Table 1. The cultivars and boron rates used in experiment 2.

Cultivar	Rate 1	Rate 2	Growth Stage
Bailey	0 lb B/ac	0.5 lb B/ac	R4
FL07	0 lb B/ac	0.5 lb B/ac	R4
Florunner	0 lb B/ac	0.5 lb B/ac	R4
GA06G	0 lb B/ac	0.5 lb B/ac	R4
GA13M	0 lb B/ac	0.5 lb B/ac	R4
GAGreen	0 lb B/ac	0.5 lb B/ac	R4
Gregory	0 lb B/ac	0.5 lb B/ac	R4
NC-V11	0 lb B/ac	0.5 lb B/ac	R4
Sullivan	0 lb B/ac	0.5 lb B/ac	R4
TUFRun511	0 lb B/ac	0.5 lb B/ac	R4
VA98R	0 lb B/ac	0.5 lb B/ac	R4
Wynne	0 lb B/ac	0.5 lb B/ac	R4

VI. Results:

Experiment 1: Within each location, there was no significant difference for yield, value, and grading factors among boron rates and application times. Because there was no interaction between rate and location, and application time and location, all locations were further combined for analysis. Only after combining the locations (higher number of replications) a significant effect of boron versus no boron was obtained (Table 2). The highest yield was when 0.5 lb B/acre was applied. Likely this yield increase was due to a higher percent of ELK, SMK, and total meat. When boron was used, the damage kernel (DK) content was significantly less than without boron. In terms of the time of application, table 2 shows that the highest value, and grading factors were either when boron was applied a single application at growth stage R2 (beginning peg) or as a split application at planting and at R6 (full seed).

Experiment 2: There were no significant differences for yield and grading factors when boron was used versus no boron applied in this test.

Table 2. Yield, value, and grading factors when all locations were combined

Boron Rate	% LSK	% FM	% Fancy	% Water	% ELK	% SS	% OK	% DK	% SMK	% Total Kernels	Support Price $/cwt	Yield[1] lb/A	Value $/A
0 lb/acre	1.0	2.0	88 a	7.3	44	2.6	2.9	1.8	63	70.7 b	17.17 b	4802 b	822 b
0.3 lb/ac	1.0	2.2	87 a	7.2	45	2.5	2.7	1.5	65	71.7 a	17.57 a	4999 ab	876 a
0.5 lb/ac	0.9	2.1	87 a	7.2	46	2.6	2.7	1.5	65	71.6 a	17.54 a	5067 a	887 a
1.0 lb/ac	0.8	2.4	87 a	7.3	44	2.6	2.9	1.6	64	71.4 ab	17.43 ab	4866 ab	845 ab
Mean	**0.9**	**2.2**	**87**	**7.3**	**45**	**2.6**	**2.8**	**1.6**	**64**	**71.4**	**17.43**	**4934**	**858**
$LSD_{0.05}$[3]	**0.3**	**0.6**	**2**	**0.2**	**2**	**0.3**	**0.3**	**0.3**	**1**	**0.8**	**0.003**	**255**	**51**

Boron Timing	% LSK	% FM	% Fancy	% Water	% ELK	% SS	% OK	% DK	% SMK	% Total Kernels	Support Price $/cwt	Yield[1] lb/A	Value $/A
None	1.0	2.0	88 a	7.3	44	2.6	2.9	1.8	63	70.7 b	17.17 b	4802 a	822 b
Planting	0.9	2.2	86 a	7.2	44	2.5	2.8	1.5	65	71.6 ab	17.50 ab	4977 a	871 ab
R2	0.9	2.2	87 a	7.2	44	2.7	2.8	1.4	65	71.5 ab	17.51 ab	5099 a	889 a
R6	0.8	2.3	87 a	7.3	45	2.5	2.9	1.6	64	71.4 ab	17.43 ab	4813 a	837 ab
Planting + R2	0.9	2.3	88 a	7.3	46	2.4	2.7	1.5	65	71.5 ab	17.51 ab	4922 a	859 ab
Planting + R6	1.0	2.1	88 a	7.2	45	2.7	2.5	1.5	65	71.8 a	17.63 a	5076 a	890 a
Mean	**0.9**	**2.2**	**87**	**7.3**	**45**	**2.6**	**2.8**	**1.6**	**65**	**71.4**	**17.46**	**4948**	**861**
$LSD_{0.05}$[3]	**0.3**	**0.7**	**3**	**0.2**	**2**	**0.4**	**0.4**	**0.4**	**1**	**1.0**	**0.004**	**317**	**63**

