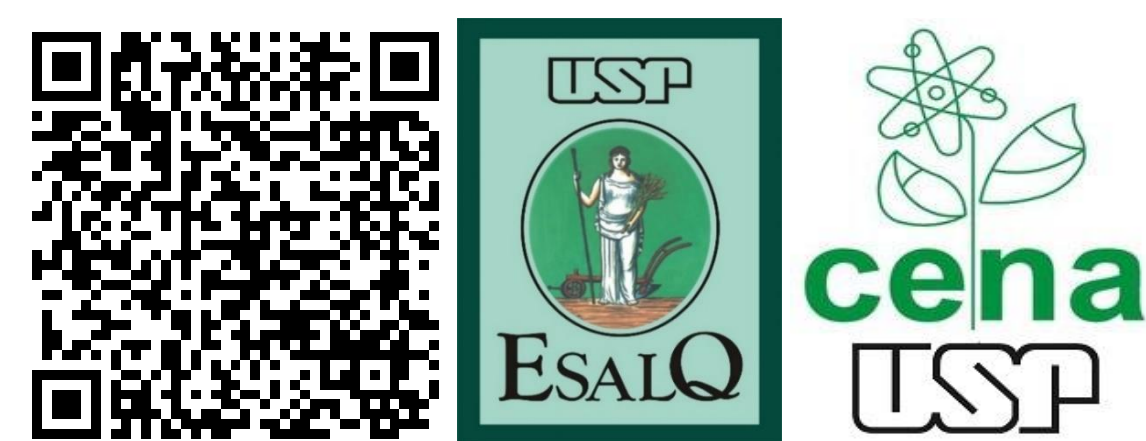


Can pre-plant polymer-sulphur coated urea replace the need of split N application?

H.A. González^{1,2}, D.A. Ruiz Diaz¹ and P.C.O. Trivelin²

¹Kansas State University, Manhattan, KS; ²University of São Paulo, Piracicaba, SP.

hugoabelardo1988@ksu.edu



INTRODUCTION

Soil surface applied urea is susceptible to nitrogen (N) losses. Split N application and use of slow release fertilizers are recommended practices to improve nitrogen use efficiency (NUE).

OBJECTIVE

To evaluate the effect of N fertilizer management as application time (at planting and split N application) and source (polymer-sulphur coated urea (PSCU) and non-coated urea (NCU)) on corn biomass production, nitrogen uptake and grain yield.

METHODS

An experiment was performed at two locations in the 2014-2015 growing season at Severinia (SEV 2015) and Iracemapolis (IRA 2015), and in the 2015-2016 growing season at Altair (ALT 2016) and Iracemapolis (IRA 2016), in the state of Sao Paulo, Brazil.

Treatments included: (1) pre-plant blend of PSCU and NCU (PSCU+NCU) at a 70:30 ratio; (2) pre-plant NCU (NCU-P); (3) split applied NCU (NCU-SA) (30% pre-plant and 70% side-dress applied at V4), and (4) a control with no fertilizer N. Application rate was 180 kg N ha⁻¹.



Corn after sugarcane

- SEV 2015
- ALT 2016
<20% clay content
<16 g dm⁻³ M.O.



Corn after black oat

- IRA 2015
- IRA 2016
>55% clay content
>25 g dm⁻³ M.O.

RESULTS AND DISCUSSION

Table 1. Probability values from the analysis of variance for corn biomass production (BP), nitrogen uptake (NU) and grain yield (GY) as affected by nitrogen fertilizer management

Main effect	BP	NU	GY
	-----P>F-----		
SEV 2015	0.007	0.002	<.001
IRA 2015	<.001	0.001	0.001
ALT 2016	0.007	<.001	0.001
IRA 2016	0.050	0.041	0.003
Across locations	<.001	<.001	<.001

