

NO-TILLAGE OF BROCCOLI ON DIFFERENT CROP RESIDUES AND NITROGEN FERTILIZATION IN CERRADO

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INTRODUCTION

The no-tillage of vegetables can reduce the dependence on mineral fertilizers used in these crops, due to the cycling of macro and micronutrients contained in the plant residues of the different cover plants used, which are deposited on the soil after each cultivation cycle (Miranda et al., 2020).

OBJECTIVE

The objective of this study was to evaluate the effects of plant residue decomposition and the cycling of macro and micronutrients of four cover crops preceding the broccoli production (Avenger hybrid).

MATERIAL AND METHODS

The study was conducted in IFTM, Uberaba, MG, Brazil.

- Soil in the area was classified as medium-texture, Oxisol.
- The experiment was conducted in factorial scheme 4x3, being four cover crops: Signal grass (SG), Pearl millet (PM), Sunn hemp (SH) and PM+SH), and three mineral fertilizer doses (0, 50 and 100% of the recommended fertilizer dose: 400, 100 and 150 kg ha⁻¹ of P₂O₅, K₂O and N.
- Fresh (FB) and dry biomass (DB), residue decomposition, nutrient cycling of cover crops and broccoli yield were evaluated. The data were submitted to analysis of variance using the F-test, and the means compared with the Scott-Knott test at 5% probability.

RESULTS

The FB production from PM (25.9 t ha⁻¹), SG (23.3 t ha⁻¹) and PM+SH (23.9 t ha⁻¹) were similar, while the largest production of DB occurred in the SG (11.9 t ha⁻¹). The lowest rate of decomposition and the greatest half-life time of residues occurred where PM was present (Fig. 1). The accumulation and nutrient cycling follow the sequence K>N>Ca>Mg>P>S and Mn>Zn>B>Cu for all cover crop treatments evaluated.

