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## Crop Production Guide Series

### Cotton Fleahopper Management Tips

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The cotton fleahopper is a key pest of High Plains cotton during the first 3-5 weeks of squaring. This square thief can get the upper hand even before many producers realize their cotton plants are squaring. While area-wide severe infestations of this pest are a rare occurrence, their sneak attacks can make them difficult to manage. The key to their management is to “know your cotton plants”. Without plant mapping, there is no easy way to determine if this pest has adversely impacted cotton square production.

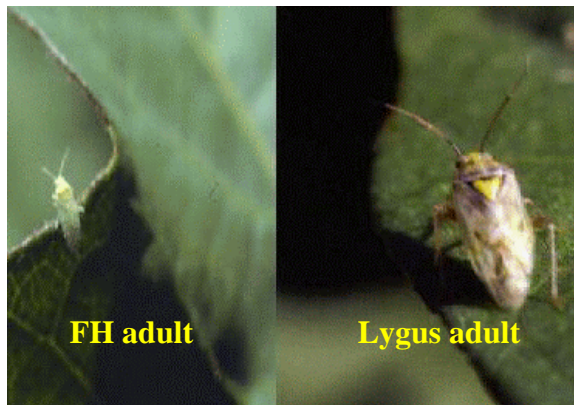
**Identification:** The winged adult fleahopper (FH) is about 1/8 inch long, yellowish-green to almost off white. With flight capabilities, this insect can rapidly disperse and can rapidly leave plants when



**FH adult**



**FH nymph**



**FH adult**

**Lygus adult**

disturbed as scouts approach. Adult bodies are flattened and elongated and can have black hairs and spots on their upper surface. Wingless nymphs are generally more secretive than adults and are about 1/30<sup>th</sup> of an inch long when emerging from eggs. These immatures are almost translucent after egg hatch but gain a pale green color after feeding. They have reddish eyes,



**BEB nymph**

**MPB nymph**

as do some other insect nymphs. Several other insects can be confused with fleahoppers. Scouts often mistake tan leafhoppers for adult fleahoppers when approaching plants to be monitored. Leafhoppers do not have flattened bodies and tend to “spring” off plants rather than fly away. This behavioral difference is important to avoid adding this insect to your adult fleahopper counts. Nymphs sometimes can be confused with immature minute pirate bugs (MPH), big-eyed bugs (BEB), aphids, and Lygus to mention a few. But color, shape, behavioral patterns, etc. can be used to distinguish these possible fleahopper look-a-likes.

**Life Cycle:** Fleahoppers overwinter in the egg stage in various weed hosts including croton, evening primrose, silverleaf nightshade and lanceleaf sage. Eggs are yellowish-white and inserted into plant tissue. Therefore the egg stage is not visible to the observer and not vulnerable to predation. Eggs hatch in the spring with fleahoppers infesting available weed hosts. Once cotton begins to square, adult fleahoppers can and often do move into these fields. Rarely are there sufficient numbers of fleahoppers resulting from the overwintering eggs to cause damage at levels to justify treatment. It usually takes a generation in the earlier cotton fields to produce economically damaging numbers. The egg stage takes about 11 days while the immature wingless stages last about two weeks. Total egg to adult time is about 25 days. Adults can live for about three weeks. Highest numbers of fleahoppers in cotton are found in August, well past the period where they can affect yield. At this time they are considered to be more beneficial than pestiferous as they do feed on other insects.

**Damage:** Both adults and nymphs will feed on tender plant parts including new terminal growth and small squares. Their piercing, sucking mouthparts will penetrate small squares causing desiccation from sap removal. Pinhead size squares are the most vulnerable to this “blasting”, where squares turn brown and die. Feeding damage may not appear for 1-3 days depending upon environmental conditions.



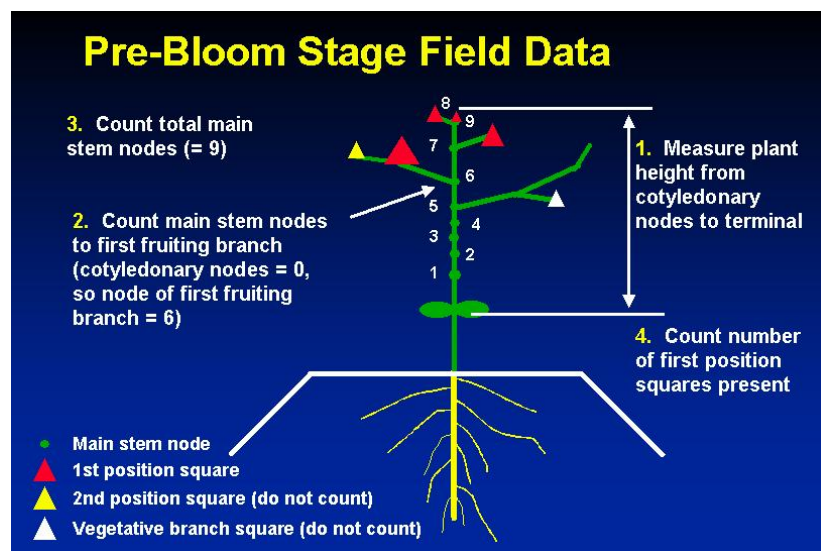
Larger squares, flowers and bolls are not vulnerable to fleahopper feeding damage. Fleahoppers inject saliva when feeding, causing abnormal growth patterns to plants that sustain heavy damage. Shorter internodes, “suckering” and generally “crazy” cotton can result from loss of terminal dominance. Damage after five weeks of squaring rarely justifies treatment even for the higher yielding fields.



