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COTTON INSECTS

Cotton looks good if only it were June! As of July 13, only 54% of Texas' fields were squaring as compared to 76% last year at this time. Recent weather has turned our crop around but it is still generally very late. Randy Boman has put together a publication (see below) on the "in's and out's" of managing late cotton. I have included a section on managing insects in late cotton. If you have late cotton, I would advise looking over this and other sections of this document.

Insect activity continues to be light although there have been reported increases in several pests including fleahoppers and Lygus bugs. Square retention remains high, often averaging 85% and above. We can't expect to do much better than that. Most problem fields have been associated with adjacent cut alfalfa and fields with silverleaf nightshade or lanceleaf sage problems. Our June rains have produced an abundance of weeds. Several of these are hosts for our fleahoppers and plant bugs. Be especially watchful of cotton fields near weedy borders and bar ditches, as well as near alfalfa fields.

If you intend to maintain high square retention, then you must be careful when managing fleahoppers and Lygus bugs. Prior to bloom our current management approach is to have enough bugs present to justify treatment and a reduced square set. But if there are a lot of bugs in your field and you wait for square set to fall, it might just fall to far and end up never recovering to acceptable levels. Remember, we won't have time to compensate for early square loss this year!

Overwintered boll weevils continued to emerge at lower levels as more cotton became hostable. No weevils have been caught this year in the NWP zone, but 4 have been caught in the WHP zone, 19 in the NHP zone and 31 in the SHP zone. Weevils caught in the PB zone so far this year totaled 1087. The boll weevil eradication program still has a way to go to bring this zone back to where it should be after last year's problems.

Average accumulative number of boll weevils caught per trap through the week ending July 6.

Zone	2003	2002	2001	2000
Northwest Plains	0	0.0001	0.0195	0.1662
Western High Plains	0.000014	0.0003	0.0235	0.6657
Permian Basin	0.0033	0.0001	0.0254	0.6015
Northern High Plains	0.00006	0.0046	-------	-------
Southern High Plains	0.00004	0.0025	-------	-------

Treatments continue as more fields begin to square and become hostable. No acreage has been treated in the NWP zone through July 6. For the WHP zone, no acres were treated this past week based on fields across the adjacent SHP zone line (accumulative 2003 total 527 acres). For the PB zone, 7,786 acres were treated this past week, 2,362 acres were treated this past week in the NHP zone, and 3,418 acres were treated this past week in the SHP zone. Treated acreage is up somewhat in three of the five zones, not in response to increasing weevil pressure but rather in response to more hostable acreage in the areas were weevils were trapped.

Aphids continue to be found but increasing natural enemy numbers are holding them in check. I don't expect problems with this pest until temperatures cool down somewhat, early arriving weather fronts bring cloudy conditions and/or increased pressure from other insect pests necessitates more spraying.

Light bollworm and beet armyworm activity continues to be reported but the early flurry of bollworm activity appears to be subsiding and both caterpillar pests are being kept below treatment levels by hot weather and beneficial insects and spiders. There are heavy bollworm infestations in some fields in the Southern Blacklands, Upper Gulf Coast and Coastal Bend area of Texas. So far budworm numbers remain low in these areas. Control in south Texas has been good except where rain and dense plant canopies have confounded control. I'll keep you posted as this situation could have an impact on our area later in the season if moths from south Texas move up into our cotton.

