

A photograph of a pepper field. In the foreground, a large, ripe red pepper is prominently displayed on a wooden stake. The field is filled with rows of green pepper plants, some with small green peppers. The background shows more rows of plants stretching into the distance under bright sunlight.

# Important Insect Pest of Peppers and the Control Research Update

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# Targeted Insect Pest

- Aphids --- green peach aphid
- Whiteflies --- greenhouse whitefly
- Lepidopterous worms --- corn earworm, beet armyworm, western yellowstriped armyworm and omnivorous leafroller
- Thrips --- western flower thrips

# Aphids as Pest

- **Decrease crop yields by removing phloem sap**
- **Contaminate crop products --- aphid body, honeydew, associated sooty mold**
- **Transmit plant virus diseases --- cucumber mosaic virus causing flower break and distortion**

# Life Cycle of Aphids

- Usually do not mate and no egg stage
- All aphids are females that give birth to live nymphs
- Live up to 30 days, produce 60-100 nymphs/adult
- Winged adults appear when colony overcrowded or food supply depleted

# Green Peach Aphid



*Myzus persicae*

# Green Peach Aphid



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# Antennal Tubercles

convergent

divergent

parallel



Potato Aphid



Green Peach Aphid



Foxglove Aphid

# **The Greenhouse Whitefly as an Insect Pest**

- **Attacks over 200 plant species including pepper**
- **Secretes honeydew causing sooty mold production**
- **Decreases crop yields and quality by direct feeding damage**
- **Transmits virus diseases**

