YIELD PERFORMANCE OF PHIL 2009-0919 AT DIFFERENT FURROW DISTANCE AND PLANTING DENSITY (RATOON CROP)

Gina D. Cahilig, Ma. Theresa D. Alejandrino, Andy C. Alimpulos, and Ramon E. De Jesus Jr.

Date of Completion of Study: April 2023
Date of Completion of Terminal Report: August 2023

ABSTRACT

Several studies were conducted for cultural packaging of SRA's high yielding sugarcane varieties. The experiment was conducted to evaluate the yield performance of Phil 2009-0919 at different furrow spacing and planting densities. It was laid out in April 2021 following a split plot design arranged in RCBD.

The sugar rendement of Phil 2009–0919 was not significantly influenced by different furrow distances or planting densities. Sugar rendement ranges from 2.19 LKg/TC to 2.35 LKg/TC. On the other hand, Cane yield (TC/Ha) and sugar yield (LKg/Ha) of Phil 2009–0919 differed significantly at different furrow distances.

Significantly higher tonnage was observed on canes planted at 4 lacs per hectare at 1.3-meter furrow distance (109.82 TC/ha). Different planting densities also showed significant results when 1.5 meres furrow distance was used. Significantly higher tonnage was observed at 5 lacsas per hectare (109.68 TC/HA), while the lowest was at 6 lacsas per hectare with a mean of 80.52 TC/HA.

No significant interaction was observed between furrow spacing and planting density. Based on the results of the study, planting 4 lacsas per hectare of Phil 2009–0919 is best suited at a 1.3-meter furrow distance, while a 1.5-meter furrow distance is suitable if an increased planting density of 5 lacsas per hectare were used. Planting at a wider furrow distance of 1.8 meters could give lower yield results.

Keywords: furrow distance, planting density, high yielding variety

Prepared by:

GINA D. CAHILIG
Supervising Science Research Specialist
Production Technology & Crop Management Section

Certified Completed:

Atty. IGNACIO S. SANTILLANA
Deputy Administrator II-RDE

INTRODUCTION

Sugarcane (*Saccharum officinarum L.)* is cultivated mainly for sugar. This is one of the prime commodities especially in Western Visayas which contributes 1.44 million metric tons or 55% of the total national production Lately, an abrupt decrease in production of 59.6 percent was reported (PSA).

Several factors contribute to the decrease in sugar production such as lack of irrigation facilities, lack of machinery, limited access of farmers to new varieties and cultural practices employed among others.

