

# BMSB INSECTICIDE EFFICACY RESEARCH ON VEGETABLES IN VIRGINIA

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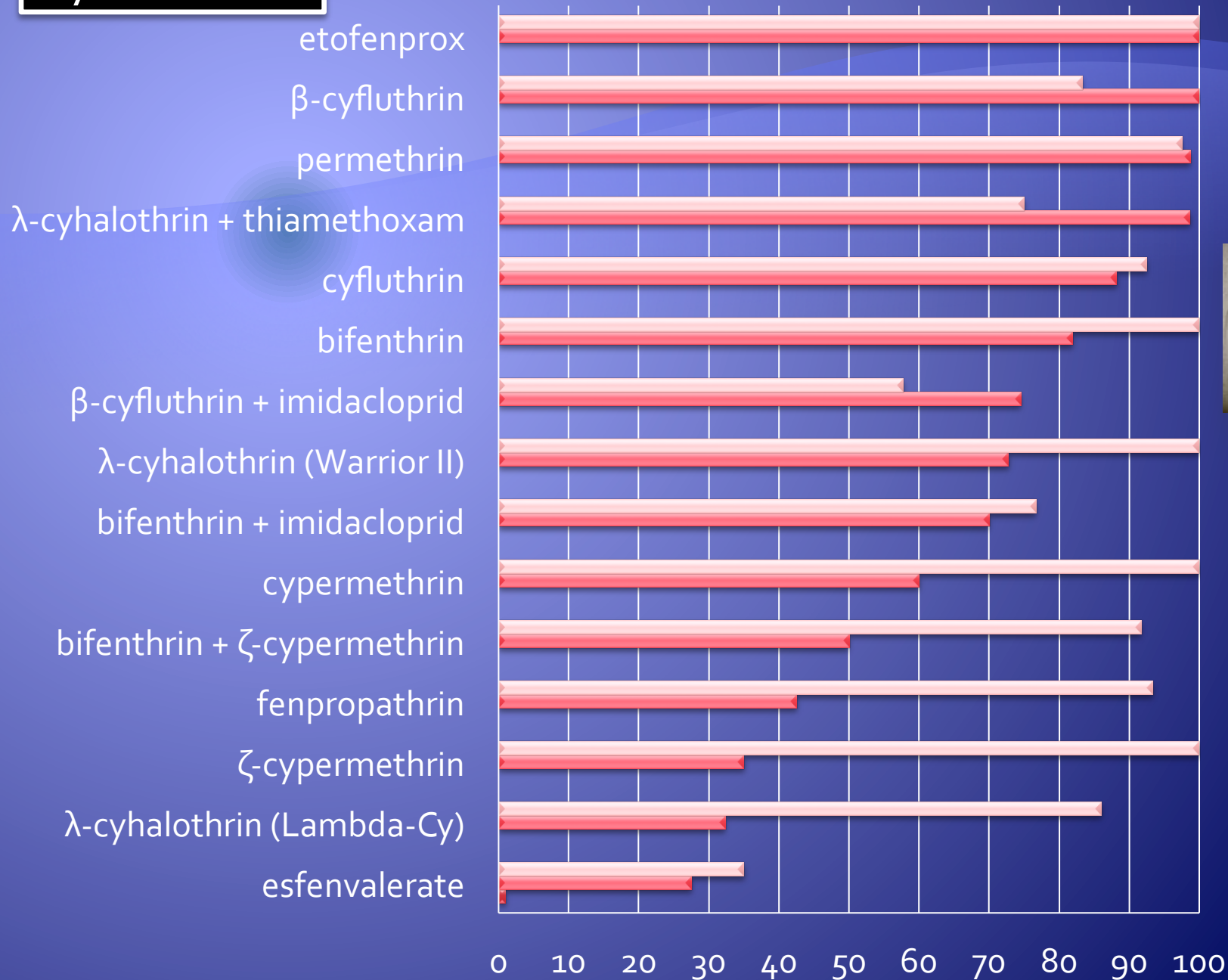
# Green bean dip bioassays

- ◆ Insecticide solution based on **100 gal / acre** water output
- ◆ **Filter paper + one green bean** were:
  - dipped in solution for 5 seconds
  - dried ½ hr under a fume hood
  - placed in a 9-cm Petri dish
- ◆ **5 adults or 2<sup>nd</sup> to 3<sup>rd</sup> instars** per dish
- ◆ 4 Petri dishes per treatment for a total of 20 insects per bout
- ◆ Mortality at 24, 48, and 72 hrs



