

Armyworms

Tom Getts UCCE



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Integrated Pest Management

- Knowledge
- Whole ecosystem
- Monitoring
- Management
 - Mechanical
 - Cultural
 - Chemical
 - Monitoring



Armyworms!

- Lepdopetera species
- Beet armyworm
- Western yellow striped armyworm
- True armyworm
- Fall Armyworm?



Beet Armyworm

- Native Southeast Asia
 - Discovered US 1876
- Throughout North America

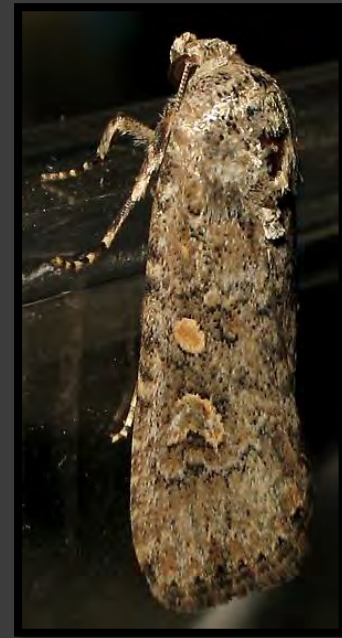
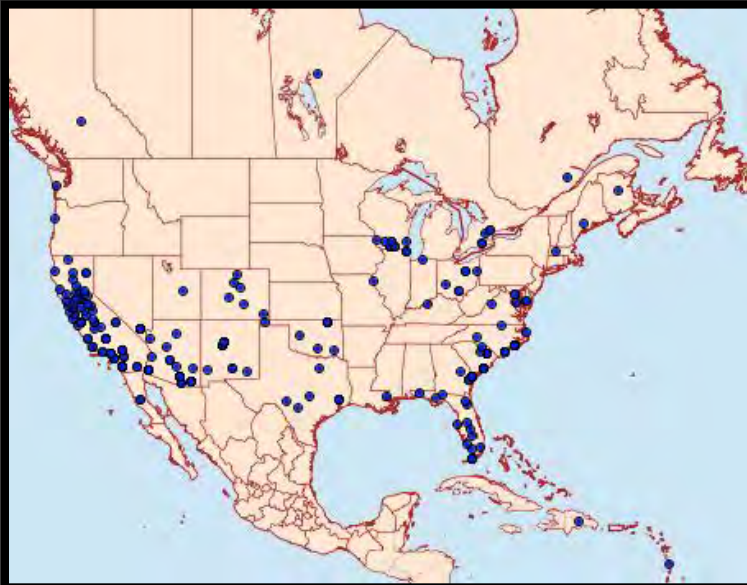


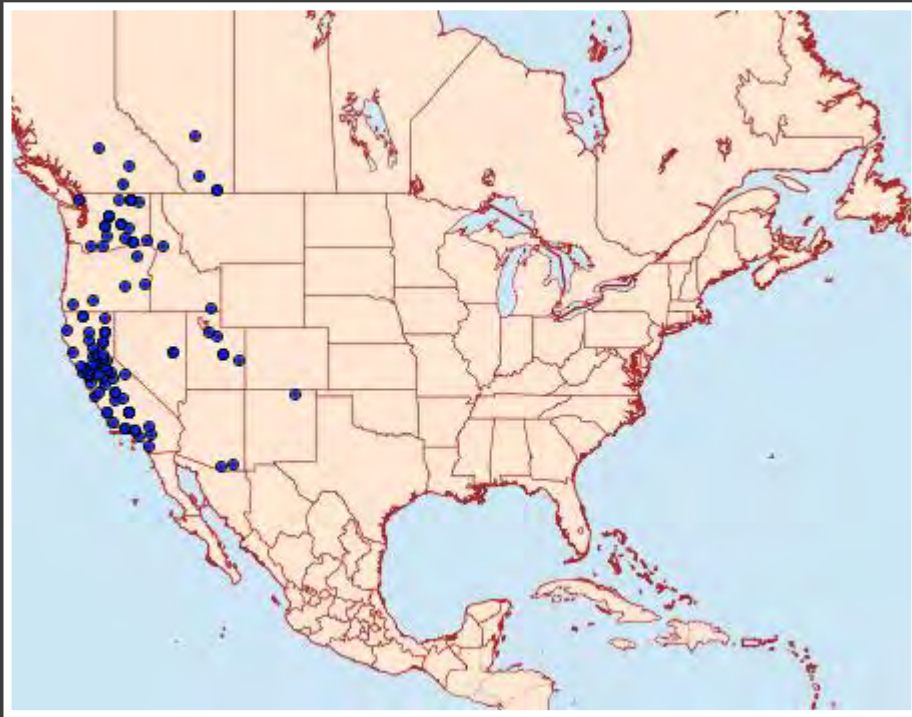
Image courtesy of: Byrain at <https://bugguide.net/node/view/693747>



