August 28, 2015 - Volume XXIII - Number 15

Crop Management Newsletter

News about Crop Management for producers in Dawson and Lynn Counties.

Thanks to the sponsors and the gins who support the Dawson/Lynn IPM Program
(found on page 2)

Current Conditions

Again, it is very quiet in the fields from an insect standpoint with most fields past the point of concern.

I have one field with very few open bolls this week.

We are seeing the "great adjustment" - my term - in cotton.

Diseases are showing their ugly head.

Open Boll

Boll development is divided into three overlapping phases: the enlargement phase, the filling phase and the maturation phase.

Bolls grow rapidly after fertilization with the most rapid growth occurring between days 7 to 18 and full size reached between days 20 to 25. Along with obtaining maximum boll size during this period, maximum seed size and maximum fiber length are established.

The maturation period from white flower to open boll is influenced strongly by temperature. Approximately 800-850 HU's are required for full maturity which might take as few as 40 days or as many as 70 days.

Based on historical records for our area, August 6 is the date in which there is an 85% chance to accumulate enough HU to mature a white flower and August 12 is the date in which there is a 50% chance to accumulate enough HU to mature a white flower.

Boll opening is under the control of hormones. Ethylene is responsible for triggering the process of boll opening and is the active ingredient in compounds such as Prep.

Boll range is size from under 3 grams (0.0066 pounds) to over 6 grams (0.013 pounds). The seeds account for about 60% of the mature bolls weight - the remainder is lint. This translates into about 200 to 400 full-sized bolls to produce a pound of lint, or 100,000 to 200,000 full-sized bolls to produce a bale of cotton. I use 160,000 full-sized bolls when estimating yields.

The Great Adjustment

We are seeing fruit (squares and small bolls) being shed by the cotton plants. This shedding is part of cotton's natural survival process. Cotton always over commits it's fruit load. If you were to estimate yields in mid- to late July, you would be buying boats and planes and maybe even a train, because you would estimate 7, 8, 9 or even over 10 bales per acre. However, we never achieve those type yields because we can not or due not supply the resources necessary to support such a yield. Water being the most limiting factor.

Cotton boll shedding is a concern due to the thought process that if shedding were decreased, then production would increase. On the other hand, boll

shedding is an important natural process which the plant adjusts its fruit load to match the resources it has available thus allowing for the highest quality and most mature bolls to make it to harvest.

Of all the several hundred sheds that I check when walking fields, I have only had three this week which were insect (worm) damaged - all those in one field.

Vascular Wilts in Cotton

Vascular wilts, such as Fusarium, Verticillium and this year Bacterial Blight, are capable of significantly reducing yields and impacting fiber quality. Properly diagnosing these diseases is critical in developing a management strategy. Subtle differences can be observed in the field but laboratory examinations are often needed to differentiate the two wilts.

Once the symptoms appear there is really nothing that can be done. Management strategies are to avoid/minimize the problems in the future.

Fusarium wilt:
Disease development is typically dependant on warmer temperatures and sandy soils where the root-knot nematode is present.

Symptoms can occur throughout the growing season. Initial symptoms consist of chlorosis and wilting on the leaf margin. Diseased plants have a discoloration of the vascular tissue with reduced stands and poor vigor. Diseased areas in the field occur in circular patches.

Verticillium wilt:
Disease development is typically dependant on cool, wet conditions, variety and plant density (typically irrigated fields).

Initial infestations occur early in the season but symptoms are more evident post-bloom. Chlorosis or

necrosis occur on the margins and intervenial areas of the leaf. Infected plants may be wilted and stunted with light to dark brown discoloration in the vascular system. Sever defoliation can result.