# Pyrethroids

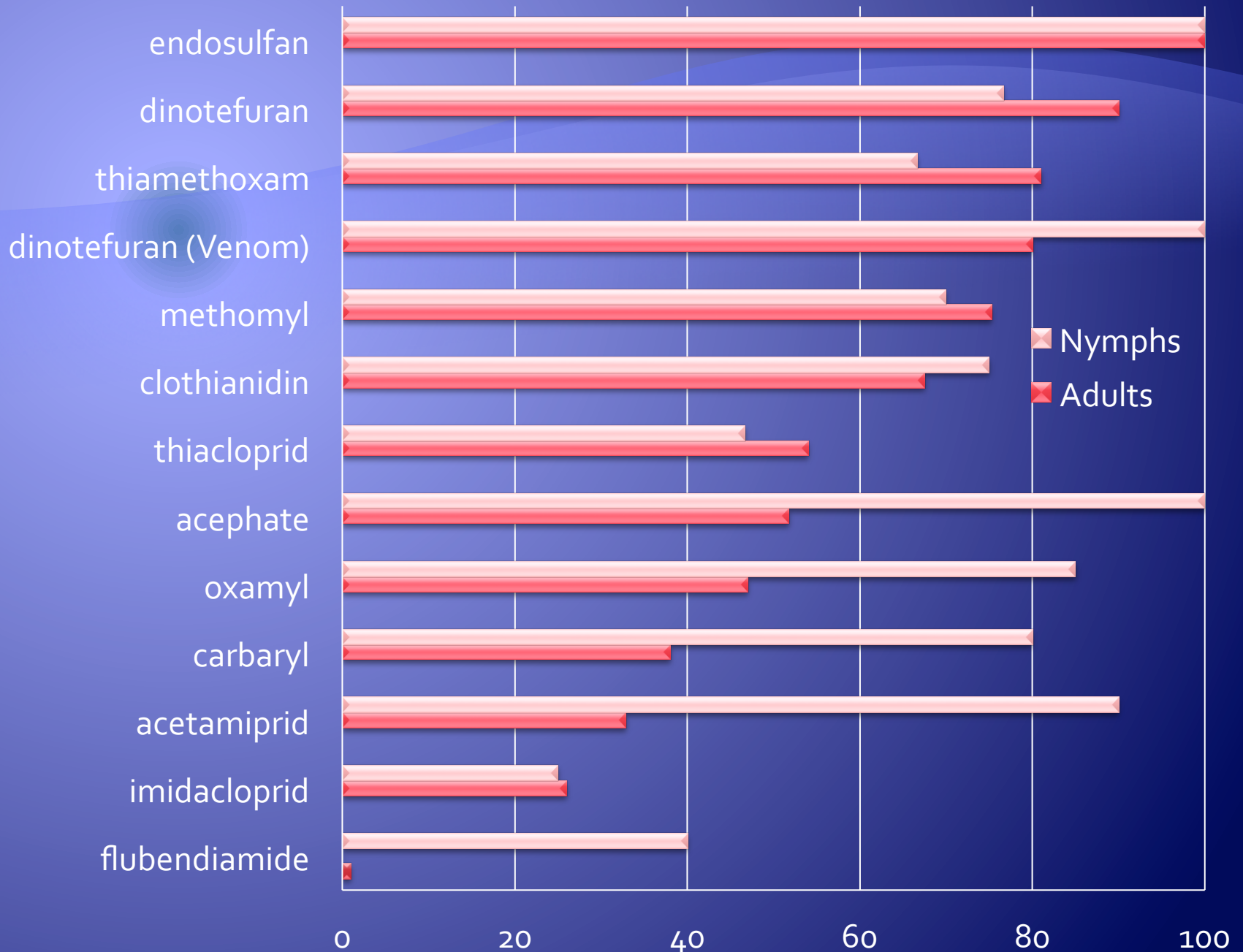
% mortality (dead + moribund) @ 72 hr



▣ Nymphs  
▣ Adults



# % mortality (dead + moribund) @ 72 hr





# 2011 insecticide efficacy trials on peppers

- ◆ Bell peppers ('Aristotle') on plastic mulch at VT Kentland Research Farm (Blacksburg, VA)
- ◆ Tested over 50 different insecticide treatments
- ◆ RCBD small-plot experiments (4 reps)
- ◆ Plot = one row (20 ft)
- ◆ CO<sub>2</sub> backpack sprayer w/ 3-nozzle drop down boom



