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Journal Name:	<a href="#">Journal of Experimental Agriculture International</a>
Manuscript Number:	Ms_JEAI_48120
Title of the Manuscript:	Genotype x harvest cycles interaction in sugarcane on the South Coast of Pernambuco
Type of the Article	Original Research Article

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**PART 1:** Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Compulsory</b> REVISION comments	<p>abstract format should be revisited again introduction part is not closely related to the study objectives objective should be specified rather than general objectives</p>	<p><b>ABSTRACT</b></p> <p><b>Aims:</b> To quantify the magnitude of the genotype x harvest cycle interaction (GxC) of sugarcane during three harvest cycles and to select superior clones for cultivation on the Coast of the Southern Forest of Pernambuco. <b>Study design:</b> The experiment was conducted in a randomized complete block design. <b>Place and Duration of Study:</b> Evaluated during the 2010/2011, 2011/2012 and 2012/2013 harvest years in the agricultural area of the Cucaú Plant, located in the Municipality of Rio Formoso (8°39' 49" S and 35°09'31" W, altitude of 5m), Microregion of the Southern Forest of Pernambuco. <b>Methodology:</b> 11 genotypes Republic of Brazil of the RB 2004 series and three RB cultivars were evaluated. Each plot was represented by five grooves of 8.0 m in length, spaced in 1.0 m, totaling 40 m<sup>2</sup>. The crops were harvested 15 months after planting (MAP) for the first crop cycle and 12 MAP during the two subsequent cycles were evaluated tons of sugarcane per hectare (TCH), tons of pol per hectare (TPH) and total recoverable sugar (ATR). The variance analyses, the Scott and Knott clustering test, the estimative of the simple and complex parts of the G x C interaction and the Pearson correlation coefficient were processed in the Genes program. <b>Results:</b> The genotypes showed a significant reduction of TCH from the first to the second cycle and that only the genotype UFRPE11 showed a significant decrease for the third. The genotypes UFRPE10, UFRPE6, UFRPE11, UFRPE7, UFRPE2, UFRPE9 and UFRPE1 exceeded all commercial varieties in TPH. It was observed for the variable ATR that there were no significant differences between the genotypes in the third cycle. The simple fraction of the interaction G x C were predominant between cycles C1 and C2 for TCH (67.91%) and TPH (69.35%), while for ATR (56.42%) the complex fraction was predominant. For the pair C2 x C3, the simple fraction of the interaction G x C predominated only in the TCH (62.85%) and TPH (62.41%) variables, but was not significant for the variable ATR. It is worth mentioning that the C1 x C3 cycle pair presented predominantly complex type interactions for all variables TCH (50.42%), TPH (52.20%) and ATR (59.66%). <b>Conclusion:</b> The simple fraction of the genotype x harvest cycles (G x C) interaction provides genetic gain for yield of sugarcane and sugar in selection in subsequent pairs of harvest cycles, year by year. The complex fraction of G x C interaction reduces the predictability of genetic gain, making it difficult to select new cultivars. Local selection favors expressive genetic gain in a few selection cycles. However, it does not favor the selection of genotypes with high adaptability and phenotypic stability, requiring tests in several environments. The UFRPE06 and UFRPE10 clones can be selected to continue the selection cycles for the southern coastal conditions of the Mata de Pernambuco.</p> <p><b>Keywords:</b> <i>Saccharum spp.</i>, <i>genotype x harvest cycles interaction</i>, <i>genetic gain</i>.</p> <p><b>1. INTRODUCTION</b></p> <p>The verticalization of sugarcane production in Brazil occurs due to the development and implementation of new agricultural production technologies, among which are the new cultivars developed by the breeding programs [1, 2]. According to Barbosa et al. [3], the cultivars are the basis of the productive</p>



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		<p>chain and their continuous replacement by other more productive ones represents significant economic gain for the sugar-energy sector.</p> <p>The main characteristics used as parameters for the selection of superior cultivars are: agroindustrial productivity, tolerance to water stress, resistance to pests and diseases, adaptability and phenotypic stability [4,5,6]. To better explore the genetic variability of sugarcane, the selection should be based on the main components for agricultural and industrial productivity, the most important variables being tons of sugarcane per hectare (TCH), tons of pol. per hectare (TPH) and total recoverable sugars (ATR).</p> <p>The selection of cultivars that present favorable alleles for these characteristics, as well as the recommendation of these cultivars for the different production environments, are the main challenges for sugarcane breeding programs, especially in the Northeast region of Brazil. This is because the region presents high variation of soils and topography, besides a great oscillation of the climatic conditions between the years [7].</p> <p>Such environmental variations are determinant for genotype expression, which can cause significant variations in the performance of the cultivars when evaluated in different locations and in different agricultural years, hindering the selection and recommendation of cultivars [8,9,10,11,12].</p> <p>Several studies aimed at quantifying the genotype x environment interaction (GxC), have been carried out in sugarcane, which helps to recommend the most appropriate varietal management and to determine strategies for exploring genetic variability to optimize the selection gain [13,14; 15,16,17,18].</p> <p>The GxC interactions can be provided by the existence of great variability between the genotypes in the environments, called the simple part, or associated with the lack of correlation between the genotypes, called the complex part. Complex-type interactions hinder selection in breeding, as they indicate that genotype superiority does not occur due to the inheritable portion of the genetic variance, but rather due to environmental factors [19].</p> <p>The present work aimed to quantify the magnitude of the genotype x harvest cycle interaction (GxC) of sugarcane during three harvest cycles and to select superior clones for cultivation on the Coast of the Southern Forest of Pernambuco.</p>
<b>Minor</b> REVISION comments	results are not sufficiently elaborated. should give emphasis on results of study rather than to the discussion section.	
<b>Optional/General</b> comments	conclusion should reflect the impact of the study to the reader despite of giving very less significant findings	

**PART 2:**

	<b>Reviewer's comment</b>	<b>Author's comment</b> (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Are there ethical issues in this manuscript?</b>	(If yes, Kindly please write down the ethical issues here in details)	