
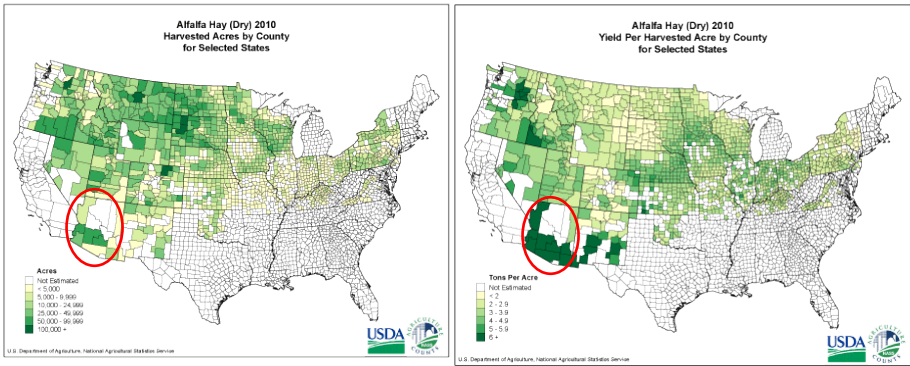


Management of Insect Pests of Alfalfa

Ayman Mostafa, Ph.D.
University of Arizona



COLLEGE OF AGRICULTURE AND LIFE SCIENCES
COOPERATIVE EXTENSION



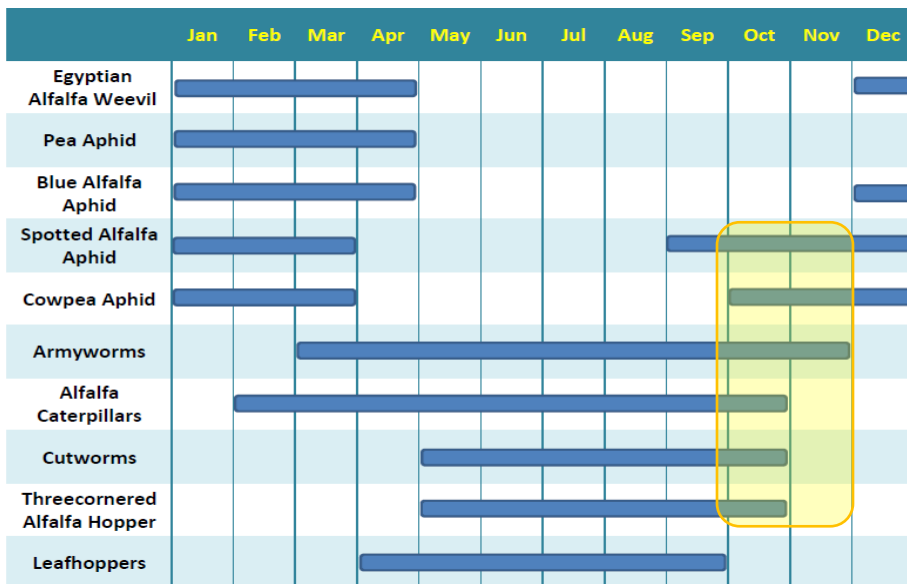
	Harvested Acre	Total Production (tons)	Yield (tons) / Acre	Total value (\$)
Arizona	280,000	2,296,000	8.2	289,296,000 (at \$126 / ton)

National average yield / Acre is 3.35 tons

Insects in Alfalfa Fields

- Over 1000 species of Arthropods have been observed in alfalfa fields.
- Majority are beneficial
- Few are pests but cause substantial damage if present in high numbers
- Reduce yield quantity and/or quality

Seasonal occurrence of Major Insect Pests of Desert-Grown Alfalfa



Caterpillars

- Larval forms of several species of Lepidoptera
 - Butterflies, moths, skippers
- Beet Armyworm, *Spodoptera exigua*
- Western Yellowstriped Armyworm: *Spodoptera praefica*
- Alfalfa Caterpillar: *Colias eurytheme*