# Year-round Multi-crop Culture Systems



**Summer Strawberry**

**July to Dec.**



**Winter Strawberry**

**Sept to next Jun.**



**Tomato**

**Jun to Nov.**



**Pepper**

**Jun to Oct**



**Cucumber**

**May to Oct.**

**Lima Bean  
(May to August)**

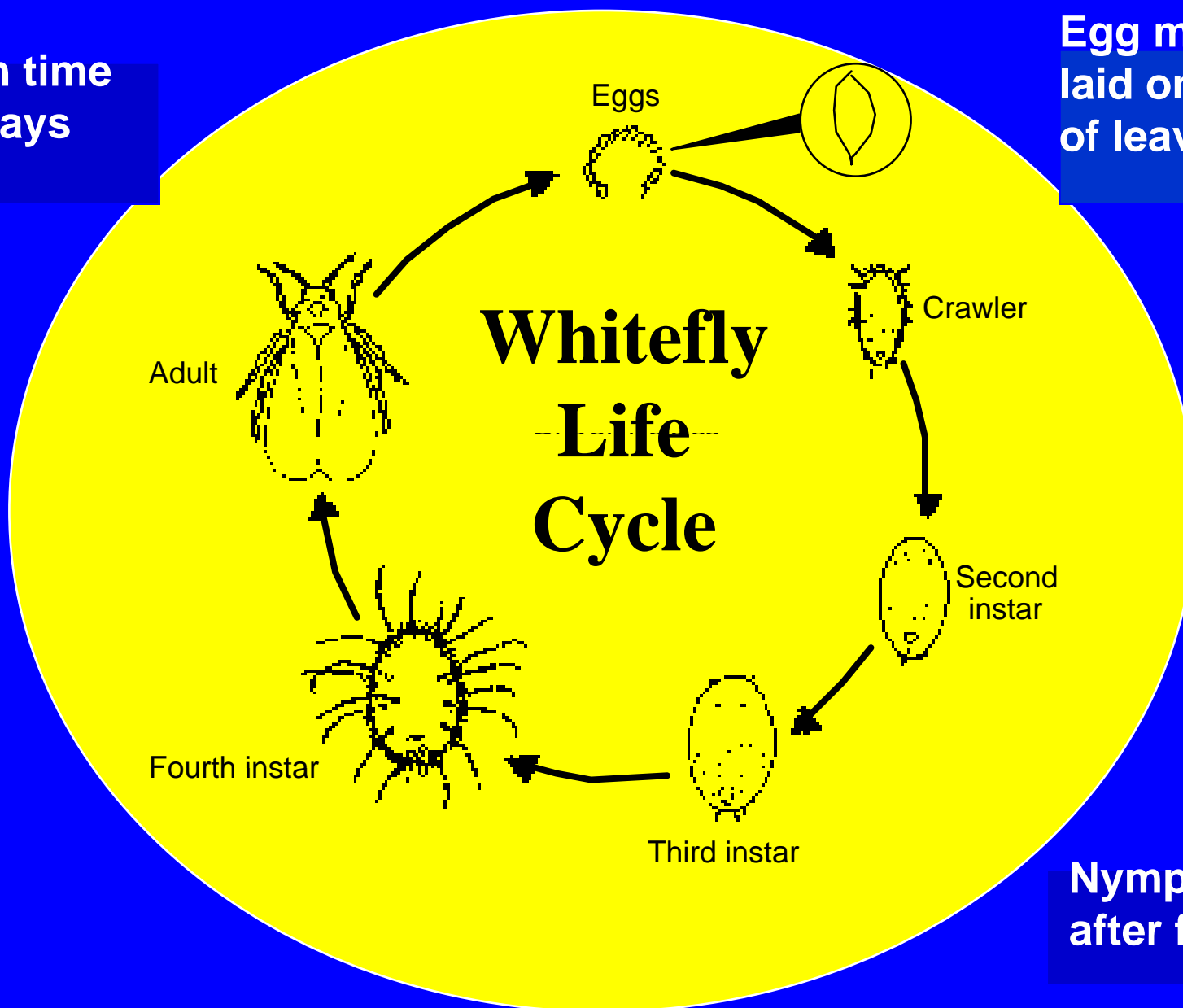
**Celery, Raspberry,**

**Lettuce, Lemon,**

**Cut flower, Cole Crops**

Generation time  
about 35 days

Egg microscopic &  
laid on undersides  
of leaves



Nymphs immobile  
after first instar



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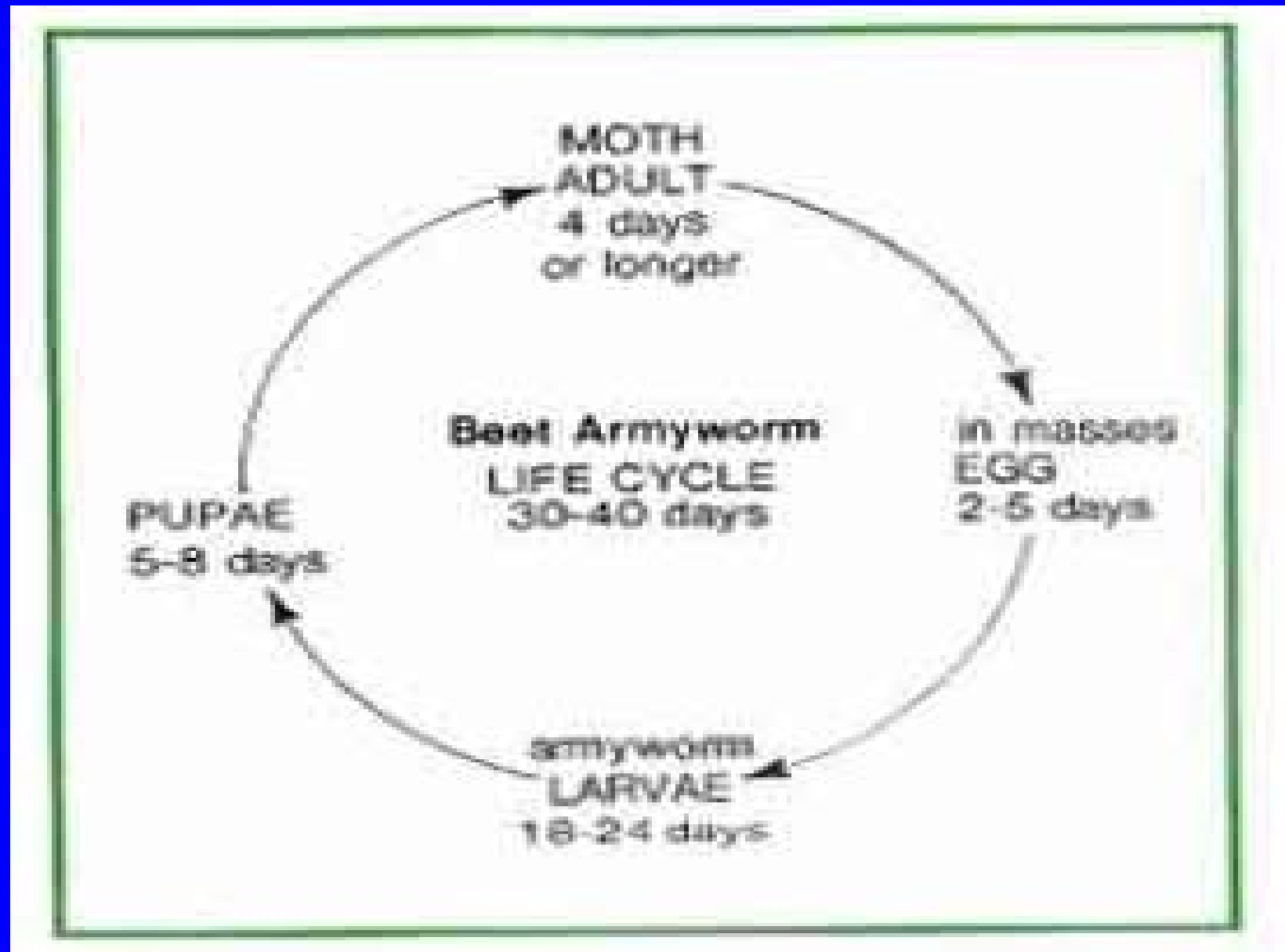
# Greenhouse Whitefly Problem



