Efficient Cotton Production

David Wright

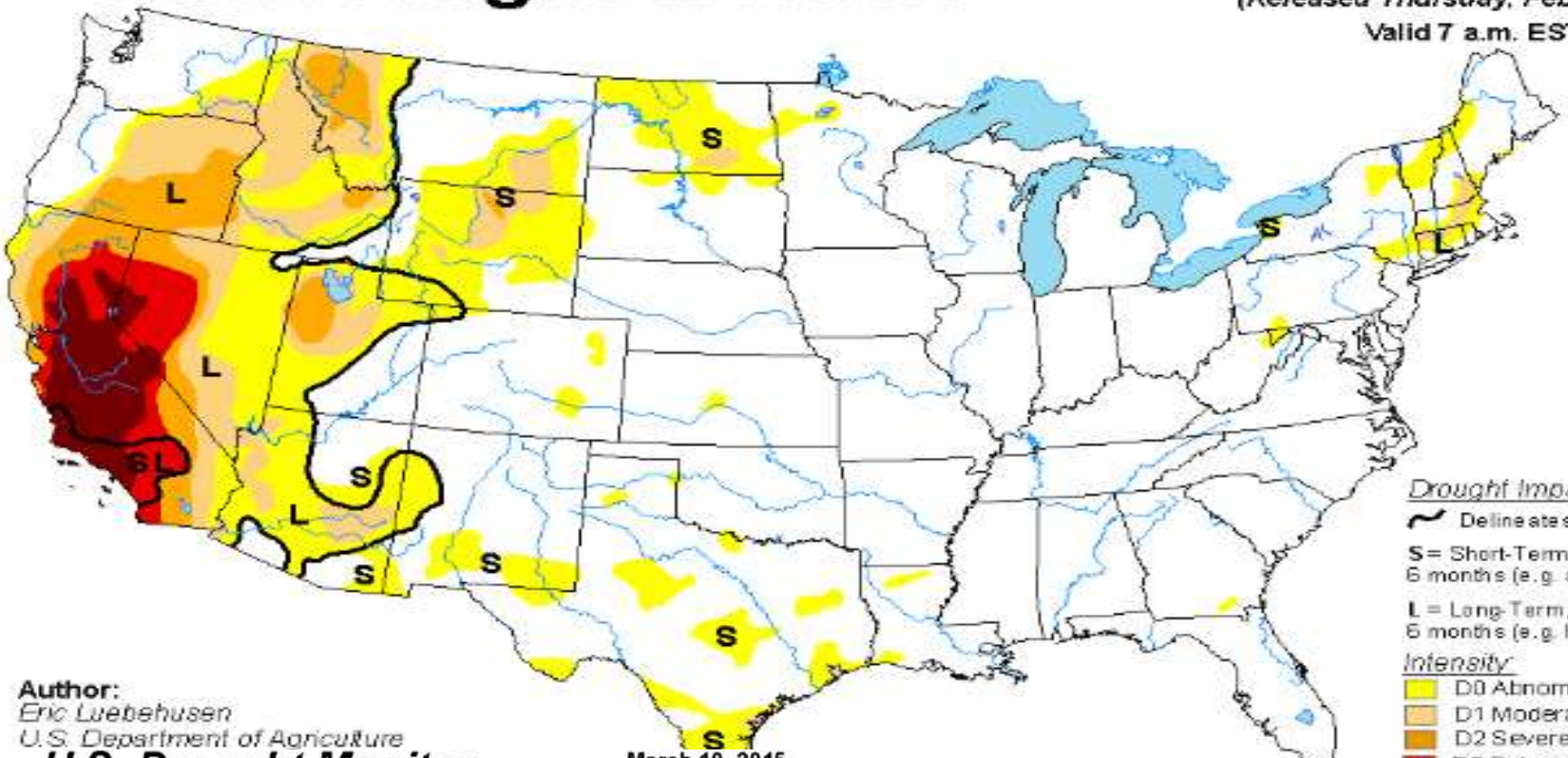
UF IFAS
UNIVERSITY of FLORIDA

U.S. Drought Monitor

February 23, 2016

(Released Thursday, Feb. 25, 2016)

Valid 7 a.m. EST



Drought Impact Types:

Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

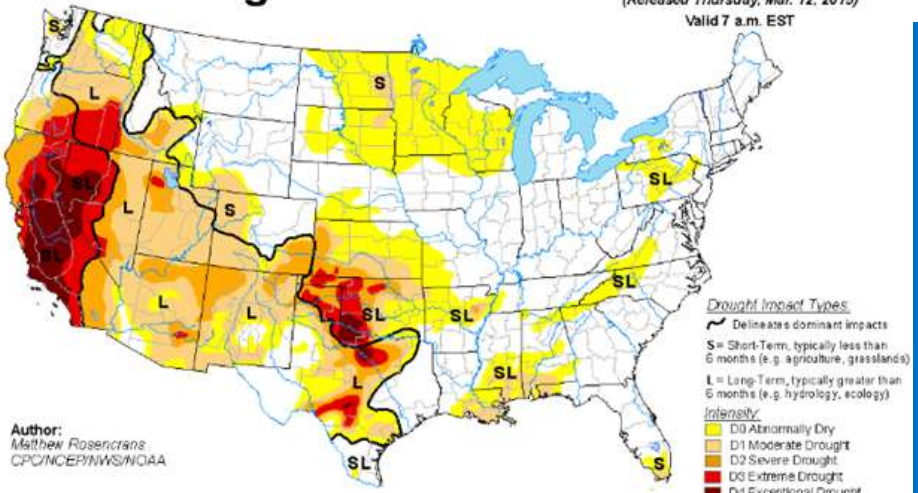
Author:
Eric Luebehusen
U.S. Department of Agriculture

U.S. Drought Monitor

March 10, 2015

(Released Thursday, Mar. 12, 2015)

Valid 7 a.m. EST



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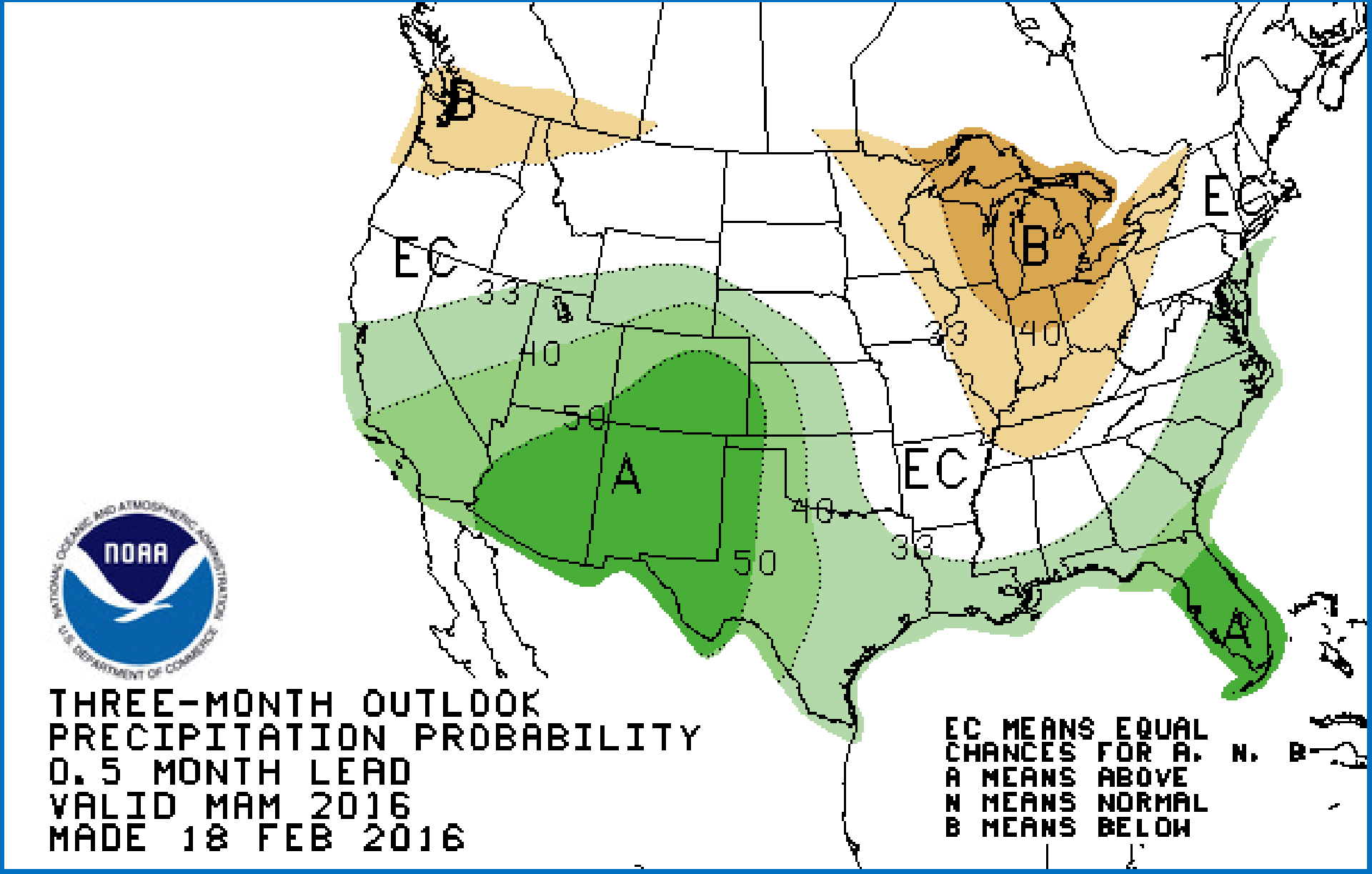
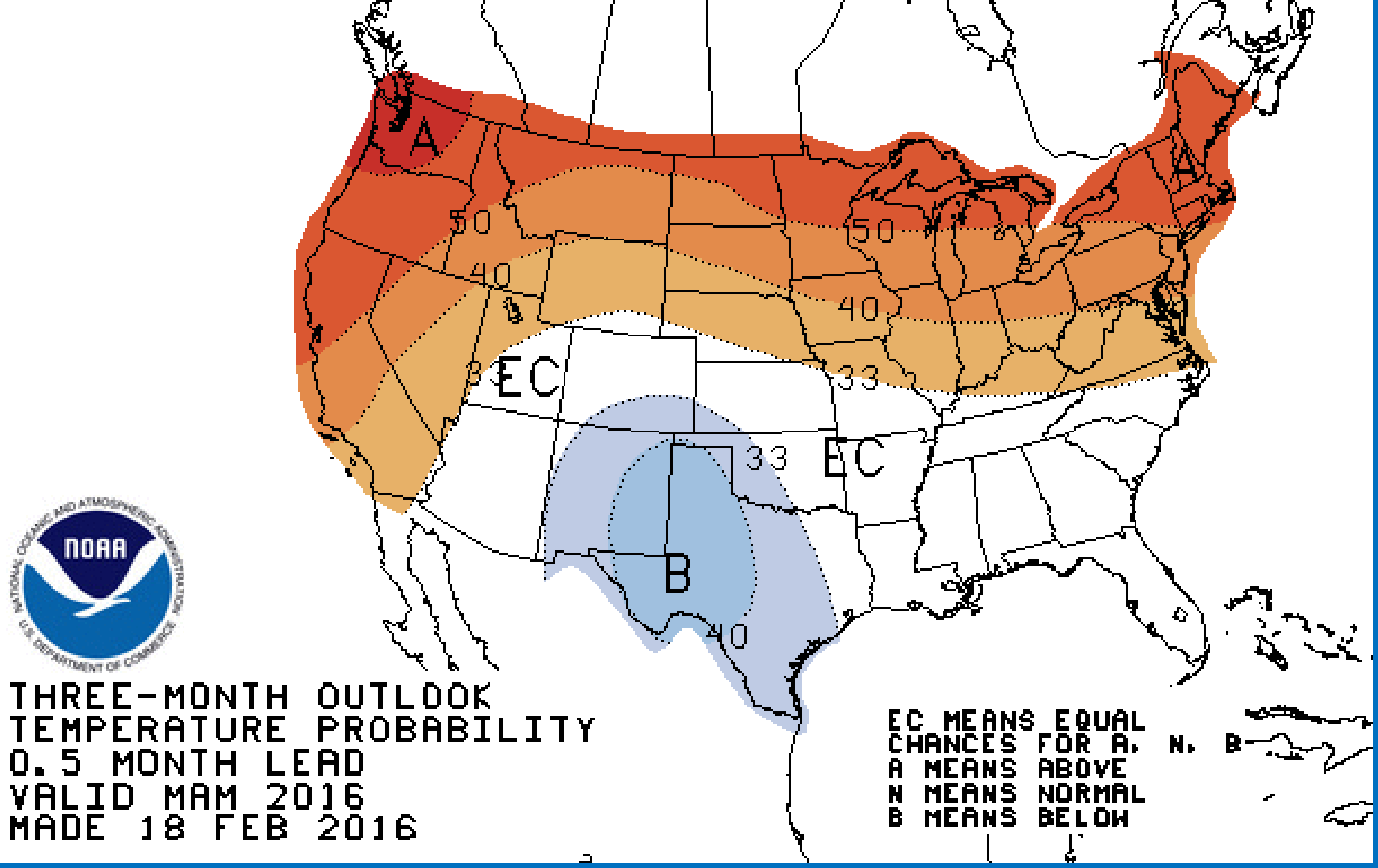
Author:
Matthew Rosencrans
CPC/NCEP/NWS/NOAA



