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GINGER PRODUCTION AND STORAGE IN THE VIRGIN ISLANDS

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Abstract: Ginger is widely utilized in the Virgin Islands but seldom grown. The objective was to determine the production potential, in-row plant spacing, length of postharvest storage and develop value added products of these spicy rhizomes. Ginger was planted at eight and twelve inches in-row spacing in February. The high pH calcareous soils caused chlorosis which was controlled through the use of supplemental iron (Fe-EDDHA). Harvest was over a three month period starting in December by mechanical means. No significant difference was obtained in the production between in-row spacing for either total yield or marketable yield. Harvested ginger was stored at 40, 60 or 80°F over 75 days. Ginger at 40 ^{o}F exhibited chilling injury after two weeks of storage. The ambient temperature, 80 ^{o}F, resulted in desiccation and sprouting of the ginger within 40 days. Refrigeration at 60 ^{o}F provided the best storage for ginger after 75 days. Ginger was also processed by slicing at 2 or 4 mm, dried and ground into powder. The 2 mm ginger resulted in a finer powder. Finally, the peeled and sliced Ginger was candied to provide long-term storage where the 4 mm slices worked best. Ginger was found to successfully grow in the Virgin Islands at 8" or 1' in-row spacing and best stored postharvest at 60 ^{o}F. This project was developed through grant funding by the USDA-NIFA- Specialty Crops Block Grant administered by the VI Department of Agriculture.

Keywords: In-row spacing, postharvest storage, temperature, calcareous soil

INTRODUCTION

Ginger (*Zingiber officinale* Rosc.) originated in South Asia and is grown for its pungent rhizomes. The rhizomes are utilized for culinary and medicinal purposes. Ginger is used to alleviate nausea, vomiting, morning sickness and motion sickness. Ginger is reported to promote digestion, blood circulation, lower blood sugar and lower blood pressure (Singletary, 2010). Though ginger is widely used, it is seldom grown in the US Virgin Islands. The objectives were to determine the optimum in-row plant spacing for the U.S. Virgin Islands, define the postharvest storage temperature for these spicy rhizomes and extend shelf-life with value-added products.

MATERIALS AND METHODS

Ginger rhizomes were obtained in December and stored at 75°F for a month prior to cutting into 5-7 cm pieces. Soil was prepared in banks 5 ft apart to allow for mechanical harvest and drip irrigation installed. Pre-emergent herbicide was applied prior to planting for weed control during establishment. Rhizomes were planted at either 8" or 12 in-row spacing. The 8" spacing required 4.6 Kg seed pieces per 75 ft row while the 12" spacing required 3.4 Kg. Ginger was grown in calcareous soils with pH 8.5 and iron in the form of Fe-EDDHA was applied in the fertilizer to control chlorosis. Due to the one year growing cycle, the banks needed to be reformed twice after heavy rains. Harvest, with a one row 3 ft potato digger, occurred over three month period starting

in December. After harvest the ginger was cleaned and put in three storage temperatures 40, 60 or 80°F and the marketable storage weight determined over time. Other harvested ginger was peeled, sliced at 2 or 4 mm, dried and ground to powder.

RESULTS AND DISCUSSION

Germination was slow and some pieces took two months to germinate. Fe-EDDHA was able to control chlorosis in the pH 8.5 calcareous soils when applied through drip irrigation. Harvest began in December when the plants started to senesce (Figure 1). The small potato digger did an excellent job separating the soil from the large ginger clusters. The late January and early February harvest had a greater fresh weight per 75 ft of row at both the 8” and 12” spacing than the December and early January harvest (Figure 2). Marketable yield of over 85 lbs per 75 ft of row were greatest and obtained with the 12” in-row spacing. A trend indicated that 12” spacing results in a greater fresh weight and marketable yield that the 8” in-row spacing. The 12” spacing requires less seed pieces per row but outperforms the higher 8” spacing density.

Fig. 1. Ginger plants at maturity in December.

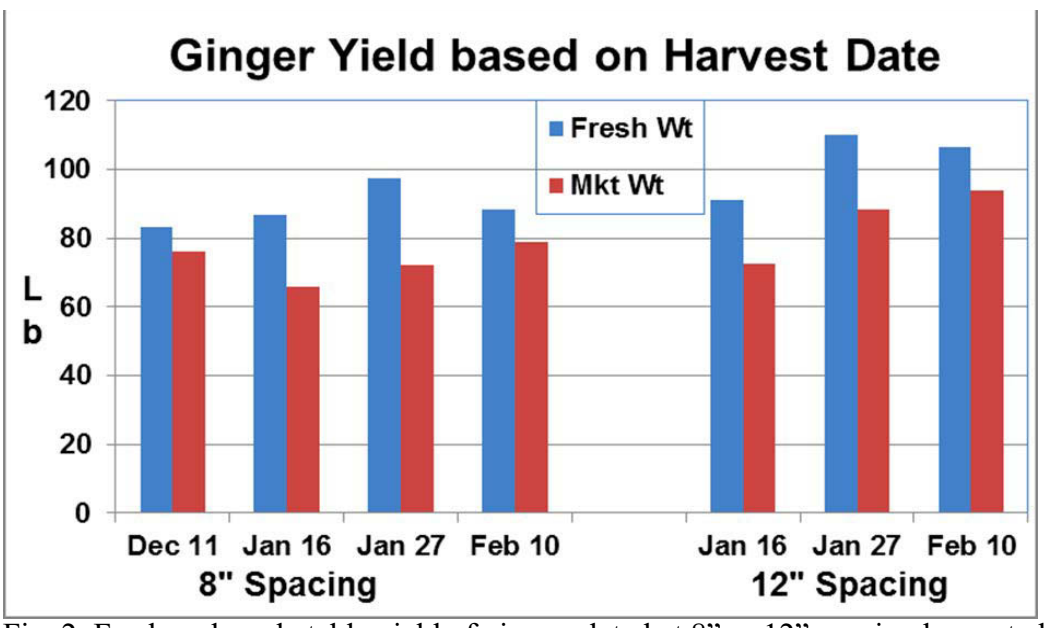

Fig. 2. Fresh and marketable yield of ginger plated at 8” or 12” spacing harvested over time.