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Final Report

434/1348

2015

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Report : Boron Application Time and Rating for Improved Peanut Quality in Virginia

Authors: Maria Balota, Anna Benton, and Joseph Oakes

Technical Support: Doug Redd, Frank Bryant, Brenda Kennedy, Carolyn Daughtrey

Duration: 2015

Budget request: $ 11,701

Virginia Peanut Board
December 2, 2015
Suffolk, VA

PPWS
Plant Pathology Physiology and Weed Science

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RATIONALE

- Current B application in peanut production has been determined by research in 1970's with recommendations of 0.5 lb B/acre applied, pre-plant or with the first or second fungicide application, when soil B was below 0.4 lb B/acre. (*Perry, 1971, Hartzog and Adams, 1973*)
- 97% of producers in VA and NC apply B annually. (*Morgan, et al., 2014*)
- Peanut B sufficiency levels are 20 to 60 ppm; and B over 85 ppm can cause yield loss
- Outdated recommendations could lead to over- or under-application of B, and decrease yield and quality

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Objective

The objective of this project is to assess the effectiveness of boron application recommendations on current peanut production through tissue B content, NDVI, yield and grading factors, and germination of seed produced.

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Methods

Experiment Number	Test Name	Location	Replication Numbers	Plant Date
Exp. 1	Boron Application Rates and Times	TAREC Field 23	3	5-5-15
Exp. 1	Boron Application Rates and Times	TAREC Field 63A	3	5-5-15
Exp. 1	Boron Application Rates and Times	Lewiston, NC	4	5-7-15
Exp. 1	Boron Application Rates and Times	Rocky Mount, NC	3	5-14-15
Exp. 2	Cultivar Response to Boron Application	TAREC Field 27	3	5-13-15
Exp. 2	Cultivar Response to Boron Application	Sussex, VA	3	5-8-15
Exp. 2	Cultivar Response to Boron Application	Southampton, VA	3	5-18-15

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Experiment 1

Rate (lb B/ac)	Stage	Variety
0	Planting	Bailey
0.3	Planting	Bailey
0.5	Planting	Bailey
1	Planting	Bailey
0	R2	Bailey
0.3	R2	Bailey
0.5	R2	Bailey
1	R2	Bailey
0	R6	Bailey
0.3	R6	Bailey
0.5	R6	Bailey
1	R6	Bailey
0	Planting+R2	Bailey
0.3	Planting+R2	Bailey
0.5	Planting+R2	Bailey
1	Planting+R2	Bailey
0	Planting+R6	Bailey
0.3	Planting+R6	Bailey
0.5	Planting+R6	Bailey
1	Planting+R6	Bailey

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Experiment 2

Cultivar	Rate 1	Rate 2	Growth Stage
Bailey	0 lb B/ac	0.5 lb B/ac	R4
FL07	0 lb B/ac	0.5 lb B/ac	R4
Florunner	0 lb B/ac	0.5 lb B/ac	R4
GA06G	0 lb B/ac	0.5 lb B/ac	R4
GA13M	0 lb B/ac	0.5 lb B/ac	R4
07030-1-10-1	0 lb B/ac	0.5 lb B/ac	R4
Gregory	0 lb B/ac	0.5 lb B/ac	R4
NC-V11	0 lb B/ac	0.5 lb B/ac	R4
Sullivan	0 lb B/ac	0.5 lb B/ac	R4
TUFRun511	0 lb B/ac	0.5 lb B/ac	R4
VA98R	0 lb B/ac	0.5 lb B/ac	R4
Wynne	0 lb B/ac	0.5 lb B/ac	R4

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PRELIMINARY RESULTS (2014)

Adjusted yield (lb/acre) by application time for Spain and Bailey. Using Fisher's LSD

Application Time	Adjusted Yield
Split Early & mid bloom	5743.0 a
Early bloom	5723.9 a
Split Planting & mid bloom	5722.6 a
Mid bloom	5620.2 a
No Boron	5592.3 a
Split Plant & early bloom	5410.6 a

No significant differences between application times in yields or other grading factors.

