

PHENOTYPICAL CORRELATIONS BETWEEN AGRONOMICAL CHARACTERS IN TYPE PRATA BANANAS AND ITS IMPLICATIONS ON YIELD ESTIMATE

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SUMMARY

This work aimed to evaluate correlations between agronomic characters and production in Prata-type banana trees, in a way to contribute in the confection of models for harvest estimation. Vegetative and yield characters of 98 plants of 'Dwarf-Prata' and 96 plants of 'BRS Platina', considered as replicates and randomly sampled, were evaluated. The highest correlation coefficient between yield and vegetative characteristics, for 'Dwarf-Prata' and 'BRS Platina', was associated to the pseudostem perimeter at soil level, indicating higher potential to compose harvest estimate. The correlations between the masses of the bunch and hands with yield characters, for both genotypes, showed higher potential for predicting the number of hands and fruits. Appropriate correlation estimates are associated with the fourth and fifth bunch, for 'Dwarf-Prata' and 'BRS Platina', respectively, using the mass of the fruit in the external row.

Key words: phenotypic descriptors, statistics, associations, genotypes.

INTRODUCTION

Estimates of phenotypic correlations involving banana production, yield components and other important characters can be found in several articles (1). However, for the same character, it can be identified a positive, negative or null value estimate. This can be explained by the fact that these correlations have been estimated in different genotypes and environments with the use of different methods. In view of this, if possible, new correlations must be estimated to assist the conduction a breeding program. Moreover, the correlation study may be used to provide values related to the harvest and using variables that are significant and highly associated with production. This justifies the importance of identifying variables highly associated with productivity for use in mathematical modeling to estimate the harvest, based on agronomic traits measured throughout the crop cycle. In this sense, various statistical studies linear and nonlinear models, are developed with the purpose of obtaining further information and describe plant growth over time (2) based on the analysis of the correlation coefficients between the variables of the plant. This study aimed to estimate the correlations between agronomic characters and yield in type Prata banana trees, so that it can contribute to the production of models to estimate the harvest.

MATERIAL AND METHODS

The experiment was conducted in the Federal Institute of Bahia at the Guanambi Campus, Bahia. The vegetative phenotypic descriptors were measured: plant height, pseudostem diameters at ground level, at 30 cm and at 100 cm in height, number of green leaves; and of bunch yield: bunch mass; number of hands and fruits per bunch, mass of the bunches, mass, length and diameter of the peduncle; and of the hands yield: mass of the central fruit of the external row from the first to the tenth bunch. For each evaluated genotype, Dwarf-Silver and BRS Platina, phenotypic correlations were estimated regarding associations between the masses of the bunch and hands with evaluated yield and vegetative characteristics, based on the Pearson correlation (3).

RESULTS AND DISCUSSION

From the analysis of the association between yield characters, masses of bunch and hands and the vegetative characteristic pseudostem perimeter evaluated at ground level, at 30 cm and at 100 cm from the ground, satisfactory correlation estimates were observed. However, the association with the perimeter of the pseudostem at ground level expressed better response, which suggests it can be used as an effective prediction variable (Table 1). Additionally, to compose prediction equations, the variables should be easy to measure and have easy practical application, as well as

allow determining in advance the phenomenon wished to be predicted about 120-150 days before harvesting Prata type bananas (1). The correlations between bunch mass and number of hands were significant and positive, being the highest correlation coefficient associated with the genitor 'Dwarf-Prata' (0.70), while the 'BRS Platina' hybrid presented immediately lower correlation coefficient (0.60) for the same variables (Table 2). According to (1), for the evaluated genotypes, this association was stable, positive and of high magnitude. Furthermore, it is noteworthy that the variable number of hands has a discrete quantitative nature, being easy to apply in practice and obtained at the stage of flowering, much prior to bunch harvesting of 'Dwarf-Prata' and 'BRS Platina' as previously mentioned, about 120 to 150 days, and that allied to the technique of hand marking by age as a criterion for harvesting (6), allows to predict time and quantity of harvest with greater precision, which qualifies it for use in a harvest prediction model. Significant and positive correlations were found between the bunch mass and the masses of hands from the first to the tenth hand, for both genotypes. The highest correlation coefficients for both the mass of the bunch and for the mass of the hands were observed in association with the mass of the fifth hand for the Dwarf-Prata (0.88**), and with the mass of the fourth hand for BRS Platina (0.85**). Therefore, the characteristics of these hands have the potential to compose models to predict harvest.

Table 1. Coefficients of phenotypic correlations between masses of bunch and hands, related to the vegetative characteristics in type Prata banana trees, 'Dwarf-Prata' and 'BRS Platina'

Vegetative Characteristics	Genotypes		Genotypes	
	Dwarf-Prata	'BRS Platina'	'Dwarf-Prata'	'BRS Platina'
	Bunch mass		Hands mass	
Plant height	0,63**	0,49**	0,63**	0,47**
Pseudst. ground level	0,75**	0,75**	0,75**	0,73**
Pseudostem 30 cm	0,69**	0,64**	0,68**	0,63**
Pseudostem 100 cm	0,68**	0,74**	0,67**	0,72**

**Significant at 1% significance level.

Table 2. Coefficients of phenotypic correlations between the bunch mass and other yield characteristics in type Prata banana trees, 'Dwarf-Prata' and 'BRS Platina'

Bunch yield characteristics	Genotypes	
	Dwarf-Prata	BRS Platina
Hands mass	0,99**	0,99**
Peduncle mass	0,82**	0,71**
Peduncle length	0,35**	0,08 ^{ns}
Peduncle diameter	0,69**	0,68**
Number of hands	0,70**	0,60**
Number of fruits	0,74**	0,74**
Average hands mass	0,86**	0,89**

** and ns Significant at 1% significance and not significant, respectively.

CONCLUSIONS

The highest correlation coefficient between yield and vegetative characteristics for 'Dwarf-Prata' and 'BRS Platina', was the pseudostem perimeter at ground level, which suggests greater potential to compose harvest estimation. The correlations between the masses of the bunch and hands with yield characters for both genotypes showed greater potential for predicting the number of hands and fruits. Adequate correlation estimates are associated with the fourth and fifth hand for 'Dwarf-Prata' and 'BRS Platina', respectively, using the mass of the central fruit on the external row.

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