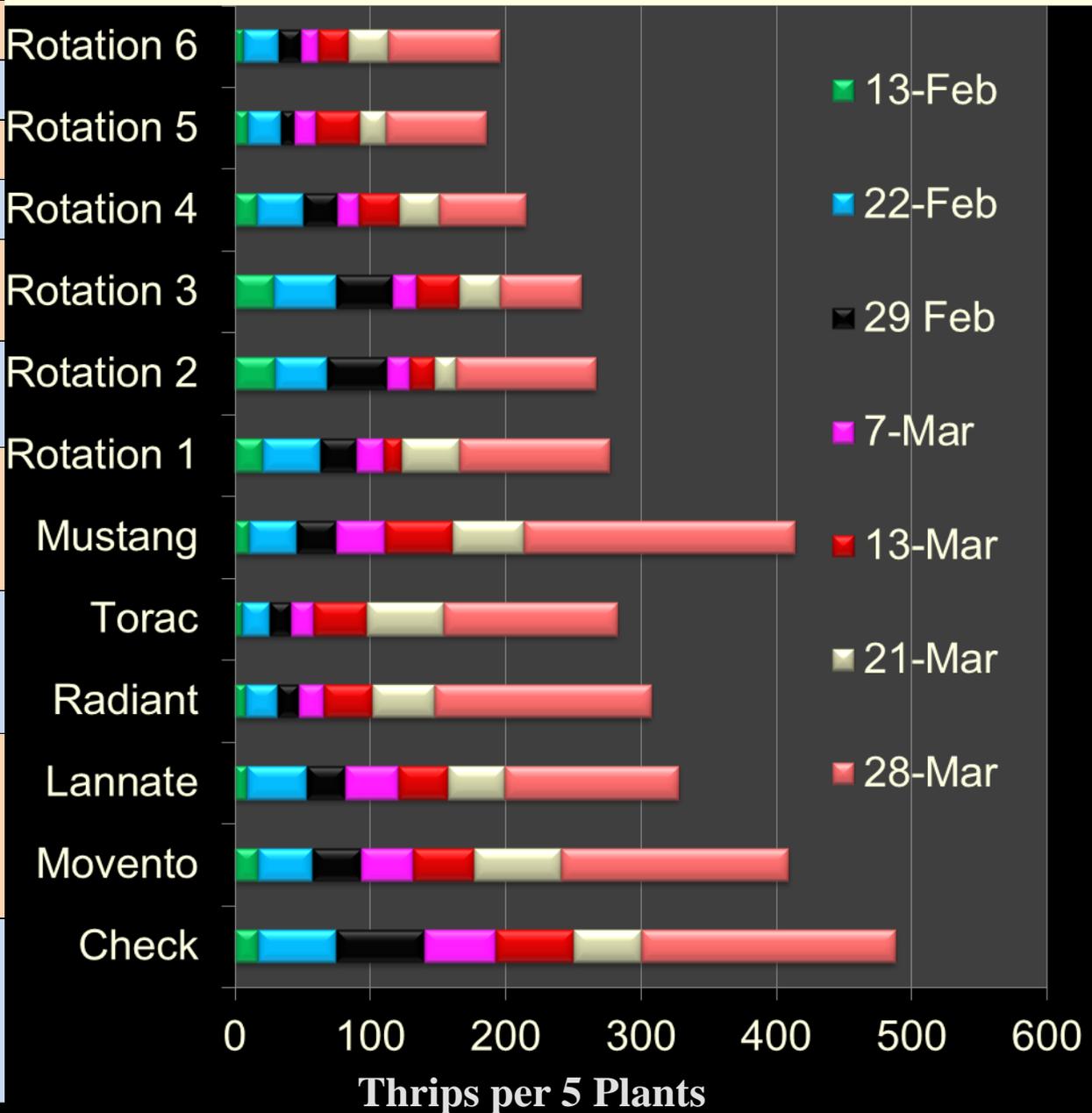
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Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
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Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
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Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b	24.0 + 36.0 8.0 fl oz
Mustang f/b Torac 15 EC + Lannate LV	4.0 fl oz 24.0 + 36.0

