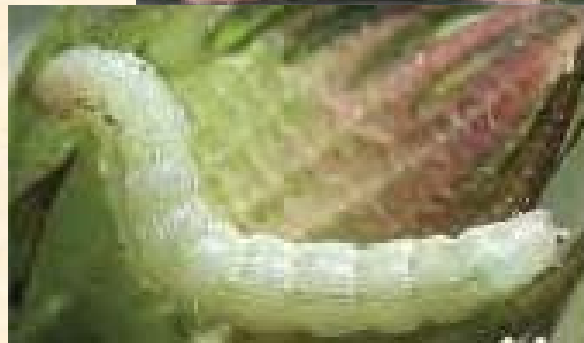


Status of Insecticide Resistance: Bt Cotton

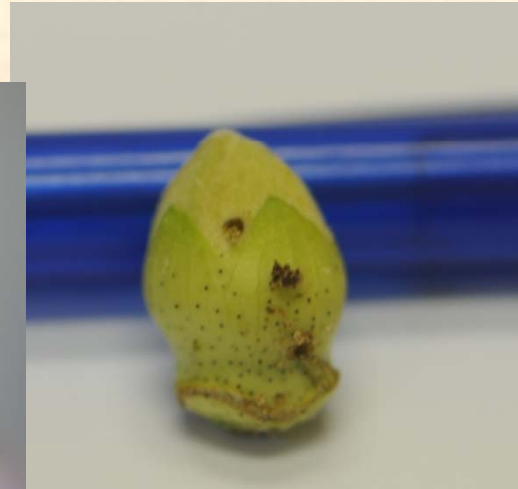
Ryan Jackson
USDA-ARS-SIMRU

Bollworm

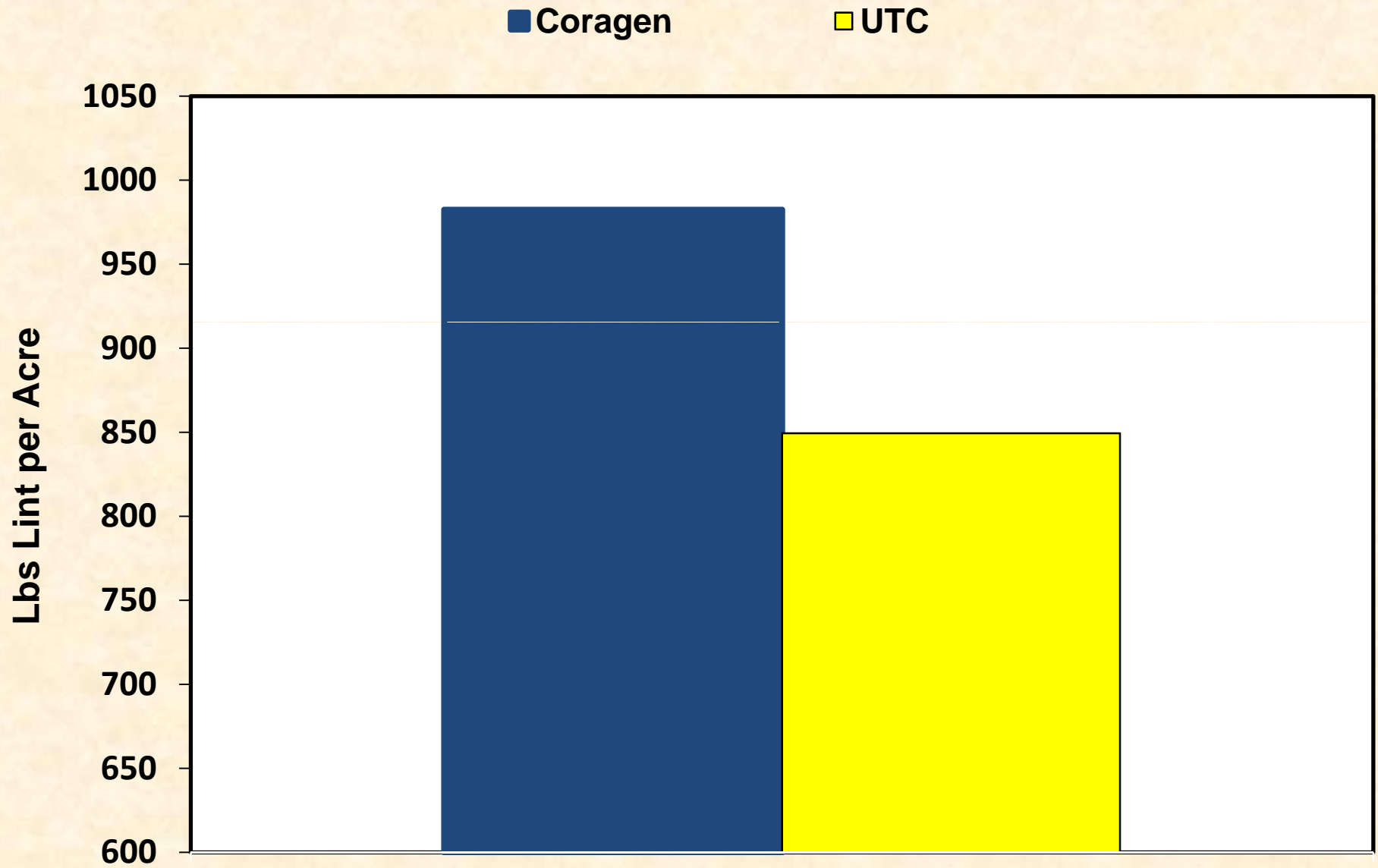
MS averaged
1.7 insecticide
applications/acre
of Bt cotton for
bollworm control



