WEST PLAINS IPM UPDATE

News about Integrated Pest Management in Hockley, Cochran, and Lamb Counties from Kerry Siders

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CROP & PEST UPDATE

Area producers need to be scouting conventional cotton for bollworms! Just this week the scouts and I have been finding cotton bollworms, not over threshold of 8,000 small to medium worms per acre, but at 0 to 3,500 small worms per acre. I have been finding an egg lay of around 2,000 to 20,000 eggs per acre and subsequent worm numbers for the past couple of days. Beneficial numbers are good and may be sufficient to stay up with these current infestations of worms. Fortunately, we are not seeing cotton aphids, which can be a tough expensive venture if you need to treat for both. But do be careful to scout for both and not to flare the aphids if you do end up needing to spray for worms. The peanuts and grain fields can be more attractive to egg laying moths possibly. But you must check every cotton field individually to be certain. This is the reason for a good consultant.

Figure 1 Bollworm feeding in bloom.

Now I have talked mostly about conventional cotton. This does not excuse you from checking your other cotton acres with technology. We can find worms there as well. Now we are not finding much damage or so far cause to treat. However, I would still closely watch/scout all cotton for all insects, period.

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Figure 2 The white dot in center of picture is a bollworm egg on underside of cotton leaf.

Figure 3 A 3-4 day old bollworm in bloom.

Figure 4 Hole in small cotton boll from bollworm.

Figure 5 Small bollworm inside boll to right.

Bollworm and Tobacco Budworm Management

Bollworm and tobacco budworm larvae look very much alike and cause similar damage. Full-grown larvae are about 1½ inches long and vary in color from pale green, pink, or brownish to black, with longitudinal stripes along the back.

Bollworm and tobacco budworm moths are attracted to and lay eggs in cotton with lush new growth. Moths usually lay single eggs on the tops or undersides of young, tender, terminal leaves in the upper third of the plant. However, in transgenic Bt cotton, moths frequently lay eggs on blooms, drying petals of blooms (bloom tags), or other tissues deeper in the canopy. Larvae survive better because these Bt cotton tissues have lower concentrations of Bt protein toxins.

Tobacco budworm and bollworm eggs are pearly white to cream color and about half the size of a pinhead. They can be confused with looper eggs (which are flatter), can have a blue greenish-white tint, and are usually laid singly on the undersides of leaves.

Bollworm and budworm eggs hatch in 3 to 4 days, turning light brown before hatching. Young worms usually feed for a day or two on tender leaves, leaf buds, and small squares in the plant terminal before moving down the plant to attack larger squares and bolls. Small worms are most vulnerable to insecticides when they are in the upper third of the plant.

Moths sometimes deposit eggs on squares, bolls, stems, and lower parts of the plant when cotton plants are stressed and making little new growth, or during periods of high temperature and low humidity. Detecting eggs and controlling small worms is more difficult when the eggs are deposited in the lower plant canopy.

Budworms are typically less numerous than bollworms, and, in recent years, have rarely reached damaging levels. With the increased adoption of transgenic Bt cotton, insecticide sprays for bollworm and tobacco budworm control have become much less common in Texas, particularly in West Texas.

Scouting and Decision Making

In Bt cotton, search the entire plant for tobacco budworm and bollworm larvae and injury. A proper sample includes squares, white blooms, pink blooms, bloom tags, and bolls. Reduce the scouting intervals to 3 to 4 days during periods of increasing bollworm egg laying, especially during peak bloom. The presence of eggs alone should not trigger treatment since hatching larvae must first feed on the cotton plant to receive a toxic dose.

Terminal and Square Inspection Method

- ◆ Divide the cotton field into four or more manageable sections, depending on the field size.
- ◆ Examine 25 plant terminals (upper third of the plant), selected at random from each quadrant, for small larvae and eggs. Also, from each quadrant, examine 25 half-grown and larger green squares as well as small, medium, and large bolls for bollworms and bollworm damage.
- ◆ Keep track of the number of undamaged and damaged squares and bolls. Select fruit at random and do not include flared or yellow squares in the sample.
- ◆ Pay attention to bloom tags and petals stuck to small bolls; they will often hide larvae that burrow into the tip of the boll.

Whole Plant Inspection Method

- ◆ Divide the cotton field into four or more manageable sections, depending on the field size.
- ◆ Make whole-plant inspections of five randomly chosen groups of three adjacent cotton plants in each section. Look in every square, bloom, and boll.
- ◆ Thoroughly inspect dried blooms or bloom tags attached to small bolls.
- ◆ Count the number of undamaged and damaged fruit and calculate the percentage of damaged fruit.

Chemical Control and Action Thresholds

Thresholds in Bt cotton fields are based on how many worms survive to late first- or second-instar larval stage, not on newly hatched larvae or the presence of eggs. Since newly hatched larvae must feed on the plant for the Bt toxin to be effective, base treatment decisions on damaged fruit and the presence of larvae. Budworms are more resistant to certain insecticides (for example, pyrethroids) than are bollworms, but more sensitive to the Bt toxins in transgenic cotton. Aphids and other secondary pests may increase when broad-spectrum insecticides targeted at budworms or bollworms disrupt natural control. When secondary pests are present during a budworm or bollworm outbreak, use a selective insecticide to help prevent a secondary pest outbreak. Insecticides in the diamide, oxadiazine, and spinosyn classes are more selective than the pyrethroid and carbamate classes.