# Lepidopterous Worms as Pests

- **Decrease crop yields by feeding on leaf and fruit**
- **Contaminate crop products --- burrowing into fruit and the frass**

# Life Cycle of Worms



# Beet Armyworm



# Western Yellowstriped Armyworm



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# Beet Armyworm Feeding Damage



# Tomato Fruitworm



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# Tomato Fruitworm Feeding Damage



# Omnivorous Leafroller



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# Western Flower Thrips as Pest

- Injure crop plants by rasping and sucking bud, flower, fruit and leaf tissues to decrease yield and quality
- Contaminate crop products --- adults and nymphs
- Transmit plant virus diseases --- impatiens necrotic spot virus (INSV) and tomato spotted wilt virus (TSWV)

# Life Cycle of Thrips



WESTERN FLOWER THRIPS LIFE CYCLE

# Western Flower Thrips



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# Thrips Feeding Damage



Cucumber



Pepper



# Thrips Feeding Damage

Tomato





**Control Research Update**

**Chemical Trials**

**John Trumble, UCR**

# Chemical Trials

John Trumble, UCR

- \* **Chemical Screening test**
  - 15 treatments
  - weekly sprays
  
- \* **IPM Trials**
  - 3 treatments
  - sprayed as needed

# Chemical Screening Trial

<u>Treatment</u>	<u>Manufacturer</u>	<u># Rates</u>
Untreated	-	-
Voliam flexi	Syngenta	3
Voliam xpress	Syngenta	3
Leverage	Bayer	1
NNI-0871	Nichino	1
Radiant	Dow	1
GF-1029+	Dow	4
XR-25		
XR-25	Dow	1
GF-1029	Dow	1