Onion thrips adults per plant following applications



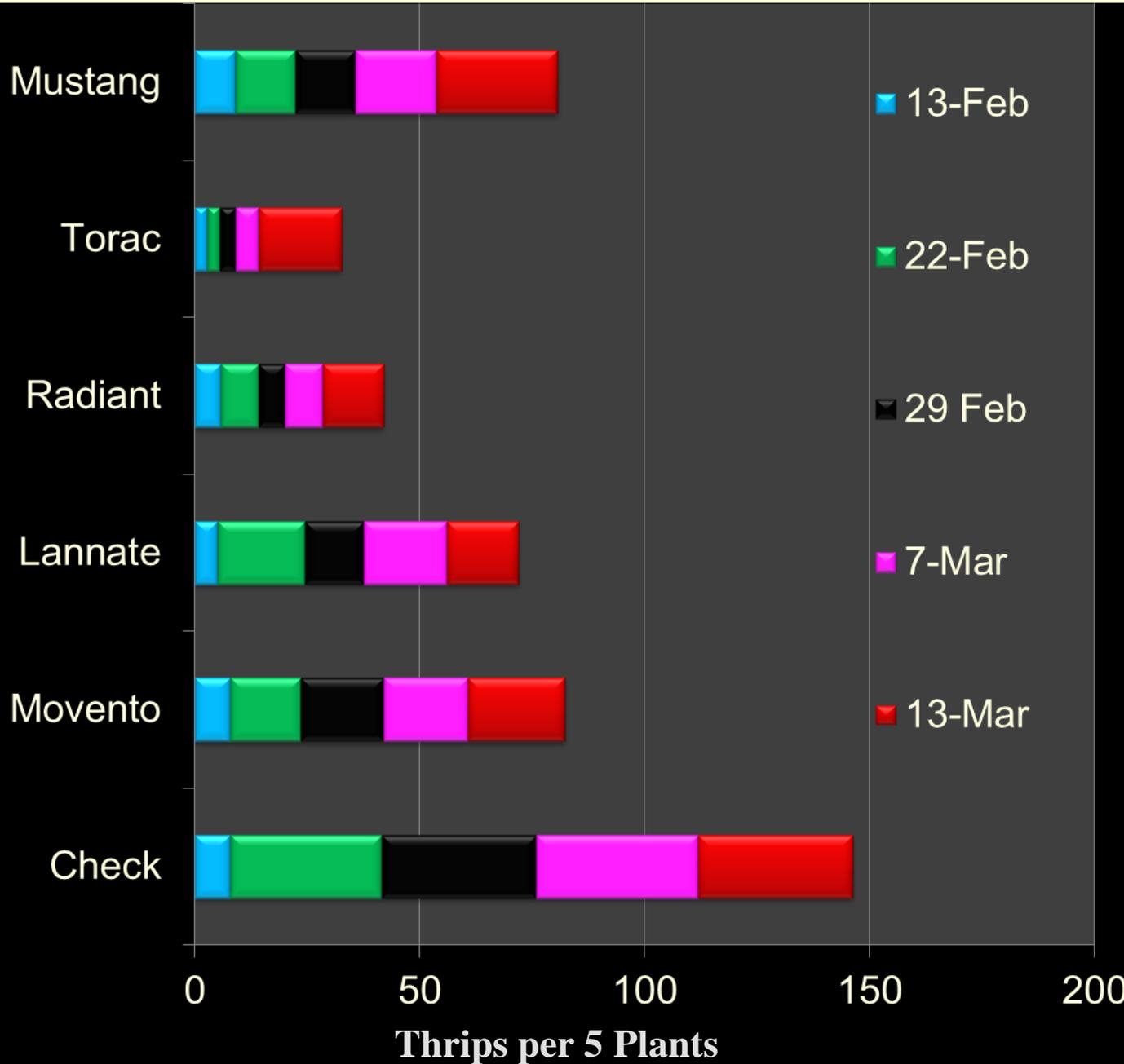
Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b Mustang f/b Torac 15 EC + Lannate LV	24.0 + 36.0 8.0 fl oz 4.0 fl oz 24.0 + 36.0

All thrips per plant by dates after applications



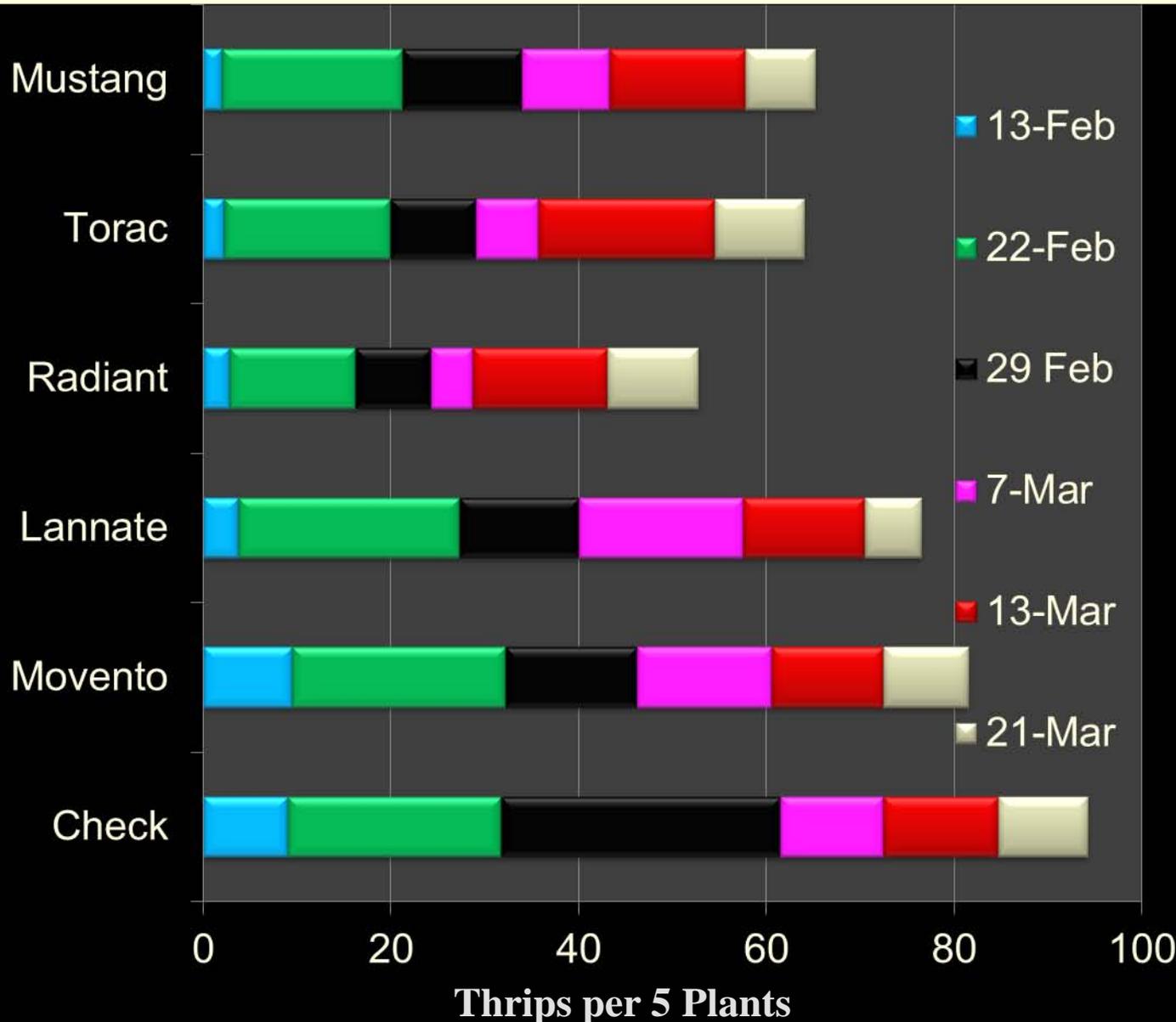
Thrips larvae per plant by dates after insecticide applications

Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Applications on 6 & 22 Feb 2012	



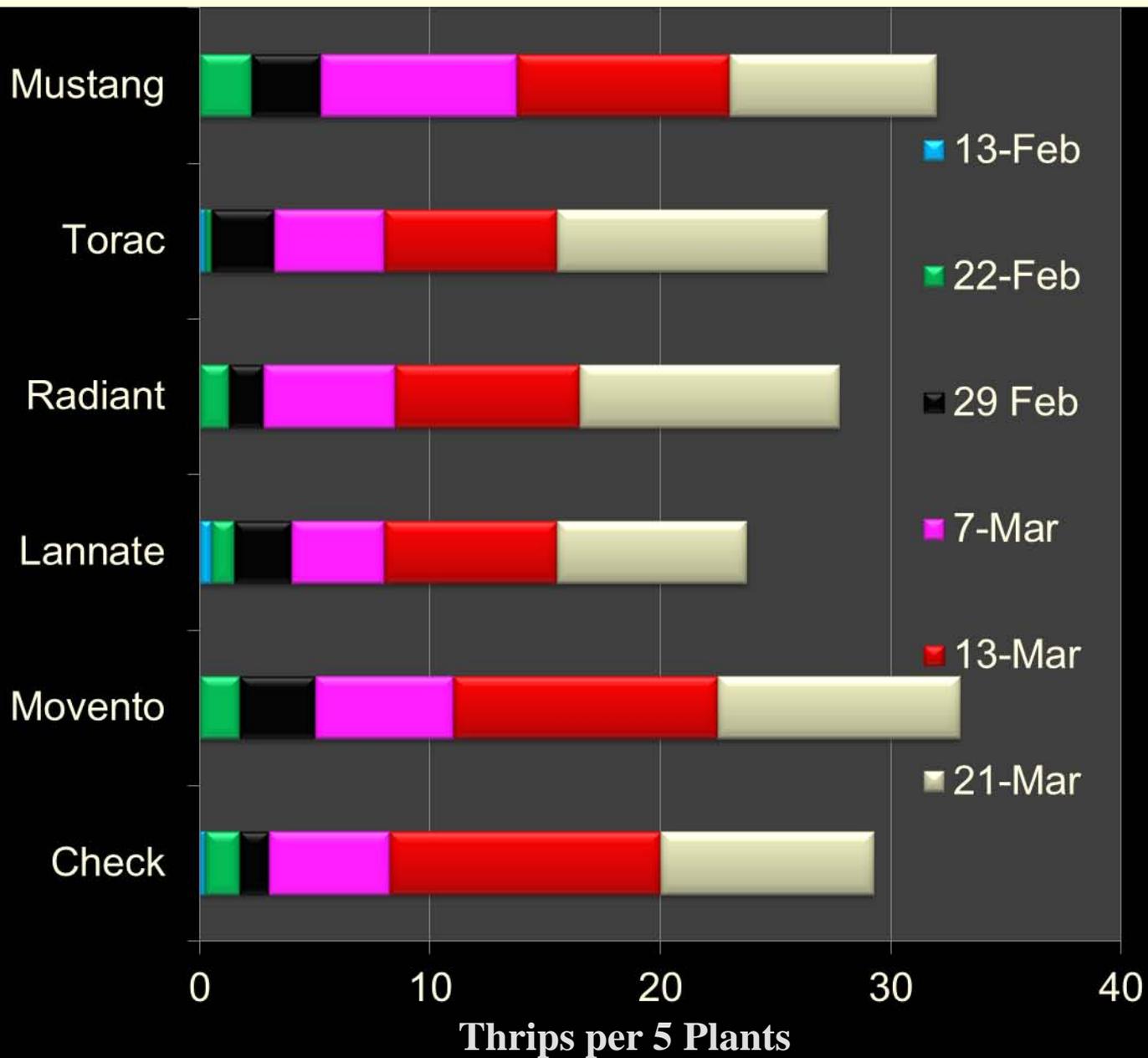
Western flower thrips adults per plant following treatments

Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Applications on 6 & 22 Feb 2012	



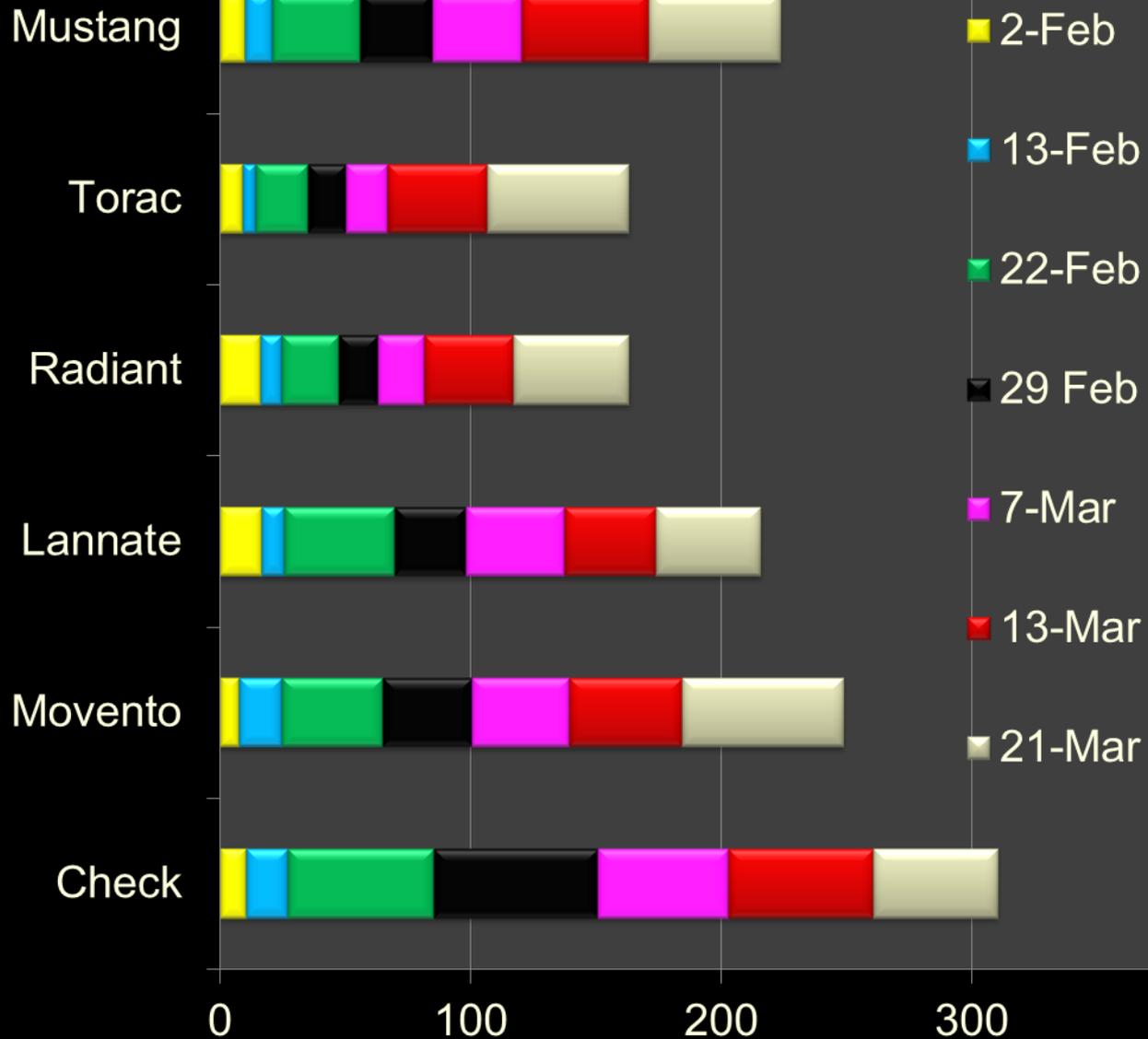
Onion thrips adults per plant following insecticide applications

Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Applications on 6 & 22 Feb 2012	



