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Pest Cast

The Row Crops IPM Newsletter for the LRGV, a cooperative project of Texas AgriLife Extension Service and the Cotton & Grain Producers of the lower Rio Grande.

John W. Norman, Jr.
Editor

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GENERAL SITUATION: Most of the Valley was extremely hot with highs during the day above 100° F and lows in the high 70's to low 80's this week. Not good conditions for cotton fruit set and retention. Perfect conditions for grain harvesting, however.

COTTON: A report that a few fields were defoliated were received late this week. Most Valley fields were showing signs of near final maturity this week. Many fields had only bolls left in the tops of the plants. Many more fields had open bolls, especially in dryland fields but also in irrigated fields that were either planted by mid-March, or which have not had enough supplemental water to keep up with plant needs. Many fields were showing signs of permanent wilt. But, despite the brutal atmospheric conditions of late, some dryland fields and most irrigated fields were holding their own and looked no worse than the better, fully irrigated fields. However, if the heat and dry weather continues for another week, most fields will be well on their way to final maturity. Percent open boll counts ranged from 0 to near 70 in a few fields.

Late afternoon in the life of a cotton bloom.

Whiteflies were reported to be increasing still in many fields across the Valley this week. Some previously sprayed fields needed to be retreated due to migrating whitefly adults coming in from other host plants. Melon fields were being destroyed in increasing numbers this week and some whiteflies were observed moving out of the melon fields. Other crops, like matured cotton were also contributing to the overall whitefly migration.

Verde bug nymph on cotton.

Verde bugs were again on the increase in many fields in both eastern and mid-Valley fields. Beat bucket samples from grain sorghum fields still showed very high counts of Verde bug nymphs, along with a few adults coming from eastern portions of the Valley. Mid-Valley area grain fields were showing very few to no Verde bugs. Never-the-less, checking all grain sorghum fields which are bordering cotton fields is in order to determine if the sorghum fields are harboring Verde bug adults that might migrate to cotton. Then, check the cotton fields.

Tarnished plant bugs in cotton. Photo credited to Dr. John C. French, Sr., retired from Universities of Auburn, Georgia, Clemson and Missouri.

Tarnished Plant Bugs, another pest of cotton, tarnished plant bugs were reported from a few conventional cotton fields this week. Tarnished plant bugs have been an occasional pest in cotton in the Valley in the past. A few adults are seen each season, but rarely are numbers high enough to cause any significant damage. But, this is the Valley, so never say never about tarnished plant bugs status as damaging pests.

Bollworm activity was lower in conventional cotton this week. Counts from 0 to 2 bollworm larvae per 100 plants were reported. A few *fall armyworms* (6-8 per 100 plants) were also reported in some conventional cotton fields in the mid-Valley area. One *beet armyworm* egg mass was reported from a bt field in the mid-Valley area this week. None of the eggs from the beet armyworm egg mass will hatch because I performed a little pest mashing on 'em.

Premature defoliation in some fields has been reported over the last two weeks in different locations in the Valley. This is not cotton root rot. This is the same physiological disorder we reported on in last year's Pest Cast. Some cotton fields, which have a good to heavy boll load and are under stress from the very dry and hot conditions are beginning to show yellow or purple leaves. The damaged leaves eventually turn brown or black and fall to the ground before the field is fully matured and ready for harvest. Premature leaf shed can occur in either irrigated and dryland fields. Often, a few plants to nearly the whole field will lose all of their leaves as if they were dead. Once the bolls are fully open, the plants most often will recover and try to start their fruiting cycle again. In contrast, root rot kills the plant and there is no recovery for infected plants.

Initial stages of premature leaf shed in cotton. Affected (yellow colored) plants scattered across the field.

Near final stage of premature leaf shed disorder in cotton. Nearly all leaves shed.

Next phase of premature leaf shed in cotton. Some leaves shed from plant.

Heavy infestations of whiteflies can also cause premature defoliation. Whiteflies can cover over the leaf surface with honey dew. Then sooty mold fungus covers over the honey-dewed leaf to the extent that the leaf dies and sheds. Also, large numbers of whitefly nymphs can damage leaves so badly that they drop prematurely.

A Texas AgriLife Extension publication which covers the physiological premature defoliation topic is at the end of this newsletter.

GRAIN SORGHUM: Grain sorghum harvesting continued in most of the Valley areas. There were still large numbers of fields left to be harvested this week. I received reports this week of some later planted fields in Cameron county that needed more time before they will be ready for harvest. Reports of *rice stinkbugs* being sprayed in some late maturing grain sorghum fields also were received this week. Populations exceeding 3 rice stinkbug adults and numerous nymphs per head were received on some of these fields this week.

In the off chance there are sorghum fields blooming right now, *sorghum midge* were in more than enough numbers to destroy yield this week. I scouted some blooming heads near otherwise mature sorghum fields and found midge numbers ranging from 5 to over 50 per head.

Grain harvesting continues.

Midge galore (those small reddish colored gnats) on blooming sorghum this week.

