The use of multivariate analysis in tropical grass and legume seed production in Cuban regions

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Introduction Seed production is an important activity in developing countries where pastures are the main source for animal feeding (Febles *et al*. 2003). Another outstanding aspect is the mathematical analysis used when a large number of species, varieties and ecotypes are used in the same study. The objective of this paper was to examine the use of multivariate analysis in studies on the effects of edaphoclimatic factors on seed production from tropical grasses and legumes.

Materials and methods Six grasses and legumes were sown in six Cuban provinces without fertilisation and irrigation. Seed yields were measured together with the range of climatic and edaphic factors listed in Table 1 and the data analysed by the principal component method

Results Table 1 shows the effects of the edaphoclimatic factors on seed yields. Amongst the species effects were greatest for *Brachiaria decumbens* and least for *Neonotonia wightii* (data not shown). The complete data set demonstrates that the lowest yield for legumes was *Pueraria phaseoloides* in Camagüey province (40.6 kg/ha) and the highest for *Leucaena. leucocephala* in Guantánamo province (170 kg/ha). For the herbaceous legumes, the highest value was for *Macroptilium atropurpureum* in Guantánamo and the lowest for *Teramnus labialis* in S. Spíritus .

Table 1 Most preponderant values in edaphoclimatic variables with coefficients above 0.70 and their main components

	Species			
Climatic	*P. phaseoloides*	*L. leucocephala*	*B. brizantha*	*P. maximum*
Mean temperature	-	1 (.74)	1 (-.71)	1 (.78)
Minimum temperature	-	-	1 (-.76)	1 (-.82)
Maximum temperature	-	-	1 (-.77)	-
Rainy season	-	-	1 (.88)	3 (.71)
Dry season	3 (-.73)	-	3 (.90)	3 (.71)
Relative humidity	1 (-.72)	-	1 (.73)	1 (.81)
Total rainfall	-	1 (-.79)	1 (.81)	1 (-.77)
Light hours	2 (-.69)	-	4 (.82)	2 (.84)
Soil physics				
Dryness	1 (-.92)	1 (-.86)	2 (.80)	2 (.84)
Effective depth	2 (-.69)	2 (-.91)	1 (.96)	-
Pedregosity	-	-	-	-
Soil chemistry				
K	1 (.76)	-	1 (.96)	1 (.98)
Organic matter	1 (.83)	1 (.88)	1 (.83)	1 (.72)
pH	1 (.79)	1 (.73)	1 (.97)	1 (.88)
P	1 (.88)	2 (.85)	2 (-.86)	1 (.98)

() values between parenthesis represent most preponderant values

Conclusions The relationships obtained demonstrate the large effects of edaphoclimatic factors on seed production and the value of multivariate analysis in both understanding factors determining seed yield and the identification of appropriate sites for production of seed of particular species. Most of the principal components had positions 1 and 2 in the analysis.

Reference

Febles, G., V. Torres, T.E. Ruiz, L. Martínez, H. Díaz and A. Noda (2003). The use of multivariate analysis to evaluate the production of seeds in accessions of Leucaena leucocephala in Cuba. *Cuban Journal of Agricultural Science*, 37, 299-304.