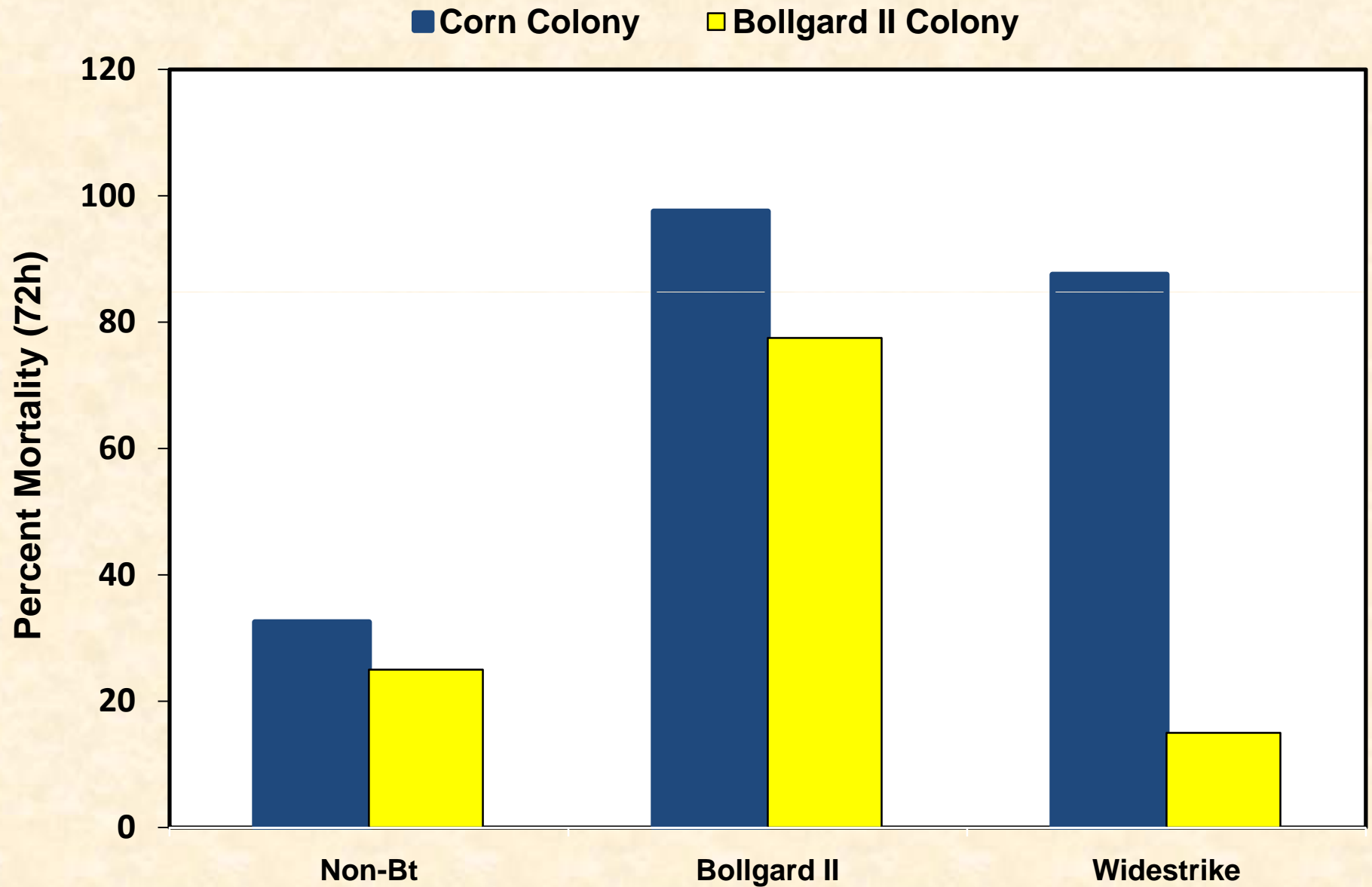
Bollworm Damage to Bollgard II Cotton



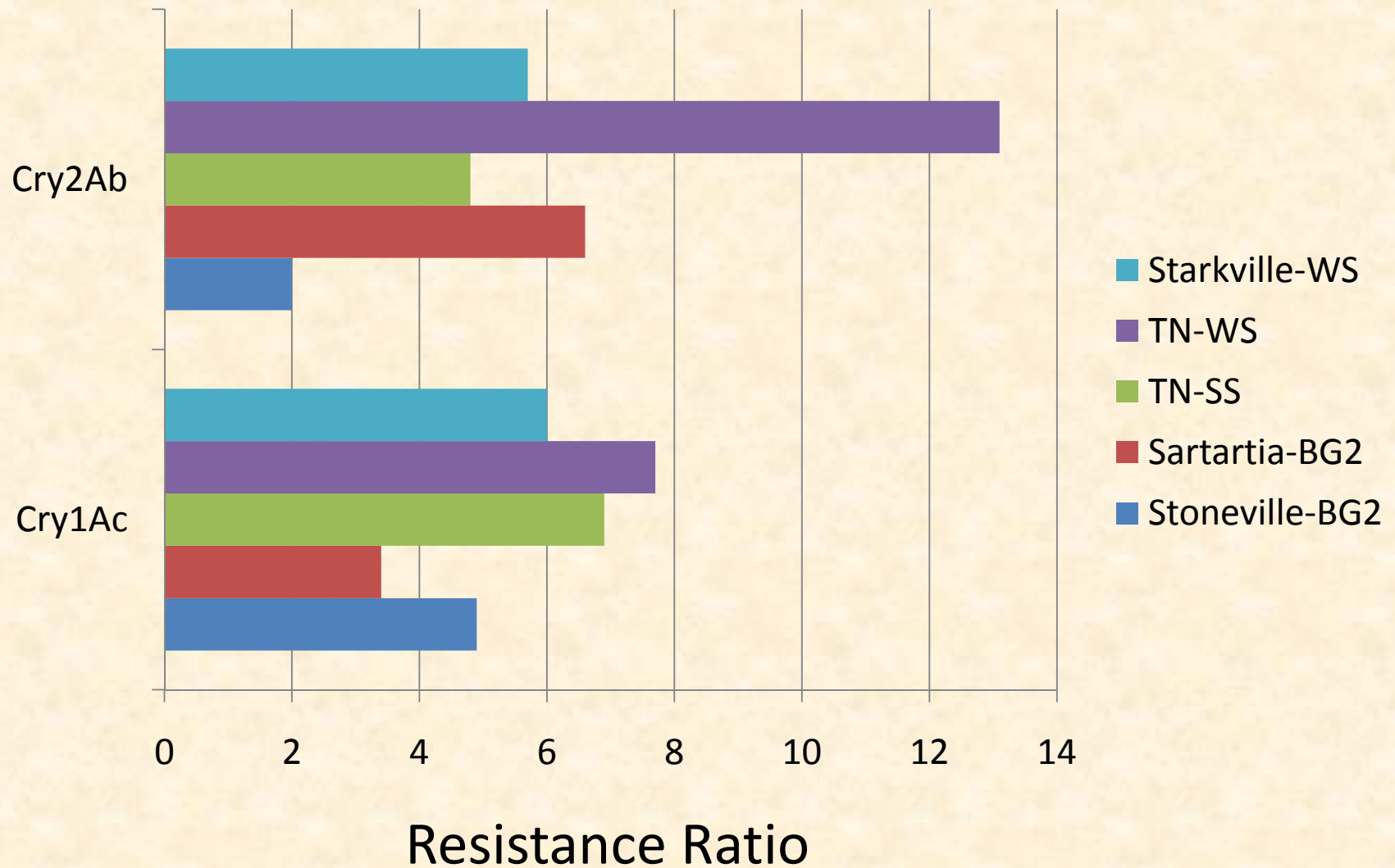
Bollworms on Bollgard II Cotton



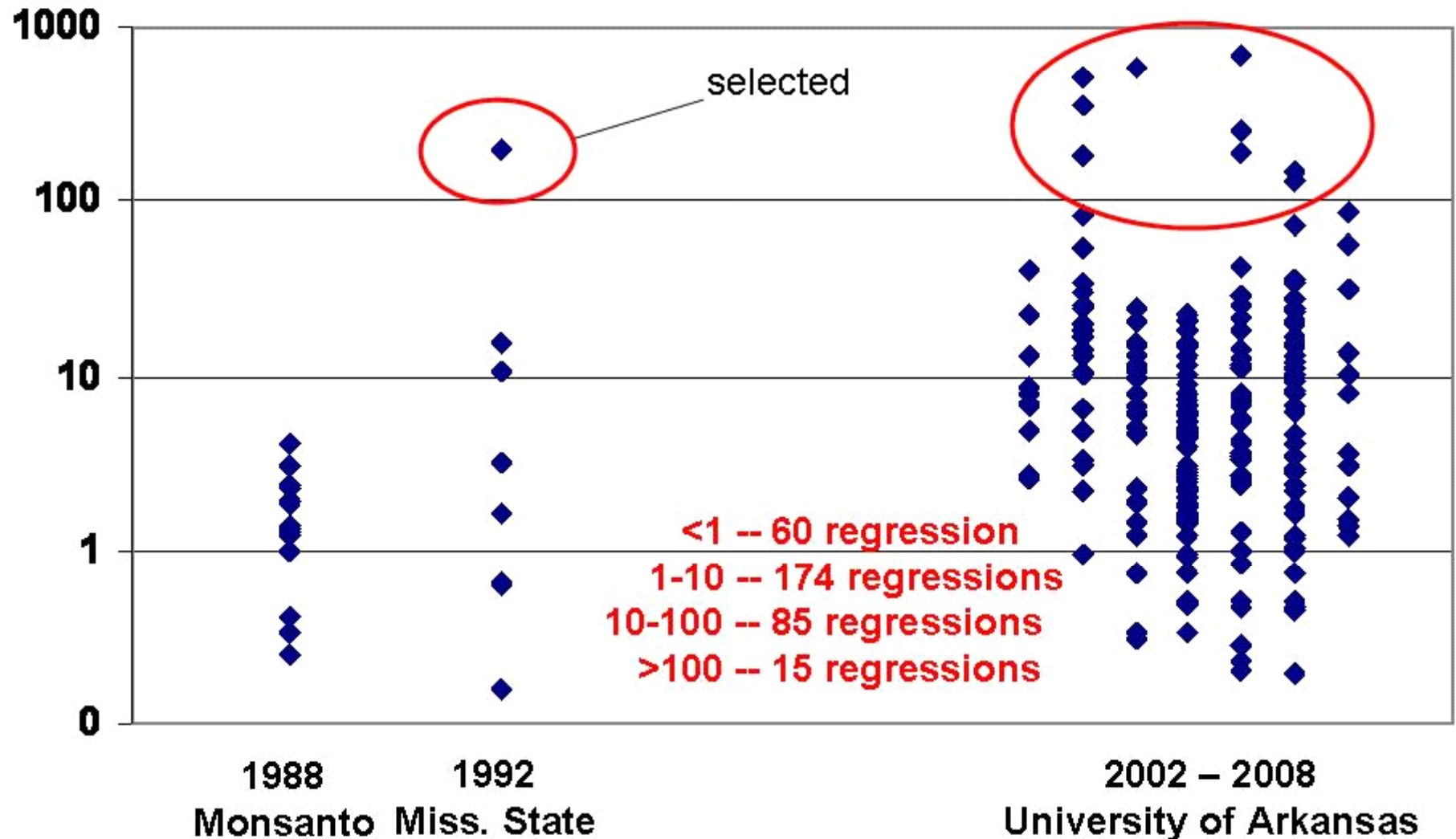
Mortality of Bollworms on Bt Technologies



Resistance Ratios of Various Bollworm Populations to Bt Proteins



**LC50 Ratios (LC50 field colony/LC50 laboratory susceptible)
Diet Incorporation Assays for Cry1Ac Susceptibility
