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**CARIBBEAN FOOD
CROPS SOCIETY**

47

**Forty-seventh
Annual Meeting 2011**

**Bridgetown, Barbados
Vol. XLVII**

PROCEEDINGS
OF THE
47th ANNUAL MEETING

Caribbean Food Crops Society
47th Annual Meeting
July 3rd – 8th, 2011

Lloyd Erskine Sandiford Centre
Bridgetown, Barbados

“Assuring Caribbean Food and Nutrition Security in the Context of Climate Change”

Edited
by
Wanda I. Lugo, Wilfredo Colón, and Ralph Farnum

Published by the Caribbean Food Crops Society

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ISSN 95-07-0410

Copies of this publication may be obtained from:

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P.O. Box 40108
San Juan, Puerto Rico, 00940

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PLANT SPACING INFLUENCES PRODUCTION ON LATE SEASON PLANTED SORREL (*HIBISCUS SABDARIFFA*)

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ABSTRACT: *Hibiscus sabdariffa*, also known as sorrel in the Virgin Islands, is an annual plant that is grown mainly for its colorful fleshy calyxes during the Christmas Season. Sorrel is used to make a healthy drink that is high in vitamin C and anthocyanins which is claimed to be better than cranberry juice. Sorrel is normally planted at 60 cm during July and August. The objective of this study was to compare sorrel growth and production of a Caribbean day-neutral variety and a Zambian short-day variety planted in September with in-row plant spacing of 20 cm, 40 cm and 60 cm, and 150 cm between rows. Data was collected weekly on plant height, branching and fruit set. The results indicated that the Caribbean day-neutral variety can be grown at 20 to 60 cm with no effect on branching or production. However, the Caribbean day-neutral plants were shorter at 60 cm spacing than either at 20 or 40 cm, while spacing was not an influence on plant height for the Zambian short-day variety at 20 to 60 cm. The Zambian short-day sorrel has greater branching and fruit set as the plant spacing increases from 20 to 60 cm. Planting sorrel in September at 40 cm can increase production per length of row. This research was funded through VI Dept. of Agriculture Specialty Crops Block Grant and USDA-NIFA-Resident Instruction in Insular Areas (Grant # #2008-34816-20016).

Keywords: *Hibiscus sabdariffa*, Roselle, planting density

INTRODUCTION

The sorrel plant (*Hibiscus sabdariffa*), also known as the roselle, is an annual plant in the Malvaceae family with hibiscus, okra and cotton (Duke, 1983). Sorrel contains high levels of vitamin C and anthocyanins and claimed to be better than cranberry juice (Hall, 2005; Appell, 2003). In the Caribbean, sorrel is used to make a healthy drink during the holiday season (Morton, 1987). Sorrel is normally planted in July or August at 60 to 100 cm spacing to obtain large plants when they induce flowers under short days (George and Morris, 1984). Two types of sorrel were planted during the beginning of September to study the influence of late planting under shorter day length. The objective of this study was to compare growth and production of two varieties of sorrel in a late planting with in-row plant spacing of 20 cm, 40 cm and 60 cm.

MATERIALS AND METHODS

Two sorrel varieties were used, Zambia-500752 (ZSD) obtained from the USDA Germplasm Repository, Griffin, Georgia, USA, and a local Caribbean Day Neutral (CDN) variety. Seeds were sown in trays containing eighteen 8 cm³ cells per tray and filled with ProMix on September 3, 2010. Three trays were planted per variety with two seeds/cell and thinned to one seedling after a week. Three weeks later, the seedlings were transplanted into the field where a drip line, with emitters every 20 cm, was used to supply water. The in row plant spacing was 20, 40 or 60 cm for each variety and 150 cm between rows. Each variety had two sets of five consecutive plants chosen for each between plants, in row spacing for data collection. The plant height,

branch number and fruit set were collected weekly for three months. Data was analyzed using ANOVA, and LSD for the means was done at P=0.05 significance level.