Map courtesy of: http://mothphotographersgroup.msstate.edu/large_map.php?hodges=9665

Western Yellow Striped Armyworm

- Mainly Western US
- Native Species



Map courtesy of: Moth photographers group



Image courtesy of : John Davis bugguide.net



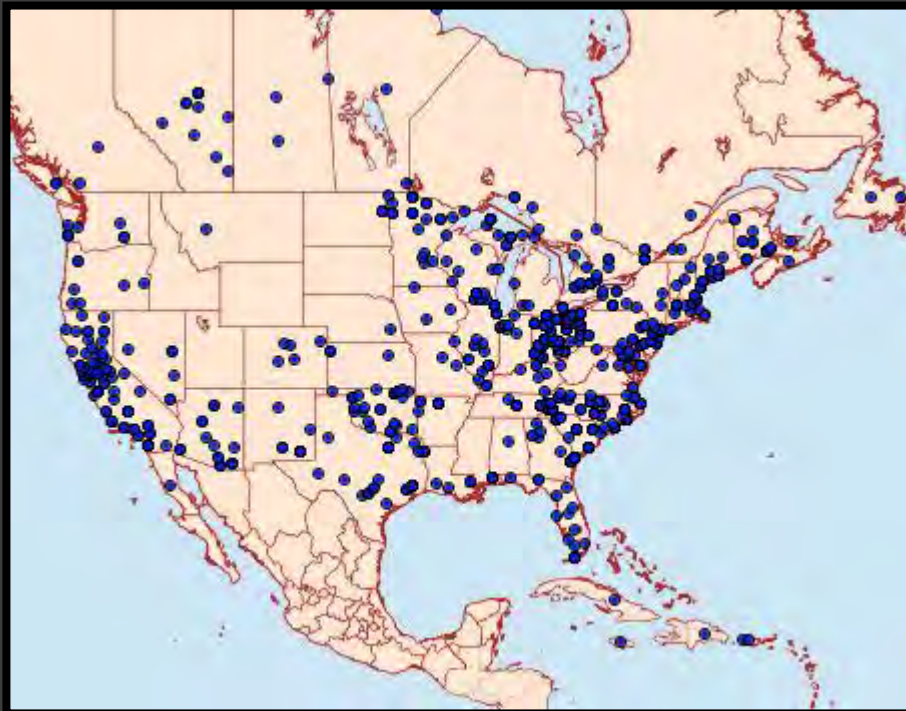
Image courtesy of: Oregon State

True Armyworm

- All throughout world and North America



Image courtesy of: Clay Nichols bugguide.com



Map courtesy of Moth photographers group



Image courtesy of: Ilona L. bugguide.com

Fall Armyworm?



Image courtesy of: Carol wolf at the moths photographers group
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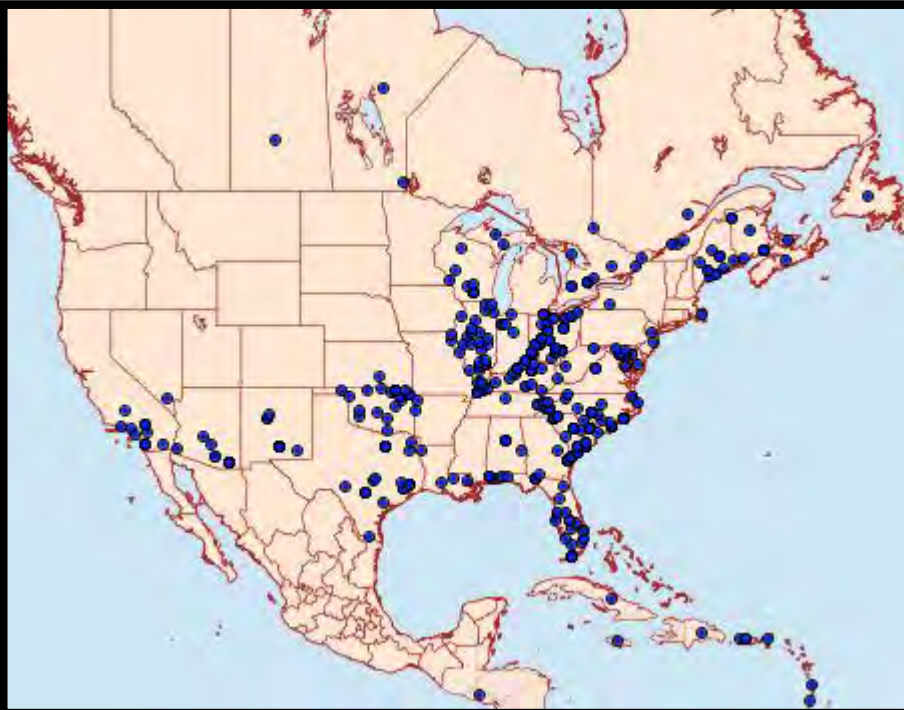


