

# VARIABILITY AMONG COMMON BEAN GENOTYPES ON MOLYBDENUM CONCENTRATION AND CONTENT IN SEED

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## INTRODUCTION

At Zona da Mata region of the Minas Gerais State, Brazil, application of molybdenum (Mo) on foliage has been used instead of nitrogen (N) as topdressing to achieve common bean yield as high as 3000 kg ha<sup>-1</sup> (Amane et al., 1999; Vieira et al., 2005). The recommended rate of Mo for foliar application in this region is between 70 and 100 g ha<sup>-1</sup> (Amane et al., 1999). However, for significantly improvement of Mo content in seed, rates of Mo applied on foliage should be over 500 g ha<sup>-1</sup> (Vieira et al., 2005). The objective with this research was to evaluate accumulation Mo in seed of common bean genotypes in response to Mo applied as solution on foliage.

## MATERIALS AND METHODS

Two trials were conducted, one during summer-fall season (soil pH in H<sub>2</sub>O = 4.8) and other during winter-spring season (pH = 5.2), in Coimbra, at Zona da Mata region, in a Mo-deficient Alfissol. Twelve genotypes (Table 1) were sprayed with both 300 g ha<sup>-1</sup> of Mo at pre-flowering stage and 300 g ha<sup>-1</sup> of Mo at pod development stage. Fifteen seeds per meter were sown in rows 0.5 m apart. Plants received a basal fertilization of 28 kg N ha<sup>-1</sup>, 43 kg P ha<sup>-1</sup>, and 46 kg K ha<sup>-1</sup>. Urea was applied as topdressing 10 or 16 DAE at 100 kg ha<sup>-1</sup>. Applications of Mo were done with a hand-held CO<sub>2</sub> sprayer delivering 450 L ha<sup>-1</sup>. An overhead sprinkler irrigation was used. Treatments were replicated six times in a randomized complete block design. Each plot had one 2 m-long row.

## RESULTS AND DISCUSSION

Yields were high in both years (Tables 1 and 2). There was no difference among genotypes in Mo concentration in seed, but Mo content in seed varied from 1.47 (Table 2) to 4.28 µg Mo seed<sup>-1</sup> (Table 1) owing to differences in seed weight. Mo content in seed of cv. Pérola obtained by Vieira et al. (2005), also in Coimbra, raised from plants sprayed with 720 g ha<sup>-1</sup> of Mo was lower (0.74 µg Mo seed<sup>-1</sup>) than Mo contents in seed verified in this study with 600 g ha<sup>-1</sup>.

## ACKNOWLEDGEMENTS

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## REFERENCES

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**Table 1** – Mean results of summer-fall season trial.

Genotype <sup>1</sup>	Yield (kg ha <sup>-1</sup> )	100-seed weight (g)	Mo in seed (µg g <sup>-1</sup> )	Mo content <sup>2</sup> (µg seed <sup>-1</sup> )
Ouro Negro	4279 a <sup>3</sup>	28.3 d	7.38 a	2.09 c
VC-3	4073 a	25.8 e	8.05 a	2.07 c
Pérola	3698 b	26.7 d	7.83 a	2.09 c
Ouro Vermelho	3636 b	28.7 c	8.27 a	2.37 b
Majestoso	3415 b	27.7 d	7.92 a	2.19 b
Talismã	3371 b	27.9 d	8.52 a	2.38 b
VC-8	3305 b	29.9 c	8.02 a	2.40 b
Pioneiro	3228 b	21.8 g	8.30 a	1.81 c
Carnaval MG	2903 c	54.4 a	7.88 a	4.28 a
Jalo MG-65	2858 c	48.0 b	8.40 a	4.03 a
Valente	2751 c	23.6 e	7.43 a	1.73 c
Horizonte	2254 c	24.7 e	7.83 a	1.94 c
CV (%)	17.1	4.9	10.9	11.4

<sup>1</sup>VC-3, Pérola, Majestoso, Talismã, VC-8, Pioneiro, and Horizonte are carioca beans; Ouro Negro and Valente are black beans; Carnaval MG is a cranberry bean; Ouro Vermelho is a red bean; and Jalo MG 65 is a yellow bean. Genotypes were sprayed with 600 g ha<sup>-1</sup> of Mo.

<sup>2</sup>Dry seed weight of each plot was used in the calculation of Mo content in seed.

<sup>3</sup>Treatments followed by different letters come from different groups ( $P \leq 0.05$ ) according to the Scott-Knott cluster analysis method.

**Table 2** – Mean results of winter-spring season trial.

Genotype	Yield (kg ha <sup>-1</sup> )	100-seed weight (g)	Mo in seed (µg g <sup>-1</sup> )	Mo content (µg seed <sup>-1</sup> )
Ouro Negro	3689 a	28.0 c	7.37 a	1.89 b
VC-3	3625 a	24.2 d	8.37 a	1.89 b
VC-8	3536 a	28.1 c	7.84 a	2.00 b
Ouro Vermelho	3451 a	23.7 d	8.04 a	1.72 c
Pioneiro	3167 a	20.2 e	7.91 a	1.47 c
Pérola	3039 a	26.1 c	7.59 a	1.82 b
Valente	2700 b	22.3 e	7.17 a	1.47 c
Talismã	2628 b	24.7 d	8.20 a	1.85 b
Horizonte	2528 b	24.2 d	7.78 a	1.71 c
Majestoso	2428 b	25.0 d	7.88 a	1.79 b
Carnaval MG	2038 c	41.3 a	7.72 a	2.97 a
Jalo MG-65	1922 c	30.5 b	7.82 a	2.16 b
CV (%)	16.3	9.6	7.9	12.6

See Table 1.