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$1⁺ Cotton? New Thresholds?

Peter C. Ellsworth, Lydia Brown, Al Fournier (University of Arizona) & Steven Naranjo (USDA-ARS, ALARC)

With historically high cotton prices, many farmers wonder if thresholds for insect control should be adjusted downward. As "economic" thresholds, this is an astute question! The answers are in the research that supports our threshold systems and are insect-specific. For *Lygus*, the original research that supports a threshold of ***15 total Lygus with at least 4 nymphs per 100 sweeps*** is based on the yield and revenue curves (Fig. 1). As it turns out, the '15:4' threshold is close to the apex of the curve, where we make the most money. These curves were developed when cotton was worth just 50–75¢ per lb. However, examine our attempts to maximize yield by controlling *Lygus* below the 4 nymphs level (Fig. 1A). We were unable to increase yields with nearly double the number of sprays. The current *Lygus* threshold is appropriate for the new economics in play. In fact research supports thresholds as high as '15:8'.

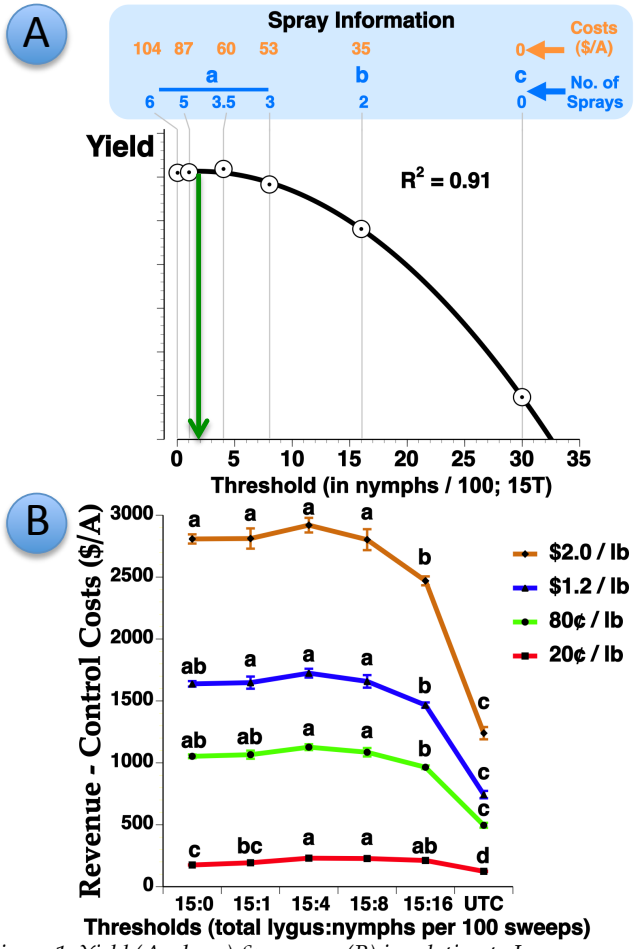

Figure 1. Yield (A, above) & revenue (B) in relation to Lygus densities in nymphs (with at least 15 total Lygus) per 100 sweeps. Maximum yield (A) shown with a green arrow, 1.7 nymphs; however, maximum revenues were measured at 5.2 nymphs for 60¢ cotton (not shown) and 4.8 nymphs for $1.20 cotton. '15:4' (B) gives the best economic outcome, regardless of lint price. Thresholds not sharing a letter are statistically different from each other.

We've managed whiteflies for years and perhaps we need a refresher on the threshold levels we use and why. Whiteflies are a potential quality-reducing insect. It takes far fewer whiteflies in the field to impact quality than it does to impact yield (Fig. 2). In fact, it takes 2–4 times the number of whiteflies to impact yield as it does to cause risks for quality reductions. Yield loss does not occur unless >90% of leaves are infested with adults and/or >76% of leaf disks are infested with large nymphs. So here too, there is no need to lower the thresholds for whiteflies. The levels currently in use for Stage I, Fully Selective materials, and for Stage II, Partially Selective materials, are more than sufficient to protect against any yield loss whatsoever, and still ensure high quality cotton by preventing excess whitefly sugars on lint.

Adult Count Conversion Table

	Number of leaves infested with 3 or more adults	% Infested Leaves	Average per Leaf
Wait; re-sample	1	3.4	0.3
	2	6.7	0.6
	3	10	0.8
	4	13	1.0
	5	17	1.3
	6	20	1.5
	7	23	1.8
See Matrix	8	27	2.1
	9	30	2.3
	10	33	2.6
	11	37	2.9
Use Stage I	12	40	3.2
	13	43	3.6
	14	47	3.9
	15	50	4.3
	16	53	4.7
	17	57	5.1
"Gray" area	18	60	5.5
	19	63	6.0
	20	67	6.5
	21	70	7.1
	22	73	7.7
Use Adulticide	23	77	8.4
	24	80	9.2
	25	83	10.2
	26	87	11.3
	27	90	12.8
	28	93	14.9
	29	97	18.4
	30	100	34.9

Yield Loss Possible

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Large Nymph Count Conversion Table

Number of disks infested with live large nymphs	% Infested Disks	Average per Disk
4	13	0.2
8	26	0.5
12	40	1.0
16	52	1.5
18	60	2.0
20	67	2.5
22	72	3.0
23	76	3.5
24	80	4.0
25	83	4.5
26	85	5.0

Yield Loss Possible

Figure 2. Thresholds for whitefly control that prevent reductions in quality based on 30-leaf samples. E.g., apply Stage I materials when 40% of leaves have 3 or more adults and 40% of leaf disks have 1 or more live, large nymphs (green zone).

Also see:

http://cals.arizona.edu/crops/cotton/insects/lygus/lyg00cr.pdf
http://cals.arizona.edu/crops/cotton/insects/lygus/lygus3.pdf
http://cals.arizona.edu/pubs/crops/az1224/az12247j.pdf
http://cals.arizona.edu/pubs/insects/az1404.pdf