Image courtesy of: the moths photographers group



Image courtesy of: Ken Childs at the moths photographers group

Biology

- Moths - Nocturnal
- Lay eggs 20-400 in mass
- Up to 2,000 eggs per female
 - Beet armyworm and Western yellow striped upper side of leaf. Cottony covering.
 - True Armyworm - rolled in grass
- Typically hatch 1-2 weeks



Image courtesy of: Oregon State, and UC IPM



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Image courtesy of: UC IPM

Biology continued

- Western Yellow Striped and Beet Armyworm
 - 2-3 weeks until mature
- True Armyworm
 - Typically 3-4 weeks until mature
- Central Valley
 - Up to 5 generations
- Intermountain Region
 - Only 2 maybe 3 generations



Photo courtesy of: UC IPM

Winter

- Do not overwinter in harsh climates
 - No definition of “harsh” climate in literature
 - Migrates in from warmer areas
 - Overwinters as pupa in soil



Biology continued

- Appears in Intermountain Region July and August
- Second generation causes most damage
- Damage typically arises 2-3 weeks after second cutting
- Full life cycle can be from 4-6 weeks depending on temperature
- Generations can be concurrent!

Damage

- Defoliation of the crop
- Skeletonize alfalfa leaves
 - Cause flagging in field
- Grass eaten often avoids midvein
- Voracious feeder



Damage

- Study looking at fall armyworm feeding
- 80% of total foliage consumed in last instar