Germination of Harvested Seed by Application Time

Application Time		Mean (%Germination)
Full Seed	A	82
Planting & Full Seed	A	81
Planting & Beginning Peg	A	80
Beginning Peg	A	77
No B Control	A	70

no significant differences in germination.
replication numbers, and control plot numbers were low.

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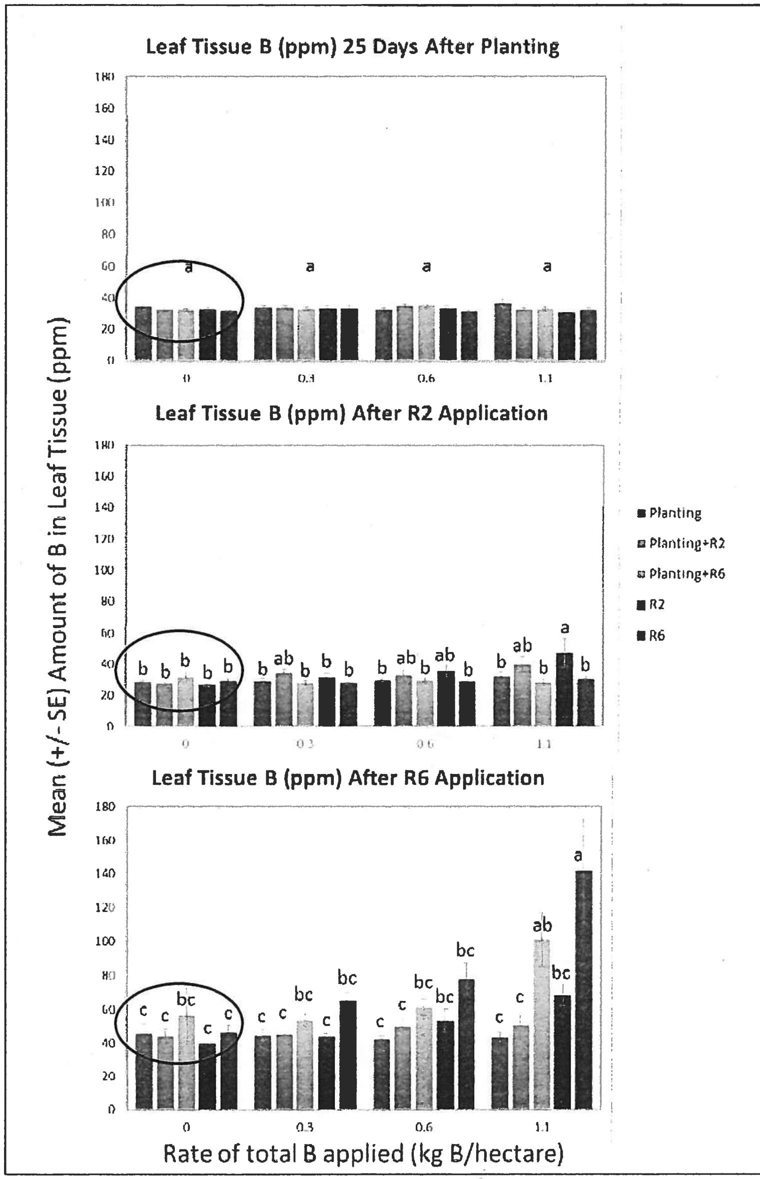
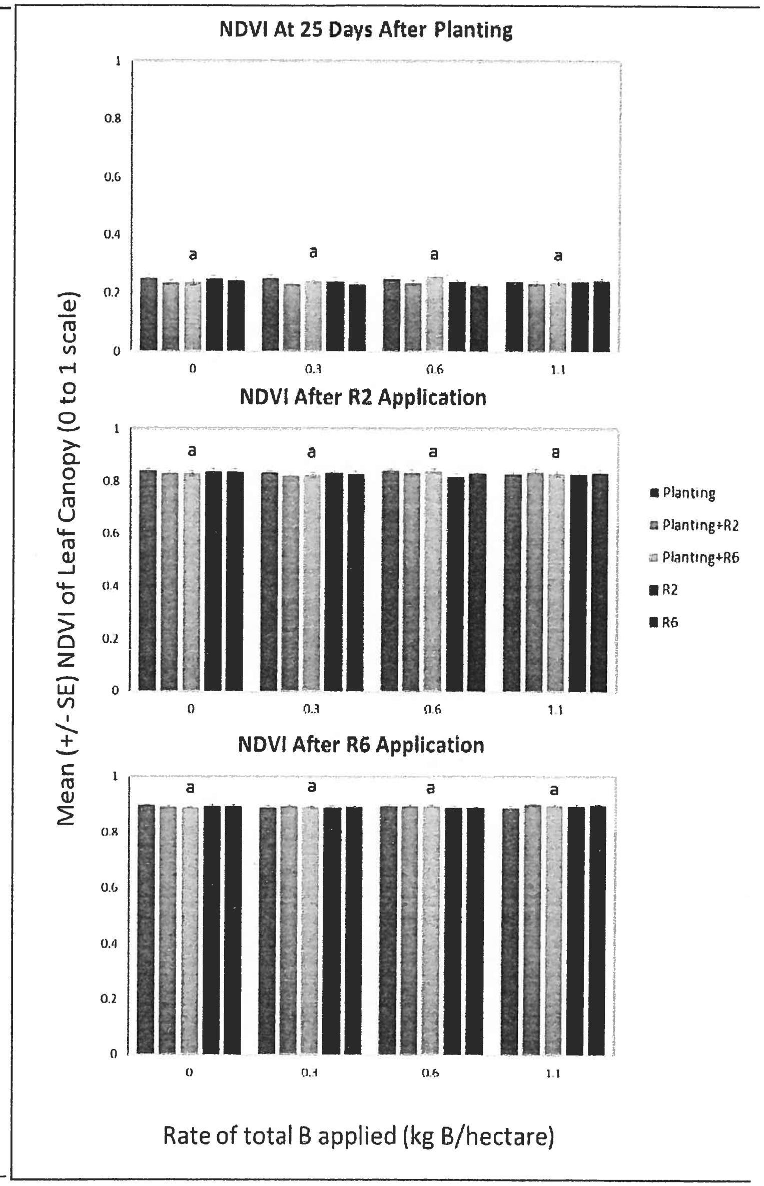
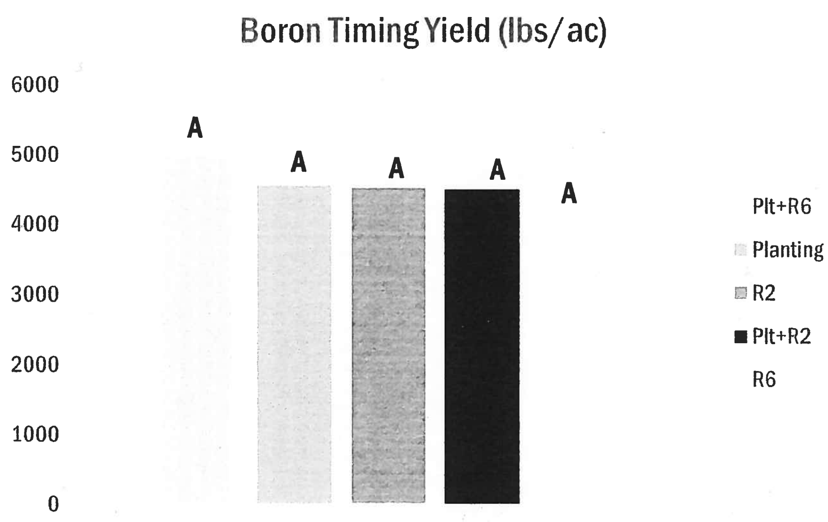
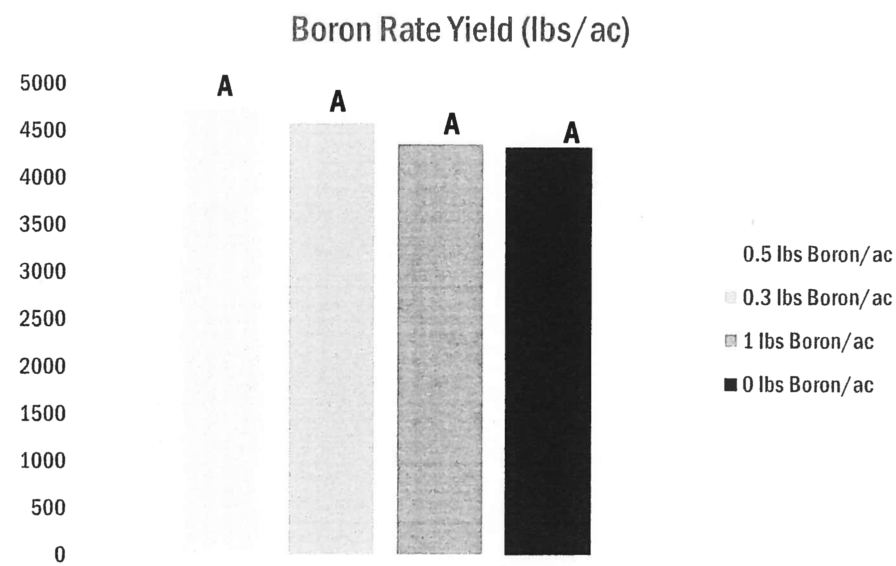
Results In 2015