Mid-Feb.- Mid-May, 2016



Mid-Feb.- Mid-May, 2016

Comparison of 2016 Estimated Net Returns, Georgia, Irrigated

	Corn	Cotton	Grn Sorgh	Peanuts	Soybeans
Expected Yield	200	1,200	100	4,700	60
Expected Average Price[1]	$4.25	$0.70	$4.04	$370	$8.60
Crop Income	$850	$840	$404	$869	$516
Variable Costs[2]	$593	$544	$306	$607	$271
Net Return Per Acre Above VC	$257	$296	$98	$262	$246
Net Return per Acre Above VC & $185 Land Rent	$72	$111	($87)	$77	$61

1/ Expected average price. Cotton includes LDP and quality premium.

2/ Assumes Jan 2016 costs, Crop Comparison Tool, Department of Agricultural and Applied Economics, UGA

Comparison of 2016 Estimated Net Returns, Georgia, Non-Irrigated

	Corn	Cotton	Grn Sorgh	Peanuts	Soybeans
Expected Yield	85	750	65	3,400	30
Expected Average Price[1]	$4.25	$0.70	$4.04	$370	$8.60
Crop Income	$361	$525	$263	$630	$258
Variable Costs[2]	$296	$435	$199	$533	$202
Net Return Per Acre Above VC	$66	$91	$65	$98	$56
Net Return Per Acre Above VC + $75 Land Rent	($10)	$16	($11)	$23	($19)

1/ Expected average price. Cotton includes LDP and quality premium. At 1000 lbs/A non irrigated profit of $160-180/A

2/ Assumes Jan 2016 costs, Crop Comparison Tool, Department of Agricultural and Applied Economics, University of Georgia

CONVENTIONAL 3 YR Cotton-Cotton-Peanut Rotation on 200 acres with cover crops

	CROP	YIELD	UNITS	ACRES	COSTS	REVENUE	PROFIT
	COTTON	1200	LBS	133.7	$102,939	$112,308	$9,369
	PEANUT	4800	LBS	66.3	$52,224	$63,648	$11,424
			TOTAL	200	$155,163	$175,956	$20,793

$70/A profit 1st year vs. $310/A after fully in the system the 4th year

YEAR 1 Converting to Sod Based Rotation

FIELD	CROP	YIELD	UNITS	ACRES	COSTS	REVENUE	PROFIT
1	BAHIA 1	3	TONS	50	$18,554	$32,826	$14,272
2	COTTON	1200	LBS	50	$38,496	$42,000	$3,504
3	PEANUT	4800	LBS	50	$39,384	$48,000	$8,616
4	COTTON	1200	LBS	50	$38,496	$42,000	$3,504
			TOTAL	200	$134,930	$164,826	$29,896

YEAR 2 Converting to Sod Based Rotation

FIELD	CROP	YIELD	UNITS	ACRES	COSTS	REVENUE	PROFIT
1	CATTLE	81	CALVES	50	$34,139	$110,768	$76,628
2	BAHIA 1	3	TONS	50	$18,554	$32,826	$14,272
3	COTTON*	1400	LBS	50	$42,246	$49,000	$6,754
4	PEANUT	4800	LBS	50	$43,134	$48,000	$4,866
			TOTAL	200	$138,074	$240,594	$102,520

YEAR 3 Converting to Sod Based Rotation

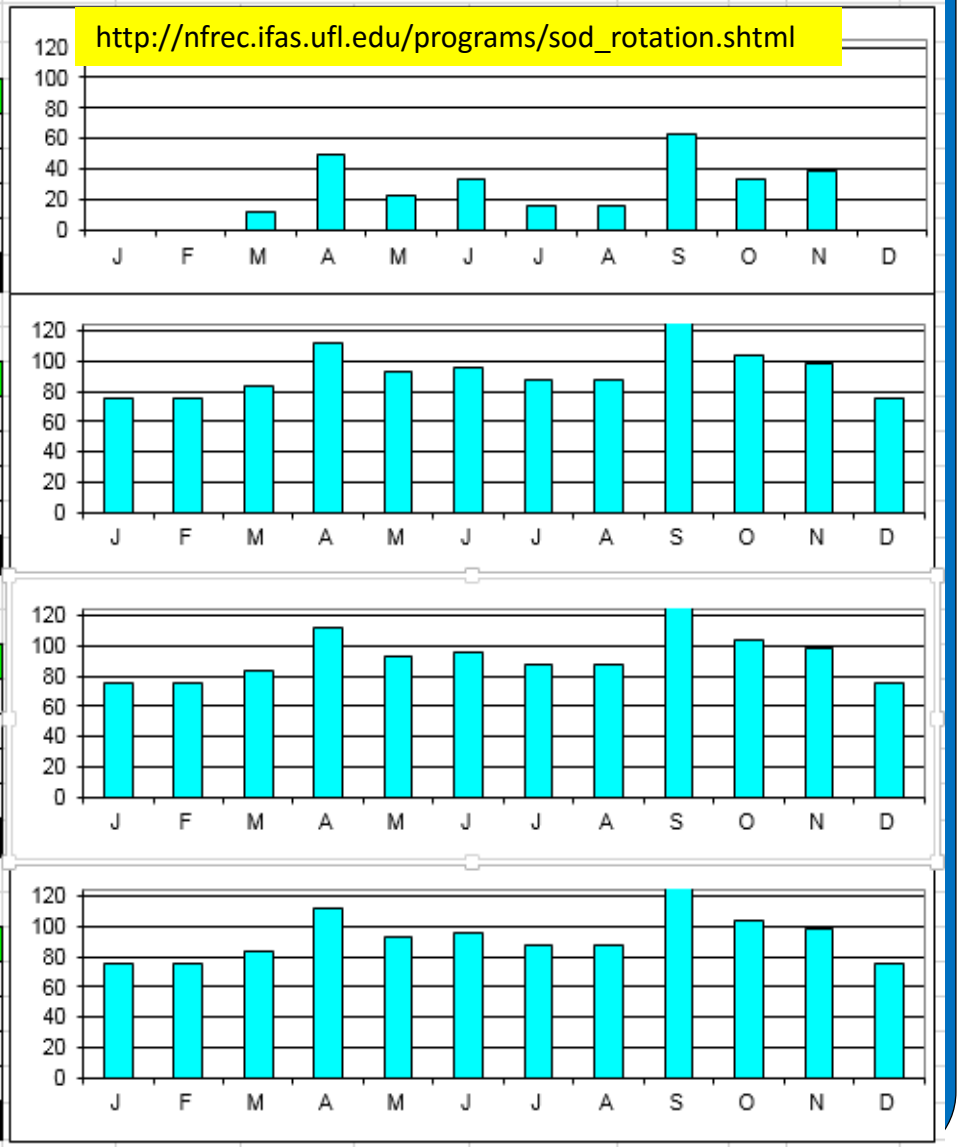
FIELD	CROP	YIELD	UNITS	ACRES	COSTS	REVENUE	PROFIT
1	PEANUT	6200	LBS	50	$43,134	$62,000	$18,866
2	CATTLE	81	CALVES	50	$34,139	$110,768	$76,628
3	BAHIA 1	3	TONS	50	$18,554	$32,826	$14,272
4	COTTON*	1400	LBS	50	$42,246	$49,000	$6,754
			TOTAL	200	$138,074	$254,594	$116,520

YEAR 4 Full Sod Based Roation

FIELD	CROP	YIELD	UNITS	ACRES	COSTS	REVENUE	PROFIT
1	COTTON*	1650	LBS	50	$42,246	$57,750	$15,504
2	PEANUT	6200	LBS	50	$43,134	$62,000	$18,866
3	CATTLE	81	CALVES	50	$34,139	$110,768	$76,628
4	BAHIA 1	3	TONS	50	$18,554	$32,826	$14,272
			TOTAL	200	$138,074	$263,344	$125,270

HOURS OF LABOR PER MONTH

http://nfrec.ifas.ufl.edu/programs/sod_rotation.shtml



Management impacts on cotton yields

Management/yield response	Cost of practice
• Rotation/grazing- 100-300 lbs/A	Low
• Variety selection- 100-300 lbs/A	Low
• N rate, placement, timing- 100-300 lbs/A	Moderate
• Cover crops and strip tillage- 0-100	$ moderate
• In-row ripping- 100-150 lbs/A	$15/A
• Insecticides during bloom-100-300 lbs/A	$10-30/A
• Irrigation- 0-500 lbs/A	$12/A inch
• Nematicide- 50-200 lbs/A	$15-35/A Velum Total, Tem.
• Starter fertilizer-0-200 lbs/A	$10-30/A
• Micronutrients at plant-0-100	$5-15/A
• Plant population- 0-100	Low
• Fungicide- 0-100 lbs/A	$15-20/A