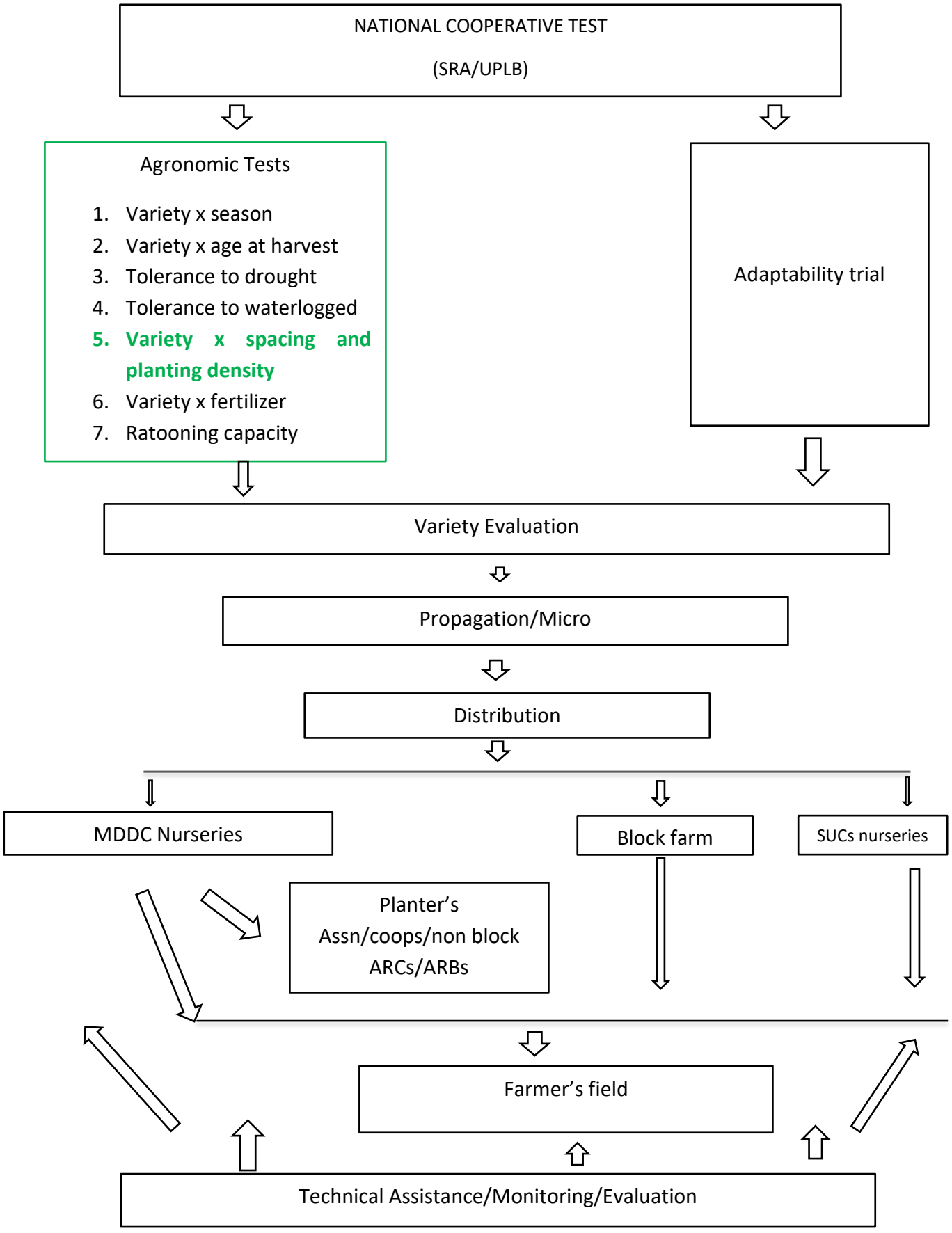
The Sugar Regulatory Administration, in its quest to further improve the local production of sugar continues to produce sugarcane varieties which are not only high yielding but also resistant to major pest and diseases. Furthermore, cultural management and responses to biotic and abiotic factors are continuously studied for the total packaging of the varieties.

This particular study is a routine activity following the process flow on the propagation and distribution of SRA's new high yielding varieties. This was included in the agronomic tests for varieties prior to their release for commercial production.

SRA's recommendation is planting 40,000 or 4 lacsas cane points per hectare using a furrow distance of 1.0 meter during the early season of planting and 50,000 or 5 lacsas canepoints per hectare during the late planting season. Several studies were conducted related to planting density and furrow distance (De los Santo *et al*, 2005; Morales *et al,* 1995) Recently, high tillering varieties suggest a wider space for maximum production and establishment of the succeeding ratoon crop.

Above all, the scarcity of manual labor that beset the sugar industry triggered the shift from conventional to mechanized farming. It is in this context that the need to evaluate the furrow spacing and planting density for maximum production of high yielding varieties, hence, this study.

PROCESS FLOW ON THE PROPAGATION AND DISTRIBUTION OF SRA NEW HYVS



OBJECTIVES

The general objective of the study is to evaluate the growth and yield performance of Phil 2009-0919 at different furrow spacing and planting densities. Specifically, the study aims to evaluate the desired furrow distance and planting density for Phil 2009-0919 variety.

METHODOLOGY

The experiment was conducted at the Sugar Regulatory Administration (SRA), La Granja Agricultural Research and Extension Center (LGAREC), La Carlota City, Negros Occidental from April 2021 to April 2023 in Guimbalaon sandy clay loam soil. This was laid-out following a split-plot in RCBD plots measuring 6 rows by 9 meters and replicated three times. The furrow distance served as the main plot and variety as sub-plot.