Heat Units (H.U.) as shown are calculated from the dates of planting shown in the left column		
Planting Dates	2012 H.U.s	Historical H.U.s
2/15	2582.0	2283.3
3/1	2414.0	2181.4
3/15	2310.5	2066.2
4/1	2038.0	1862.0

LRGV

BOLL WEEVIL TRAPPING INFORMATION

YTD	2012	2011	2010	2009	2008	2007	2006	2005
	.00763	.00290	.00803	.14764	.14230	.21237	.38834	1.97565

Week Ending	2012	2011	2010	2009	2008	2007	2006	2005
4/1/12	.03353	.00476	.00672	.19847	.08503	.64118	.48544	0
4/8/12	.01617	.00360	.00592	.11633	.30512	.40392	.37552	0
4/15/12	.01572	.00114	.00312	.23686	.17102	.36414	.88875	6.47392
4/22/12	.00339	.00133	.01426	.38106	.05425	.23751	.15855	3.48685
4/29/12	.00474	.00043	.01528	.09081	.09113	.18227	.08629	1.70269
5/6/12	.00136	.00077	.00825	.05548	.08168	.07073	.09976	.73028
5/13/12	.00055	.00174	.00291	.02454	.07013	.17113	.09204	.72057
5/20/12	.00485	.00234	.00140	.10516	.08410	.06717	.20786	.58319
5/27/12	.00426	.00177	.00336	.20724	.06413	.17113	.09204	.72057
6/3/12	.00339	.00244	.01018	.13857	.04752	.13497	1.00114	.82565
6/10/12	.00281	.00720	.00794	.17487	.11127	.03975	.46624	1.77066
6/17/12	.01212	.00556	.00766	.06249	.13535	.17113	.09204	.72057
6/24/12	.00935	.00570	.01430	.03580	.49846	.12318	.32430	6.85560

Traps inspected for current week: 35,403

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Premature Senescence Syndrome

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Premature senescence syndrome has occurred over the past several years in the eastern and southern cotton production regions. This condition is generally thought to be caused by insufficient potassium in plant leaf tissue which predisposes the foliage to secondary pathogen infection. This was very widespread across both regions in 2002, 2003 and was also observed to a limited extent in 2005. The scenario that appears to favor the onset of premature senescence is very dry conditions during the boll filling period followed by extended periods of wet, cloudy weather post-cutout, and plants with decent boll load (relatively speaking). Symptoms are seen in the upper third of the canopy and are characterized initially as yellowing between the leaf veins followed by a rapid change in leaf tissue to a red/orange/bronze coloration (Figure I). The affected leaves continue to deteriorate, eventually showing brown, necrotic lesions and leaf margins. Generally, secondary foliar pathogens such as *Alternaria, Cercospora* and *Stemphyllium* can be isolated from affected leaf tissue (Figure II). These are not considered primary pathogens, but they attack these debilitated plants and contribute to premature senescence and defoliation (Figure III).

The boll is the major sink for potassium (60% of total plant potassium is in the bolls). Adequate potassium is necessary for fiber and seed development. Also, potassium is important for enzyme activation, pH balance, stomatal control and translocation of photosynthates. Both the extended dry period and the onset of late season rains (waterlogged soils) contribute to reduced root function. The relatively non-functioning root system can't uptake enough potassium (and perhaps other nutrients) to meet boll demand, hence the deficiency. Barren plants and those with very little boll load will generally appear unaffected because their demand for potassium and other nutrients is much less (Figure IV).

In addition, the plant hormone cytokinin is important in regulating senescence and roots are a major site of cytokinin production. As root function decreases, so does the production of cytokinin, which leads to senescence.

For nutrients to be absorbed by plant roots, they must come in contact with the root surface. There are generally three ways that this occurs: root interception (very small amounts), movement of ions by mass flow with the soil solution, and diffusion of ions through the soil solution. Most of the potassium moves to roots by diffusion. Diffusion occurs when an ion moves from an area of high concentration to one of low concentration. As plant roots absorb nutrients from the surrounding soil solution, a diffusion gradient is established. Under low soil moisture conditions, water films around soil particles become deleted and discontinuous, slowing the movement of potassium to the roots, thereby reducing uptake. Under these conditions, plants cannot absorb enough of the nutrient to meet boll demand.

Research has indicated that this condition can occur even in fields that contain ample soil potassium. In 2002 and 2003, we collected soil samples from about 20 fields showing signs of premature senescence. Results indicated that soil test potassium levels in 18 of these fields were in the moderate to high category, and presumably sufficient for optimum plant growth.

However, it is important to test the soil annually to determine seasonal crop needs. In addition, annual soil testing will provide a good history for tracking nutrient levels over time. Moderate soil potassium levels in fields with a history of premature senescence may signal the need for supplemental fertilizer. Soil applications of potassium fertilizer may be justified in some situations. In-season foliar potassium applications have been evaluated, but generally have proven effective only about 20% of the time.

Figure I. Symptomology first appears on younger leaves in upper-third of canopy indicating K requirements exceed plant uptake

Figure II. Alternaria,Stemphyllium,Cercospora

Figure III. Premature Defoliation

Figure IV.

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