- Look at economics to determine prospects for the crop

Most expensive non management is to allow soil to wash away: USE CONSERVATION TILLAGE/COVER CROPS

Cover crops and conservation tillage helps retain soil moisture and slows weed emergence and soil loss

2015 GA & FL On-Farm Trials- look for consistency in low and high yielding environments

17 Trials = 607 – 1626 lbs/A		
Variety	**Combined Average**	**% Top 3**
DP 1538 B2XF	1332	65
DP 1558NR B2RF	1305	53
DP 1553 B2XF	1286	59
ST 6182 GLT	1253	35
DP 1252 B2RF	1253	35
PHY 333 WRF	1199	24
PHY 552 WRF	1183	6
PHY 444 WRF	1175	12
ST 4946 GLB2	1158	12

Jefferson County non-irrigated, high residue, cotton trial, cattle/forage rotation with cropland, 2015

Variety	Lint lbs/A	Turnout %
DP 1558 NRB2RF	1447a	42.8
DP1538 B2XF	1394a	43.0
CG 3787 B2RF	1379ab	41.5
DP 1252 B2RF	1355ab	42.7
DP 1553 B2XF	1285ab	42.2
ST 6448 GLB2	1275ab	39.1
PHY 552 WRF	1254ab	41.9
ST 4946 GLB2	1249a	39.1
ST 6182 GLT	1217ab	42.8
PHY 333 WRF	1215ab	43.0
PHY 444 WRF	1180b	42.4
PHY 499 WRF	1160b	43.9
Mean	1284	42.0
Min. significant. dif.	262	

Top 4 Performance Highlighted (GA)

Variety	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Average
DP 1538 B2XF	686	679	769	1,167	925	1,171	1,362	1,199	1,154	1,283	1,799	1,421	1,535	1,590	1,502	1,558	1,590	1,678	1,596	**1,298**
DP 1558NR B2RF	646	695	702	935	1,036	1,323	1,142	1,058	1,251	1,296	1,275	1,447	1,515	1,900	1,691	1,352	1,581	1,555	1,735	**1,270**
CG 3885 B2XF	680	695	730	835	1,076	1,225	1,120	1,181	1,384	1,269	1,400	1,427	1,591	1,595	1,517	1,652	1,543	1,668	1,462	**1,266**
DP 1553 B2XF	662	673	728	900	1,055	1,011	1,185	1,140	1,256	1,218	1,412	1,521	1,572	1,684	1,463	1,592	1,523	1,652	1,587	**1,254**
ST 6182 GLT	616	667	679	885	953	1,096	1,097	1,250	1,362	1,347	1,208	1,456	1,568	1,348	1,472	1,654	1,526	1,577	1,743	**1,237**
DP 1252 B2RF	672	659	719	916	913	1,195	985	1,210	1,240	1,265	1,138	1,500	1,451	1,536	1,504	1,216	1,582	1,651	1,664	**1,211**
NG 5007 B2XF	555	691	411	1,005	799	945	1,147	1,157	1,240	1,240	1,423	1,428	1,462	1,555	1,459	1,497	1,465	1,483	1,612	**1,188**
PHY 333 WRF	554	703	720	920	883	969	1,025	1,108	1,189	1,293	1,104	1,312	1,431	1,336	1,614	1,566	1,452	1,464	1,761	**1,179**
PHY 444 WRF	530	600	646	877	1,039	1,198	1,006	1,155	1,126	1,361	1,126	1,351	1,407	1,241	1,364	1,553	1,427	1,502	1,635	**1,166**
PHY 552 WRF	591	541	682	860	857	907	1,031	1,024	1,037	1,311	1,140	1,449	1,471	1,433	1,288	1,437	1,501	1,528	1,653	**1,144**
ST 4946 GLB2	561	632	665	874	822	884	934	1,009	1,291	1,141	1,219	1,291	1,375	1,354	1,516	1,535	1,486	1,397	1,501	**1,131**
NG 3405 B2XF	534	638	629	806	887	1,018	984	1,093	1,044	1,158	1,308	1,115	1,314	1,153	1,464	1,409	1,450	1,273	1,573	**1,097**
Grand Total	**607**	**656**	**673**	**915**	**937**	**1,079**	**1,085**	**1,132**	**1,214**	**1,265**	**1,296**	**1,393**	**1,474**	**1,477**	**1,488**	**1,502**	**1,510**	**1,536**	**1,627**	

2015 AL On-Farm Trials

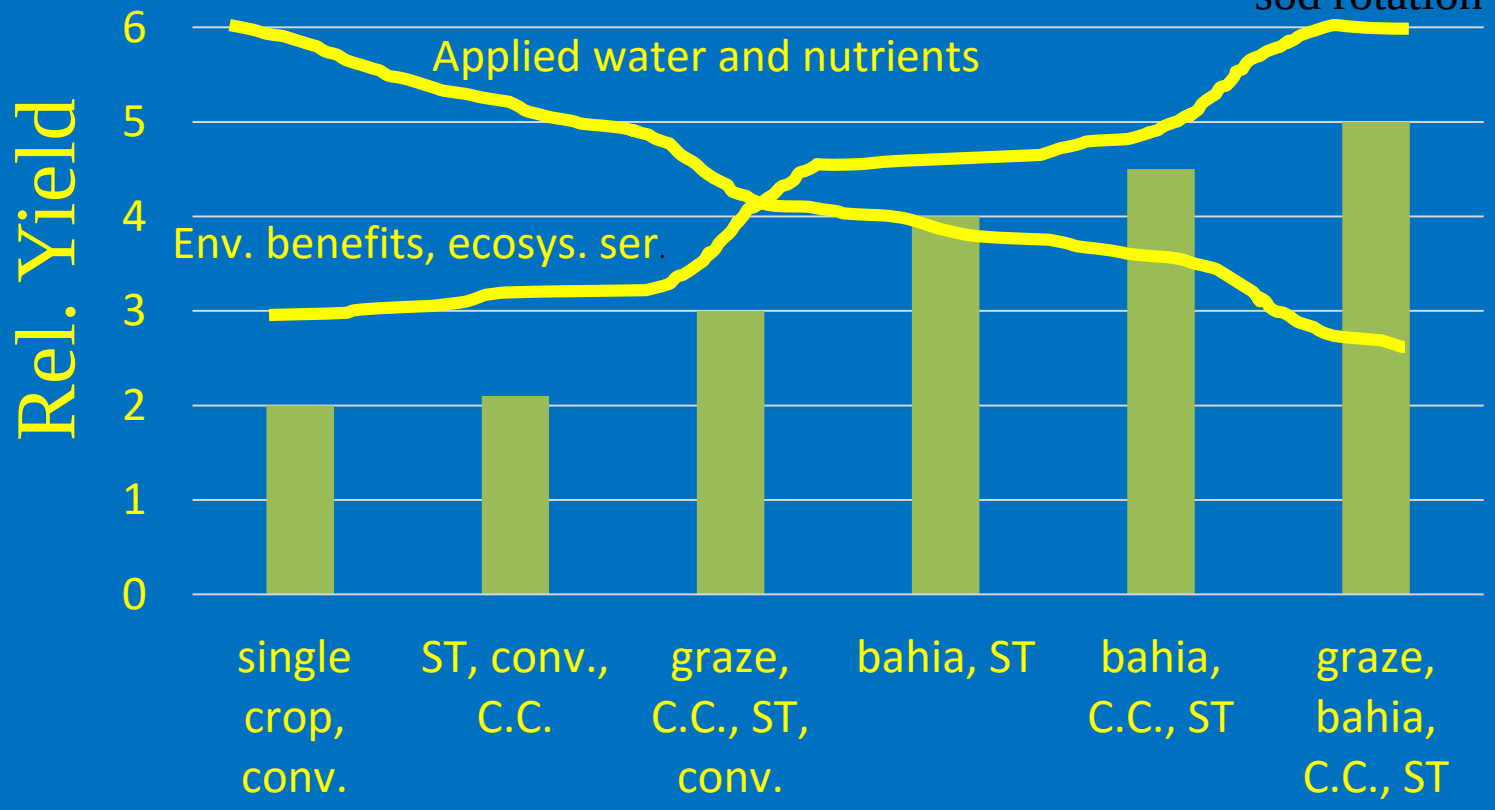
4 Trials = 712 – 1420 lbs/A		
Variety	Combined Average	% Top 3
DP 1538 B2XF	1278	75
DP 1553 B2XF	1265	50
DP 1522 B2XF	1258	50
ST 4946 GLB2	1180	25
ST 6182 GLT	1178	0
PHY 487 WRF	1176	25
PHY 495 W3RF	1171	25
DP 1518 B2XF	1133	25
ST 5115 GLT	1122	0
ST 6448 GLB2	1113	0
ST 4747 GLB2	1098	25

Crop yield with and without irrigation

- Corn- 80-120 vs. 200-240 bu/A, difference= $400/A, 100% inc.
- Soybean- 35 vs. 55-60 bu/A, difference = $250/A, 60%
- Peanut- 4000 vs. 5000 lbs/A, difference = $200/A, 25%
- Cotton- 900 vs. 1200 lbs/A, difference = $180/A, 30%

Impacts of rotations/cattle on farming systems

Invitation for a tour of the sod rotation anytime.

