Cotton Insect Management

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- Sampling, Detection, & Monitoring
- Effective & Selective Chemistry
- Resistance Management
- Action Thresholds
- Effective Chemical Use
- Avoidance

- Exploitation of Pest Biology & Ecology
- Overwintering Ecology
- Conservation of Natural Enemies
- In-Field Mortality Dynamics
- Pest & Outbreak Prediction
- Alternate Host Management
- Inter-Crop Movement
- Crop Placement
- Planting & Termination Date Management
- Pest x H2O Interactions
- Tolerant / Resistant Varieties
- Pest x N Interactions
- Cross-Commodity Cooperation
- Areawide Impact

Cotton Insect Management
2 Sprays

- Carbine
- Transform 2oz
- Transform 1.5oz
- Acenthrin
- UA2002oh
- UA2002ol
- UA2002sh
- UA2002sl

Nymphs per 100 sweeps

UTC

0 2 4 6 8 10 12 14 16 18 20
The diagram shows the nymphs per 100 sweeps for different sprays:

- **2 Sprays**
  - Carbine
  - Transform 2oz
  - Transform 1.5oz
- **3–4 Sprays**
  - Acenthrin
  - UA2002oh
  - UA2002ol
  - UA2002sh
  - UA2002sl
  - PQZ
  - UA2001
  - Celite
  - Steward
- **1 Spray**
  - UA2003l-
  - UA2003ld
  - UA2003lm
  - UA2003h-
  - UA2003hd
  - UA2003hm
  - UTC

The nymphs per 100 sweeps range from 0 to 20.
- **Carbine**: Nymphs per 100 sweeps
- **Transform 2oz**: Nymphs per 100 sweeps
- **Transform 1.5oz**: Nymphs per 100 sweeps
- **Acenthrin**: Nymphs per 100 sweeps
- **UA2002oh**: Nymphs per 100 sweeps
- **UA2002ol**: Nymphs per 100 sweeps
- **UA2002sh**: Nymphs per 100 sweeps
- **UA2002sl**: Nymphs per 100 sweeps
- **PQZ**: Nymphs per 100 sweeps
- **UA2001**: Nymphs per 100 sweeps
- **Celite**: Nymphs per 100 sweeps
- **Steward**: Nymphs per 100 sweeps
- **UA2003l-**: Nymphs per 100 sweeps
- **UA2003ld**: Nymphs per 100 sweeps
- **UA2003lm**: Nymphs per 100 sweeps
- **UA2003h-**: Nymphs per 100 sweeps
- **UA2003hd**: Nymphs per 100 sweeps
- **UA2003hm**: Nymphs per 100 sweeps
- **UTC**: Nymphs per 100 sweeps

**Legend**:
- 2 Sprays
- 3-4 Sprays
- 1 Spray

**Y-axis**:
- 0
- 2
- 4
- 6
- 8
- 10
- 12
- 14
- 16
- 18
- 20

**Nymphs per 100 sweeps**

**Notes**:
- * indicates a significant result.
≥50% Fruit retention
Compact stature
Carbohydrates to bolls
Lygus feed on squares
Hard cutout
Identifying Cut-out
Untreated Check (UTC)

- 0 Lygus sprays
- 1 PGR spray

Tall plants = Damage
Look for compressed internode
Lost fruiting sites
Late season Lygus
Taller “top” crop
Compensation for losses
Insufficient water & HUs
Top Crop Flower in UTC

Misshapen
Brown spots on petals
Brown anther sacs
Lygus nymph feeding
Prefer squares & floral structures
Will not be productive
Top Crop Flower in Carbine

Inspect quality of flower
Clean petals
Clean floral structures
Viable, dehiscing pollen
Very good late season control
Examination of Upper Nodes

Short format cotton
No top crop
Excellent fruit retention
~3.5 bales / A
1 Lygus spray only

Untreated Check
Upper 13 nodes
8 nodes in top crop
Reduce compensation masking of Lygus effects

Planting: 5/29
Final water: 8/21
Defoliation: 9/30, 10/5
Harvest: 10/20
The diagram illustrates the yield (bales per acre) of various crops treated with different chemicals and spraying schedules. The crops are categorized into 2 Sprays, 3–4 Sprays, and 1 Spray categories.

- **Carbine** and **Transform 2oz** are in the 2 Sprays category.
- **PQZ**, **UA2001**, **Celite**, **Steward**, **UA2003l-** through **UA2003hm**, and **UTC** are in the 1 Spray category.