Caterpillars

Beet Armyworm:
Spodoptera exigua



Western Yellowstriped Armyworm: *S. praefica*

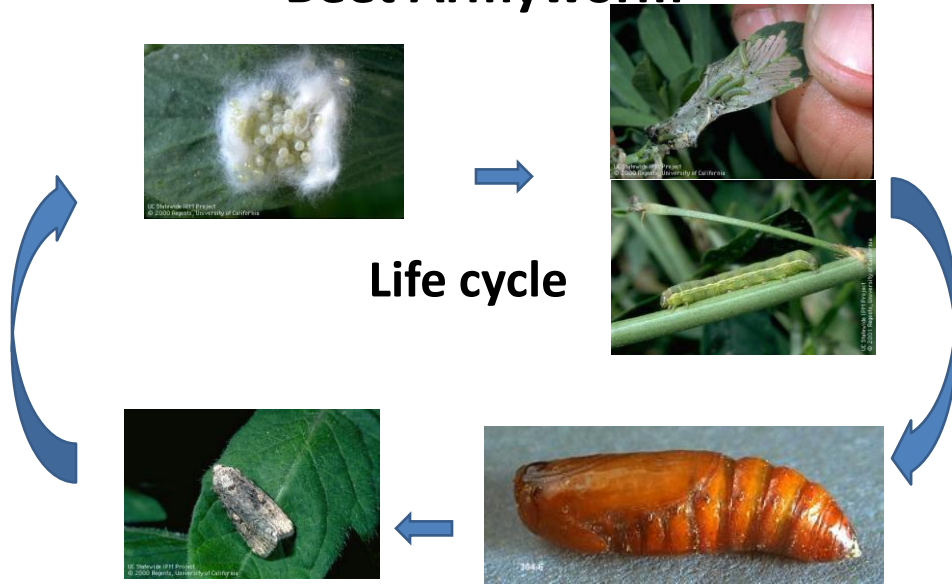


Alfalfa Caterpillar:
Colias eurytheme

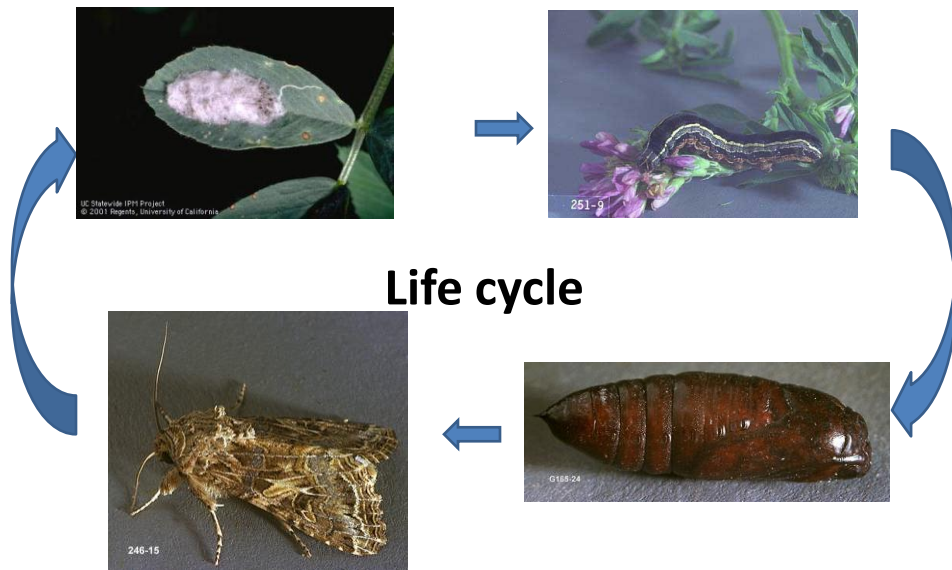


Egyptian Alfalfa Weevil larva

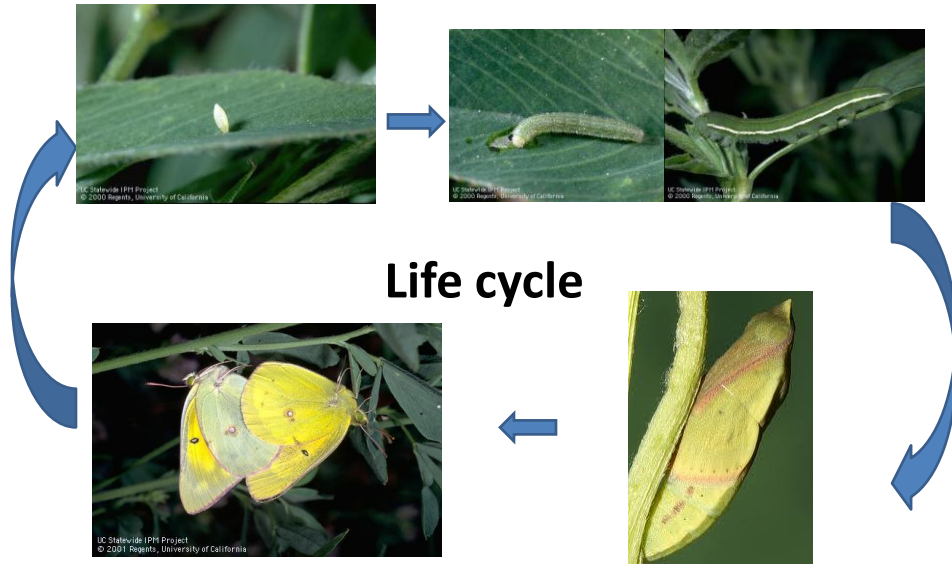
Beet Armyworm



Western Yellowstriped Armyworm



Alfalfa Caterpillar



Damage of Caterpillars



Management of Caterpillars

- **Biological control**



Management of Caterpillars

- **Culture Control**

- **Border-Strip Harvesting**



- **Early harvesting** (slight change in cutting cycle)

Management of Caterpillars

- **Monitoring**

- Start sweeping in early summer
- Sweep net samples should be conducted in 4 quadrants of the field (5 sweeps / area)
- determine if caterpillars are parasitized



Management of Caterpillars

- Control measure taken when:
- Cutting is not practical or not scheduled soon AND the average / sweep is:
- 10 or more nonparasitized **alfalfa caterpillars**
- 15 or more nonparasitized **armyworms**
- 10 or more combined nonparasitized **alfalfa caterpillars** and **armyworms**



Alfalfa Aphid Complex

- The pea aphid, *Acyrtosiphon pisum*



- The blue alfalfa aphid, *Acyrtosiphon kondoi*



Alfalfa Aphid Complex

- The spotted alfalfa aphid, *Therioaphis maculata*



- The cowpea aphid, *Aphis craccivora*



Alfalfa Aphid Complex

• Damage



- Sucking plant sap
- +
- injecting toxins
- +
- secreting honeydew



- ↓
- Leaf curling, shortened internodes and yellowing
 - Sooty mold reduces photosynthesis and quality

- ↓