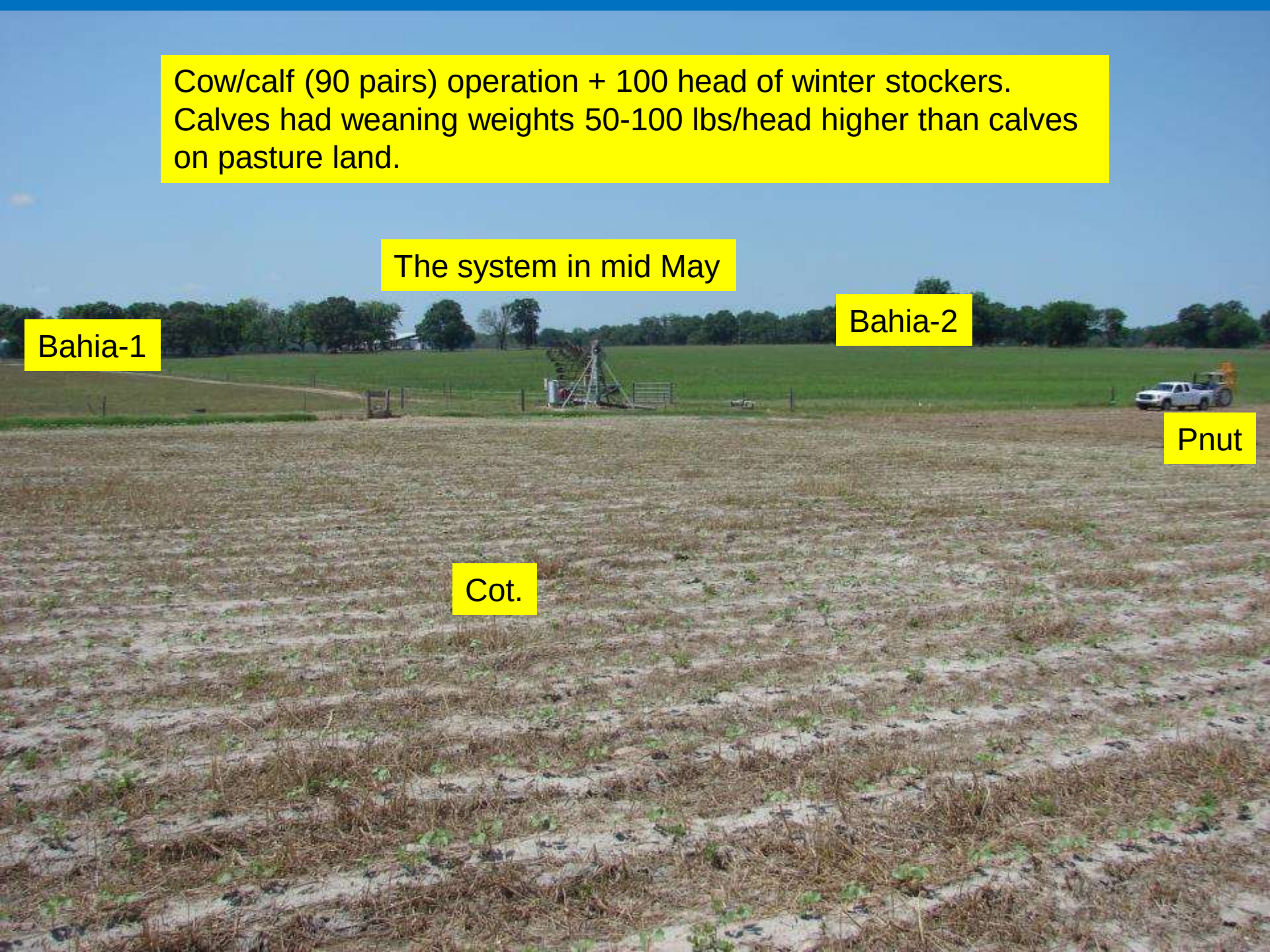


C.C.= cover crops, ST= strip tillage, conv.= conventional rotation

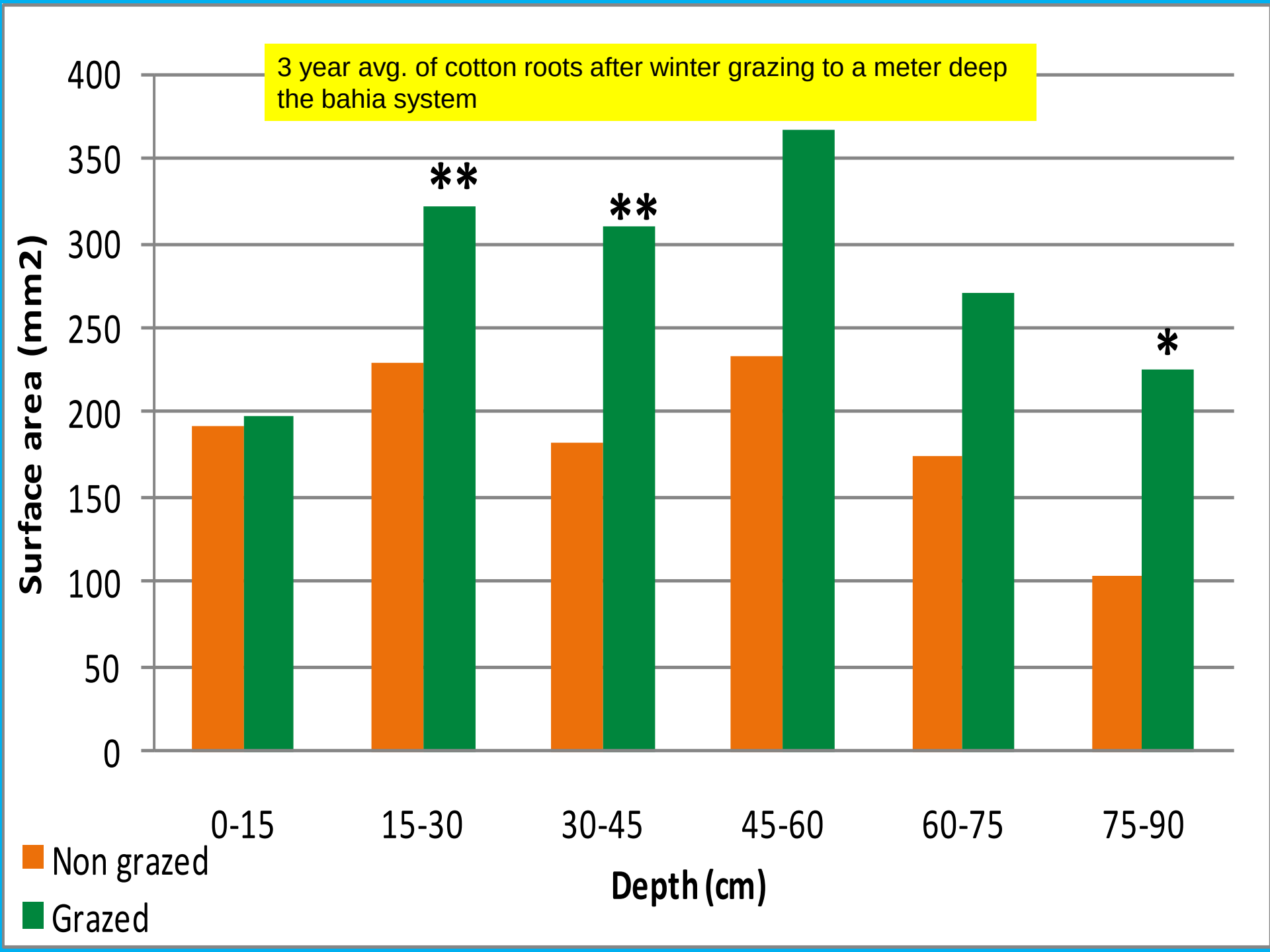
Drilling bahiagrass into winter grazing in Feb.-March. Timing with grazing is late January until March at 20-30 lbs/A of seed with a drill or no-till drill.
Rye and oats works best and ryegrass is only planted into bahiagrass going into year 2.
Cattle have grazed this so a no-till drill is being used. Do not plant bahia into ryegrass.

After cotton/winter grazing bahiagrass is planted in early March and is grazed through mid May. Bahiagrass planted after small grain in late May or June has severe competition with crabgrass and other summer grasses. If bahia is shorter cattle can be removed for 4-6 weeks to allow bahiagrass to get 12” tall.

May 15

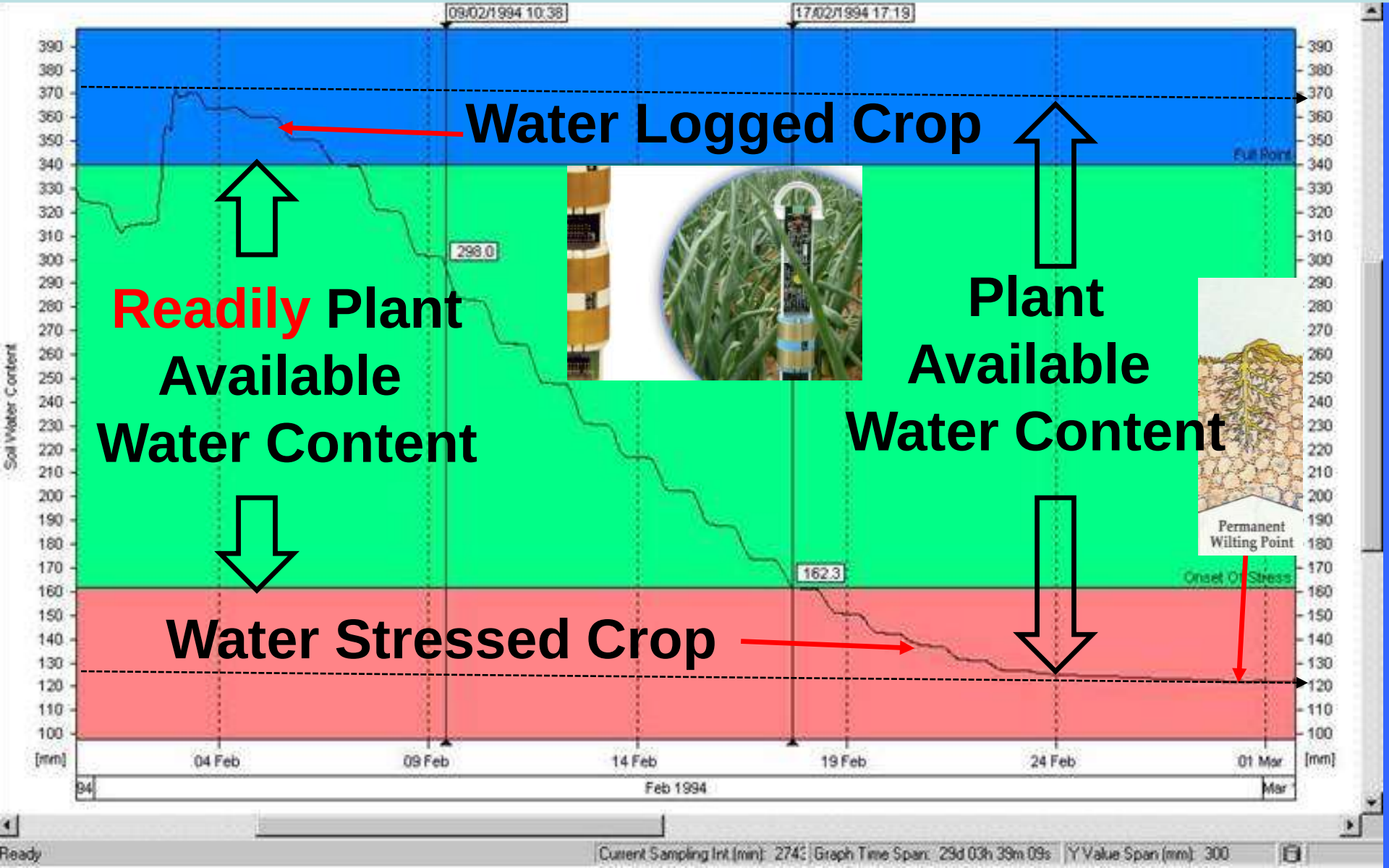

Cow/calf (90 pairs) operation + 100 head of winter stockers. Calves had weaning weights 50-100 lbs/head higher than calves on pasture land.
The system in mid May
Bahia-1
Bahia-2
Pnut
Cot.

