

## References

1. El-Beltagy, A.S. and M.S. Hall. 1975. Studies on endogenous levels of ethylene and auxin in Vicia faba L. during growth and development. *New Phytol.* 75:215-224.
2. Izquierdo, J.A., G.L. Hosfield, M.W. Adams and M.A. Uebersax. 1980. C-assimilate partitioning relationship to reproductive abscission and yield of dry beans (Phaseolus vulgaris L). Biennial Conf. Bean Improv. Coop. and Nat. Dry Bean Council Proc., Madison, Wisc., Nov 7-9, 1979.

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### CORRELATION OF SOME PARAMETERS AND GROWTH FACTORS WITH THE YIELD OF DRY MATTER ON BEAN PLANT (Phaseolus vulgaris L.)

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The growth parameter generally used to select varieties to Al and Mn tolerance is TDW. Measurements of TDW are laborious and time-consuming especially when a large number of cultivars are handled. Therefore, the search for another less laborious and time-consuming parameter of analysis having good correlation with TDW is necessary.

The objective of this study was to determine growth factor or parameter which can substitute TDW in evaluating cultivars sensitivity to Al/or Mn.

Three bean cultivars were selected from a previous experiment for their reaction to Al/or Mn. They are 'Rio Tibagi' - sensitive to aluminium, 'Mulatinho Paulista' - tolerant to aluminium, and 'Goiano Precoce' - sensitive to manganese. Growth parameter and nutrient data were collected:

RL - root length (cm)  
PH - plant height (cm)  
RDW - root dry weight (g)  
SDW - shoot dry weight (g)  
TDW - total dry weight (g)  
 $\bar{X}$  - average of parameters and growth factors  
PR - phosphorus on the roots (%)  
PS - phosphorus on the shoots (%)  
MnR - manganese on the roots (ppm)  
MnS - manganese on the shoot (ppm)

and all possible correlations calculated (Table 1 and 3).

SDW can be considered a better growth parameter for differentiation of varieties with respect to both Al and Mn effect than PH, RDW and TDW. SDW presented the best correlation coefficient with TDW and is easily determined.

Apparently SDW meets these requirements needed and the correlations

obtained were constant for the three varieties tested. These facts make it possible to recommend SDW as a reliable parameter to estimate TDW.

Table 1. Correlation between parameters and growth factors of 'Rio Tibagi'.

	RL	PR	PS	PH	RDW	SDW	TDW	$\bar{X}$
RL	-	-0.42*	0.18	0.94**	0.40*	0.23	0.31	0.41
PR	-	-	0.04	-0.53**	-0.30	-0.52**	-0.58**	0.40
PS			-	0.16	-0.15	-0.44*	-0.37	0.22
PH				-	0.38	0.31	0.37	0.44
RDW					-	0.61**	0.75**	0.43
SDW						-	0.96**	0.51
TDW							-	0.55

Table 2. Correlation between parameters and growth factors of 'Mulatinho Paulista'.

	RL	PR	PS	PH	RDW	SDW	TDW	$\bar{X}$
RL	-	-0.39	-0.45*	0.99**	0.75**	0.39	0.52**	0.58
PR		-	0.26	-0.39	-0.22	-0.30	-0.32	0.32
PS			-	-0.44	-0.58**	-0.44*	-0.52**	0.45
PH				-	0.76**	0.39	0.53**	0.58
RDW					-	0.55**	0.73**	0.60
SDW						-	0.97**	0.51
TDW							-	0.60

Table 3. Correlation between parameters and growth factors of 'Goiano Precoce'.

	RL	MnR	MnS	PH	RDW	SDW	TDW	$\bar{X}$
RL	-	-0.07	-0.08	0.97**	0.16	0.13	0.31	0.29
MnR		-	0.78**	-0.11	-0.39	-0.31	-0.44*	0.35
MnS			-	-0.10	-0.07	-0.42*	-0.48*	0.32
PH				-	0.27	0.09	0.13	0.28
RDW					-	0.70**	0.23	0.30
SDW						-	0.98**	0.44
TDW							-	0.43