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**Scouting Tips:** Monitoring for potential fleahopper problems should begin as cotton starts to square. Some varieties will commence squaring as low as the 5<sup>th</sup> node while others may not start any lower than node eight. Since management decisions are based on both fleahopper numbers and square retention levels, plant mapping is a necessity. The use of [COTMAN](#) is an excellent means of monitoring squaring progress. But any plant mapping technique will work. While all squaring positions can be monitored, we focus only on first position squares. A square in this position is produced about every 3-4 days depending on temperature and other environmental factors. When monitoring plants for square set, look for squares all the way up to the

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lowest curled up mainstem leaf. This would be associated with a pinhead size square. Larger leaves will have larger squares and represent older squares that were previously vulnerable to fleahopper damage and shedding. Also look for scars indicating that a square was shed. Large scars would indicate the shedding of a large square, not due to fleahopper feeding. Record number of first position fruiting positions and the number still with squares. This will provide square set information.

Determination of fleahopper numbers is also important. Again, do not accidentally count fleahopper look-a-likes. Approach plants very carefully, avoid casting your shadow across the plant to be monitored. Count adult fleahoppers that take flight as you approach. Continue looking intently at the monitored plant while you slip your hand under the plant with the stalk between your fingers. This prevents fleahoppers from running down the plant to the ground undetected. Inspect the plant for fleahoppers and pay particular attention to the terminal and terminal ends of fruiting branches. If scouting into the blooming period in high yielding cotton, be sure to look into flowers. Record wingless nymphs and winged adults separately. The beat bucket method may work in lieu of visual inspection.



Once-a-week scouting is sufficient until either large numbers of fleahopper adults appear or square set starts to fall close to dangerous levels. Then scouting frequency should be increased to at least every 3-4 days depending upon the situation.

**Management Decisions:** Treatment decisions should be based on several factors including fleahopper numbers, the adult/nymph ratio, square retention, the week of squaring and overall condition of the crop. Dryland and limited irrigated fields should be managed differently than fields with full irrigation potential. Our current management approach entails being very aggressive in the early weeks of squaring but backing off in weeks 3-5. Compensation research conducted in recent years would indicate that this might not be the correct approach. Where water is not limiting, 1<sup>st</sup> square retention levels prior to bloom as low as 60% can be tolerated without significant yield loss or maturity delays. Higher square loss levels will ultimately affect yield but more drastically delay maturity. Dryland cotton cannot make up for early losses as well as irrigated cotton but a more aggressive management approach may not be economically justified.

A more prudent approach to fleahopper management would probably entail being less aggressive in the first two weeks of squaring when there are few fruiting positions to protect. Our current 90% square set threshold for the first week should probably be no higher than 75% if that. But I would probably want to try to hold on to as many of the 1<sup>st</sup> position squares in weeks 3, 4, and 5 as possible. Since other non-insect factors can cause square shed or loss, you must include fleahopper numbers in your treatment decision. Currently that threshold number is about 30 fleahoppers per 100 plant terminals. If there are many adults, and square set is still good, I would increase my frequency of scouting. Ninety percent square set can fall to 65% in one week's time.



Other management considerations include: an assessment of weed hosts bordering, near or in fields and planting date. Late planted fields are often the targets of fleahopper infestations that developed in earlier planted fields. If weed hosts are eliminated by spraying or mowing, fleahoppers may be forced into adjacent cotton

resulting in a spike in fleahopper damage. Some cotton cultivars are more attractive to fleahoppers or are more susceptible to their damage than others. Be aware of this fact. While we do not have a means at this time to weigh in the benefit of natural enemies, there is no doubt they play a part in control. And one final management tip: there is unfortunately no good predictability of square shed based on fleahopper numbers. Sampling problems, feeding behavior, complicating environmental factors and differing varietal response to fleahopper feeding could all play into this dilemma. **Square loss is not always due to insect feeding.**

**Selected Insecticides:** There are several labeled insecticides to choose from. Some are safer to use than others. Some are softer on natural enemies and less likely to cause secondary pest problems. These include:

acephate (Orthene or Address)	Lorsban
Bidrin	Metasystox-R
Centric	methyl parathion
dimethoate (Dimate or Dimethoate)	Steward
Imidacloprid (Provado or Trimax)	Vydate
Lannate	



My favorites include acephate, imidacloprid, Vydate and Centric. These are less toxic to us as applicators, softer on “beneficials” and less likely to cause aphid outbreaks. Pyrethroids would work too but have too many negatives to be used this early in the season. Lower rates can save money and natural enemies without a control penalty. Later planted fields could be in need of natural enemies as the first flurry of bollworm activity ramps up soon after fleahopper treatment time. More insecticide and management information is available in our [cotton insect management guides](#).

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