Cotton following peanut without bahia on left and following peanut after bahia on right with 60 lbs/A N on each. Strip tilled into oat cover crop

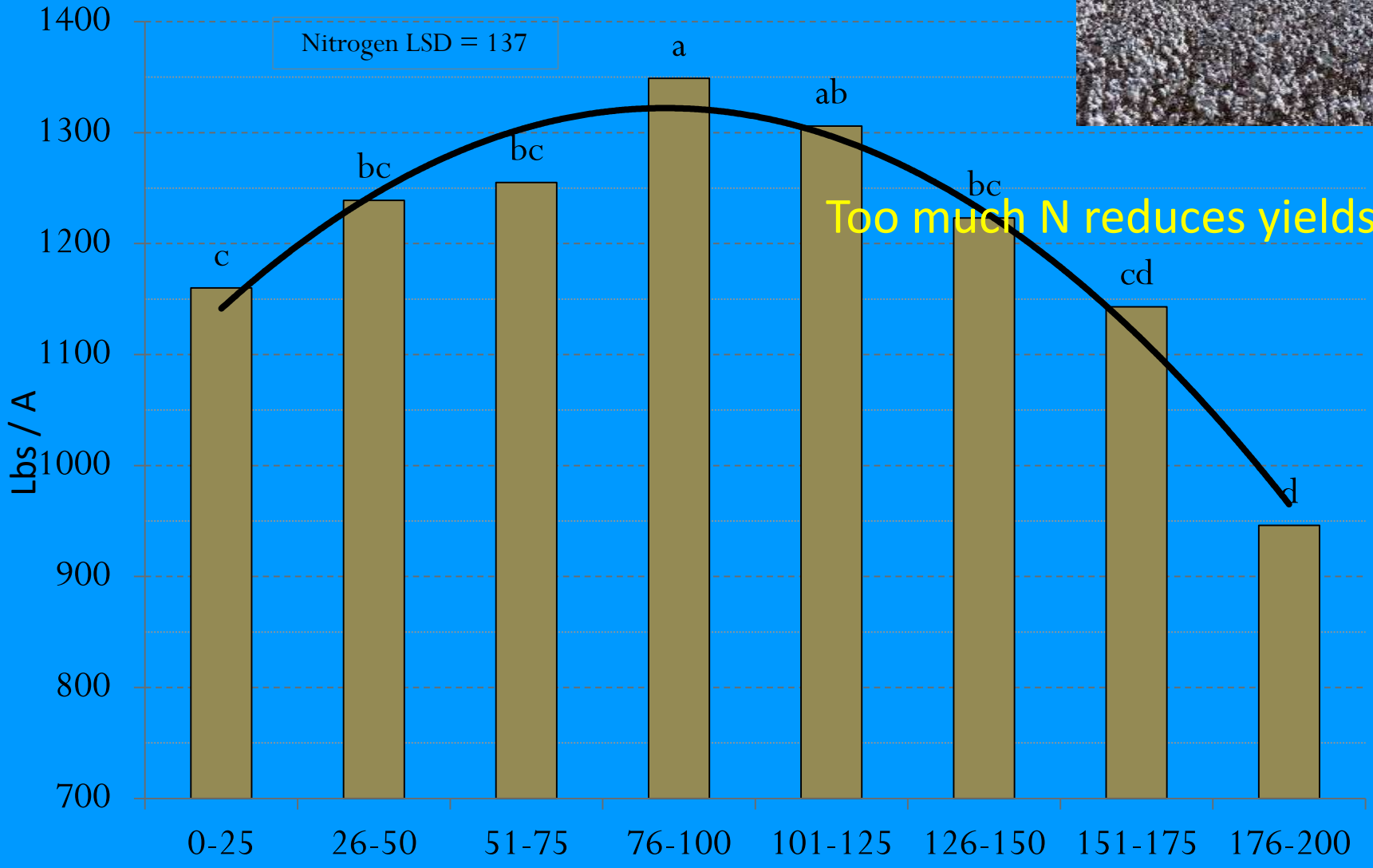

3 year avg. of cotton roots after winter grazing to a meter deep the bahia system
Surface area (mm2)
400
350
300
250
200
150
100
50
0
**
**
*
0-15
15-30
30-45
45-60
60-75
75-90
Depth (cm)
Non grazed
Grazed

