

-----SUPPLEMENTAL MATERIAL-----

Early and Late Season Nutrient Stress Conditions: Impact on Cotton

Productivity and Quality

Solomon Amissah ¹, Michael Baidoo ², Benjamin K. Agyei ^{1,3}, Godfred Ankomah ¹, Roger A. Black ⁴, Calvin D. Perry ⁵, Stephanie Hollifield ⁶, Nana Yaw Kusi ⁷, Glendon H. Harris ¹ and Henry Y. Sintim ^{1,*}

¹ Department of Crop & Soil Sciences, University of Georgia, Tifton, GA 31793, USA

² Vision Research Park, United Agronomy, Berthold, ND 58718, USA

³ Department of Plant, Soil, and Microbial Sciences, Michigan State University, East Lansing, MI 48824, USA

⁴ Southeast Georgia Research and Education Center, University of Georgia, Midville, GA 30441, USA

⁵ The C. M. Stripling Irrigation Research Park, University of Georgia, Camilla, GA 31730, USA

⁶ Southwest District Extension, University of Georgia, Tifton, GA 31794, USA

⁷ Research and Extension, South Carolina State University, Orangeburg, SC 29117, USA

* Correspondence: hsintim@uga.edu

Table S1: Fertilizers applied as the main sources of the different nutrient elements in Camilla and Midville.

Nutrient	Camilla SSDI	Camilla overhead and Midville rainfed and overhead
N	Urea	Urea
P	Di-ammonium phosphate; Haifa MAP™	Di-ammonium phosphate
K	Potassium chloride; Potassium nitrate	Potassium chloride
Mg	Magnesium oxy-sulfate; Magnesium nitrate solution	Magnesium oxy-sulfate
Ca	Calcium chloride; Calcium sulfate; Calcium nitrate solution	Calcium chloride; Calcium sulfate
S	Potassium sulfate; Epsom; Ammonium thiosulfate solution	Potassium sulfate; Epsom
B	Fertilizer borate; Borosol® 10 solution	Fertilizer borate
Zn	Zinc oxysulfate; Zinc nitrate solution	Zinc oxysulfate
Mn	Manganese sucate; Manganese nitrate solution	Manganese sucate
Fe	Iron sucate; Iron nitrate solution	Iron sucate
Cu	Copper sulfate; Copper nitrate solution	Copper sulfate

Table S2: *P*-values of the main effects and interaction effects of nutrient stress and production conditions on the growth and productivity of cotton in Camilla and Midville.

Source	Lint yield	Gin turnout	Cottonseed yield	Seed cotton per boll	Plant height	Main stem nodes	Total bolls	Harvestable bolls
----- Camilla -----								
Nutrient stress (NS)	<0.001	<0.001	<0.001	0.002	0.010	0.014	0.068	0.694
Condition (C)	0.472	0.004	0.141	0.697	0.700	0.007	0.215	0.015
NS x C	0.001	0.401	0.001	0.003	0.198	0.034	0.004	0.030
----- Midville -----								
Nutrient stress (NS)	<0.001	0.858	<0.001	0.164	0.056	0.083	0.058	0.360
Condition (C)	0.358	0.229	0.322	0.430	0.677	0.523	0.401	0.541
NS x C	0.380	0.055	0.052	0.212	0.040	0.048	0.102	0.220

[†] Bold texts highlight significant effect terms ($P < 0.05$).

Table S3: *P*-values of the main effects and interaction effects of nutrient stress and growth stage on biomass accumulation of cotton in Camilla and Midville under different production conditions.

Source	----- Camilla -----			----- Midville -----		
	SSDI (2020)	SSDI (2021)	Overhead (2021)	Rainfed (2020)	Rainfed (2021)	Overhead (2021)
Nutrient stress (NS)	0.796	0.002	0.038	0.855	0.31	0.064
Growth stage (GS)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
NS x GS	0.646	0.014	0.097	0.965	0.048	0.042

[†] Bold texts highlight significant effect terms ($P < 0.05$). SSDI: Sub-surface drip irrigation.

Table S4: *P*-values of the main effects and interaction effects of nutrient stress and production conditions on the fiber quality of cotton in Camilla and Midville.

Source	Fiber length	Fiber strength	Uniformity	Micronaire	Rd	+b
----- Camilla -----						
Nutrient stress (NS)	<0.001[†]	0.032	0.006	0.001	0.244	0.033
Condition (C)	0.001	<0.001	0.059	0.005	0.748	0.819
NS x C	0.024	0.640	0.062	0.101	0.980	0.340
----- Midville -----						
Nutrient stress (NS)	0.513	0.879	0.320	0.298	0.445	0.411
Condition (C)	0.334	0.323	1.000	0.404	0.524	0.008
NS x C	0.038	0.200	0.135	0.054	0.397	0.003

[†] Bold texts highlight significant effect terms ($P < 0.05$).