RESULTS AND DISCUSSION

Sorrel seeds germinated within three days and by seven days CDN and ZSD had 100% and 70% germination, respectively. After transplanting to the field, the plants actively grew but yellowing of leaves, interveinal chlorosis, were present especially in the CDN variety due to the high pH caused by the calcareous soil in the field plot. The plant spacing had no effect on plant height for ZSD variety where the height averaged around a meter (Fig. 1). However, the 60 cm plant spacing resulted in significantly shorter plants for the CDN variety. The closer spacing of 20 cm and 40 cm caused the CDN plants to grow taller.

Within seven days of transplanting, the ZSD started branching whereas branching was delayed a week in the CDN variety. Flower buds were observed on the CDN plants within two weeks of transplanting to the field while they were only observed in the ZSD variety after the third week. The in-row between plant spacing had a significant influence on branching with closer spacing resulting in fewer branches (Fig. 2). However, plant spacing had no significant influence on CDN branching (Fig. 2). The number of branches should influence fruiting since flowers develop from the leaf axis along the stem and branches. Therefore, with more branches, there should be more flowers and fruit. Since the CDN plants had similar branching for all plant spacing, we also found no significant difference in the number of calyxes produced (Fig. 3). The 20 cm spacing for Zambian sorrel did produce 150 fruiting calyxes which was significantly less than the 206 and 211 calyxes at 40 or 60 cm, respectively (Fig. 3). The sorrel results were different more because of their variety than because of plant spacing.

CONCLUSION

Sorrel can be planted in September at a closer in-row spacing than traditionally used and still be productive. The Caribbean Day Neutral variety can be grown at 20 to 60 cm with no effect on branching or production. However, the Caribbean Day Neutral plants are shorter at 60 cm spacing than either the 20 or 40 cm in row spacing. However, plant spacing was not an influence on plant height for the Zambian variety at 20 to 60 cm. Zambian sorrel has greater branching and fruit set as the plant spacing increases from 20 to 60 cm. Planting sorrel in September at a closer spacing can increase production per length of row.

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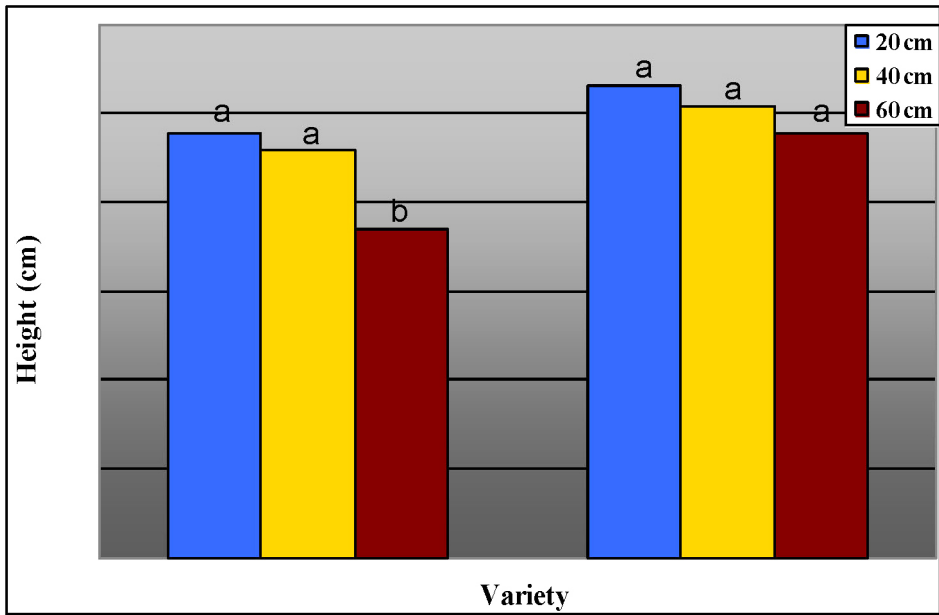


Figure 1. Effect of plant spacing on plant height of two sorrel varieties after 77 days.