The planting densities used were 4.0, 5.0 and 6.0 lacsas per hectare. Phil 2009-0919 was used as test plant and distance between furrows used were 1.3 meter,1.5 meters and 1.8 meters.

Planting and Fertilization

Three-eyed seed pieces of the test variety Phil 2009-0919 were selected for vigor and uniformity. Seeding rate was based on the treatments.

The recommended rates of fertilizer based on soil analysis (140-70-60) were applied in two doses. The first dose, consisting of full dose of phosphorus (P) fertilizer and one-half of the recommended nitrogen (N) and potassium (K) fertilizers were applied in the furrow and covered with thin soil before planting. The second dose of fertilizers or the remaining one-half of N and K were applied on the off-barred sides (side-dressed) of the cane rows two months after planting (MAP).

Weeding, cultivation and pest control

Recommended cultural practices on weeding and cultivation employed by SRA were followed for the entire duration of the study. Trichogramma strips were applied in the field one month and a half after planting (MAP) to control stem borers. Rat baits were also applied for the control of rodents.

Data Gathering, Harvesting and Data Analysis

Data on plant height and number of tillers/stool were taken from 12 representative samples within the four middle rows of each plot. At harvest, 12 representative talk samples were taken at random from four middle rows for measurement of stalk length, diameter and stalk weight. Juice from the samples were extracted and brought to the laboratory for the analysis of per cent brix and pol. The total number and weight of millable stalks per plot were taken and recorded. From the data, tonnage yield (TC/Ha), sugar rendement (LKg/TC) and sugar yield (LKg/Ha) were computed. Analysis of variance and mean comparison were done using the Star Nebula software.

RESULTS AND DISCUSSIONS

Sugar cane yield (TC/HA) of test variety is shown in Table 1. Significant variations between planting densities at 1.3meter furrow distance were observed. Significantly higher cane yield was obtained by planting 4 lacsas with 109.82 TC/Ha. Lower cane yield were obtained from planting densities of 5 lacsas and 6 lacsas of canepoints per hectare with 83.01 TC/HA; 76.42 TC/Ha respectively. Sugarcane yield (TC/Ha) obtained from furrow distance of 1.5 meter showed significant differences when planting densities of 4.0 , 5.0 and 6 lacsas per hectare were used. A significant increase in tonnage was observed when planting density was increased to 5.0 lacsas per hectare. Adjusting the furrow distance to 1.8 meters gave lower yield results among planting densities of 4.0, 5.0 and 6.0 lacsas per hecatre. Noticeably, tonnage was higher when planting density was increased to 5.0 lacsas per hectare at 1.5 meter furrow distance.

The decrease in cane tonnage using higher density of canepoints (6 lacsa) could be attributed partly due to overcrowding which led to competition for light, nutrients and water uptake.

Table 5. Cane yield (TC/Ha) of Phil 2009-0919 as influenced by two furrow distance and four planting densities.

Planting density/ha, Pd	Furrow distance, Fd		
	1.3 M	1.5 M	1.8 M
Pd_{2}- 40000 cp	109.82a	90.93b	81.96
Pd_{3}- 5000 cp	83.01b	109.68a	82.93
$Pd_{4,}$ 60000 cp	80.42b	85.51b	86.51
Fd/V-Mean	91.08	95.19	83.7

The high sugar rendement of Phil 2009-0919 is inherent to variety as described by the sugarcane breeder of the Variety Improvement and Pest management Unit.

Other factors did not significantly influence the sugar rendement. No significant interaction was also observed. (Table 2).

Table 2. Sugar Rendement (LKg/TC) of Phil 2009-0919 as influenced by furrow distance and planting densities.