Critical Crop Water Thresholds

Summed Soil Water Profile Graph



Lint Yield*

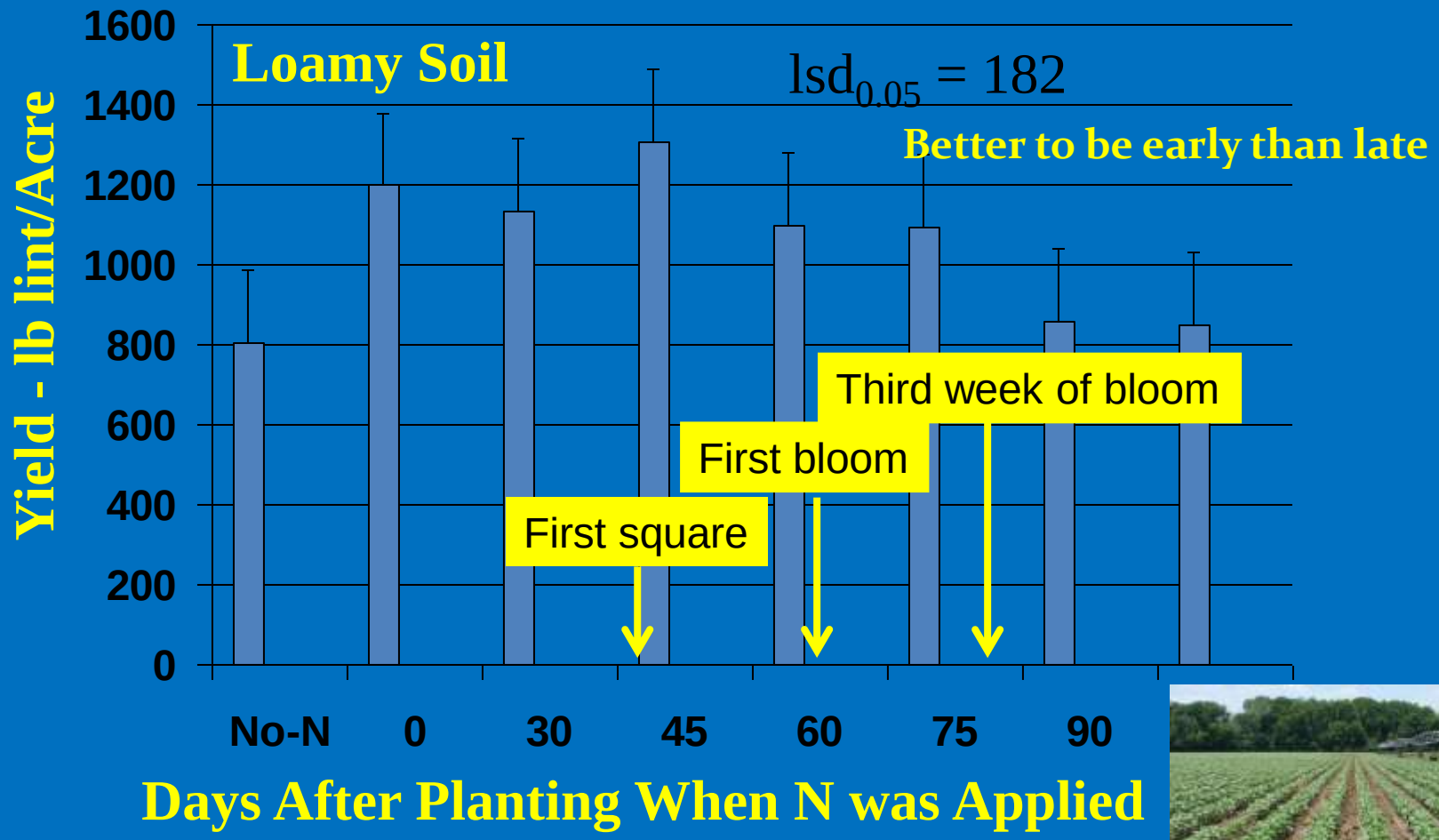


Too much N reduces yields

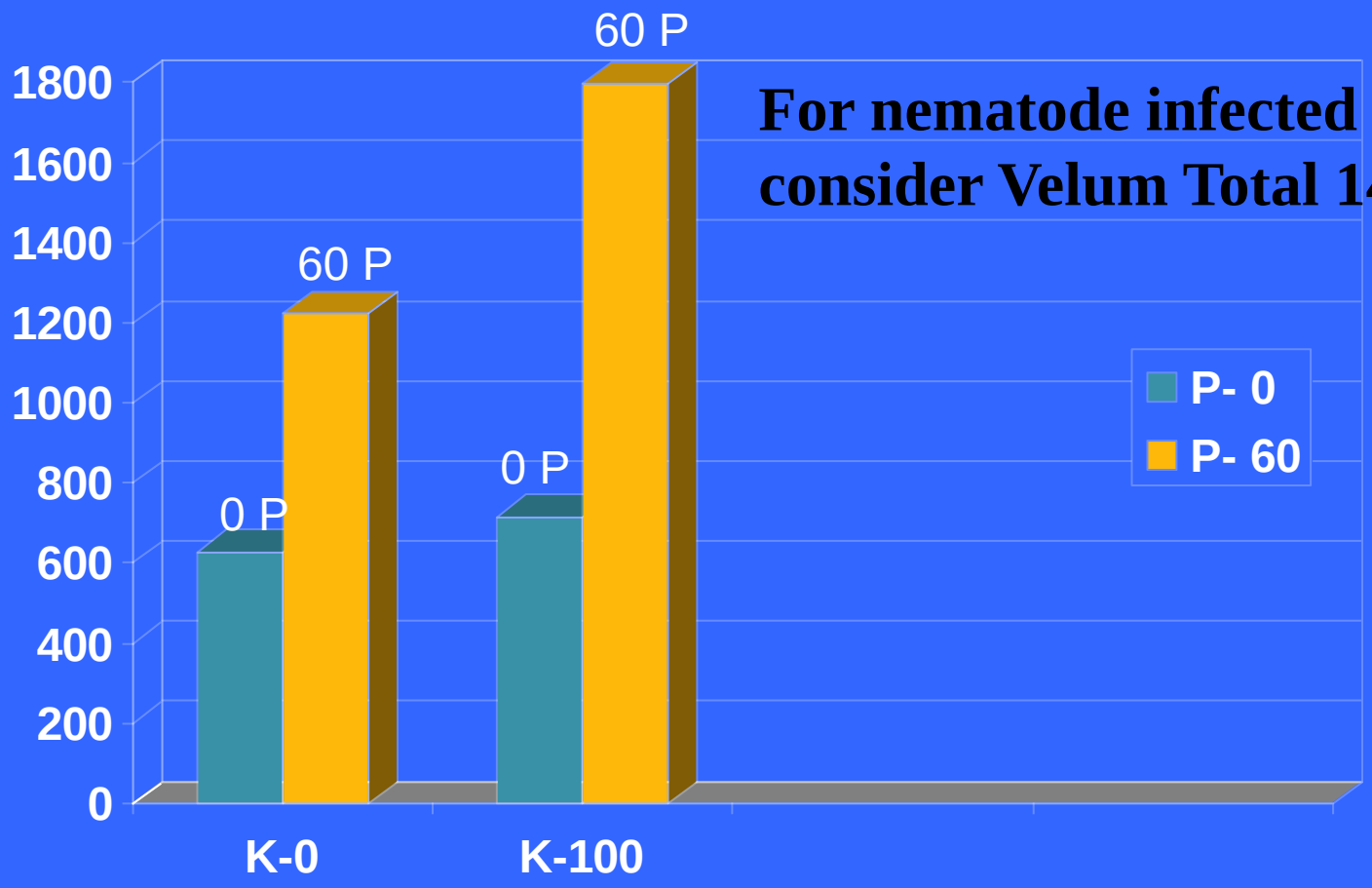
*16 locations across cotton belt

Nitrogen Pr>F = <0.0001

N timing is critical to yield of cotton - All plots except control got 60 lb N/A



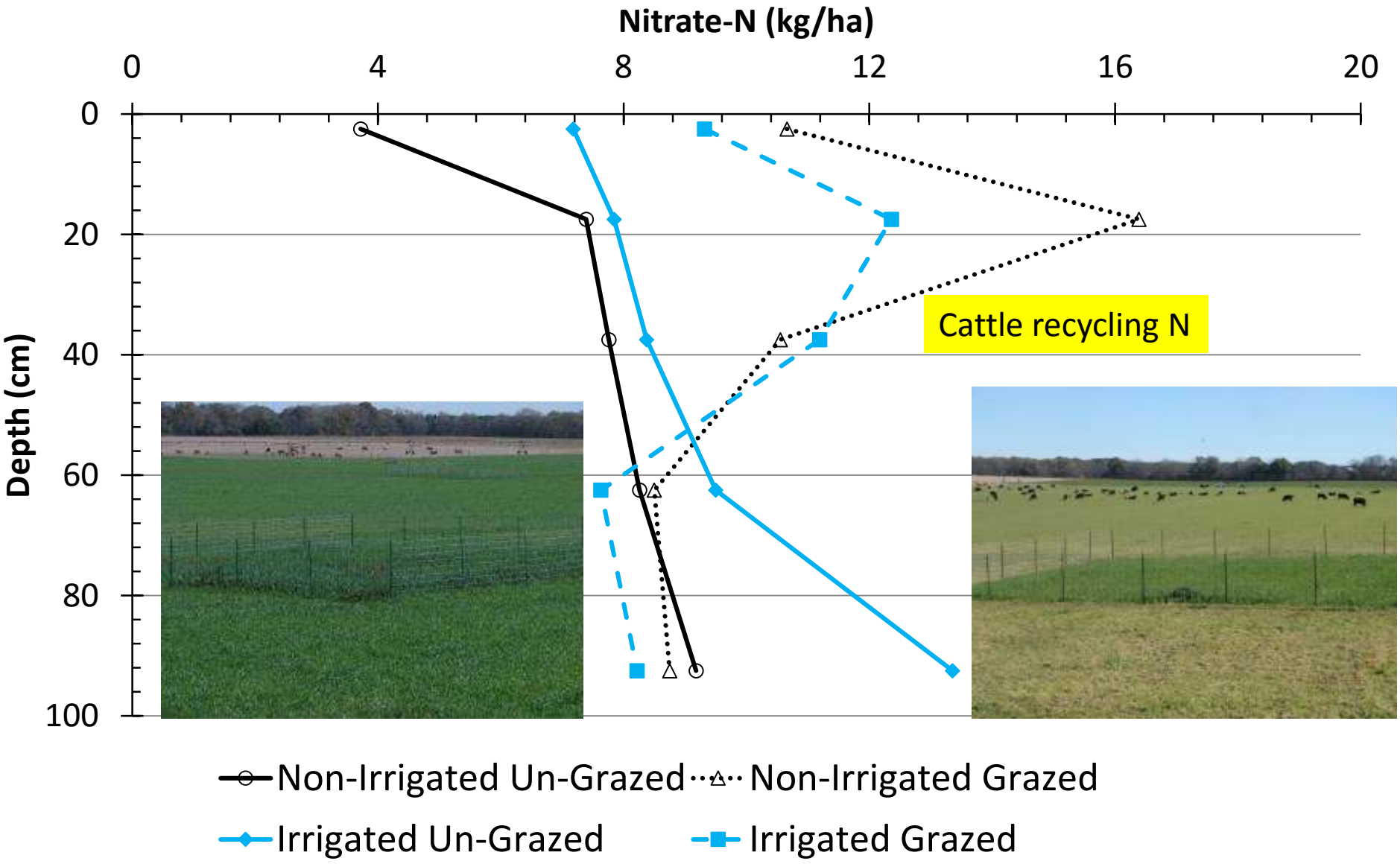
Cotton lint yield as influenced by P and K rates on low soil tests (UF)



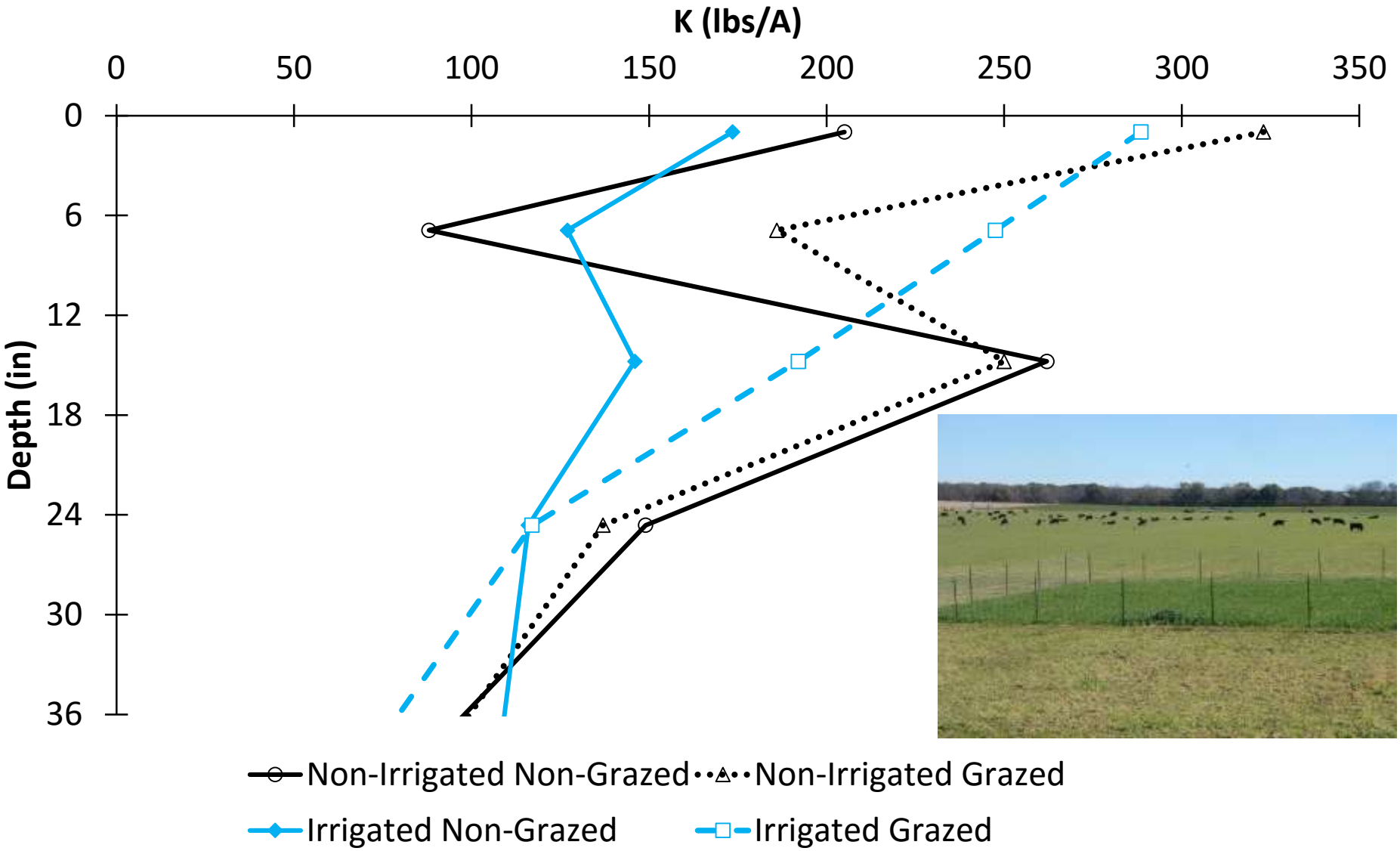
For nematode infected fields consider Velum Total 14-18oz/A

Follow soil tests for these elements

Nitrate-N in soil profile of sod-based rotation after bahia-peanut and winter grazing before cotton, Marianna



Potassium (K) in soil profile of sod-based rotation after Bahia-Peanut and winter grazing before Cotton, Marianna