- Reducing growth and yield
 - Plant death

Management of Alfalfa Aphid Complex

• Biological Control



Management of Alfalfa Aphid Complex

- **Cultural Control**

- **Resistant Varieties**

ALMOST LIKE GETTING MARRIED!!

You'll have to live with your decision for a long time, so take a little time to investigate the potential performance of your alfalfa varieties.



- **Strip Cutting**



- **Proper irrigation**

Monitoring Alfalfa Aphids

- Divide field into 4 quadrants
- Randomly select 5 stems from each quadrant
- Record average stem height from each section
- Shake stem over sweep net or white cloth
- ID aphids and record number of each species
- Take additional 5 sweeps of each section and record number of lady beetle adults and larvae



Economic Levels for Spotted Aphid

Time of occurrence	No. of spotted aphids
Spring months	40 aphids per stem
Summer months	20 aphids per stem
After last cutting in the fall	50 to 70 aphids per stem
Newly seeded alfalfa in lower desert	20 aphids per stem

Economic Levels for Spotted Aphid

- During spring and summer, DO NOT treat if ratio of lady beetles to aphids is equal to or exceeds the following:

No. of lady beetles per sweep	No. of spotted aphids
ON STANDING ALFALFA	
1 or more adults	5 to 10 aphids
3 or more larvae	40 aphids
ON STUBBLE	
1 or more larvae	50 aphids

Economic Levels for Cowpea Aphid

- Spotty distribution
- Spotty sampling and treatments, especially on the field border
- No economic threshold levels have been established
- Usually using the thresholds for the blue alfalfa aphid:

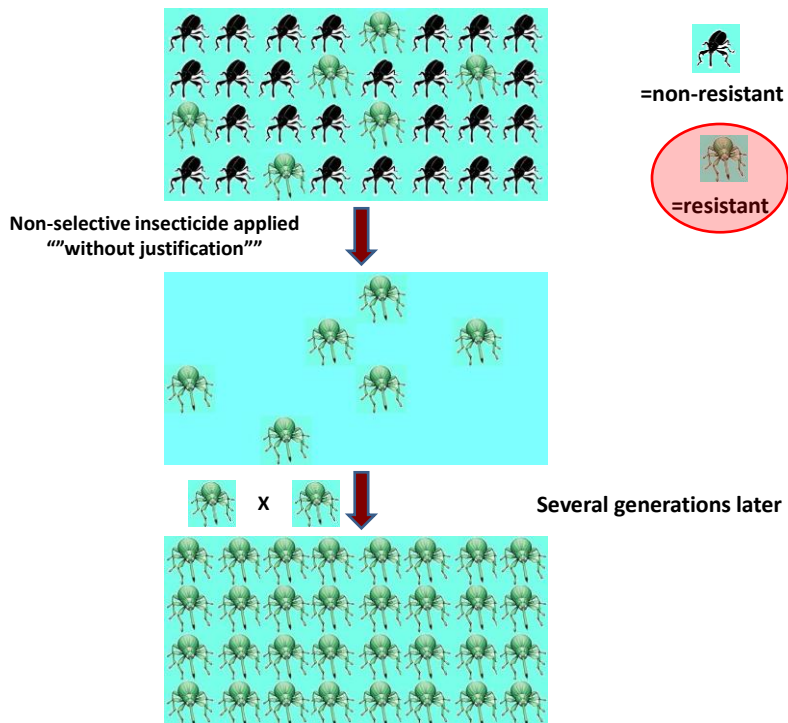
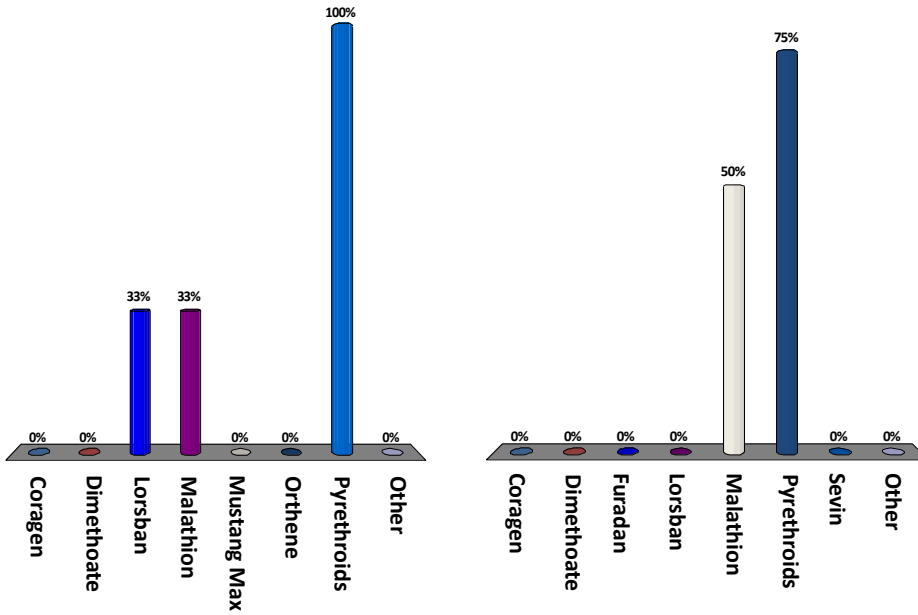
Plant height	Aphids
Under 10 inches	10 to 12 per stem
10 to 20 inches	40 to 50 per stem
Over 20 inches	40 to 50 per stem

Three-cornered Alfalfa Hopper

- Buffalo Hopper
- Rarely cause significant damage
- Heat and/or water stressed plant are at greater risk of damage
- Damage caused by feeding and oviposition activity of the adult (girdle stems)



Chemicals used in alfalfa



Issues with Management Insect Pests of Desert-Grown Alfalfa

- Outdated or absence of Economic Threshold
- The lack of research on insecticide efficacy and selectivity in the system
- Understanding the roles of natural enemies and incorporating them in Economic Threshold
- Enhance the utilization of culture control