# Stink bug feeding injury on peppers



# Trial # 1 – Bell Peppers , Blacksburg, VA (4 weekly sprays)

Treatment	Rate / acre	% stink bug damage			% control (dmg reduction)
		8-Aug	19-Aug	30-Aug	
Untr. Control		32.0	26.7	28.8	
Acephate 97UP	16 oz	7.5	11.3	7.5	70.4
Assail 30G	4 oz	8.0	6.7	11.3	70.4
Bifenture 2EC	6.4 fl. oz	13.8	5.0	12.5	64.8
Lambda-Cy 1EC	3.84 fl. oz	12.5	10.0	11.3	62.0
Perm-up 3.2EC	8 fl. oz	8.8	7.5	18.8	60.6



# Trial # 1 – Bell Peppers , Blacksburg, VA (4 weekly sprays)

Treatment	Rate / acre	% stink bug damage			% control (dmg reduction)	Mean no. green peach aphids / 20 leaves
		8-Aug	19-Aug	30-Aug		
Untr. Control		32.0	26.7	28.8		10.3
Acephate 97UP	16 oz	7.5	11.3	7.5	70.4	0.0
Assail 30G	4 oz	8.0	6.7	11.3	70.4	1.5
Bifenture 2EC	6.4 fl. oz	13.8	5.0	12.5	64.8	765.5
Lambda-Cy 1EC	3.84 fl. oz	12.5	10.0	11.3	62.0	850.8
Perm-up 3.2EC	8 fl. oz	8.8	7.5	18.8	60.6	539.0



# Trial # 2 – Bell Peppers, Blacksburg, VA

## (4 weekly sprays)

Treatment	Rate / acre	% stink bug fruit damage, VA			% control (dmg reduction)	Mean no. green peach aphids / 20 leaves
		8-Aug	19-Aug	30-Aug		
Untr. Control		31.3 a	26.3	21.3		6.0
Belay 2.13SC	4 fl. oz	10.0 b	3.8	12.5	66.7	0.5
Danitol 2.4SC	10.67 fl. oz	10.0 b	10.0	11.3	60.3	120.0
Actara 25WG	5.5 oz	12.5 b	7.5	11.3	60.3	2.5
Endigo ZC	5.5 fl. oz	17.5 ab	8.8	13.8	49.2	1.3
Venom 70SG	4 oz	17.5 ab	13.8	11.3	46.0	2.5
Warrior II	1.92 fl. oz	31.3 a	11.3	6.3	38.0	498.5
Trebon 280 g/l	8 fl. oz	21.3 ab	11.3	17.5	36.5	100.0

# Trial # 3 – Bell Peppers , Blacksburg, VA

## (4 weekly sprays)

Treatment	Rate / acre	% stink bug fruit damage			% control (dmg reduction)	Mean no. green peach aphids / 20 leaves
		8-Aug	19-Aug	30-Aug		
Untr. Control		40.0	15.0	32.5		2.8
Mustang Max	4 fl. oz	7.5	8.8	7.5	72.8	155.0
Brigadier 2SC	8 fl. oz	15.0	7.5	3.8	69.9	0.3
Hero	6.4 fl. oz	17.5	2.5	10.0	65.7	1014.0
Athena	16 fl. oz	12.5	5.0	17.5	60.0	63.3
Beleaf	2.8 oz	23.8	7.5	16.3	45.6	1.0
Baythroid XL	2.8 fl. oz	25.0	6.3	10.0	52.8	201.8
Leverage 360	2.8 fl. oz	20.0	8.8	15.0	49.9	0.5



# Trial # 4 – Bell Peppers , Blacksburg, VA

## (4 weekly sprays or 2 soil drenches)

Treatment	Rate / acre	% stink bug damage			% control (damage reduction)
		8-Aug	19-Aug	30-Aug	
Untreated Control		28.8 a	17.5 a	65.0 a	
Scorpion 35SL (soil application)	10.5 fl. oz	8.8 b	3.8 b	18.8 b	71.8
Admire Pro (soil application)	10.5 fl. oz	17.5 ab	2.5 b	10.0 b	73.0
Scorpion 35SL	5 fl. oz	13.8 b	6.3 b	8.8 b	74.0
Vydate L	24 fl. oz	13.8 b	5 a	7.5 b	76.4
Lannate LV	24 fl. oz	12.5 b	6.3 a	3.8 b	79.7
Asana XL	9 fl. oz	7.5 b	7.5 a	11.3 b	76.4