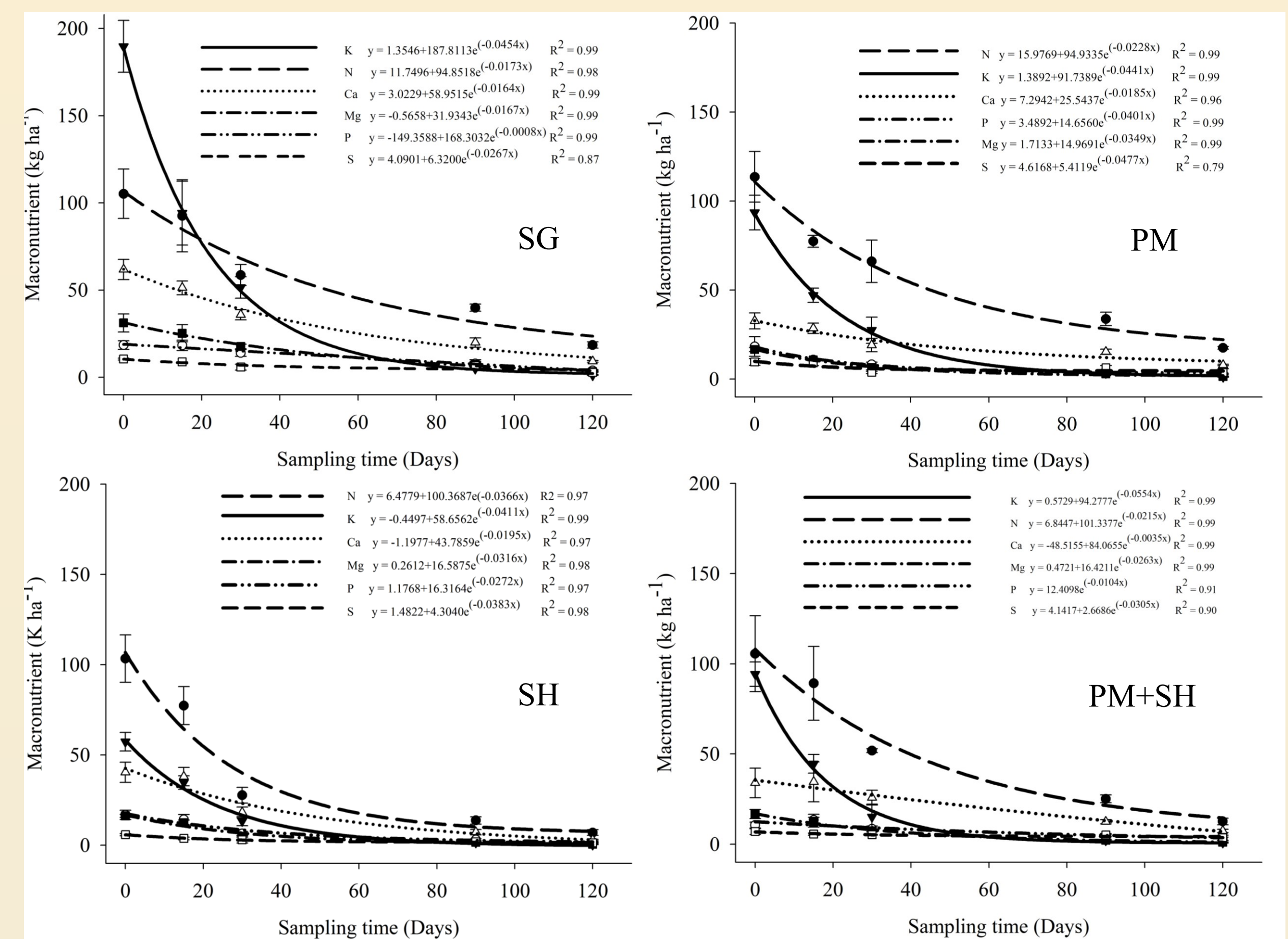


Figure 2. Macronutrients released during the decomposition process of signal grass (SG), pearl millet (PM), sunn hemp (SH) and PM+SH plant residues, in irrigated area. 2015/16. Uberaba, instituição responsável. R² = coefficient of determination.

The highest values of broccoli yield (25.3; 24.9 and 24.7 t ha⁻¹) was observed in the 100% dose of mineral fertilizer and on the residues of SH or PM+SH mixture, respectively (Table 1).

Table 1. Agronomic evaluations of broccoli cultivated on cover crop residues and fertilizer doses, in irrigated area. 2015/16.

Factor levels	NL	PH	SD	HD	FB	DB	Prod
	--	cm	----- mm	-----	----- kg	-----	t ha ⁻¹
Cover crops (CC)							
Signal grass (SG)	31	16.0	45.90 b	175.73	0.82 b	0.06	20.5 b
Sunn hemp (C)	32	15.2	50.67 a	183.48	0.97 a	0.07	24.7 a
Pear millet (PM)	31	14.8	46.70 b	171.89	0.81 b	0.06	21.4 b
PM+SH	33	16.2	51.44 a	187.41	1.00 a	0.07	24.9 a
F test	0.32 ^{ns}	1.85 ^{ns}	2.88*	1.85 ^{ns}	2.74*	1.65 ^{ns}	3.14*
Fertilizer doses (FD)							
0%	31 b	15.9	45.21 b	169.44 b	0.79 b	0.05 b	20.5 b
50%	31 b	15.4	48.86 a	181.46 a	0.90 b	0.07 a	22.8 b
100%	33 a	16.2	51.95 a	187.97 a	1.01 a	0.08 a	25.3 a
F test	0.03*	1.88 ^{ns}	5.65*	4.35*	4.61*	5.02*	4.48*
Interaction CC x FD							
F test	0.72 ^{ns}	0.27 ^{ns}	0.34 ^{ns}	0.59 ^{ns}	0.20 ^{ns}	0.85 ^{ns}	.36 ^{ns}
CV (%)	6.91	8.91	10.11	8.69	11.06	12.28	9.44

^{ns} = not significant (p>0.05). * = significant differences (p<0.05). Averages followed by the same letter do not differ by the Scott-Knott test (p<0.05). NL = number of leaves; PH = plant height; SD = stem diameter; HD = head diameter; FB = fresh biomass; DB = dry biomass;

CONCLUSION

The greatest broccoli production occurs with 100% of the mineral fertilizer dose where SH, alone or mixed with PM, was cultivated preceding the crop.