Tommy Doederlein
Extension Agent - IPM
(806)872-3444 (office)
(806)759-7030 (cell)
t-doederlein@tamu.edu

Bacterial blight:

The bacterium, *Xanthomonas axonopodis* pv. *malvacearum*, is capable of surviving saprophytically (An organism, especially a fungus or bacterium, that lives on and gets its nourishment from dead organisms or decaying organic material. Saprophytes recycle organic material in the soil, breaking it down into in simpler compounds that can be taken up by other organisms.) on infested crop residue. Dry arid conditions facilitate survival in soil from year to year. Cotton plants are susceptible to infection at all growth stages; however, leaves and bolls are most commonly infected later in the growing season. Conditions that favor disease development consist of moderate temperatures and high humidity. Wounding of leaves by blowing sand or hail may lead to an increase in incidence of the disease. Sprinkler irrigation can increase spread of the pathogen. The population structure of this bacterium is complicated with numerous races being present in cotton around the world. In the United States, race 18 has been the predominant race of the pathogen for the past several decades. The identification of multiple resistance genes and deployment has led to resistance or immunity in many upland varieties. As a result, Bacterial blight epidemics have been sporadic causing negligible losses. Various symptoms are associated with the disease. Initial symptoms consist of small, pinpoint lesions on foliage. As the disease progresses, lesions take on a blocky, angular shape as the bacterium is not capable of crossing veins found within leaves (Fig. 1). Following systemic infections, veins may become necrotic (Fig. 2). Petiole infections result in severe necrosis, which may progress down the limb or branch resulting in a symptom referred to as Blackarm (Fig. 3). Premature defoliation and fruit abortion are often associated with the aforementioned symptoms. Later in the season, the bacterium may infect developing bolls causing a boll rot (Fig. 4). The appearance of these symptoms differs from foliar symptoms. Such lesions have a circular appearance, as there are no veins within the boll to limit growth of the bacterium. These symptoms are characteristic of what has been associated with infections caused by *Xanthomonas axonopodis* pv. *malvacearum*, race 18 over the past several decades.

During the 2015 growing season, subtle differences in symptom expression have been observed when the disease occurs on varieties that were previously documented as being resistant. While angular lesions occur still occur, the middle potion of the lesion has a distinctly different appearance. Seeming as though the center of the lesion is more degraded and falls out, giving the infected tissue a 'shot hole' appearance (Fig. 5). Furthermore, infected leaves of 'resistant' varieties tend to turn chlorotic more readily (Fig. 6). Recent field observations have shown that most all varieties evaluated exhibited some level of disease (Table 1). Additional ratings can be obtained as they become available.

Figure 1. Appearance of angular leaf spot lesions characteristic of Bacterial blight.

Figure 2. Vein necrosis (top) and leaf necrosis (bottom) associated with Bacterial blight.

Figure 3. Initial blackarm symptom associated with Bacterial blight.

Figure 4. Boll rot symptom associated with Bacterial blight.

Figure 5. Falling out of leaf tissue associated with Bacterial blight.

Figure 6. Chlorotic appearance of leaves exhibiting Bacterial blight.

Table 1. Blight incidence ratings in a variety trial.

Variety	% of plants with blight symptoms	Rating from trials with race 18 of normal bacterial blight
DP 1549B2XF	60.00	No data yet
DP 1321B2RF	48.75	Susceptible
PHY 495W3RF	43.75	No data yet
BX 1531GLT	42.50	No data yet
FM 1830GLT	**42.50**	**Immune**
BX 1634GLT	37.50	No data yet
BX 1635GLT	37.50	No data yet
FM 2322GL	37.50	Susceptible
DP 0912B2RF	33.75	Susceptible
DP 1558NRB2RF	32.50	No data yet
PHY 487WRF	32.50	No data yet
FM 2007GLT	**31.25**	**Resistant**
DP 1359B2RF	**30.00**	**Partially resistant**
BX 1637GLT	28.75	No data yet
DP 1410B2RF	**27.50**	**Resistant**
PHY 444WRF	27.50	No data yet
PHY 575WRF	27.50	No data yet
FM 2484B2F	**26.25**	**Immune**
NG 1511B2RF	26.25	Susceptible
DP 1555B2RF	22.50	No data yet
NG 5007B2XF	21.25	No data yet
PHY 417WRF	21.25	Susceptible
PHY 339WRF	**20.00**	**Partially resistant**
FM 2334GLT	**17.50**	**Immune**
PHY 499WRF	17.50	Susceptible
ST 6182GLT	17.50	No data yet
DP 1538B2XF	16.25	No data yet
FM 1320GL	16.25	Susceptible
PHX 3003-04WRF	13.75	No data yet
DP 1441RF	10.00	Susceptible
DP 1553B2XF	8.75	No data yet
ST 5289GLT	**8.75**	**Immune**
DP 1311B2RF	3.75	Susceptible
DP 1454NRB2RF	3.75	Susceptible
BX 1532GLT	2.50	No data yet
BX 1633GLT	2.50	No data yet