# Performance of insecticides – all tests

Product	Rate/Acre	Bean - Nymph	Bean - Adult	% control peppers	Avg. of all three
Permethrin 3.2EC	8	97.5	98.8	60.6	85.6
Scorpion 3.24	7.7	76.7	90.0	85.4	84.0
Bifenture 10DF	12.8	100.0	81.9	56.3	79.4
Trebon	8	100.0	100.0	36.5	78.8
Baythroid XL	2.8	92.5	88.2	52.8	77.8
Venom 70	4	100.0	80.0	46.0	75.3
Endigo ZC	4.5	75.0	98.7	49.2	74.3
Acephate 97UP	16	100.0	51.8	70.4	74.1
Lannate LV	40	66.7	75.3	79.8	73.9
Leverage 360	2.8	97.3	74.5	49.9	73.9
Brigadier	9.85	76.7	70.0	69.9	72.2
Hero EC	10.3	91.7	50.0	72.8	71.5
Vydate L	48	85.0	47.0	79.7	70.6
Warrior II	2.5	100.0	72.8	38.0	70.3
Belay	4	75.0	67.5	66.7	69.7
Actara 50 WG	5.5	66.7	81.0	60.3	69.3
MustangMax	4	100.0	35.0	72.8	69.3
Danitol	16	93.3	42.5	60.3	65.4
Assail 30 G	4	90.0	32.8	70.4	64.4
Lambda-cy	3.84	86.0	32.3	62.0	60.1
Asana XL	9	35.0	27.5	76.4	46.3

# Bioassays

- ◆ Greenhouse tomato trial
  - ◆ Insecticide solutions were sprayed (4 pumps per plant) on 'Patio' tomatoes grown in the greenhouse and allowed to dry for one hour.
  - ◆ 5 stink bugs were placed in mesh bags and placed over tomato leaf and fruit cluster
  - ◆ Mortality (dead + moribund) was assessed after 72 h.





# Laboratory Bioassays

Edith Lurvey (IR-4) will talk more about these treatments



- untreated
- dinotefuran 0.200 + PBO 0.350 kg ai/ha
- etofenprox 0.163 + PBO 0.56 kg ai/ha

- dinotefuran 0.200 kg ai/ha
- etofenprox 0.163 kg ai/ha
- bifenthrin 0.027 kg ai/ha

# Rimon & Dimilin Bioassays

- ◆ Novaluron and diflubenzuron bioassays
- ◆ MOA: Inhibitors of chitin biosynthesis, type o
- ◆ BMSB egg mortality from topical application
- ◆ Nymphal mortality & molting from dipped bean
- ◆ Effects on adults and reproduction via ingestion



# Rimon & Dimilin Bioassays – Egg mortality

- Water control
- Dimilin 2L @ 16 fl. oz/Acre (1.25 mL/L)
- Rimon 0.83 @ 50 fl. oz/Acre (3.91 mL/L)

Treatment	% of eggs hatching after treatment		
	Trial 1	Trial 2	Trial 3
Water	78.6	89.0	45.5
Dimilin	69.6	60.7	69.6
Rimon	79.2	86.9	76.4



# Rimon & Dimilin Bioassays – Nymphal Mortality (2<sup>nd</sup> instars held on dipped beans & carrot: n = 40 nymphs/bout)

Trial 1

Treatment	% mortality @ 72 hr
Water	0
Dimilin	65
Rimon	60

Trials 2 & 3

Treatment	# exuviae (molts) after 1 wk	
	Trial 2	Trial 3
Water	19	12
Dimilin	0	3*
Rimon	0	2*

\* Molted, but all nymphs died soon after.

# Rimon & Dimilin : Adult Bioassays

- ◆ New adults fed exclusively on dipped beans and carrot and treated water wick

Adult % mortality after prolonged exposure to treated food and water

Treatment	ml of product/ liter water	Test 1 April 11 (18 days)	Test 2 May 11 (42 days)	Test 3 Sept 5 (60 days)
Control		57.5	NA	60.0
Rimon	3.91	92.5	NA	50.0
Dimilin	1.25	52.5	NA	40.0

# Rimon & Dimilin : Adult Bioassays

- ◆ New adults fed exclusively on dipped beans and carrot and treated water wick

Treatment	ml of product/ liter water	Number of egg masses deposited (% egg hatch)		
		Test 1 April 11 (18 days)	Test 2 May 11 (42 days)	Test 3 Sept 5 (60 days)
Control		6 (100%)	4 (70.6%)	4 (98.1%)
Rimon	3.91	10 (100%)	3 (82.5%)	5 (95.8%)
Dimilin	1.25	7 (100%)	1 (100%)	4 (85.7%)





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