All thrips per plant by dates after insecticide applications

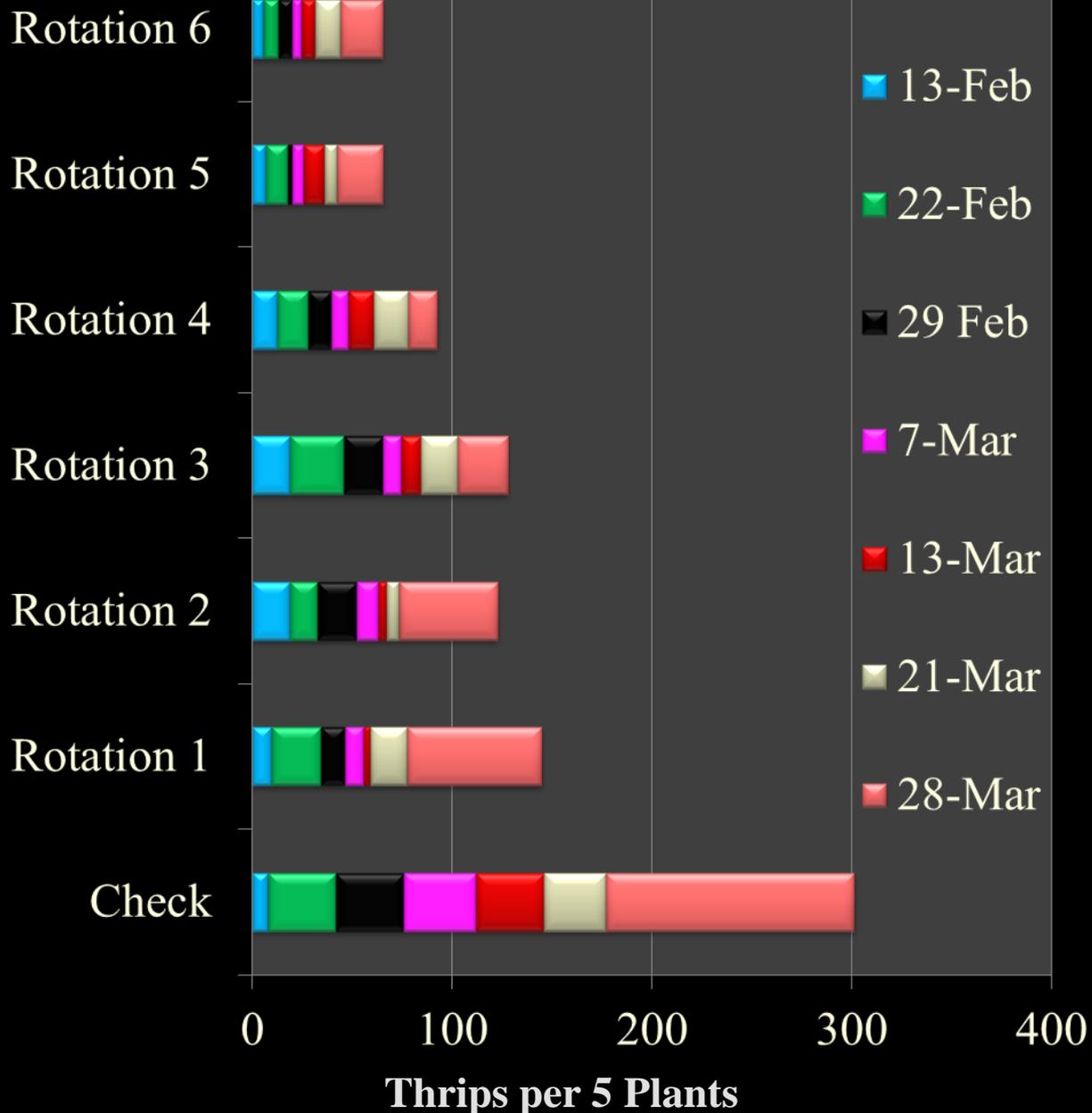
Check	-----
Movento	5.0 fl oz
Lannate LV	36.0 fl oz
Radiant SC	8.0 fl oz
Torac	24.0 fl oz
Mustang	4.0 fl oz
Applications on 6 & 22 Feb 2012	



Thrips per 5 Plants

Thrips larvae per plant by dates after insecticide applications

Check	-----
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b Mustang f/b Torac 15 EC + Lannate LV	24.0 + 36.0 8.0 fl oz 4.0 fl oz 24.0 + 36.0
Applications on 6, 22 & 29 Feb & on 14 Mar 2012	



Western flower thrips adults per plant following insecticide treatments

Check	-----
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b Mustang f/b Torac 15 EC + Lannate LV	24.0 + 36.0 8.0 fl oz 4.0 fl oz 24.0 + 36.0
Applications on 6, 22 & 29 Feb & on 14 Mar 2012	

