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## INTRODUCTION

The breeding values, genotypic and phenotypic variances, heritability and the correlation coefficients of the agronomic traits are some of the key parameters, which determine the efficiency of a breeding program.

The phenotypic correlation is important because it shows how selection for one trait influences the expression of other traits.

## OBJECTIVE

Obtain the genetic parameters estimated among the traits including the genotypic variances, phenotypic variances, genotype by environment variances, heritability and correlation coefficients, aiming to improve selection for important agronomic traits.

## MATERIAL AND METHODS

- 24 Burley tobacco hybrids developed by Alliance One International;
- 5 commercial checks: DBH 455; HB 4180P; HB 4192P; HB 4196P; TN 90;
- Evaluated traits: Yield, Nicotine and Quality Index Grade
- Environments: 7 environments in the southern region of Brazil;
- Statistical design: Randomized Complete Blocks (RCBD), with 3 replications;
- Statistical analyzes were performed in the JMP software program (SAS Institute Inc.);
- Linear Mixed Model (LMM) approach using the Restricted Maximum Likelihood method (REML) and Pearson's correlation coefficient;
- Genetic parameters were estimated via REML, with genotypic means adjusted and estimated using the Best Linear Unbiased Predictor (BLUP) procedure;
- The likelihood ratio test (LRT) was performed and the significance was verified by the Wald test;
- Based on the predicted mean values, Pearson's correlation between traits were estimated.

## RESULTS

**Table 1.** Wald test for Yield (kg.ha<sup>-1</sup>), Nicotine (%) and Quality Index Grade (%) traits referring to the evaluation of 24 Burley hybrids in 7 different environments in the southern region of Brazil.

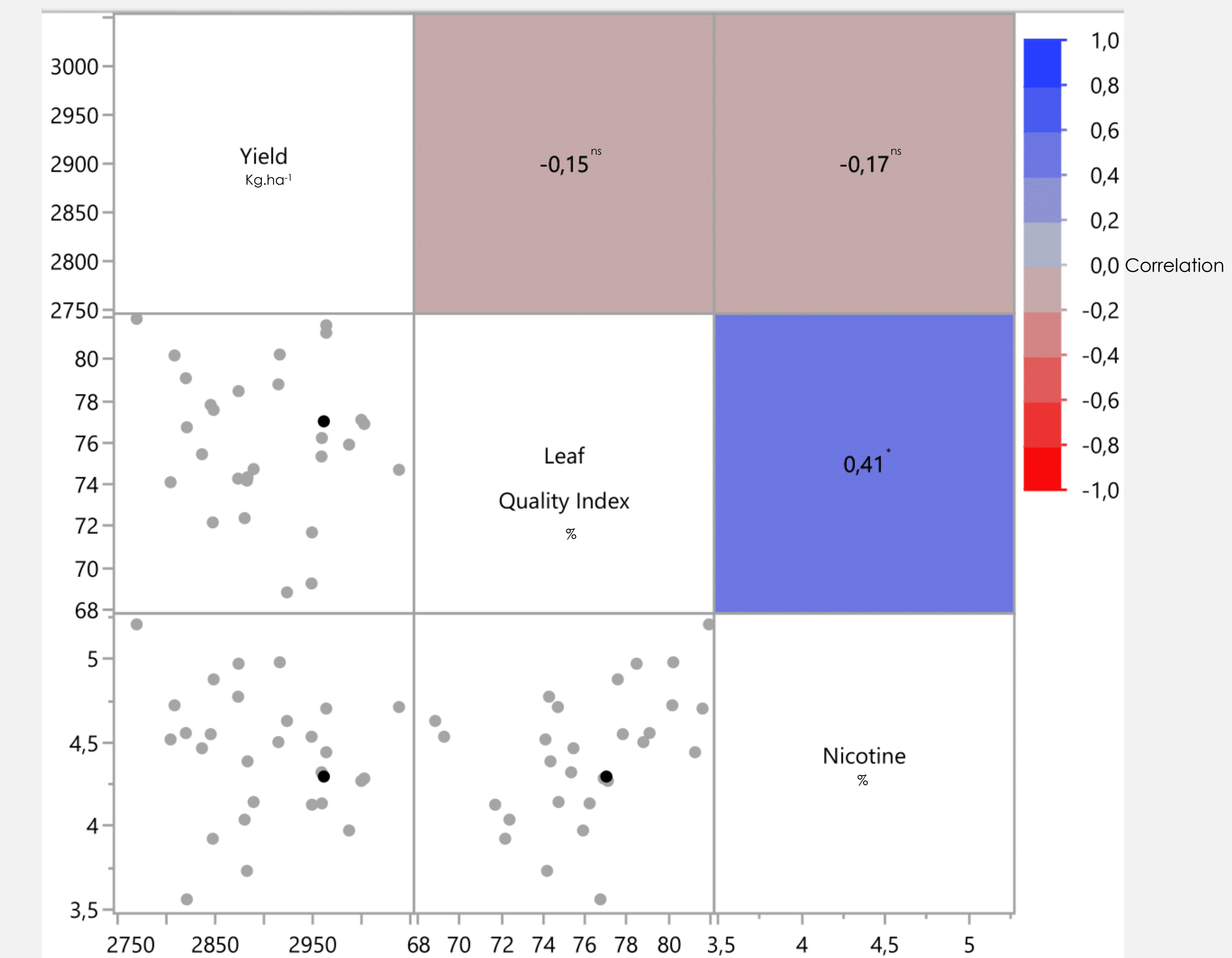
Effects	DF	Yield	Nicotine	Quality Index
Genotype	28	8318.0146*	0.1552264**	15.711221**
G x E	6	12673.313**	0.0058498 <sup>ns</sup>	5.7057516 <sup>ns</sup>
Residual	6	42386.767	0.1226974	57.148849

