GLADSTONE ROAD AGRICULTURAL CENTRE
CROP RESEARCH REPORT NO. 11

PRELIMINARY EVALUATION OF A YELLOW ZUCCHINI SQUASH (*Cucurbita pepo* L.) VARIETY FOR THE FRESH MARKET AND FOR USE AS A FROZEN VEGETABLE

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ABSTRACT

The evaluation of a yellow zucchini (Cucurbita pepo L.) variety was conducted in a replicated small plot trial at the Gladstone Road Agricultural Centre during 2012, to examine yield and quality of the zucchini variety 'Sebring' over several harvests and under local field conditions. The first harvest occurred on the 3 February, 51 days after planting, followed by harvests on the 10, 17 and 24 of February. Weights of the zucchini variety 'Sebring' were within the range of similar zucchini types. Because of the short growing time, this crop can be grown at several different planting dates during the cool growing season. For added value, yellow zucchini slices can be added to a mixed vegetable package and sold as a frozen food item by local farmers.

Yellow zucchini (*Cucurbita pepo* L.) grown at the Gladstone Road Agricultural Centre during 2012

Introduction:

Worldwide, the zucchini (*Cucurbita pepo* L.) is one of the most popular vegetable crops purchased by consumers. However, it is very difficult to obtain production data on the zucchini, since most statistics group squash, pumpkin and other cucurbits together. According to FAOSTAT (2010) estimates, more than 22.9 million tonnes of pumpkin, squash and gourds are produced annually on an area of approximately 1.7 million hectares. Commercially, the zucchini can be grown successfully on a large scale by large farmers, or it can be grown on less than one

hectare of land by small farmers. It is also suited for cultivation in the home garden by individual householders. Production constraints include many pest and disease problems that affect yields (Powell *et al.*,1993; Webb and Tyson, 1997; Cradock *et al.*, 2001; Xu *et al*., 2004; Yandoc-Ables *et al*., 2007; Murphy *et al*., 2009).

The zucchini is a very diverse crop, with much variation in shape, texture and colour. The yellow zucchini is a slender, bright yellow attractive fruit. It is a fast growing bush type crop which matures in approximately 40-50 days. Yellow zucchini yields tend to be lower than those for the green varieties. When harvested early this crop generally fetches a better price, with a better quality of fruit. Late harvests may contribute to deterioration in fruit quality.

In The Bahamas, the yellow zucchini is not planted on a commercial scale but is grown mostly by small famers on a small scale as a specialty crop for a specialised market. This cucurbit is among those crops that have attracted interest as a potential cash crop for diversification of crop production systems. Introduction of this crop to a wider market will mean that local farmers must select varieties that are high yielding, resistant to pests and diseases and generally meet the demands of production and quality. Therefore, it is essential to evaluate zucchini varieties, for yield performance and for insect and disease tolerance.

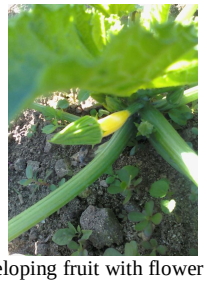
Objectives:

The objectives of this trial are to evaluate the performance of the zucchini variety 'Sebring' under local conditions and to gain a better understanding of the factors affecting its production and productivity.

Materials and Methods:

The evaluation of the yellow zucchini variety 'Sebring' was conducted at the Gladstone Road Agricultural Centre during the 2011-2012 winter vegetable cropping season. The trial was laid out in a completely randomised design with three replications. Experimental plots consisted of ten plants spaced 45 cm (18 in) apart on raised beds with a row spacing of 1.5 m (5 ft) between rows. Plants were direct seeded into the experimental plots.

The zucchini variety 'Sebring' is a product of the seed company Hollar Seeds Inc. and is available through **HOLLAR PREMIUM™** distributors**.** The average fruit size for this variety is 20 cm (8 inches). The yellow zucchini is usually harvested when it is between six and seven inches in length. It can be harvested later at a larger size and chopped up with other vegetables as a mixed salad, stir fried, or as steamed mixed vegetables. Seediness can be a problem if the zucchini fruit is harvested too late.



Developing fruit with flower bud.

The zucchini seeds were planted directly to the field on the 14th December, 2011. The usual cultural practices were observed to ensure that an even stand of plants was established in the field plots. The plants were side dressed with 8-18-8 fertiliser, applied in one application at a rate of 30 g (1.0 oz) per plant, at the flowering stage. The rows were irrigated with a drip irrigation system which supplied water throughout the growing season. Plants were sprayed on a weekly basis to prevent damage by insect pests and diseases, using a combination of Xentari® and Bravo® with Nutrileaf® liquid fertiliser in a 20-20-20 formulation. Weed control was achieved through hand cultivation of the trial plots. The zucchini fruit were harvested, then weighed and measured on the 3rd, 10th, 17th and 24th February 2012. Four representative fruit from each of the three plots were randomly selected on each of the harvest dates for evaluation. Data collected included the weight (g) of a single fruit, the length (cm) of a single fruit and the number of fruit per plant.

