PHYSIOLOGICAL AND MORPHOLOGICAL RESPONSES OF CORN RELATED TO UREA APPLICATION IN DIFFERENT GROWTH STAGES

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OBJECTIVES

Evaluating the response of corn to nitrogen fertilization and the correlation between physiological and morphological characteristics in relation to shoot dry biomass production.

MATERIAL AND METHODS

The experiment was conducted under field conditions, from 2011 to 2012, in Piracicaba/SP, Brazil, and the treatments were: topdressing with N-urea at different growth stages (V4, V6, V8, V10 and V12), including a control one. The following variables were analyzed: photosynthetic pigments (Chlorophyll Total (CT), Chlorophyll A (CA), Chlorophyll B (CB) and Carotenoids (CRT)); SPAD Index (SI); Leaf Area (LA) evaluated in V14 phenological stage; Plant Height (PH) and Shoot Dry Biomass (SDB) evaluated at flowering and during kernel dough stage, respectively. The experiment was carried out in randomized blocks with four replicates. The data were subjected to variance analysis using the F test ($p<0.05$), LSD test for mean comparison. Pearson correlation test was also performed to verify the possible correlation between variables.

RESULTS

Table 1 – Summary of the variance analysis using the F test for variables: Chlorophyll Total (CT), Chlorophyll A (CA), Chlorophyll B (CB), Carotenoids (CRT), SPAD Index (SI); Leaf Area (LA), Plant Height (PH) and Shoot Dry Biomass (SDB)

	Variables							
Factors	SPAD	CT	CA	CB	SDB	CRT	LA	PH
Blocks	0.96 ns	1.02 ns	1.30 ns	1.27 ns	0.56 ns	1.15 ns	2.83 ns	0.86 ns
Treat.	12.67*	0.75 ns	0.68 ns	1.20 ns	4.34*	0.70 ns	4.46*	3.64*
CV%	5.36	17.51	26.36	26.34	6.41	37.12	8.48	4.11

* Significant and ns not significant ($p<0.05$)

Table 2 – Pearson correlation coefficients among study variables: Chlorophyll Total (CT), Chlorophyll A (CA), Chlorophyll B (CB), Carotenoids (CRT), SPAD Index (SI); Leaf Area (LA), Plant Height (PH) and Shoot Dry Biomass (SDB)

	SI	CT	CA	CB	SDB	CRT	LA	PH
SI	-							
CT	0.33	-						
CA	0.37	0.59*	-					
CB	0.45*	0.61*	0.98*	-				
SDB	0.47*	0.74*	0.90*	0.90*	-			
CRT	0.64*	0.09	0.18	0.28	0.24	-		
LA	0.61*	0.33	0.46*	0.58*	0.54*	0.48*	-	
PH	0.67*	0.12	-0.004	0.06	0.59*	0.07	0.66*	-

* Significant correlations ($p < 0.05$)

CONCLUSIONS

- SPAD, LA and PH variables were important to estimate the efficiency of fertilizer N and Shoot Dry Matter.

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