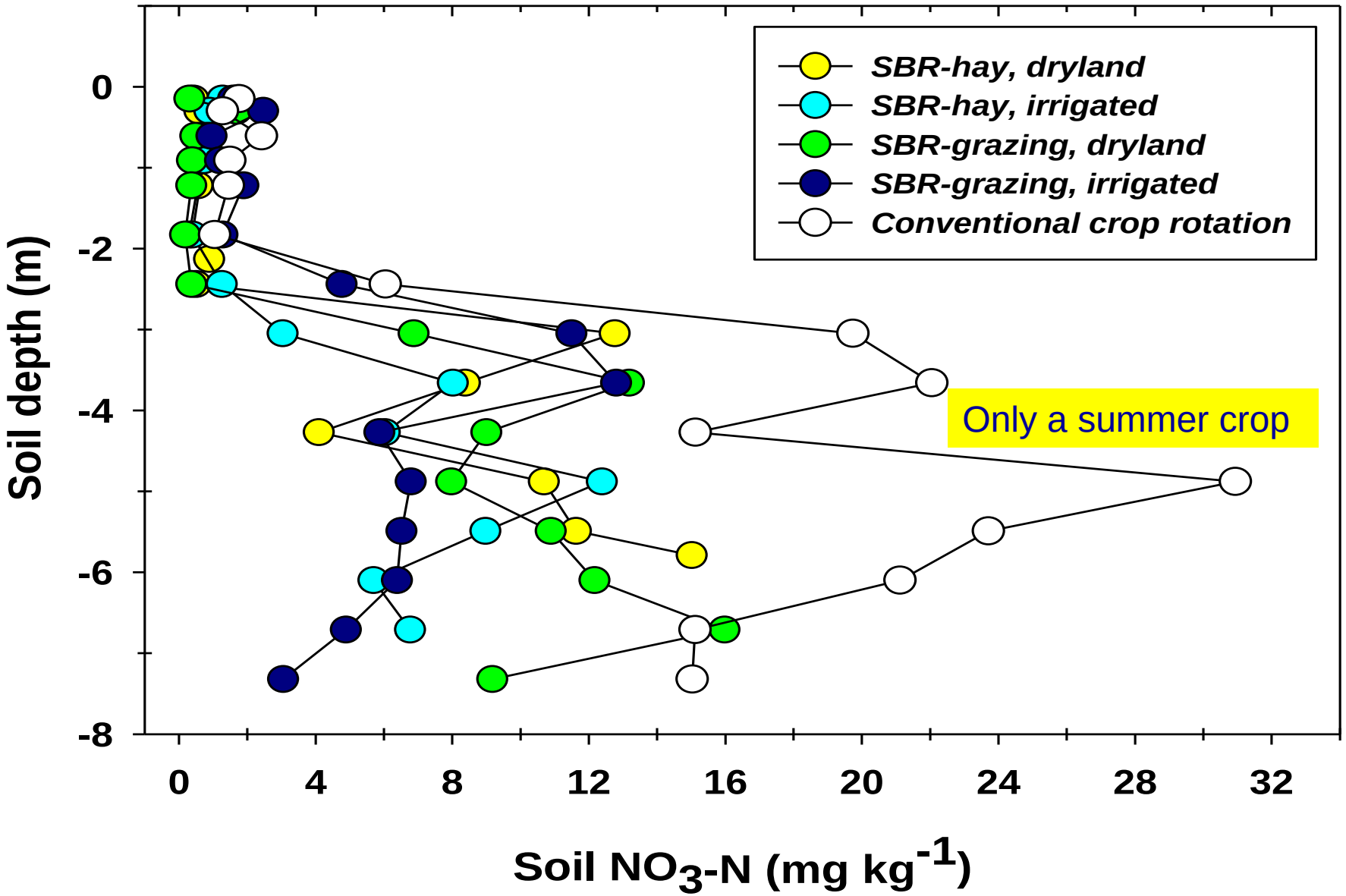



Cotton planted after winter grazing- 2150 lbs lint/A with 60 lbs/A acre of applied N.


23’ deep soil cores to look at nitrates in different systems

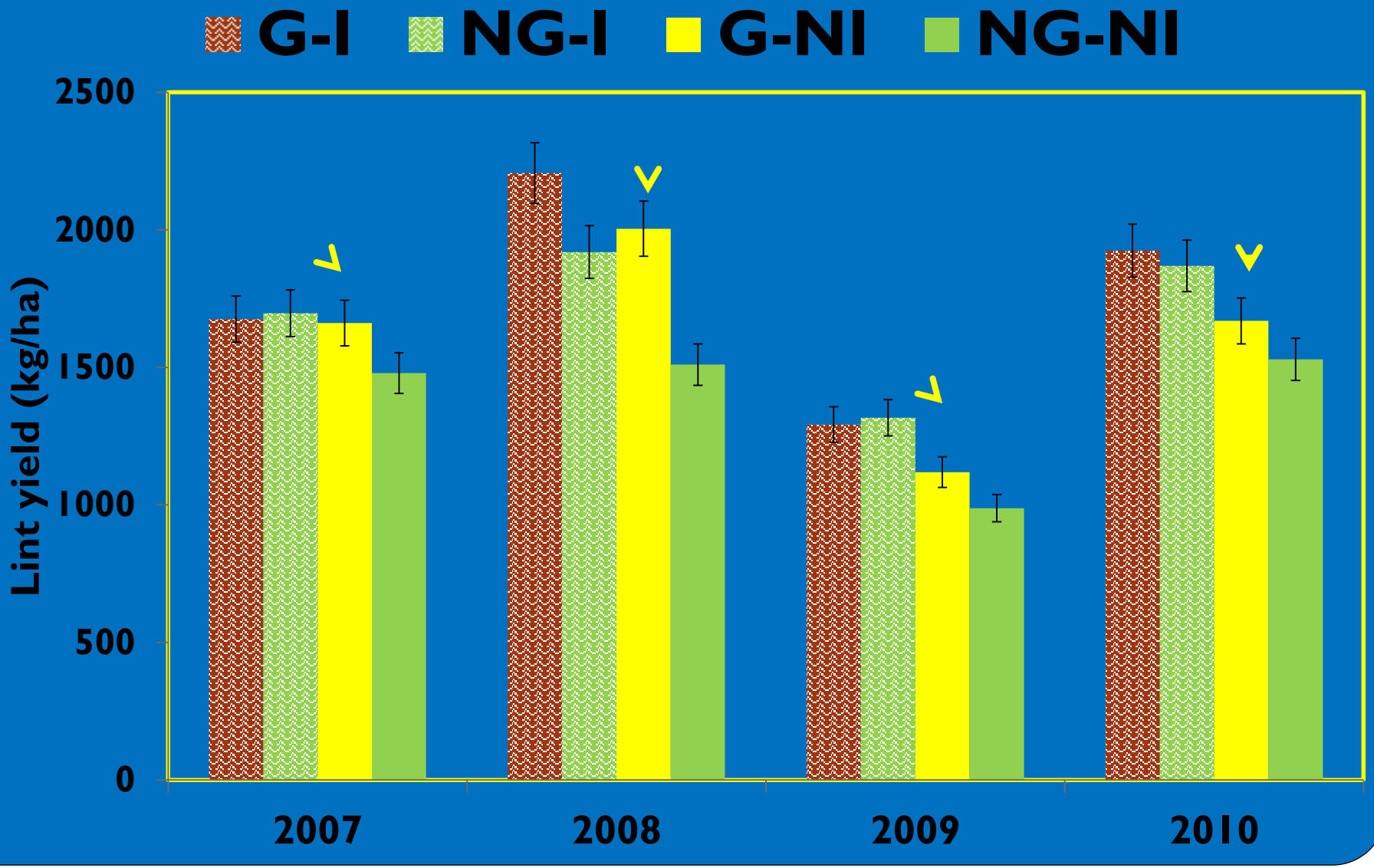
Soil cores, spring 2015

SBR soil nitrate from surface to 7 m (23 ft) depth



Cotton lint yields

Consistently higher yields for non irrigated cotton



Sod rotation + grazing + variable rate irrigation + conservation tillage= 70-80% water savings

1) **Better yields of crops**
2) **Better yields of crops after winter grazing**
3) **Better winter grazing yields by 1/3 or more**
4) **More recycled nutrients (30-50% less)**
5) **Higher calf gains by 50-100 lb**

Verified on farm

Best varieties, in-row subsoiling, split N with a total of 90 lbs/A unless leached, none after third week of bloom if good boll set, follow winter grazing if possible, insecticides at bloom to prevent hardlock, timely harvest

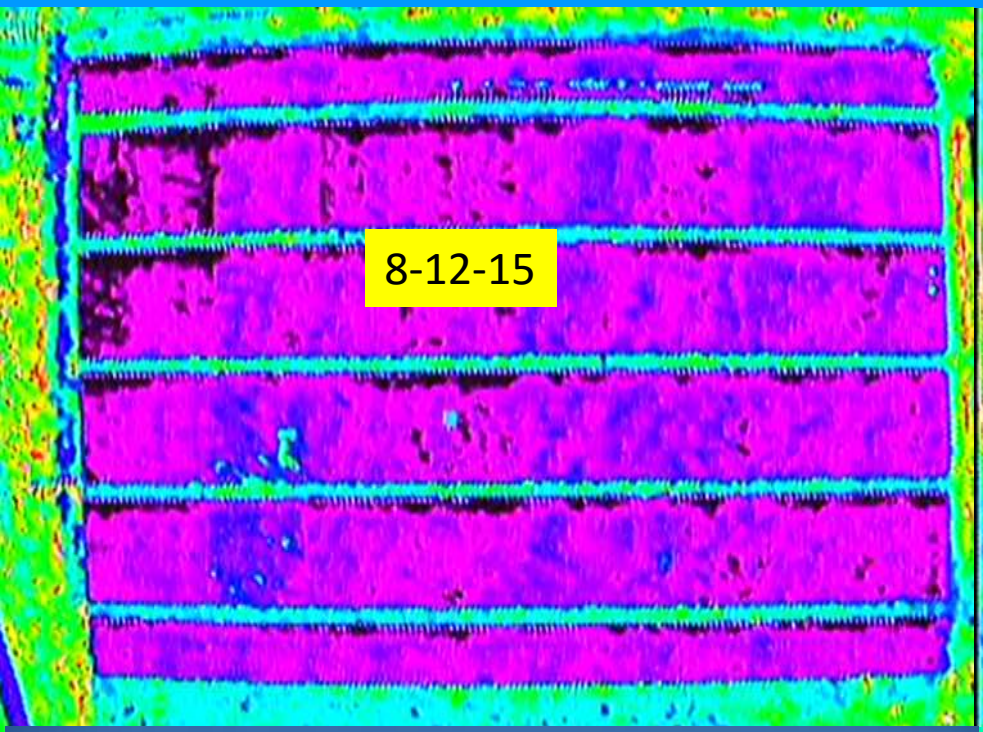
Impact of irrigation on 5 peanut varieties strip tilled into oat cover, NFREC, Quincy, 2014

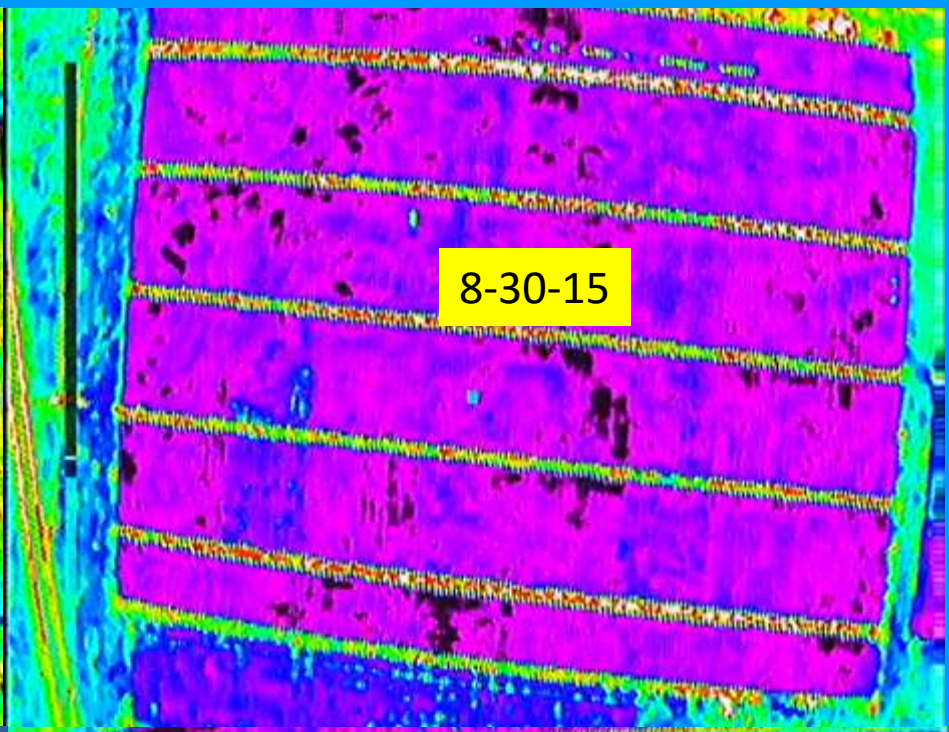
VARIETY		Irrigated Yield (lb/A)		Non-irrigated Yield (lb/A)	
GA 12Y		7420 a		7192 ab	
TUFRunner 297		6782 bc		6164 de	
TUFRunner 511		6764 bc		6456 cd	
GA06G		6493 cd		5916 e	
FloRun 107		6326 c-e		5873 de	
Mean	2014	6756		6320	