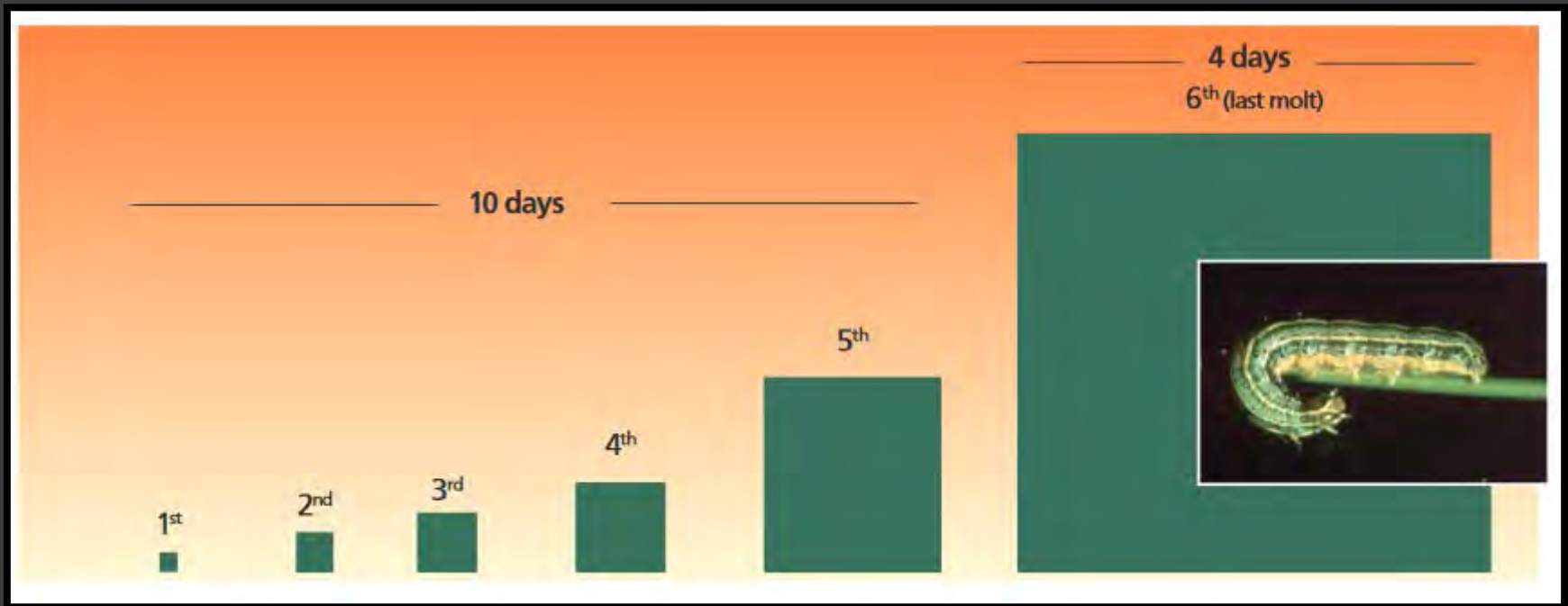


Figure courtesy of: Kathy L. Flanders Auburn University

Management

- Populations are cyclic
- Not a pest every year
- Not typically a large pest in the Intermountain Region
- Often controlled by natural predators!
- Warm winter, wet spring can lead to increased populations

Predators

- Big-eyed bugs
- Spiders
- Minute pirate bug
- Damsel bugs
- Lacewings



Image courtesy of: Southern Utah Entomology



Image courtesy of: Oregon State

Viruses

- Infected Armyworm



Photo Courtesy of: WSU

Parasites

- At least 10!
- Parasitic wasp (*Hyposoter exiguae*)
- Often manages population
- Doesn't kill young instars....
- But kills larva before last instar

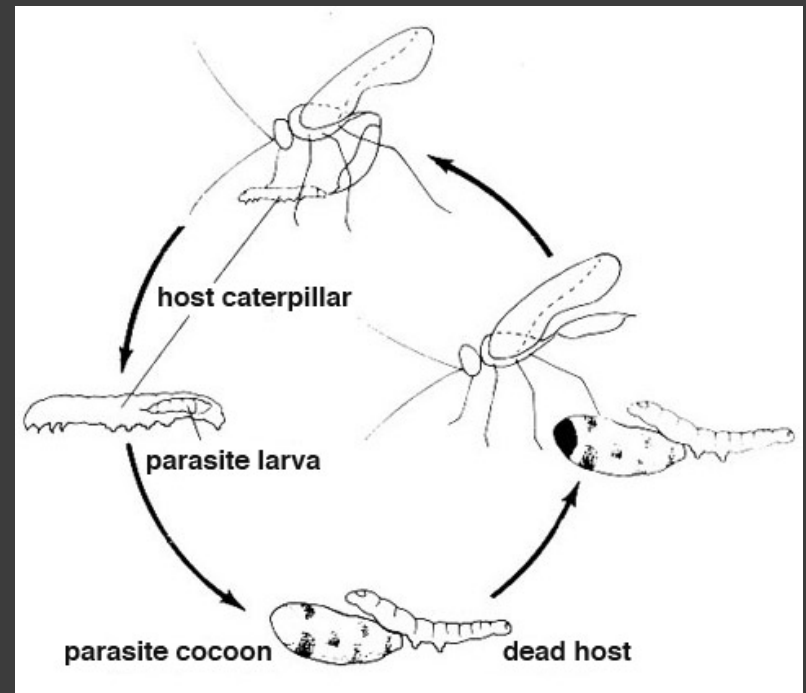


Image courtesy of: http://ipm.ucanr.edu/PMG/NE/hyposoter_exigua.html



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Photo courtesy of: UC IPM

Management

- HIGH populations this year!
- Look for “frosting” on fields
- Look for birds
- Moths flying
- Ultraviolet/backlight traps
- And MONITOR!



