

The Case for Papaya as a Non-Traditional Export Product for Ghana

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ABSTRACT

The origin of papaya and its suitability for cultivation under Ghanaian climatic condition is recalled.

A brief account of the past development, export potential and performance over the past three years has been presented.

The need for improved seed as a starting point for commercial exploitation has been stressed and proper post-harvest handling and consistent delivery of high quality product for this exotic market heavily underscored.

Areas of information gap such as spacing, fertilization, pest and disease identification and control, water relations and weed control have been highlighted and the need for intervention stressed.

Possible areas into product development including tissue culture techniques for cloning have been suggested and research support by terminal user agencies highlighted for rapid industrial growth of the horticulture sub-sector.

Keywords: *Papaya, export, varieties, selection, research.*

INTRODUCTION

The papaya, *Carica papaya* L. is variously known as papaw or papaw. It is native to tropical America, probably Southern Mexico or Central America [2]. It is a common plant throughout West Africa and is considered one of the major fruit crops which is well suited to moist but well-drained areas and grows abundantly in several vegetation zones notably coastal savannah, forest and the savannah intergrade. It however does not occur spontaneously in the Guinea savannah in northern Ghana although the plant may be found around some homesteads.

The papaya is a rapid-growing, normally unbranched polygamous species with unisexual and bisexual tree

types and tends to be columnar in growth habit and bears its fruit along the main stem in the axil of every leaf above the point of initial flowering. It is usually propagated by seed which may partly explain its occurrence in diverse ecological zones simultaneously. The seeds are dispersed by man, animals and birds feeding on the fruit and throwing away, defecating or spitting them into the environment.

PAST DEVELOPMENT

In Ghana there are numerous unnamed papaya varieties of two main types: round- and long-fruited with yellow or pink flesh colour. Four selected varieties: Solo, No 5595, Round, Long, were imported from Trinidad in 1954 [7]. Solo Round, Long, No 5595, Blue Solo, Golden Surprise, Columbian Ranchi and Honeydew were recommended for growing in Ghana [4]. At the moment none of these varieties can be identified with any degree of accuracy except for the Long- and Round-fruited types for papaya varieties cross freely among themselves because of the dioecious nature of the plant thereby losing their individual identities over successive generations [4]. There exists today a conglomeration of papaya crosses in the country and to date the author is not aware of any consistent effort to carry out research into improving the existing material for orchard cultivation though as far back as 1926 however, some hints on papaya cultivation in Ghana were given [5].

In the 1980s some hybrid papaya varieties were tried at Kwadaso by a research scientist (Francis Agble, personal communication) but there are no records of the varieties tried and the results obtained. From their bearing behaviour however, they could be grouped into long and Round types with pink or yellow flesh colour.

EXPORT POTENTIAL

Papaya has long been identified as a potential export product in such countries as Cote d'Ivoire and South Africa. As a result, several Solo strains were imported from Hawaii for the establishment of commercial ventures. Sunrise Solo is commercially grown in Cote d'Ivoire and South Africa for export [7].



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For Ghana, the fruit authentic identification of papaya for possible export was made by a consulting firm contracted by the Commonwealth Secretariat, Export and Marketing Division, to conduct a survey to identify possible products that could be advantageously exported as non-traditional products to Western European markets. The report of that survey indicated that there were excellent business opportunities in the United Kingdom for papaya and that the market could absorb up to 2000 boxes of 50 - 54kg per week [3].

With this information, a reputed Ghanaian entrepreneur made further trade enquiries at the Ghana Export Promotion Council and some overseas countries and decided in 1990 to embark on a ten-hectare orchard production of a solo type papaya. At the first flowering, the material segregated into three flower types viz. hermaphrodite producing pear-shaped fruit, female producing round fruit and males. The male and female trees were eliminated leaving the bisexuals. If the market can accept fruits from female trees as well, they can also be sold to advantage for from the results of a study carried out to compare the flavour and sweetness of papayas from female and hermaphrodite plants the flavour and sweetness did not depend on sex of the plant from which the fruits were harvested [6]. It was therefore concluded that the common prejudice against round-fruited papayas in Hawaii seemed to be based on opinion and prejudice rather than quality factors such as flavour and sweetness.

Since a few female plants are characteristically found in orchards, it will be worthwhile for orchard developers to do thorough market research so that if differential markets for globular and pear-shaped fruits exist they can exploit both simultaneously.

EXPORT PERFORMANCE

The product development is in its very infancy and therefore not much has been achieved by way of exports. Available provisional figures released by the Export Promotion Council for 1990 and 1991 have shown that 93kg of watermelon/papaya conglomerate were exported from January to September 1990 as against 9.879 tonnes of papaya alone in 1991. Exports over the same period in 1992 amounted to 9.835 tonnes [1]. The increase in volume of exports over 1990 was due largely to the production from the premier papaya orchard located in southern Ghana.

Though the product was of very high quality, several orders from buyers could not be honoured because of difficulties in production levels (George Kporye, (1994) personal communication). In 1991 the

enterprise benefited from consultancy services, provided under the auspices of the Ghana Export Promotion Council, on all aspects of production and post-harvest handling of papaya for export.

Interventions for increased production

There is dearth of information on almost all aspects of papaya production in Ghana. The information gap is so wide that intensive research will have to be undertaken if the industry is to grow and fulfil its role in the non-traditional export sector. During the consulting period, several information gaps were identified in the papaya cultivation. The areas where investigative work needs to be initiated immediately are discussed below.