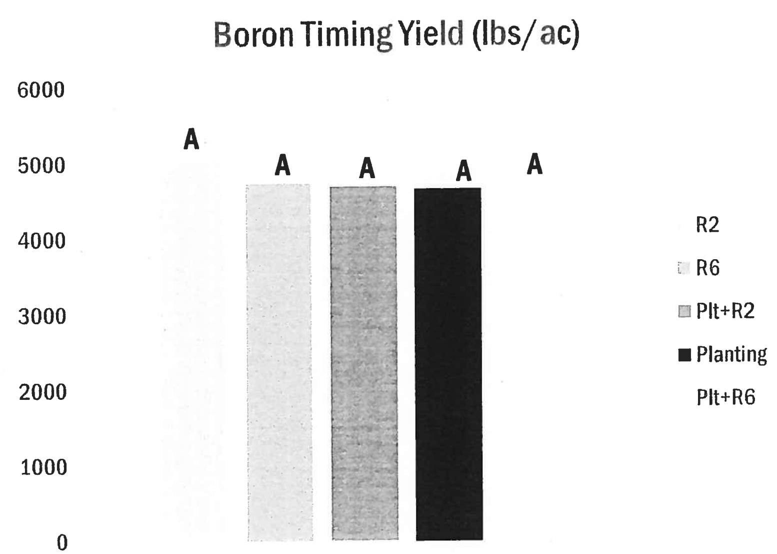


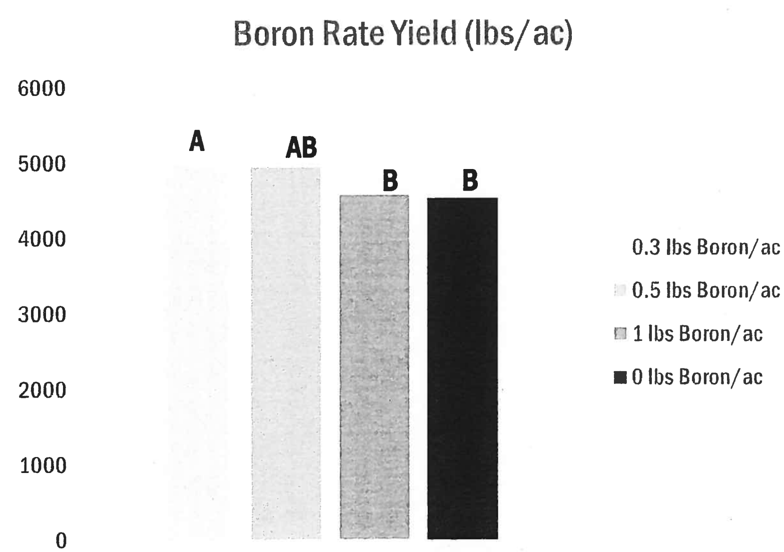
Sandy soil at Suffolk
Previous crop: cotton
Soil B: 0.1 ppm



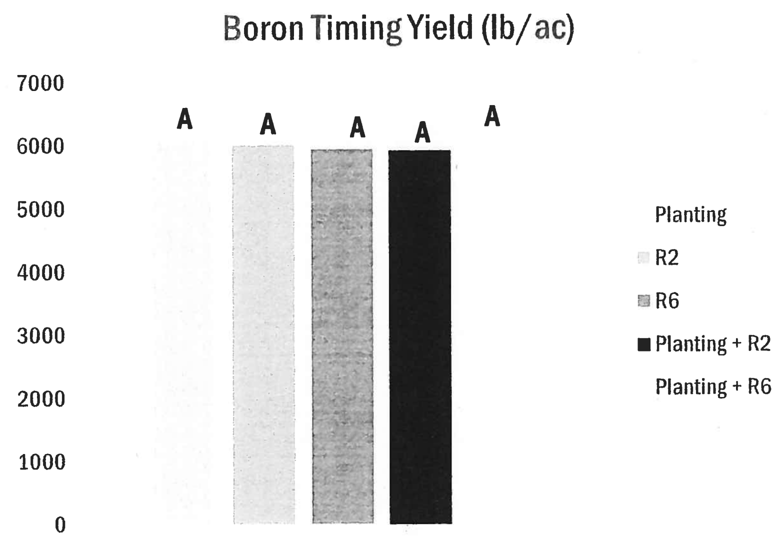


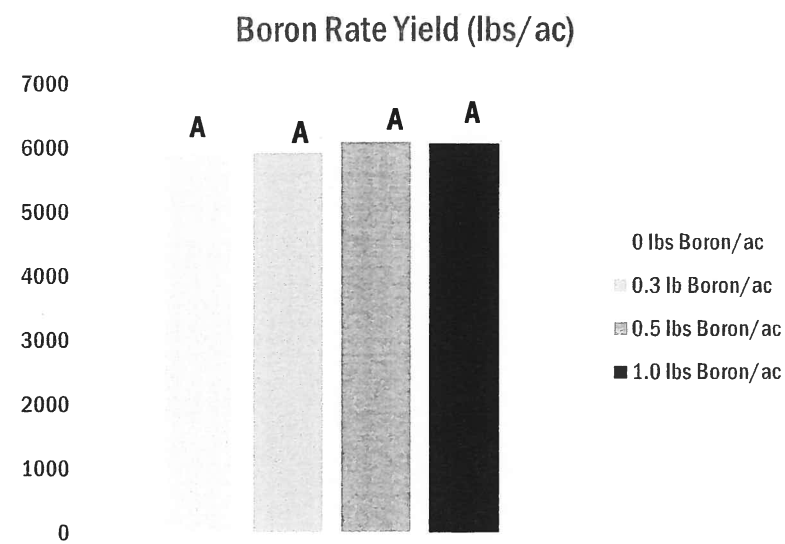
Heavier soil at Suffolk
Previous crop: corn
Soil B: 0.1 ppm





Sandy soil at Lewiston
Previous crop: corn
Soil B: 0.1 ppm





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Rocky Mount
Previous crop: cotton
Soil B: 0.3 ppm