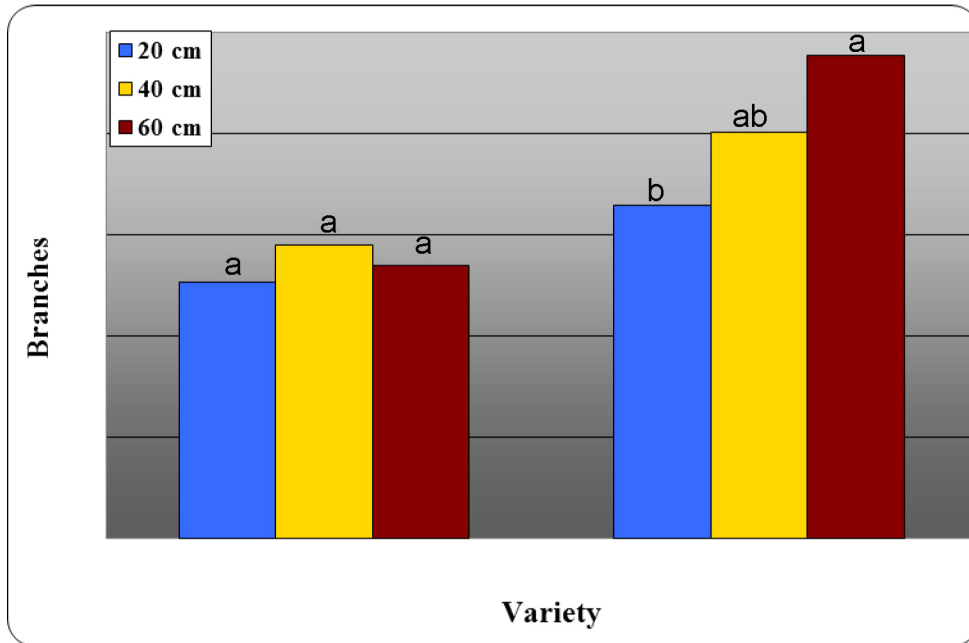


Figure 2. Influence of plant spacing on branch development for two sorrel varieties at 77 days.

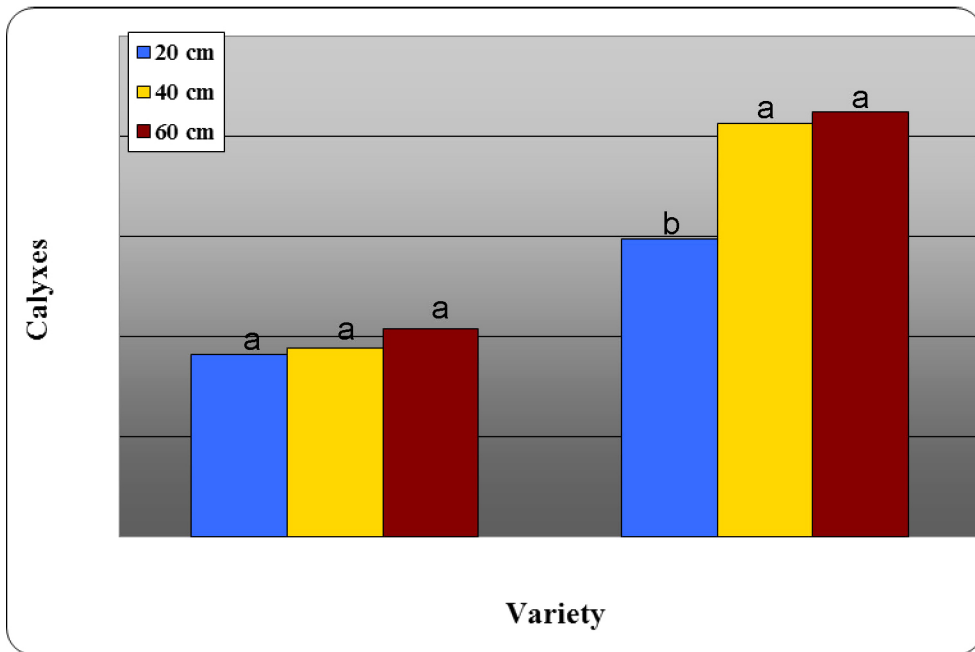


Figure 3. Effect of plant spacing on production of calyxes for two sorrel varieties.