Table 1. Bollworm and tobacco budworm action threshold based on boll damage

Cotton stage	Action threshold (both Bt and non-Bt cotton)
Emergence to	
*Before bloom	≥ 8 worms (≥1/4 inch) per 100 plants or when populations threaten to reduce square retention below 80 percent
*After boll formation	≥ 6% damaged squares and/or bolls and worms are present

Fields that have accumulated 350 DD60 (degree days 60) beyond 5 NAWF (nodes above white flower) are no longer susceptible to first or second instar bollworm/tobacco budworm larvae. Action threshold should be adjusted according to yield potential and production system (dryland vs. irrigated).

Table 11. Insecticides Labeled for Control of Insect Pests of Cotton (continued)

Pest	Product Name/ Common Name	Active Ingredient/s	Formulated Rate (fl oz or oz/A)	lb AI/A	Acres Treated per gallon/lb	Signal Word	Insecticide Class (*IRAC Groups)	Re-entry Interval	Pre-harvest Interval
Cutworms continued									
	Declare	gamma-cyhalothrin	0.77–1.02	0.0075–0.01	166.23–125.49	Caution	Pyrethroid (3A)	24h	21
	Mustang Maxx	zeta-cypermethrin	1.28–1.92	0.008–0.012	100–66.67	Warning	Pyrethroid (3A)	12h	14
	Mustang	zeta-cypermethrin	1.4–2.0	0.016–0.024	91.43–64	Warning	Pyrethroid (3A)	12h	14
Bollworm and **Tobacco Budworm									
	Blackhawk	spinosad	1.6–3.2	0.036–0.072	80–40	Caution	Spinosyn (5)	4h	28
	Prevathon	chlorantraniliprole	14–27	0.047–0.09	9.14–4.74	Caution	Diamide (28)	4h	21
	Radiant SC	spinetoram	2.8–8	0.0219–0.0625	45.71–16	Caution	Spinosyn (5)	4h	28
	Lannate LV	methomyl	24–36	0.45–0.68	5.5–3.5	Danger	Carbamate (1A)	72h	15
	Steward EC	indoxacarb	9.2–11.3	0.09–0.11	14–11.5	Caution	Oxadiazines (22A)	12h	14
	Fanfare ES	bifenthrin^	2.6–6.4	0.04–0.10	49.23–20	Warning	Pyrethroid (3A)	12h	14
	Brigade 2EC	bifenthrin	2.6–6.4	0.04–0.10	49.23–20	Warning	Pyrethroid (3A)	12h	14
	Discipline 2EC	bifenthrin	2.6–6.4	0.04–0.10	49.23–20	Warning	Pyrethroid (3A)	12h	14
	Silencer	lambda-cyhalothrin^	3.2–5.12	0.025–0.04	40–25	Warning	Pyrethroid (3A)	24h	21
	Karate/ Warrior II	lambda-cyhalothrin	1.60–2.56	0.025–0.04	80–50	Warning	Pyrethroid (3A)	24h	21
	Declare	gamma-cyhalothrin	1.28–2.05	0.0125–0.02	100–62.44	Caution	Pyrethroid (3A)	24h	21
	Mustang Maxx	zeta-cypermethrin	2.64–3.60	0.0165–0.0225	48.49–35.56	Warning	Pyrethroid (3A)	12h	14
	Baythroid XL	beta-cyfluthrin	1.6–2.6	0.013–0.021	80–49.23	Warning	Pyrethroid (3A)	12h	0
Aphids									
	Sivanto 200 SL	flupyradifurone	7.0–10.5	0.0913–0.137	18.29–12.19	Caution	Butenolide (4D)	4h	14
	Carbine 50WG	flonicamid	1.4–2.8	0.044–0.089	11.43–5.71	Warning	Flonicamid (29)	12h	30
	Intruder Max 70WP/Strafer Max	acetamiprid^	0.6–1.1	0.025–0.05	26.67–14.55	Caution	Neonicotinoid (4A)	12h	28
	Bidrin 8EC	dicrotophos^	4.0–8.0	0.25–0.5	32–16	Danger	Organophosphate (1B)	6d	30
Beet Armyworm									
	Confirm 2F	tebufenozide^	4–16	0.06–0.12	32–8	Caution	Diacylhydrazines (18)	4h	14
	Prevathon	chlorantraniliprole	14–27	0.047–0.09	9.14–4.74		Diamide (28)	4h	21
	Lannate LV	methomyl	24–36	0.45–0.68	5.5–3.5	Danger	Carbamate (1A)	72h	15
	Steward EC	indoxacarb	9.2–11.3	0.09–0.11	14–11.5	Caution	Oxadiazines (22A)	12h	14
	Blackhawk	spinosad	1.6–3.2	0.036–0.072	80–40	Caution	Spinosyn (5)	4h	28
	Intrepid 2F	methoxyfenozide^	4–10	0.06–0.16	32–13	Caution	Diacylhydrazine (18)	4h	14
	Radiant SC	spinetoram	4.25–8	0.0332–0.0625	30–16	Caution	Spinosyn (5)	4h	28

West Plains IPM Update is a publication of the Texas A&M AgriLife Extension Service IPM Program in Hockley, Cochran, and Lamb Counties.

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