The mean monthly maximum temperature for the trial period was recorded at 26.7°C (80.1°F), while the mean monthly minimum temperature was 18.9°C (66.1°F). The total rainfall for the period was 73.7 mm (2.9 in). Mean monthly sunshine duration for the period was 7.7 h. Weather data (Table 1) on maximum and minimum temperatures, rainfall and sunshine duration were obtained from the Meteorological Department of the Commonwealth of The Bahamas.

Table 1. Weather data on rainfall, hours of sunshine and mean maximum and minimum temperatures for New Providence for the period of December 2011 to February 2012, courtesy of the Meteorological Department of The Bahamas.

Month	Total rainfall (mm/inches)	Mean monthly radiation (h)	Mean maximum temperature (°C/°F)	Mean minimum temperature (°C/°F)
December 2011	**22.9**/0.9	**7.0**	**26.9**/80.4	**19.8**/67.6
January 2012	**6.6**/0.26	**8.0**	**26.1**/78.9	**17.8**/64.0
February 2012	**44.2**/1.74	**8.1**	**27.2**/81.0	**19.2**/66.6

Note: Monthly mean values have been rounded up to the nearest tenth

Yellow zucchini field trial conducted at the Gladstone Road Agricultural Centre during 2012.

Results:

Analysis of variance (Table 2) for the evaluation of the zucchini squash detected significant differences among harvest dates in the length of fruit and weight of fruit. No significant difference was recorded for the number of fruit per plant.

Table 2. Analysis of variance (ANOVA) for number of fruit per plant, weight of a single fruit and length of a single fruit of yellow zucchini, harvested at four different dates. Standard error is for each treatment mean. Error mean square has 47 df. *, ** and *** denote statistical significance at 5, 1 and 0.1% level of confidence, respectively. NS indicates differences between means not significant.

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Source	df	Number of fruit per plant	Length of fruit (cm)	Weight of fruit (g)
Harvest date	3	NS	*	*
Error	44			
Std. Err.		0.1	0.5	20.3

Mean values for number of fruit per plant, single fruit length and single fruit weight for the different harvest dates are shown in Table 3. The number of fruit per plant remained stable over the harvest period. Size of fruit and fruit weight fluctuated over time. Some of the matured fruit were of a size not acceptable for market, as they would be deemed too large for sale (USDA-AMS, 1997). If fruit is too large, seed may be too hard, rendering it inedible. The highest total of fruit weight occurred during the second harvest on 10 February, at 58 days after planting.

Table 3. Mean values of yield responses of yellow zucchini, harvested at four different dates.

Harvest date	Number of fruit per plant	Length of fruit (cm)	Weight of fruit (g)
3 February	1.58a	16.3b	196.7b
10 February	1.50a	19.9a	356.0a
17 February	1.50a	18.8ab	290.7ab
24 February	1.50a	20.8a	326.3a

The t-test at a level of 5% probability was applied. Means with different letters differ significantly.

Post harvest quality characteristics are outlined in table 4. The zucchini variety displayed an acceptable golden colour, fruit length and general appearance (Plate 1). There was no evidence of any serious pest or disease problems.

Table 4. Post-harvest quality characteristics of yellow zucchini 'Sebring' evaluated at the Gladstone Road Agricultural Centre during 2012.

Stated number of days to maturity	Actual number of days to maturity	Colour	Fruit shape	Visible signs of disease or chlorosis
42	51	golden yellow, free of green tips	cylindrical	none

Plate 1. Fruits of the variety 'Sebring' harvested at the Gladstone Road Agricultural Centre during 2012

Discussion:

The zucchini variety 'Sebring' is an early maturing variety with an attractive appearance. When compared to the research results of McGrath *et al.* (2007), whose data showed weights of 322.1 g for the variety 'Sebring', after about 47 days of growth, the yields obtained in this report were within the same range for marketable fruit weights.

Results from this preliminary trial are promising and suggest that the zucchini variety 'Sebring' can be grown successfully under local conditions. Because of the short growing time, this crop can be grown at several different planting dates during the cool growing season. While this trial may identify this yellow zucchini variety as a vegetable with great potential for local production, it does not determine it to be the best. Evaluation of zucchini and other squash varieties will need to be conducted in order to conclude with certainty which is the better among varieties, before any selection can be made.

General Comments:

Zucchini is used generally as a cooked food item, but is sometimes eaten raw as a fresh salad ingredient. The fruit is usually harvested when it is 20 cm (8 in) or less in length while seeds are still soft and palatable. It can be prepared in many ways, including boiled, baked, steamed, stir fried or grilled. Sliced zucchini can last for a long time, if frozen and stored properly. For added value, yellow zucchini slices can be added to a mixed vegetable package (Plate 2) and sold as a frozen food item by local farmers.

Plate 2. Yellow zucchini slices included in a mix of frozen vegetables grown at the Gladstone Road Agricultural Centre during 2012

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