Rotation 6

Rotation 5

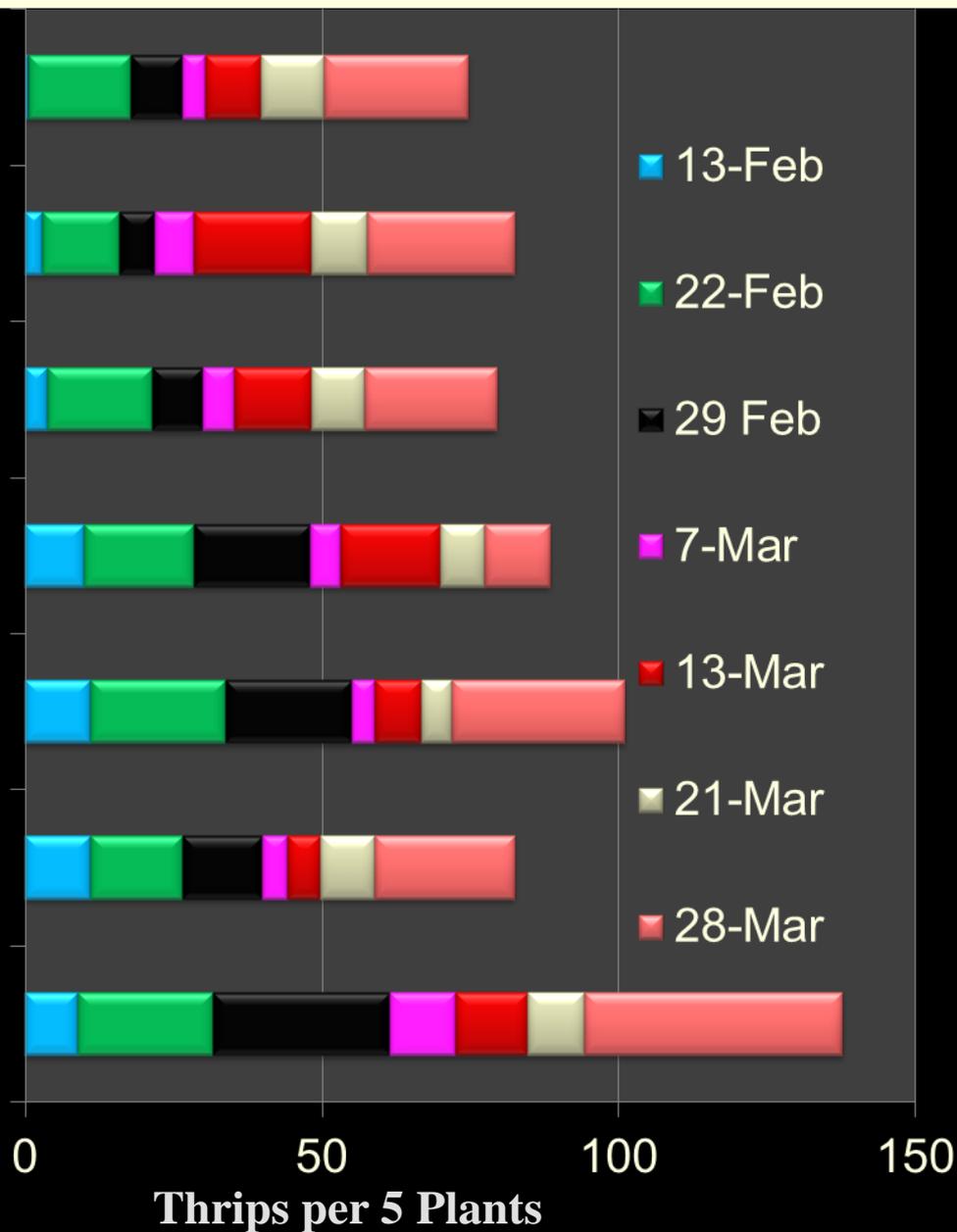
Rotation 4

Rotation 3

Rotation 2

Rotation 1

Check



Onion thrips adults per plant following insecticide applications

Check	-----
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b Mustang f/b Torac 15 EC + Lannate LV	24.0 + 36.0 8.0 fl oz 4.0 fl oz 24.0 + 36.0
Applications on 6, 22 & 29 Feb & on 14 Mar 2012	