# Foliar Application

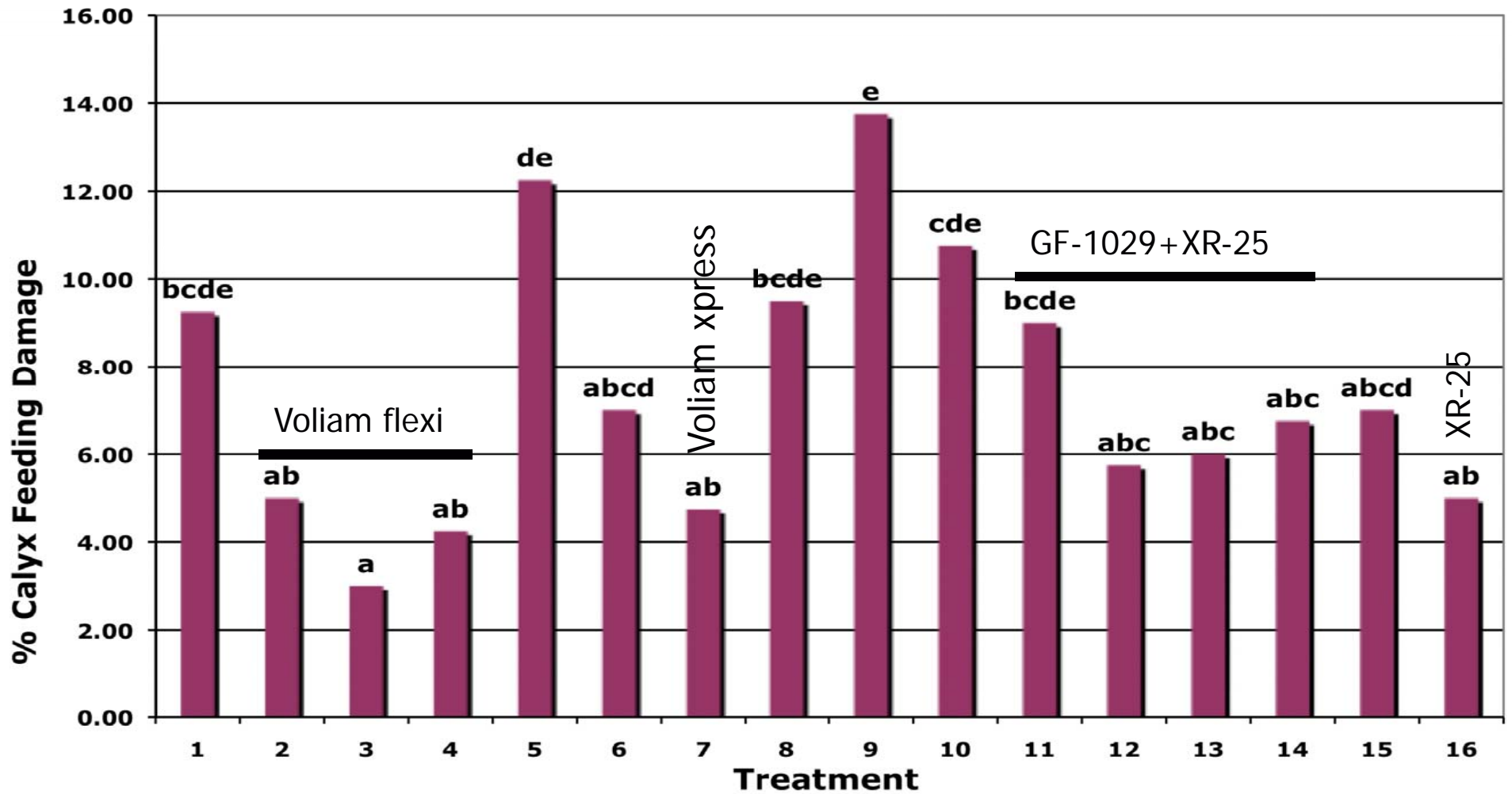


# Calyx Damage



# Calyx Feeding Damage

Pepper Chemical Trial 2008

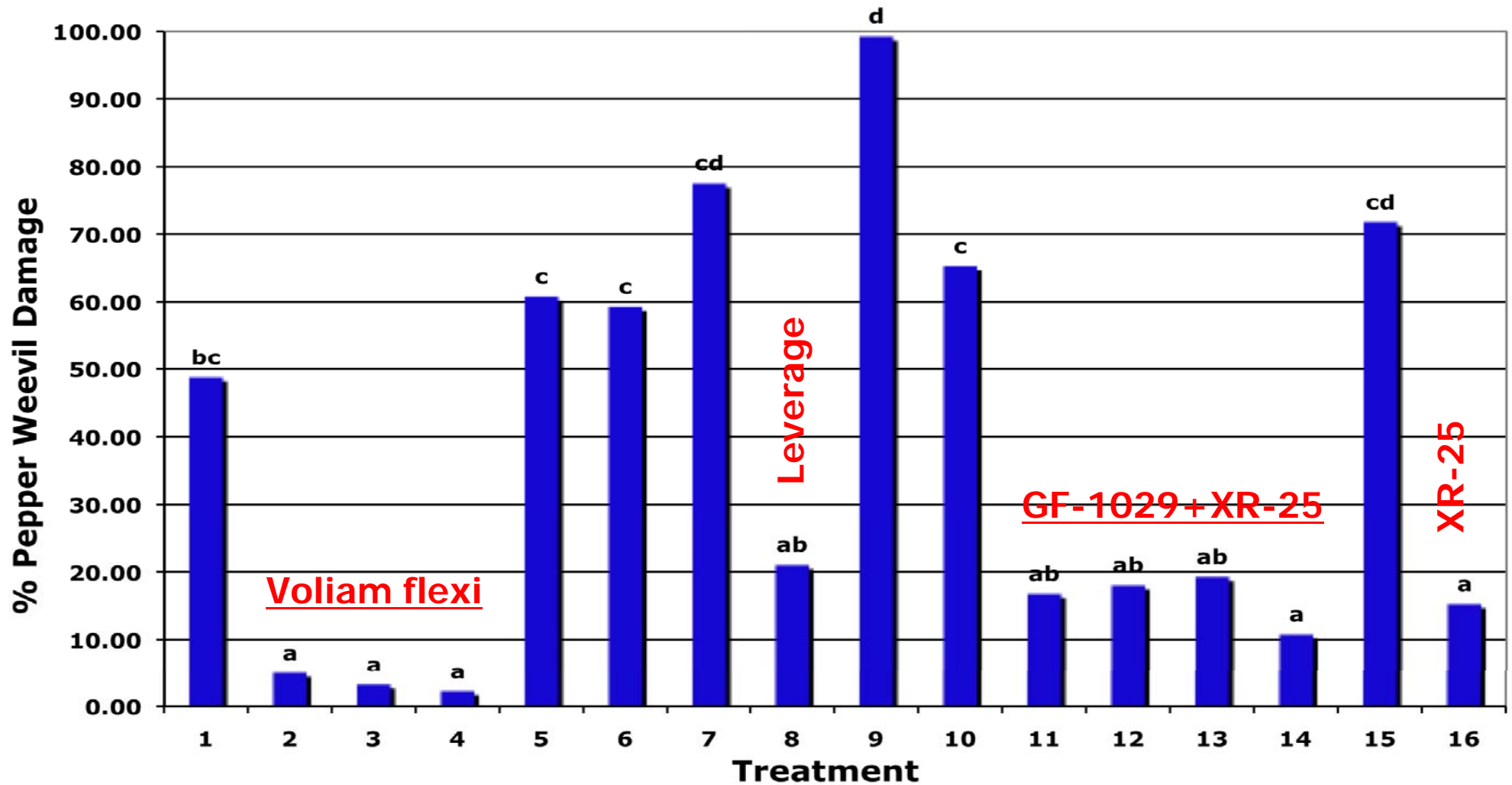


# Pepper Weevil Internal Damage



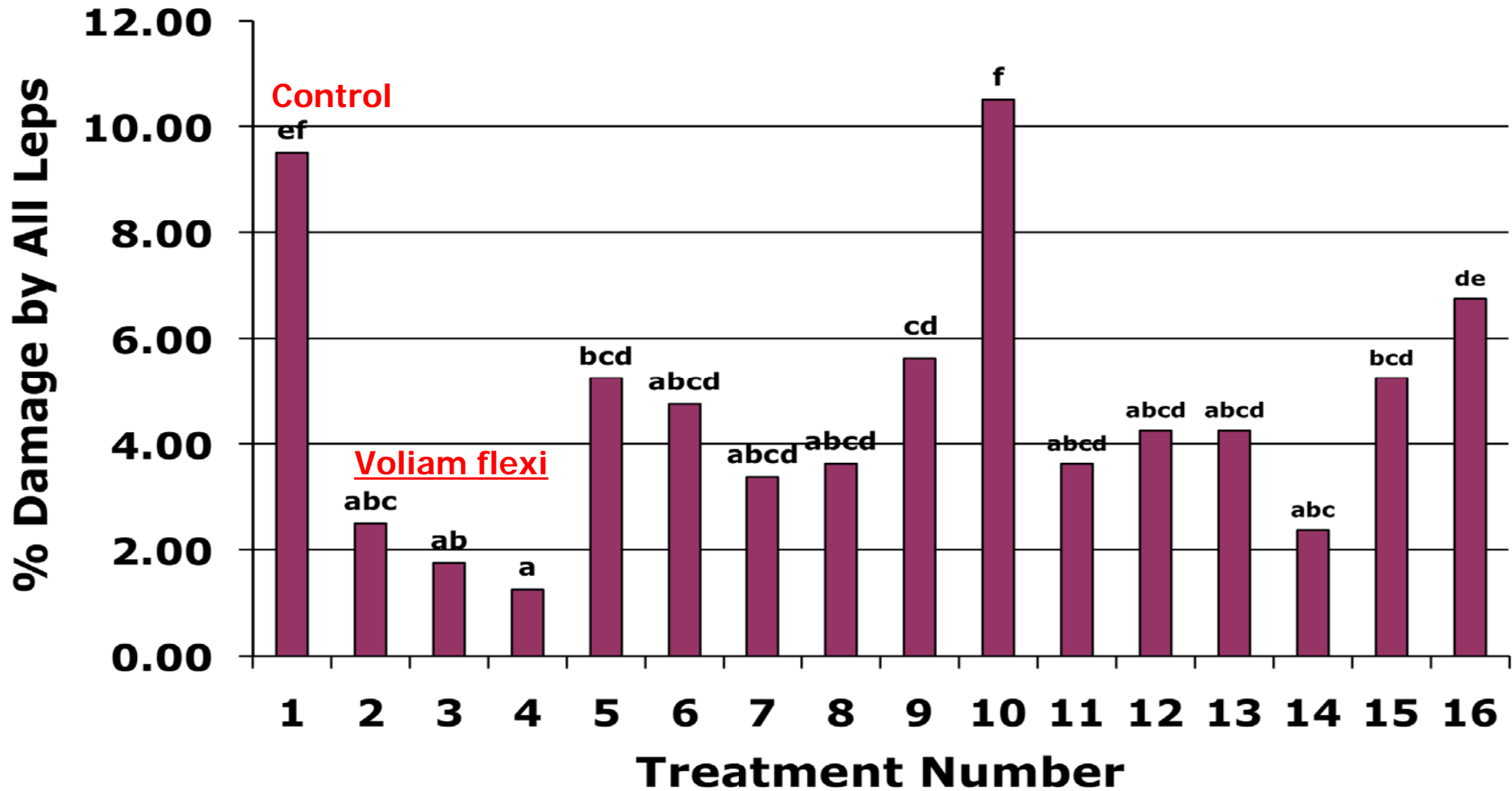
# Internal Pepper Weevil Damage

Pepper Chemical Trial 2008



# Lepidoptera Damage

Pepper Chemical Trial 2008