Helicoverpa zea – 1988-2008**



LC₅₀ estimates, percent mortality, and percent mortality + stunting (100µg/ml) for bollworm colonies exposed to Cry1Ac in diet incorporation assays.

Location	Crop	LC₅₀	95% CL	%M	%ML1
LAB	--	11.7	9.9-17.1	66.2	100
Stoneville	Bollgard 2	81.7	62.3-108.6	40.6	75
Satartia	Bollgard 2	91	78.0-107.3	9.4	59.4
Tennessee	Smartstax	58.4	31.7-105.4	19.4	80.6
Starkville	Widestrike	71.2	53.2-97.5	10.3	86.2

LC₅₀ estimates, percent mortality, and percent mortality + stunting (150µg/ml) for bollworm colonies exposed to Cry2Ab2 in diet incorporation assays.

Location	Crop	LC₅₀	95% CL	%M	%ML1
LAB	--	48.4	41.6-60.3	94.1	100
Stoneville	Bollgard 2	219.2	142.6-1053.9	3.2	12.9
Satartia	Bollgard 2	592.9	--	6.9	6.9
Tennessee	Smartstax	91.2	54.9-205.6	39.1	69.6

Status of Bt Cotton

- **Bt cotton continues to be an amazing control technology for certain caterpillar pests.**
- **Bollworms are capable of causing economic damage to this technology under some conditions.**
- **If making supplemental foliar applications of insecticides to alleviate problems with bollworm “escapes”, don’t wait until they reach bloom tags.**
- **Continued monitoring for Bt susceptibility and its relationship to field performance will help to make better management decisions in the future.**