Impact of irrigation on 5 peanut varieties strip tilled into oat cover, NFREC, Quincy, 2015

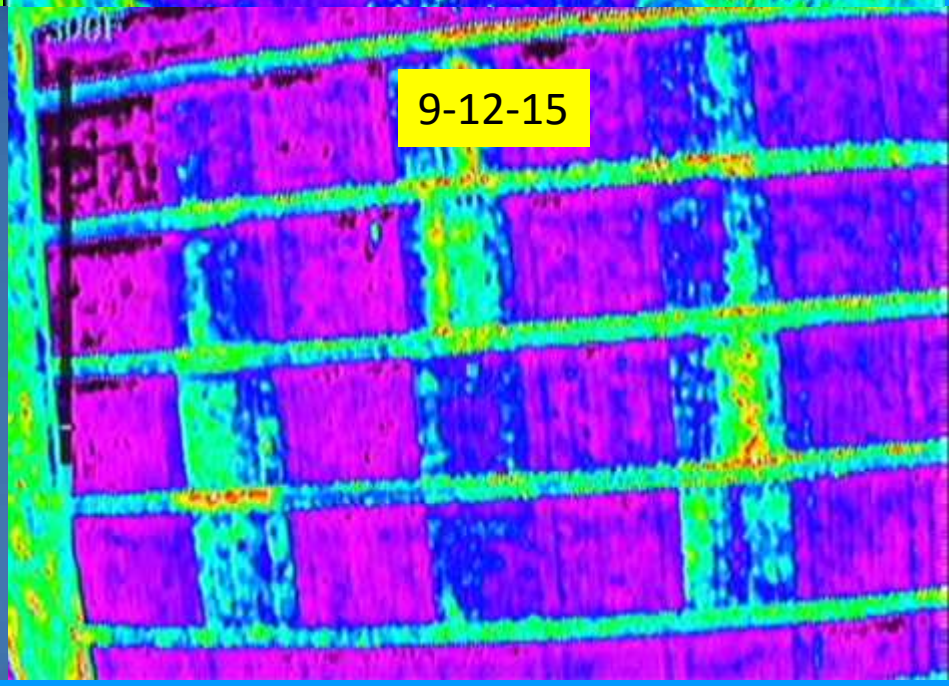
VARIETY	Irrigated Yield (lbs/A)	Non-irrigated Yield(lbs/A)
GA 12Y	5742	6337
TUFRunner 297	5274	5678
GA06G	4974	5537
FloRun 107	4353	4603
TUFRunner 511	4223	4635
Mean	4913	5358

Late leafspot levels were very high in 2015

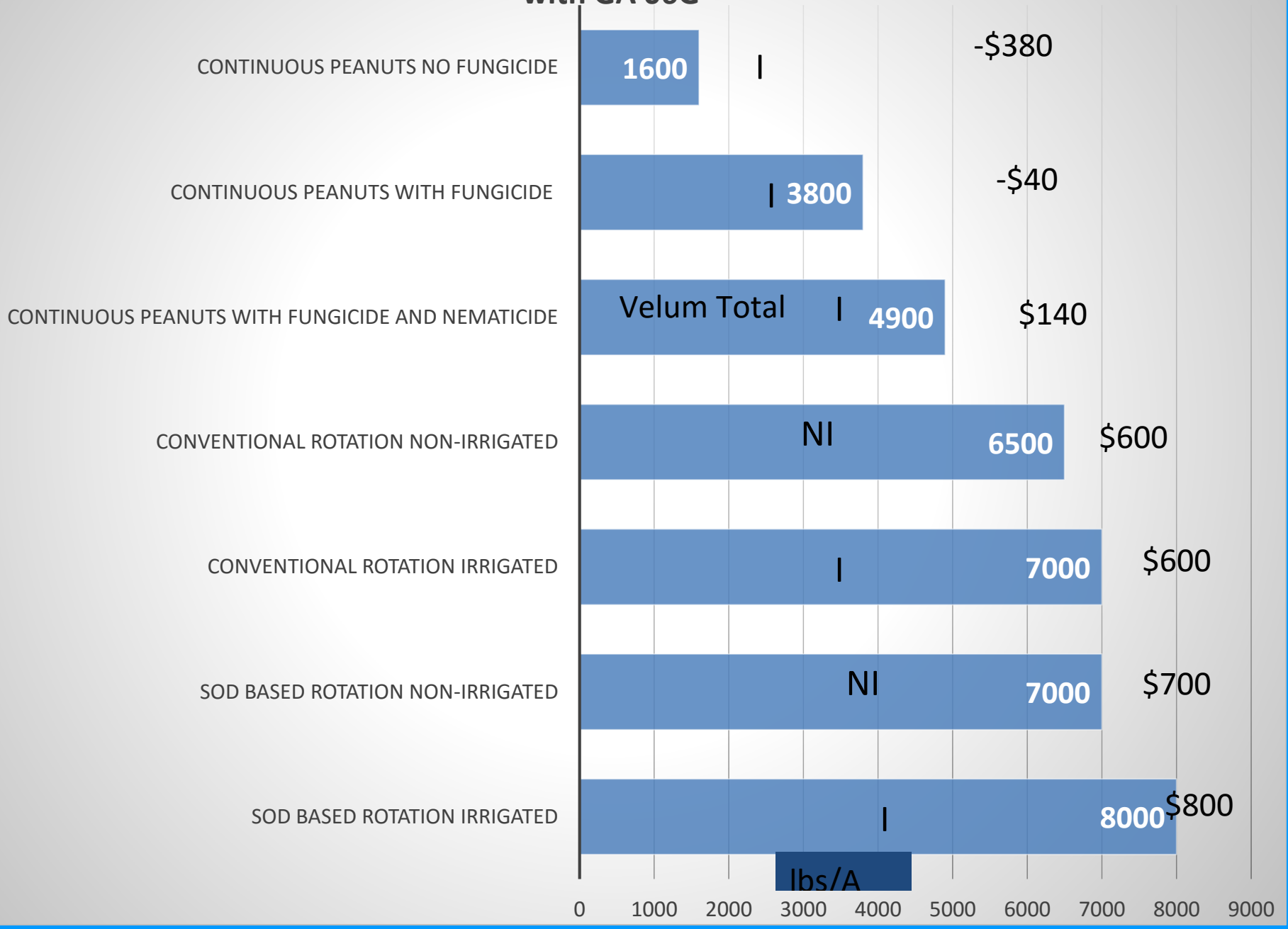




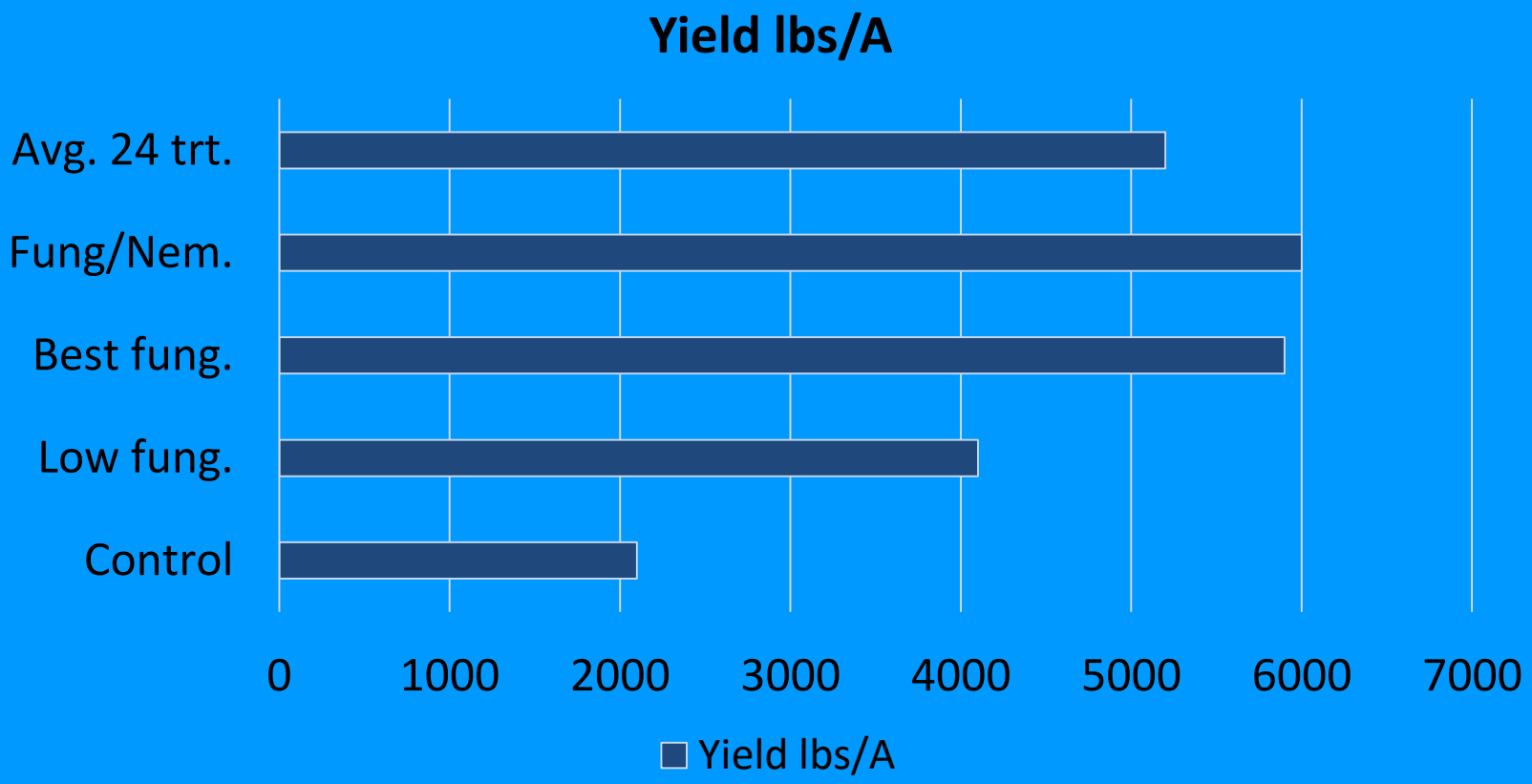
Thermal images
Late leaf spot



Effect of Rotations and Inputs on Strip-tilled Peanut Yield and Profit in 2014 with GA 06G



Impact of fungicide programs and nematicides on peanut yield, 2015 (7 yrs. cont. peanuts)



Most were 7 sprays but some 3-8

Many other crops and management decisions-

Carinata on Jan. 12, 2016- twin rows peanut planter

Carinata Summit

March 15-16 Quincy, NFREC

Thank You!