Denim insecticide received labeling for cotton and tobacco. Syngenta's Denim was registered recently for caterpillar control and spider mite suppression. We have had use of this material in past years through the section 18 process. Denim will be an excellent addition to our cotton insecticide arsenal, taking its place next to Steward and Tracer for bollworm and beet armyworm control, and Intrepid for beet army worm control. Denim (emamectin benzoate) is a 2.5% active ingredient material with the signal word danger on the label. It is highly toxic to bees and toxic to fish, birds, mammals and aquatic invertebrates. The restricted entry interval is 48 hours without personal protective gear. The product has some contact activity but its activity is mostly through ingestion. Small, ¼ inch long caterpillars are its' target. Water volume does affect coverage and a penetrating type spray adjuvant is recommended. Do not use a sticker/binder adjuvant, as these will inhibit its translaminar activity. Use is restricted from greenhouse and chemigation. No livestock grazing is permitted but there are no crop rotation restrictions. Denim is compatible with most insecticides, fungicides and foliar fertilizers. The beet armyworm, fall armyworm and cabbage looper, the rate is 6-8 ounces per acre while the bollworm/budworm rate is 8-12 ounces. Mites are suppressed at this latter rate range. See the label for a more complete description of proper use of this material. **JFL**

COTTON AGRONOMY

What a turnaround! We have been seeing some very good growth in the crop thanks to the open skies and hot temperatures over the last 10 days or so. Currently, at Lubbock, we

are at 301 heat units for the month of July compared to the long-term average of 279. That's about 8% above normal. We are beginning to see good recovery in a lot of fields that were badly damaged. The down side is that we are also getting very hot in the afternoons now and some wilting is being observed in some fields. We are going to need some good rainfall across the region fairly quickly in some areas in order to help out the late crop and keep it on track. Many producers down south have been irrigating cotton for about 2 weeks now. In the areas unaffected by weather events, cotton is really moving forward at a very good pace.

Information for management of late cotton. I have been working on assembling some information on managing late cotton. This guide draws upon some older Extension documents that I believe are still relevant today. It includes some discussion of the yield and quality potential we have across the region due to the late cotton. I think realistic assessments are in order for many fields across the region. We need to keep in mind that over the last six years, heat units at Lubbock have averaged 11% above normal for August and 24% for September. I have been wondering when we are going to have a "normal" or "below normal" September/October period in terms of sunshine and heat units. Is this the year? I hope not. **RB**

COTTON RESEARCH BRIEFS

Lady beetles can eat a lot of cotton aphids in a short period of time. A laboratory research project of the Lubbock Cotton Entomology Program demonstrated the tremendous potential impact convergent lady beetles can have on controlling cotton aphid infestations. The rate of convergent lady beetle predation on the cotton aphid was measured at varying aphid densities. Prey density treatments included 25, 50, 100, 210, and 400 aphids per leaf in a petri dish. Predation response was recorded 1 hour (h), 4 h, 8 h, 16 h, 24 h, and 48 h after assigning predators to the aphid densities.

Rate of consumption increased through time, with all 25 aphids eaten within the first 4 hours of the experiment. At the highest density, lady beetles consumed 40 aphids in 1 h, 100 aphids in 4 h, 150 aphids in 8 h, 270 aphids in 24 h, and nearly all 400 aphids in 48 h. These data clearly show that the convergent lady beetle is a very potent predator that can suppress a large aphid population in a short period of time. Most other predator species rest for an extended period of time after they satiate from their initial prey consumption. However, the convergent lady beetle fed continuously for 48 h until all the aphids in the highest prey density were consumed.

Lady beetles handled their prey more slowly with increased total available time up to 16 hours, indicating a gradual decline in their feeding efficiency per unit time and moving toward satiation. However, predators again increased their feeding efficiency with further increase in available time without attaining satiation level. By 48 hours, predators were more efficient handlers of prey than they were in the first hour of the trial. These data demonstrate that convergent lady beetles have potential to suppress larger populations of cotton aphids through continuous feeding by changing their predation efficiency during feeding.

The analysis of age-specific mortality showed that lady beetle adults could survive for up to three weeks without prey or water. The ability of a predator to survive without prey for an extended period of time, delays or prevents the rebound of pest populations following their elimination and is a significant factor in natural biological control. In the field, convergent lady beetles usually disperse after aphid infestations crash. However, the extended survivorship allows the dispersing predators sufficient time to locate another prey source. Research is underway to quantify the influence of lady beetles in cotton aphid population dynamics in the field. **MP**

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