Rotation 6

Rotation 5

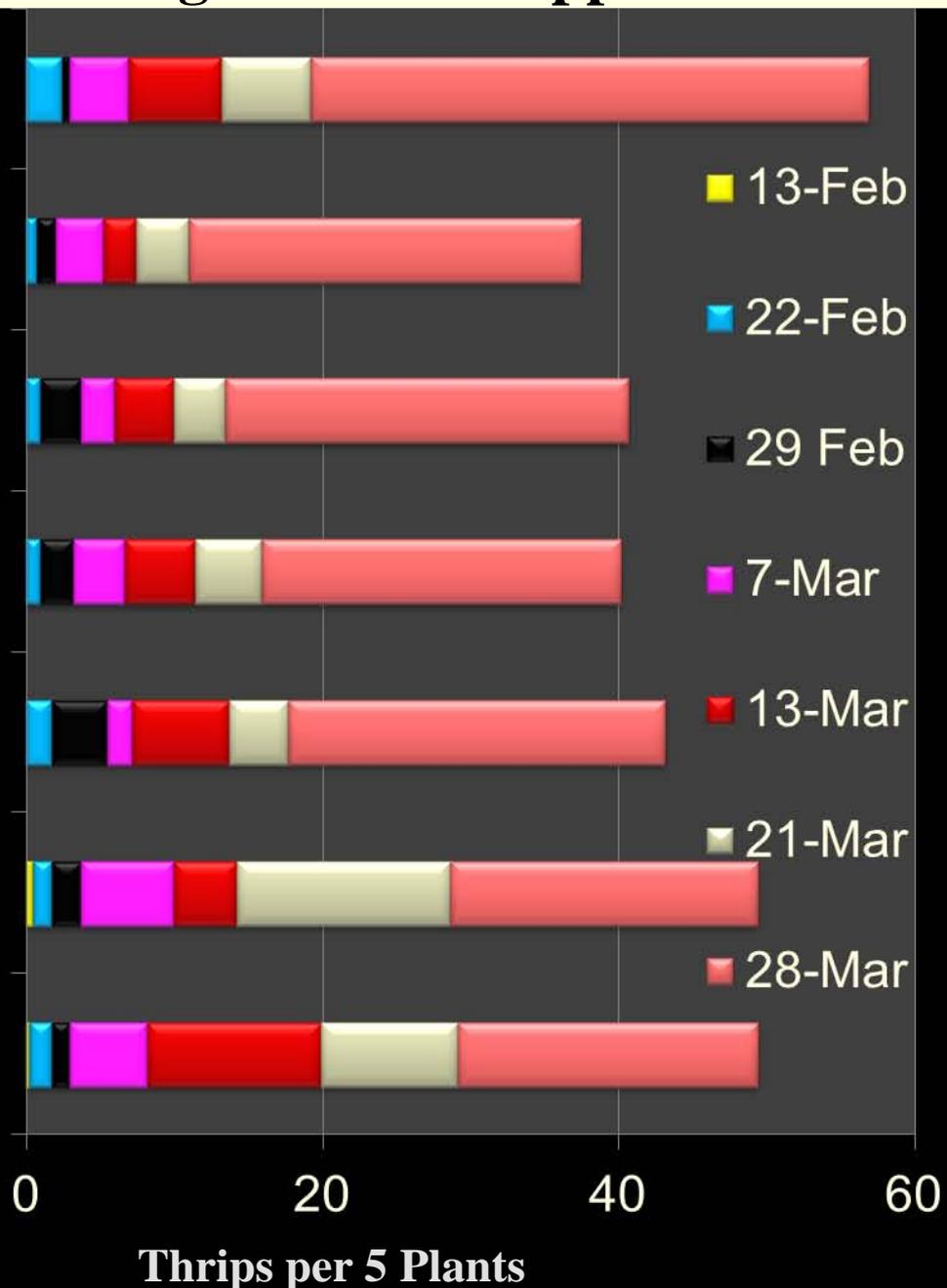
Rotation 4

Rotation 3

Rotation 2

Rotation 1

Check



Thrips per 5 Plants

All thrips per plant by dates after insecticide applications

Check	-----
Movento f/b Radiant SC	5.0 fl oz 8.0 fl oz
Movento f/b Lannate LV	5.0 fl oz 36.0 fl oz
Movento f/b Lannate LV f/b Radiant SC	5.0 fl oz 36.0 fl oz 8.0 fl oz
Mustang f/b Lannate LV f/b Radiant SC	4.0 fl oz 36.0 fl oz 8.0 fl oz
Radiant f/b Torac 15 EC f/b Lannate LV f/b Torac	8.0 fl oz 24.0 fl oz 36.0 fl oz 24.0 fl oz
Torac 15 EC + Lannate LV f/b Radiant f/b Mustang f/b Torac 15 EC + Lannate LV	24.0 + 36.0 8.0 fl oz 4.0 fl oz 24.0 + 36.0
Applications on 6, 22 & 29 Feb & on 14 Mar 2012	