VARIETIES

There is need for improved varieties of the Solo type which was introduced into the country several years ago. Most of those earlier varieties have become mixed up and their identity and quality cannot be ascertained. Some of the Solo types imported recently by an entrepreneur from which exports are now being made does not seem to be an improved variety for reasons outlined below. The point of initial flowering is high thus limiting the commercial life of the trees to about three years after which the trees become too tall for easy harvesting. Again two or three fruits are set at each node, a situation which makes fruit thinning necessary. The process is inconvenient, costly and in the thinning process latex drops contaminate fruits thereby increasing fruits with surface blemishes. There is also a high percentages production of catface fruits and several skips in bearing.

There is need to have improved short-statured Solo varieties with low initial flowering point so that the commercial exploitation period can be increased to about four years. The new varieties must have a high propensity towards sustained, regular bearing of fruits with firm flesh of acceptable colour and high edible quality. They must also set fruits singly at a node with a very low production of catfaced fruits. Solo varieties bearing uniform pyriform-shape fruits with thick flesh are desirable. Various improved Solo lines are available in Hawaii from where seed can be purchased for initial planting.

AGRONOMIC INFORMATION

There is very little information in agronomic practices in papaya production in Ghana. Information on spacing, fertilization, water requirements and pest and disease control is virtually non-existent. What is available is a compilation of information and practices

in other countries given as a stopgap information for immediate use. The papaya plant requires regular fertilization in the presence of adequate soil moisture for sustained production. In the absence of such information and its correct use, even the best varieties cannot perform optimally. There are pest and disease problems that must be solved if the industry is to thrive. Some of the most serious diseases of papaya include anthracnose disease of fruits, especially serious during post-harvest handling, and the papaya root and fruit rots caused by Phytophthora palmivora Butl [9].

Important pests include Banana fruit spotting bug, nymphs of the Greenhouse Whitefly, mites, fruit flies and nematodes [8, 12]. Mites, fruit flies and the nymphal stage of Greenhouse Whitefly are present in the papaya orchard presently exporting fresh fruit. The nymphs usually move in very large numbers from the base of the tree trunk upwards. When they infest the bearing area, their activities discolour several fruits rendering them unmarketable. Thorough weed control in the orchard together with early detection of the nymphs, when they begin to move up the trunk, are crucial in the control programme.

Other pests have not been found in epidemic proportions in the present orchard but the situation may change with expansion and intensity in cultivation.

POST-HARVEST-HANDLING

Methods of post-harvest handling of the fruits have so far remained a trade secret to the only papaya exporter in the country. Post-harvest handling starts after fruit harvest and ends with the consumer. It includes fruit washing and disinfection, size grading, degreening for uniform ripening, packaging, labelling and transportation. Methods of degreening are now a trade secret but various methods of accelerating uniform ripening will have to become accepted production techniques in the near future to ensure accelerated development of the industry.

FUTURE CONSIDERATIONS

Papaya production can expand rapidly if attention is paid to suggestions outlined earlier to solve the most pressing initial problems.

In the long term however, additional measures must be put in place to sustain and develop the industry.

These long term improvements will be achieved through systematic mission-oriented research into all

facets of production of the crop. It must be borne in mind that the demand for export supplies is for smaller-sized fruits between 250 and 400 grammes from selected varieties of the Solo type.

The logical starting point therefore should be the collection of various Solo type varieties country-wide and from exporting countries such as Brazil, United States of America, Cote d'Ivoire, Kenya and South Africa for screening and selection. Suitable varieties will then be grown in research-managed plots for further selection. Some of the most important selection criteria should include selection (i) for low mean height to flower (ii) propensity towards sustained regular bearing with no skips during dry warm periods, under optimum conditions, (iii) regular fruit shape of the pyriform type with occasional carpelloid (catfaced) fruits devoid of intra-ovarian ovaries (iv) types producing one fruit per node to eliminate fruit thinning (v) types producing fruits with high per cent total soluble solids content, with firm flesh of acceptable colour and good flavour at ripe eating stage (vi) types exhibiting a high proportion of exportable grade fraction of fruits consistent with market requirements and (vii) Varieties resistant to papaya root and fruit rots caused by Phytophthora palmivora Butl.

Inbreeding of selected types will then follow in order to further improve the varieties for uniformity in growth and the production of fruits of smooth skin, quality, flavour and colour. When an exceptionally desirable type has been selected, improved production techniques, in particular tissue culture for cloning, may be used to produce uniform plants which in turn will provide uniform, quality fruits.

The road to this achievement will be long but the results will more than compensate for the capital outlay and research effort expended. Malaysia has succeeded in developing a type of papaya, called Papaya exotica after 15 years of research by crossing a Hawaiian Solo with a Malaysian papaya and then using tissue culture techniques for cloning to obtain the exotic which is almost seedless (9).

Agronomic investigations should also start when the results of the first selections are released for interim commercial orchard production. This will ensure that by the time the final releases are made there will be recommended production packages to go with the expected expansion in planting.

The exotic fruit market is a very dynamic one and therefore there is need for producers to constantly monitor market trends and pass on information to researchers.

RESEARCH FUNDING

At the moment most of the research funds are provided by the Central Government. This source alone is inadequate because of the enormity and complexity of problems which need to be addressed. It is strongly suggested that industry supplements these funds with research grants which will be used for acquisition of specialised research equipment and supplies for efficient work. The availability of new and modern equipment to researchers will sensitize them to put in maximum research effort which in turn will lead to increased production of papaya with the right quality for export.

Contributions to a research fund should be made mandatory especially to terminal beneficiaries. In this way, industry will have greater say in the type of research that scientists carry out for industrial growth.

CONCLUSION

Papaya has been identified as one of the high value fruit products in which Ghana can have a comparative export advantage in the non-traditional export sector.

The fruit in Ghana is of high quality as shown by the large volume of export orders received annually. The volume of production is however, constrained by inadequate research and lack of orchards. These two factors need to be addressed to ensure continuous all-year-round production of fruits for export.

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