Photo courtesy of UC IPM

Monitoring Pasture/Grass

- Ground Search!
 - Late July through fall
 - 15 sites/30 acres pasture
 - Every 5-7 days
 - Under grass, around crowns, in cracks
- Economic threshold
 - Oregon State 5-10 /sq. ft.
 - Other states 2-4/sq. ft.
 - California no established threshold
 - Use judgment



Photo courtesy of: UC IPM

Monitoring Alfalfa

- Sweep 15 inch net
2-3 times/week
 - 4 sections each field
 - 5 sweeps per section
- Evening and early mornings
- Identify
- Determine if parasitized!
- Threshold
 - 15 or more non-parasitized
Armyworms longer ½ inch/sweep



Photo courtesy of: UC IPM

Parasitized Video

- <http://ipm.ucanr.edu/PMG/r1900711.html>



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Image courtesy of: UC IPM

Control options

- Cut the field
 - Creates inhospitable environment
 - If worms are large - may be problem after cutting
 - Under windrows feeding can occur
 - If threshold reached cut within 2 days or spray

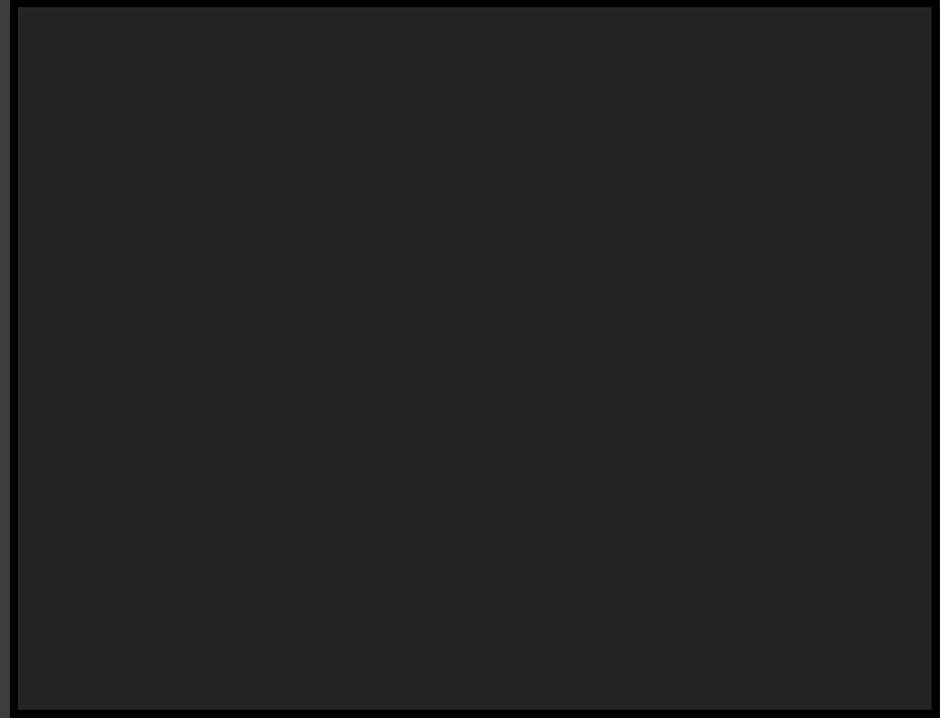


Image courtesy of: Steve Orloff

Insecticide options

- Organic
- BT (bacillus thuringiensis)
 - Agree WG or Xentari DF
 - Apply to first two instars
 - Multiple applications may be needed
 - Does not harm beneficial insects



Photo courtesy of: UC IPM

Select Insecticides for Armyworms (product/acre)

Insecticide	Active	MOA Group	Alfalfa	Grasses	Rangeland
Sevin 4F	Carbaryl	1-A	1-1.5 Quarts	1-1.5 Quarts	NO
Malathion 57	Malathion	1-B	2 pints	2 piints	3 pints
Besiege	chlorantraniliprole and lambda cyhalothrin	28+3	6-10 oz	6-10 oz	6-10 oz
Baythroid XL	cyfluthrin	3	1.6-2.8 oz	1.6-1.9 oz	1.6-1.9 oz
Warrior 2	lambda cyhalothrin	3	1.28-1.92 oz	1.28-1.92 oz	1.28-1.92 oz
Mustang	zeta-cypermethrin	3A	3-4.3 oz	3-4.3 oz	3-4.3 oz
Dimilin 2L	diflubenzuron	15	NO	2oz	2oz
Intrepid 2F	Methoxyfenozide	18	4-8oz	4-8 oz	4-8 oz
Coragen	Chlorantraniliprole	28	3.5-7.5 oz	3.5-7.5 oz	3.5-7.5 oz
Steward	Indoxacarb	22	9.2-11.3 oz	NO	NO
Xentari	BT		.5-1.5 lb	.5-2 lb	.5-2 lb

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