Rotation 6

Rotation 5

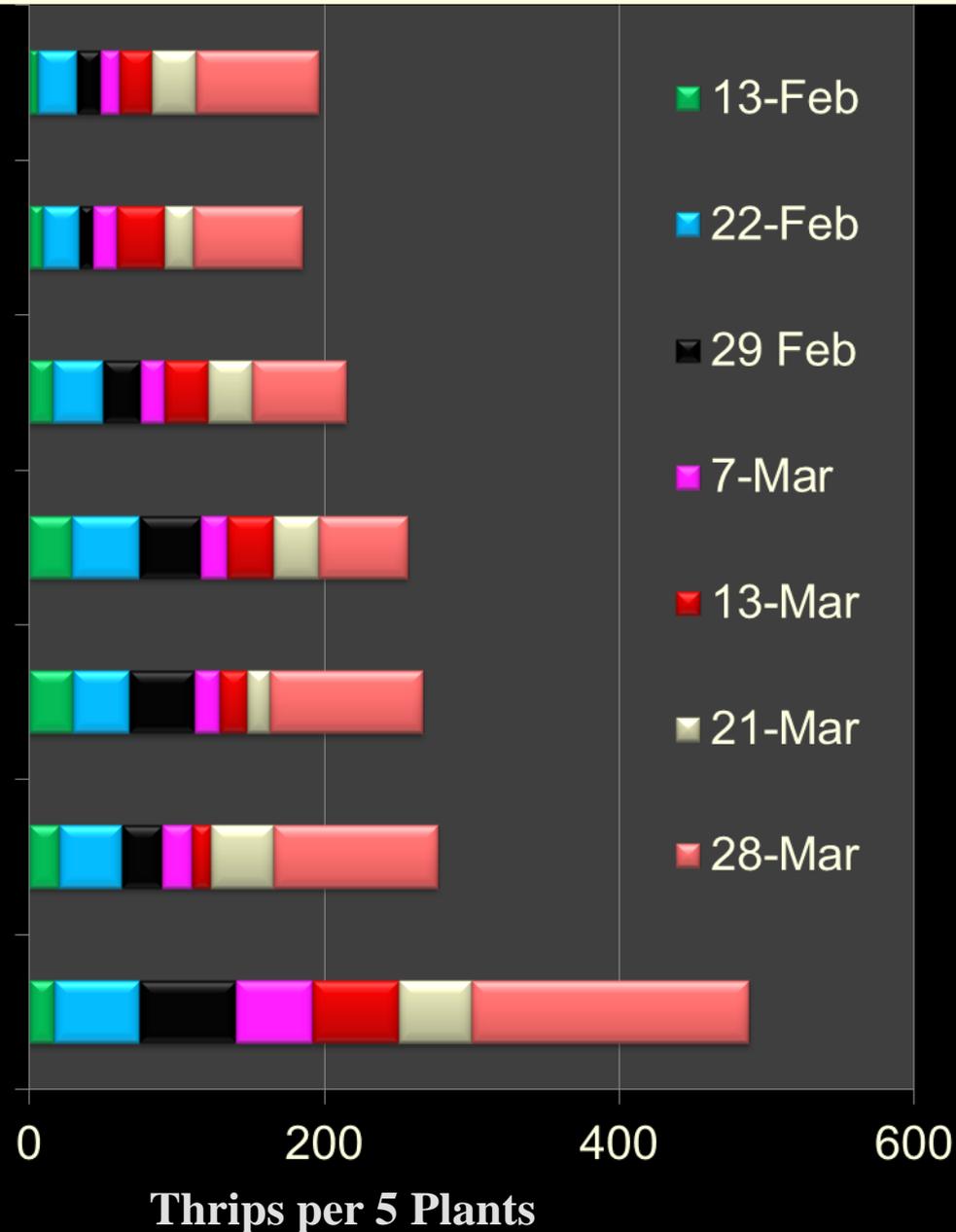
Rotation 4

Rotation 3

Rotation 2

Rotation 1

Check



Percentage IYSV symptomatic plant, bulb yield as kg per 0.002 acre and tons per acre

Treatment	oz/acre	Percentage IYSV		Tons per acre
		20 Apr	2 May	8 May
Check	-----	18.0 a	14.0 a	5.20 a
Movento	5.0	4.0 b	6.0 b	5.04 a
Lannate LV	36.0	3.0 b	4.0 b	5.86 a
Radiant SC	8.0	3.0 b	4.0 b	5.26 a
Torac	24.0	2.0 b	6.0 b	5.44 a
Mustang	4.0	3.0 b	3.0 b	5.51 a
Movento f/b	5.0	5.0 b	3.0 b	4.96 a
Radiant SC	8.0			
Movento f/b	5.0	8.0 b	4.0 b	4.89 a
Lannate LV	36.0			
Movento f/b	5.0			
Lannate LV f/b	36.0	6.0 b	3.0 b	5.28 a
Radiant SC	8.0			
Mustang f/b	4.0			
Lannate LV f/b	36.0	2.0 b	4.0 b	5.69 a
Radiant SC	8.0			
Radiant f/b	8.0			
Torac 15 EC f/b	24.0	5.0 b	4.0 b	5.36 a
Lannate LV f/b	36.0			
Torac	24.0			
Torac 15 EC + Lannate LV	24.0 + 6.0			
f/b Radiant f/b	8.0	6.0 b	6.0 b	6.05 a
Mustang f/b	4.0			
Torac 15 EC + Lannate LV	24.0 + 36.0			

Means within columns followed by the same letter are not significantly different via LSD, $P > 0.05$

THRIPS MANAGEMENT IN ONIONS

- **Don't plant onions near small grain crops.**
- **Overhead irrigation may help suppress 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, as well as those under the leaf folds.**
- **Sample at least 5 plants from 4 separate areas of the field. A suggested treatment threshold is 30 thrips per plant mid-season (lower for very young plants and higher for larger mature plants).**

Thrips Control Insecticides

- **Movento[®]** (spirotetramat) Bayer CropScience (MoA 23)
 - May not be available; Check for a Section 18 Label
- **Neonicotinoids (MoA A4)**
 - Assail
- **Spinosyns: (MoA 5)**
 - Success[®] & Entrust[®] (a.i. spinosad) Dow AgroSciences
 - Radiant[®] SC (a.i. spinetoram) Dow AgroSciences
- **Carbamates: (MoA A1)**
 - Lannate[®] (a.i. methomyl) DuPont
 - Vydate[®] (a.i. oxamyl) dry bulb onion supplemental label
- **Pyrethroids: (MoA 3) (several others not listed)**
 - Mustang[®] (a.i. zeta-cypermethrin) FMC Corp.
 - Warrior[®] (a.i. lambda-cyhalothrin) Syngenta
- **Others:**
 - a.i. Azadirachtin (various products) (MoA 18B)
 - Torac (a.i. tolfenpyrad; Nichino Americas) (MoA 21A) Not available; Check for a Section 18 Label

THRIPS CONTROL INSECTICIDES

Product	MOA Group	Rate as Oz/acre	P.H.I. days	Special Considerations
Radiant SC	5	6 - 10	1	5 - 9 pH; no more than 2 consecutive group 5 insecticides
Entrust	5	4 - 8	1	OMRI; No more than 9 oz /acre/season; pH>7
Mustang	3A	3.2 - 4.3	7	No more than 21 oz /acre/season. Other pyrethroids may be used, e.g. Warrior.
Lannate SP	1A	Garlic – 8 Onion- 16	7	May tank mix with a pyrethroid
Vydate L	1A	2-4 pt	14	Dry bulb onion only under SL R-1053; garlic & onions in Modoc & Siskiyou counties
Assail	4A	30SG 5-8 & 70 WP 2.1-3.4	7	No less than 7 days between treatments. No more than 4 appl. or more than 13.7 oz /ac/season.
Aza-Direct; Ecozin Plus	UN	16 – 32; 15 - 30	0	OMRI; Optimum pH 5.5 - 6.5; do not exceed pH of 7.0. May be mixed with other insecticides.
Movento	23	Sec. 18?		
Torac	21A	Sec. 18?		

Currently available insecticides are mostly ineffective for management of IYSV

Thank You

Are there any Questions?

This research is supported by
CA Garlic and Onion Research Advisory Board