Heat Units Totals									
	Tahoka			O'Donnell			Lamesa		
Planting window ➜	May 23	June 1	June 10	May 23	June 1	June 10	May 23	June 1	June 10
May 23-31 (actual)*	71.5			77			79		
June 1-30 (actual)*	492	492		500.5	500.5		506	506	
June 10-30 (actual)*			353			357			363
July 1-31 (actual)*	623	623	623	642.5	642.5	642.5	655.5	655.5	655.5
Aug 1-27 (actual)*	534.5	534.5	534.5	560.5	560.5	560.5	573.5	573.5	573.5
Total	1721	1649.5	1510.5	1780.5	1703.5	1560	1814	1735	1592
HU needed to obtain 2200	479	550.5	689.5	419.5	496.5	640	386	465	608

Rainfall, high and low temperatures and heat units by date for Aug. 13 - Aug. 27

Tahoka

Date	Rainfall	High	Low	Heat Units
8/13/2015	0	97*	65	21
8/14/2015	0	97*	67	22
8/15/2015	0	95	67	21
8/16/2015	0	96	65	20.5
8/17/2015	0	91	65	18
8/18/2015	0	96	67	21.5
8/19/2015	0.09	80	58	9
8/20/2015	0	85	57	11
8/21/2015	0	94	64	19
8/22/2015	0	97*	63	20
8/23/2015	0	89	64	16.5
8/24/2015	0	92	59	15.5
8/25/2015	0	96	62	19
8/26/2015	0	96	60	18
8/27/2015		96	64	20
Total	0.09			272

O'Donnell

Date	Rainfall	High	Low	Heat Units
8/13/2015	0	97*	67	22
8/14/2015	0	97*	70	23.5
8/15/2015	0.09	96	66	21
8/16/2015	0	94	66	20
8/17/2015	0	89	69	19
8/18/2015	0	97	70	23.5
8/19/2015	0	81	61	11
8/20/2015	0	86	57	11.5
8/21/2015	0	95	67	21
8/22/2015	0	97*	66	21.5
8/23/2015	0	91	67	19
8/24/2015	0	93	60	16.5
8/25/2015	0	97	64	20.5
8/26/2015	0	95	61	18
8/27/2015		96	64	20
Total	0.09			288

Lamesa

Date	Rainfall	High	Low	Heat Units
8/13/2015		97*	69	23
8/14/2015		97*	69	23
8/15/2015		97	67	22
8/16/2015		97	68	22.5
8/17/2015		88	66	17
8/18/2015		97*	68	22.5
8/19/2015		79	64	11.5
8/20/2015		87	59	13
8/21/2015		96	68	22
8/22/2015		97*	66	21.5
8/23/2015		96	69	22.5
8/24/2015		93	61	17
8/25/2015		97	65	21
8/26/2015		96	62	19
8/27/2015		97*	65	21
Total	0			298.5

* Actual temperature exceeded 97degrees - I max-out my HU calculations at 97 degrees.