# Materials in IPM Trials

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## 1. Untreated Control

## 2. Low Input

Actara WDG 4 oz, sprayed 1 time

Movento 5 oz, sprayed 1 time

Xentari DF 16 oz, sprayed 2 times

## 3. Chemical Standard

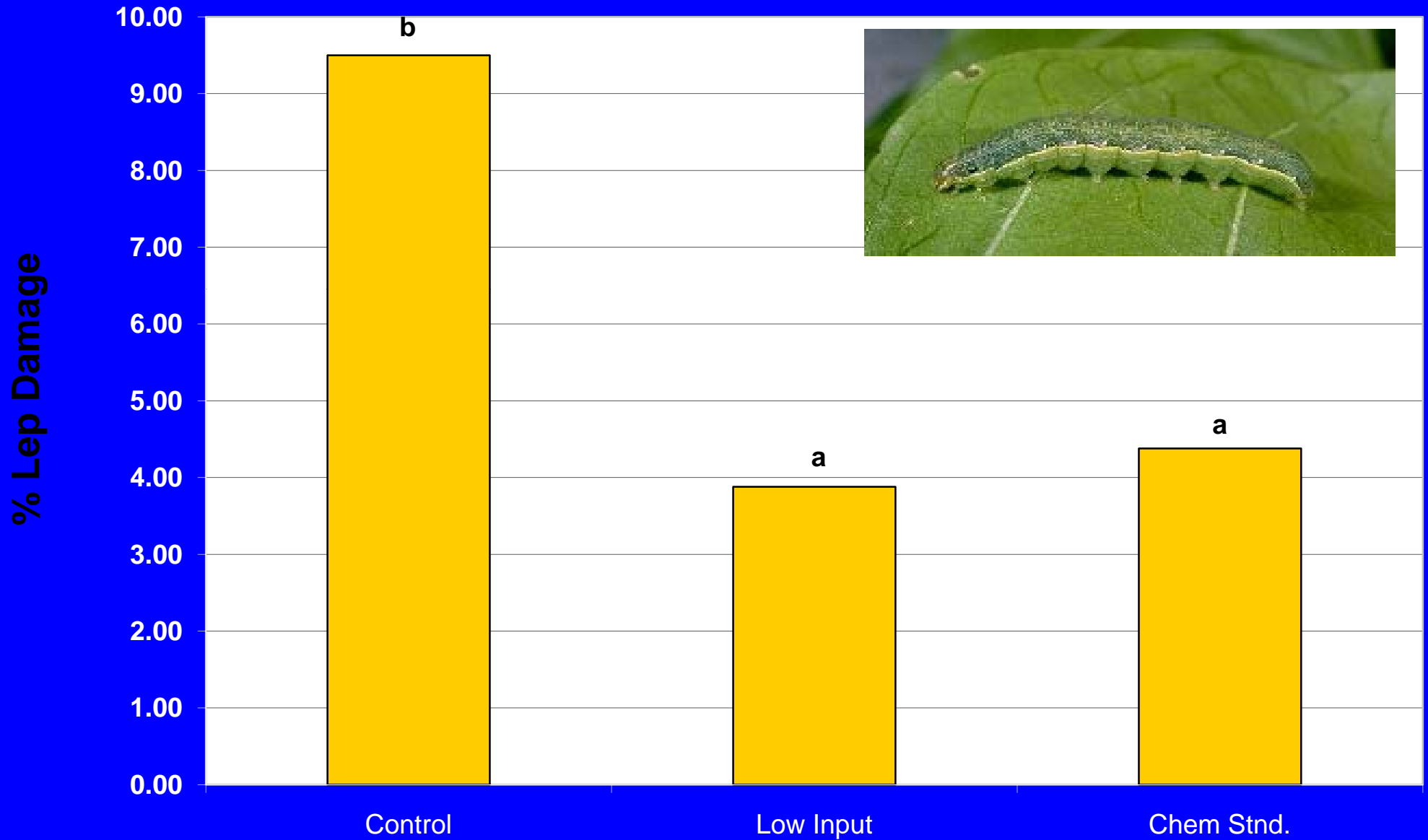
Lannate 2.4 LV 48 oz, sprayed 5 times

+ Pounce 3.2 EC 8 oz

# Damage Assessment

		Mean Number of Fruit Damaged/Replicate					
Treatment/ Formulation	Rate Amt/acre	Internal	External	All Leps	Pepper Weevil Internal	Calyx Damage	Bugs
1) Control *		0.75	18.25 b	19.00 b	*	*	*
2)Low Input: Actara 25 WG Xentari DF	4.0 oz 16.0 oz	0.75	7.00 a	7.75 a	80.75	13.75 b	4.75
3)Chemical Standard Lannate 2.4 LV + Pounce 3.2 EC	48.0 oz 8.0 oz	0.75	8.00 a	8.75 a	27.25	2.75 a	5.75
ANOVA F value (by column)		0.000	6.266	6.082	18.931	10.171	0.156
ANOVA P value (by column)		1.000	0.020	0.021	0.001	0.005	0.868

# Lep Damage



A photograph of a large agricultural field with rows of green plants, likely basil, under a clear blue sky. A line of trees is visible in the background. The text 'Thank You' is overlaid in a large, 3D, orange-to-yellow gradient font, slanted across the middle of the image.

**Thank You**