<sup>ns</sup>, \*\*, \* Wald test not significant and significant at 1% and 5% respectively, by Chi Test Square

**Table 2.** Predicted average values (BLUP) for the Yield (kg.ha<sup>-1</sup>), Nicotine (%) and Quality Index Grade (%) traits referring to the evaluation of 24 Burley hybrids in 7 different environments in the southern region of Brazil.

Genotype	BLUP		
	Yield	Nicotine	Quality Index
510	3038	4.71	74.70
600	3003	4.29	76.89
545	3000	4.27	77.09
597	2987	3.97	75.91
509	2964	4.70	81.62
544	2964	4.44	81.26
486	2961	4.30	77.02
505	2959	4.14	76.22
512	2959	4.32	75.34
543	2949	4.13	71.70
542	2949	4.53	69.26
594	2924	4.63	68.83
599	2916	4.98	80.22
HB 4192P	2915	4.50	78.79
550	2889	4.14	74.73
HB 4180P	2883	4.39	74.35
HB 4196P	2883	3.73	74.19
547	2880	4.04	72.39
595	2874	4.97	78.47
546	2874	4.77	74.28
TN 90	2848	4.88	77.57
549	2848	3.92	72.18
506	2845	4.55	77.81
596	2836	4.47	75.45
548	2821	3.56	76.74
504	2820	4.56	79.09
DBH 455	2808	4.72	80.17
598	2804	4.52	74.11
507	2770	5.21	81.93

**Figure 1.** Estimation of Pearson correlations between the traits Yield (kg.ha<sup>-1</sup>), Nicotine (%) and Quality Index Grade (%) in the 7 environments evaluated.



<sup>ns</sup>, \*\*, \* Wald test not significant and significant at 1% and 5% respectively, by Chi Test Square

**Table 3.** Broad-sense heritability- h<sup>2</sup> (%) estimates for the traits Yield (kg.ha<sup>-1</sup>), Nicotine (%) and Quality Index Grade (%)

Trait	h <sup>2</sup>
Yield	13.1
Nicotine	54.7
Quality Index	20.0

## CONCLUSIONS

- The behavior of the hybrids within the environments was verified, allowing the selection of hybrids according to the studied environments;
- The heritability estimates decreased due to the complexity of the character evaluated;
- The characters Leaf Quality Index and Nicotine have a positive association;
- The method used showed to be efficient for this type of data set regard to the selection of superior genotypes.