

SUGGESTIONS FOR COTTON APHID MANAGEMENT IN WEST TEXAS



The cotton aphid, *Aphis gossypii* Glover, is a serious problem over much of the cotton acreage in West Texas. The Cotton Aphid Task Force was formed in September, 1991 to aid in the coordination of research and education efforts. The following management suggestions are a product of this continuing collaboration between Texas Agricultural Experiment Station and Texas Cooperative Extension scientists. These suggestions incorporate current knowledge of aphid biology and ecology, cultural management practices and insecticide resistance management.

Season-long Management of Cotton Aphids

At-Planting Considerations

Aphid numbers tend to be lower on varieties with the smooth-leaf characteristic. Pubescent varieties develop higher aphid numbers than glabrous varieties. However, most commonly planted commercial varieties are pubescent with relatively little difference between them.

Aphid numbers in cotton can be lower following crops that leave a high level of residue. Aphid numbers are generally higher in clean-till or conventional-till production systems than in fields where cotton is planted into wheat or sorghum residue. Light reflectance from the residue slows aphid reproduction.

Planting dates influence aphid abundance. Aphid numbers during August are higher in late June-planted cotton than cotton planted either in April or May in the West Texas production region. Suggested planting dates for each region follow:

High Plains: April 25 - May 20

Rolling Plains: May 15 - June 7.

Trans-Pecos: April 25 - May 25

Where practical, land preparation no later than April will allow producers to have fields ready for planting during the preferred planting period.

Plant to assure an adequate and uniform stand. Cotton aphid numbers are generally higher in fields with skippy stands and in cotton planted in a skip-row pattern. Producers should use high quality seed and plant only enough seed to achieve a uniform stand of 2-4 plants per foot of row (30 and 40 inch rows) for dryland and irrigated production.

Avoid excessive nitrogen levels by fertilizing based on a soil test. Fertilizing based on soil tests and realistic yield goals will avoid cotton with high nitrogen levels. Aphid numbers are higher on plants with higher nitrogen levels. Additionally, aphids on plants with high nitrogen levels are less susceptible to aphicides.

Early Season

Aphids in pre-blooming cotton, from emergence to first bloom, rarely develop to economically damaging levels. These aphids are an important food source for natural enemies such as lady beetles and parasites. Insecticide treatments for aphids in pre-blooming cotton should be avoided if possible.

Insecticide selection. The choice of insecticides used for early season pests (thrips, cotton fleahoppers) can influence both aphid and natural enemy populations. Select an insecticide that controls the pest you are targeting but has the least detrimental impact on natural enemies. Repeated use of the same insecticide chemistry can reduce aphid response to similar insecticides later in the season.

Natural enemies. Predators and parasites can reduce aphid populations to non-economically damaging levels. Conservation of natural enemies throughout the season will maintain most aphid populations at low levels.

Mid-Season

Use economic thresholds. Delay insecticide control of aphids until infestations exceed 50 aphids/leaf, from early bloom to first open boll. Most aphid infestations develop to their highest levels after mid-August, often declining to low levels soon after this peak. When populations approach 50/leaf, scouting efforts should be intensified. Aphid populations at 50/leaf may rapidly increase, level off or decline. Infestations exceeding 50/leaf for more than 3 weeks or 100/leaf for more than 2 weeks have resulted in yield decreases.

Adherence to these thresholds provides an opportunity for parasites and predaceous insects, such as lady beetles, to control the aphid populations without the use of insecticides. When maturing grain sorghum or corn fields are nearby, natural enemies often move into cotton where aphid populations are increasing. These natural enemies can reduce aphid numbers within two weeks.

Consider alternatives to the pyrethroids. Prior to boll set, alternative insecticides for bollworms/tobacco budworms such as *Bacillus thuringiensis* products, Curacron[®], Lannate[®], Larvin[®], Steward[®] and Tracer[®] should be used where necessary. When a pyrethroid is used and cotton aphid numbers exceed 50/leaf and are rapidly increasing, add a full recommended rate of an effective aphicide. Full aphicide rates are necessary for extended residual control.

Maximize insecticide coverage. Cotton aphid infestations develop on the undersides of leaves throughout the plant canopy. Thorough top-to-bottom coverage through increased spray volume is very important. The use of drops on ground application equipment is recommended. A minimum of 10 gallons total spray volume/acre for ground equipment and 5 gallons/acre by air is suggested. Some aphicides may not perform well if delivered to the crop using oil as the carrier.

Late Season

Avoid sticky cotton once bolls open. Low infestation levels of cotton aphids can excrete sufficient honeydew to contaminate the lint of open bolls and create significant and costly problems at the textile mill. Mills are reluctant to buy and may even reject contaminated lint. Factors that increase late season aphid populations include late irrigations (after August 25), warm fall temperatures, plant regrowth, ULV malathion applications for boll weevil control, pyrethroid applications in late August-early September and Prep[®], when used alone in early September.

In the Rolling Plains, planting date can be used to reduce the probability of lint contamination by aphid honeydew. An average of 3% of the bolls will be open by late August in cotton planted between May 15 and June 7, whereas cotton planted in late April-early May can average 36% open bolls in late August. Early planted fields are very susceptible to honeydew contamination of lint during September.



To prevent sticky lint after bolls open, an insecticide treatment should be considered when aphid numbers exceed 11 per leaf. Timely rainfall of at least 1/4-inch or more can reduce honeydew deposits. Center pivot irrigation systems, configured for above canopy application or for use in a

LEPA system with drops configured to give upward penetration of water into the plant canopy, can also be used to reduce honeydew deposits. Three irrigation applications of at least 1/4-inch can remove 75-90% of the honeydew. Whether rainfall or irrigation treatment reduce honeydew contamination below troublesome levels can depend upon the initial level of contamination and multiple applications may be necessary. Also, if aphids remain on the plants during or after a rain or irrigation, the lint remains susceptible to further contamination. Aphid populations exceeding 11 aphids per leaf should be eliminated with an effective insecticide prior to using center pivot irrigation to wash honeydew from lint.

Consult your local Extension entomologist or agent for the latest list of effective insecticides. Resistance to insecticides has varied considerably from community to community and even between adjacent fields. There can also be considerable seasonal variation in aphid susceptibility to aphicides. Insecticides and insecticide combinations are continually being evaluated during the growing season.

Fields should be harvested, using harvest aid chemicals when appropriate, in a timely manner to prevent late season aphids from contaminating lint.

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