Planting density/ha, Pd	Furrow distance, Fd		
	1.3 M	1.5 M	1.8 M
Pd_{2}- 40000 cp	2.29	2.29	2.22
Pd_{3}- 50000 cp	2.19	2.25	2.35
$Pd_{4,}$ 60000 cp	2.33	2.27	2.22
Fd/V-Mean	2.27	2.27	2.26

Table 3. shows the sugar yield in LKg/Ha as influenced by furrow spacing and planting density. Significant results were observed among planting densities at 1.3 and 1.5 meter furrow distances. Significantly higher sugar yield was observed at a planting density of 4 lacsas per hectare with a mean of 251.48 LKG/ha, while lower sugar yield was obtained by planting 5 and 6 lacsas per hectare of canepoints. At a 1.5-meter furrow distance, a significantly higher sugar yield was observed at a planting density of 4 lacsa per hectare with a mean of 246.78 LKg/ha, while the lowest was at 6 lacsas per hectare. Lower LKG/Ha was obtained at different planting densities when the furrow distance was increased to 1.8 meters.

Table 3. Sugar yield (LKg/Ha) as influenced by two furrow distance and planting densities.

Planting density/ha, Pd	Furrow distance, Fd		
	1.3 M	1.5 M	1.8 M
Pd_{2}- 40000 cp	251.48a	208.23b	181.95
Pd_{3}- 5000 cp	181.79b	246.78a	194.84
$Pd_{4,}$ 60000 cp	187.38b	194.11b	192.05
Fd/V-Mean	206.88	216.37	189.61

CONCLUSION

This study set out to determine the performance of Phil 2009-0919 at different furrow distance and planting densities. The results of this study indicated that:

1. Planting 4 lacsas per hectare of Phil 2009–0919 is best suited at a 1.3-meter furrow distance, while a 1.5-meter furrow distance is suitable if an increased planting density of 5 lacsas per hectare were used. Planting at a wider furrow distance of 1.8 meters could give lower yield results.

SUMMARY AND RECOMMENDATION

The sugar rendement of Phil 2009–0919 was not significantly influenced by different furrow distances or planting densities. Sugar rendement ranges from 2.19 LKg/TC to 2.35 LKg/TC. On the other hand, Cane yield (TC/Ha) and sugar yield (LKg/Ha) of Phil 2009–0919 differed significantly at different furrow distances.

Significantly higher tonnage was observed on canes planted at 4 lacsa per hectare at 1.3-meter furrow distance (109.82 TC/ha). Different planting densities also showed significant results when 1.5 meres furrow distance was used. Significantly higher tonnage was observed at 5 lacsas per hectare (109.68 TC/HA), while the lowest was at 6 lacsas per hectare with a mean of 80.52 TC/HA.

No significant interaction was observed between furrow spacing and planting density. Based on the results of the study, planting 4 lacsas per hectare of Phil 2009–0919 is best suited at a 1.3-meter furrow distance, while a 1.5-meter furrow distance is suitable if an increased planting density of 5 lacsas per hectare were used. Planting at a wider furrow distance of 1.8 meters could give lower yield results.

It is further recommended that wider furrow spacing be evaluated for suitable adoption in mechanized farming system.

REFERENCES

DE LOS SANTOS, T.B. BAÑAS, M.T.D. ALEJANDRINO and M.L. ALMODIENTE, 2005. Evaluation of Different Planting Patterns on Plantcane and Ratoon. Proc. PHILSUTECH pp 12-21.

DOSADO, V.G. ,E. GEOLINGO and R. GEOLINGO. 1976. Factors Affecting the Yield of Sugarcane. 1 Plant Characters Associated with Yield Among DHYV's. Proc. PHILSUTECH. Pp 87-102.

MORALES C.L., R.M. BOMBIO, 1995. Canepoint Yield from Phil 8477 Micropropagated Plants at Different Planting Densities with Varying Levels of Nitrogen Fertilization. Proc. PHILSUTECH Pp 215 -220.

VILLARIEZ, H.P. F. C. BARREDO, J.M. M. MENDOZA and E.A.ESCOLLADA. 1995 Comparative Trial on Four Furrow Arrangements Using Four VMC High Yielding Varieties. Proc. PHILSUTECH Pp 206-213.

Variety Improvement and Pest Management Unit of SRA-LGAREC.

https//psa.gov.ph