Ginger is influenced by the postharvest storage temperature. Ginger kept at 80°F dried up over time and began to sprout after 40 days (Figure 3). Storing ginger at 40°F resulted in chilling injury of this tropical crop. The best of these three storage temperatures to extend the fresh use of ginger was 60°F but is only recommended for 60 days. To extend ginger for over two months, it is recommended to slice and dry the fresh ginger. Ginger sliced at 2 mm dried quicker than ginger sliced at 4 mm. Once the ginger is dried it can be stored as dried slices or ground into a powder for convenient use (Figure 4). The 2 mm sliced ground ginger resulted in a fine powder than the 4.mm slices.

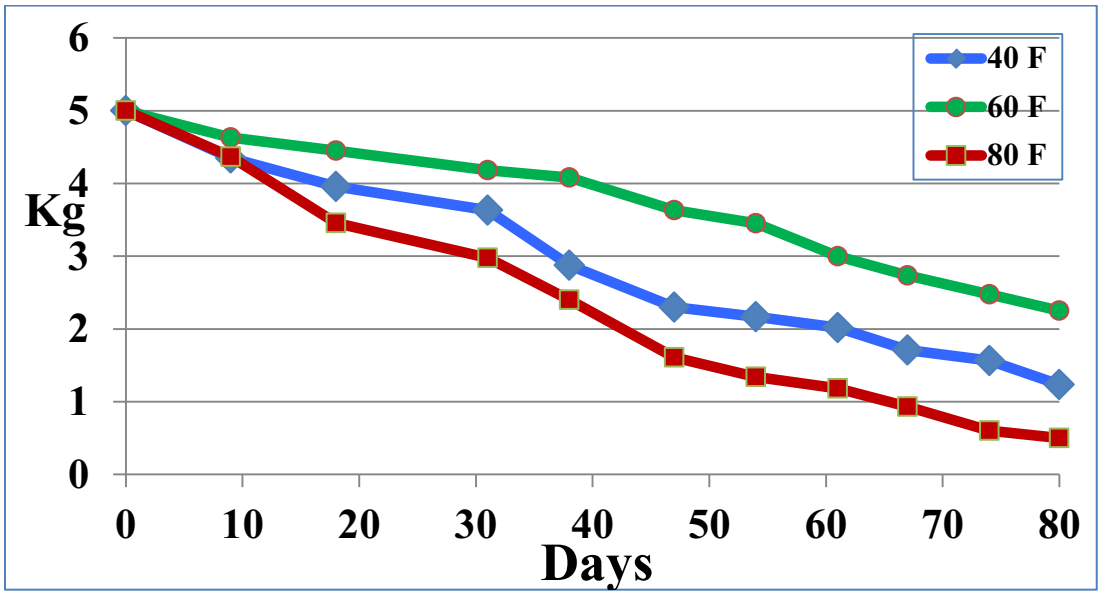

Fig. 3. Marketable ginger weight following postharvest storage at 40, 60 or 80 °F over time.

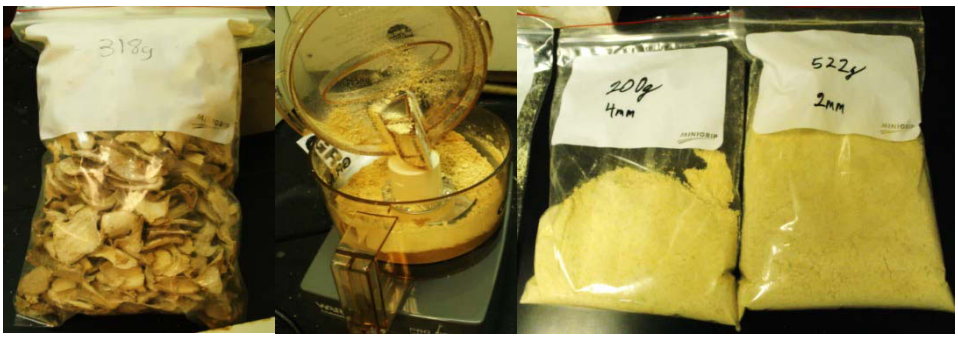

Fig. 4. Sliced dried ginger ground into powder.

CONCLUSIONS

Ginger can be successfully grown in the US Virgin Islands on high pH calcareous soils when Fe-EDDHA is used to control chlorosis. No significant difference in production was observed between 8" or 12" in-row spacing for either total yield or marketable yield on a 75 ft row. A trend was indicated with greater marketable yield with later harvests. Ginger stored at 40°F exhibited chilling injury after two weeks in storage but storage at ambient temperature of 80°F

resulted in desiccation over time and sprouting after 40 days. Ginger refrigerated at 60°F provided the best postharvest storage for up to 80 days. Value added dried ginger can extend marketing beyond the fresh storage limit.

REFERENCES

Singletary, K. 2010. Ginger: An overview of health benefits. Nutrition Today 45:171-183.