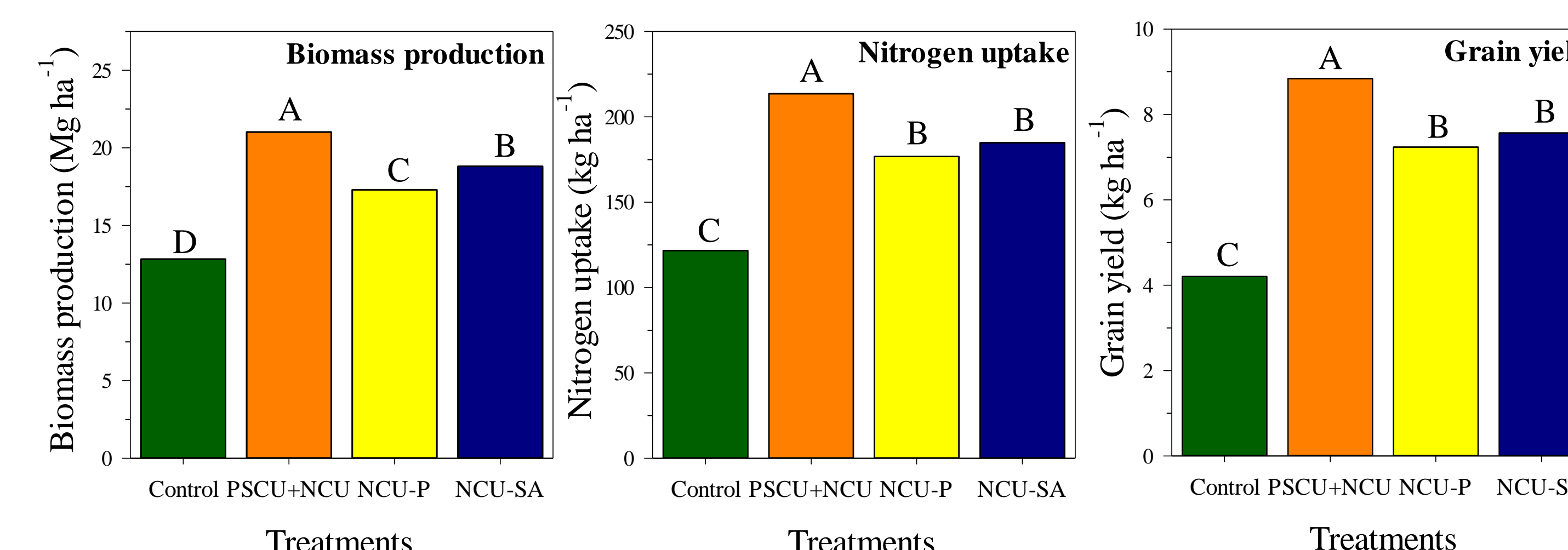


Figure 2. Corn biomass production (BP), nitrogen uptake (NU) and grain yield (GY) as affected by nitrogen fertilizer management across four locations. Mean comparison with different letters are significantly different at the 0.1 probability level.

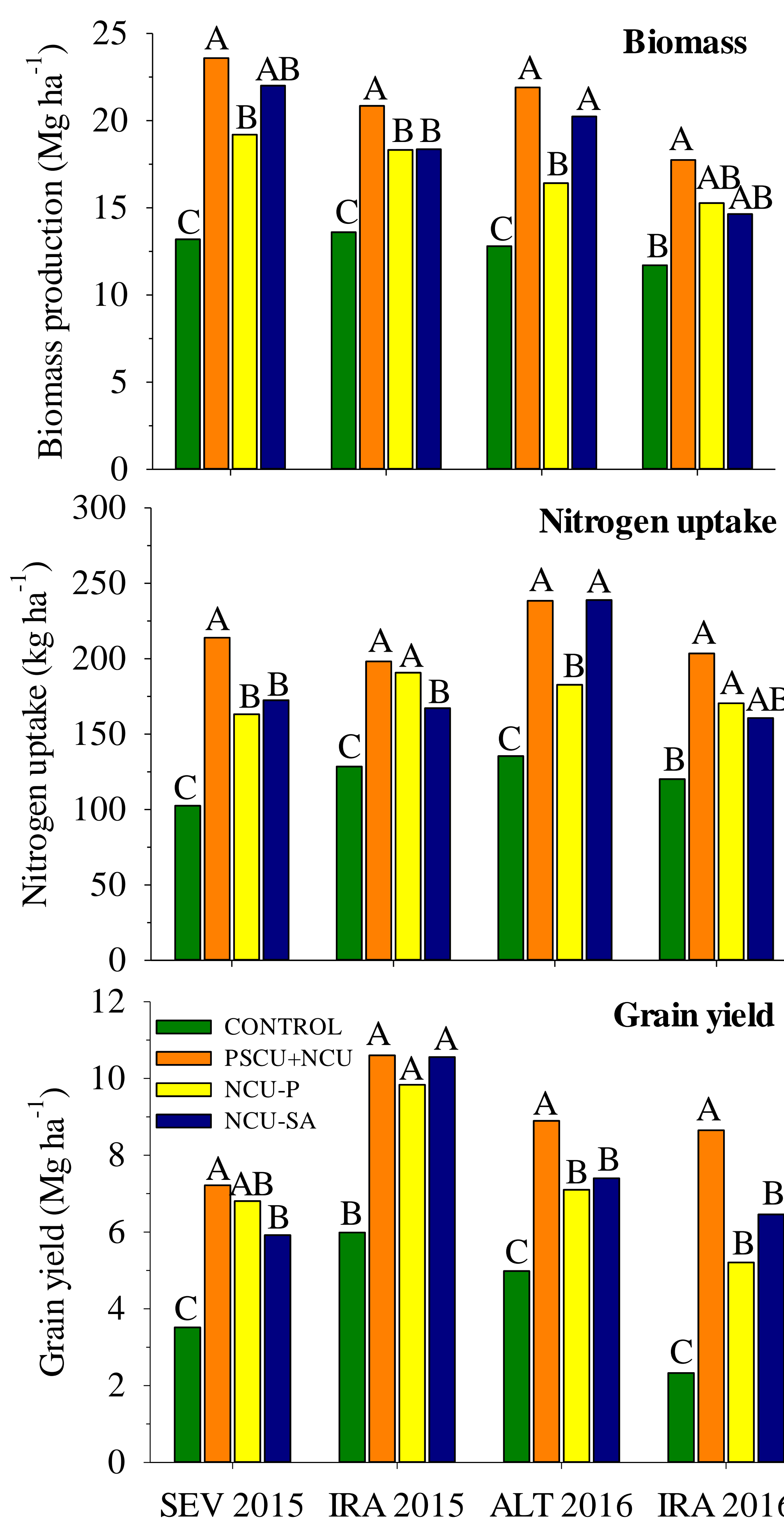


Figure 1. Corn biomass production, nitrogen uptake and grain yield as affected by nitrogen fertilizer management at four locations. Mean comparison with different letters are significantly different at the 0.1 probability level.

- All locations were responsive to N application.
- Split N application (NCU) presented no advantage over pre-plant NCU application, and presented disadvantage when compared to pre-plant PSCU+NCU.
- Across locations analysis showed that NCU-P promoted lower biomass production but equivalent N uptake and grain yield than NCU-SA.
- Pre-plant PSCU+NCU was the best N management for all variables. Since corn performed better with the use of the pre-plant slow release N, recommendation for adoption will depend on further research and economic analysis.

SUMMARY

- Pre-plant PSCU+NCU promoted greater corn biomass production, nitrogen uptake and grain yield. Applying pre-plant NCU can be equivalent to split NCU application.

ACKNOWLEDGMENT