The yield values range from 0 to 3.5 bales per acre, with each crop represented by a bar indicating its yield.
Excellent Lygus Control

Experimental

~ 3.5 bales

No Lygus Control

PQZ

~ 2.5 bales
 UTC-disrupted

Predator Threshold

UA2004

Miteus

Celite 610

Sefina

SivantoHL7oz

SivantoHL5oz

PQZ

Assail 2.3oz

Assail 3.5oz

Large Nymphs per disc

2 Sprays

0 1 2 3 4 5

Large Nymphs per 100 sweeps

UTC-disrupted

0 1 2 3 4 5

Large Nymphs per disc
UTC-disrupted

Predator Threshold

Assail 3.5oz
Assail 2.3oz
PQZ
SivantoHL5oz
SivantoHL7oz
Sefina
Celite 610
Miteus
UA2004

2 Sprays

+1 Rescue Spray

4–5 Sprays

1 Spray

Large Nymphs per disc

YIELD LOSS POSSIBLE
~72% INFESTED

QUALITY LOSS POSSIBLE
~80% INFESTED

{+1 Rescue Spray

{4–5 Sprays

{1 Spray

Predator Threshold

0 1 2 3 4 5

Large Nymphs per disc
UTC-disrupted

Predator Threshold

Assail 3.5oz
Assail 2.3oz
PQZ
SivantoHL5oz
SivantoHL7oz
Sefina
Celite 610
Miteus
UA2004

Sprays:
2 Sprays
4-5 Sprays
1 Spray
+1 Rescue Spray

Adults per leaf

0 2 4 6 8 10 12 14 16 18 20
UTC-disrupted

Predator Threshold

UA2004

Miteus

Celite 610

Sefina

SivantoHL5oz

SivantoHL7oz

PQZ

Assail 2.3oz

Assail 3.5oz

PQZ

2 Sprays

+1 Rescue Spray

4–5 Sprays

1 Spray

Partially selective

Partially selective

Fully selective

Fully selective

Fully selective

{4–5 Sprays +1 Rescue Spray

Adults per leaf

0 2 4 6 8 10 12 14 16 18 20
Just for Fun!

Demonstration
Untreated Check
0 Sprays (disrupted)

PQZ
2 Sprays (disrupted)
Untreated Check
0 Sprays
(disrupted)

Predator Threshold
1 Spray

PQZ
2 Sprays
(disrupted)

~30 per leaf

~10 per leaf

~6 per leaf
Untreated Check 0 Sprays
Sefina 2 Sprays
Assail 3.5oz 2 Sprays
PQZ 2 Sprays
Celite 610 5 Sprays
SivantoHL 7oz 2 Sprays
Assail 2.3oz 2 Sprays
Predator Threshold 1 Spray (undisrupted)
“Stickiness” Ruins Fiber & Markets!

Sugars excreted by whiteflies
Sooty mold fungi grow on sugars

Can we measure this for in-field decision-making?
Samples through time (5 bouts)

- Spraying: Indicates when to spray based on the number of Whitefly Adults (%)
- Deferring: Indicates when to wait before spraying
- Advance: Indicates when to spray before the critical threshold
- Don't Spray: Indicates not to spray

Chart shows:
- Whitefly Adults (%)
- Minute Pirate Bugs per 100 sweeps
- Zones:
  - Always Spray Zone
  - Never Spray Zone
  - Spray Zone
  - Deferral Zone

Through time, 5 bouts are analyzed to determine the optimal spraying strategy.
Right Size the Tool for Your Situation

8 Predator Thresholds

Whitefly Densities
Yield Loss Imminent!

2020 Whitefly Trial

Sprays

Adults per leaf

PQZ
Yield Loss Imminent!

2-Aug  9-Aug  16-Aug  23-Aug  30-Aug  6-Sep  13-Sep  20-Sep

Adults per leaf

UA Predator (Deferred spray for 5 weeks!)
Funding and Support

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Various Agro-industries
For more information...

Cotton Insecticide Use Guide – Knowing and Balancing Risks
https://acis.cals.arizona.edu/docs/default-source/ipm-shorts/cottoninsecticiderisk.pdf

Making Use of Predators in Cotton

Making Whitefly & Predator Counts
https://acis.cals.arizona.edu/docs/default-source/ipm-shorts/predatortopreyyratios.pdf

Predator “Thresholds”
https://acis.cals.arizona.edu/docs/default-source/ipm-shorts/wfbit.pdf
Robert Loring Nichols
March 3, 1946 - October 7, 2020