

Guide to Producing and Handling Export Quality Dasheen in the OECS



**A GUIDE TO PRODUCING AND
HANDLING EXPORT QUALITY
DASHEEN IN THE OECS**

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The ACP-EU Technical Centre for Agricultural and Rural Cooperation (CTA)

The publication of this document was made possible through the kind courtesy of the Technical Centre for Agricultural and Rural Cooperation (CTA).

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CTA, Postbus 380, 6700 AJ Wageningen, The Netherlands

ISBN: 976-617-005-3

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ERRATUM

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Planting

Spacing and depth

Beginning on line 3, the sentence should read:

Where soils are clayey and annual rainfall is less than 2000 mm, spacings of 65 x 65 cm and planting depths of 20 to 25 cm are recommended.

Introduction

A fivefold increase in dasheen (*Colocasia esculenta* (L.) Schott.) exports over the past 10 years (1985–1995), has made dasheen an important foreign exchange earner as a non-traditional export crop in the Organization of Eastern Caribbean States (OECS) Diversification Programme. However, these increases in exports have been accompanied by increasing demands for improved corm quality. This, coupled with competition from Jamaica, prompted the Dominica Export Import Agency (DEXIA), the Dominica Hucksters Association (DHA), and the Agricultural Diversification Co-ordinating Unit (ADCU) of the OECS to compile specifications which local dasheen producers and exporters are encouraged to satisfy.

Over the past eight years, research by the Caribbean Agricultural Research and Development Institute (CARDI) in Dominica has addressed both agronomic and post-harvest problems in an attempt to improve corm quality.

This Production and Handling Guide has been developed from a combination of original research work done by the Ministry of Agriculture and CARDI and imported technologies which have been validated and adapted by CARDI. The Guide is meant for farmers and extension officers involved in production for the United Kingdom (UK), United States (US), and regional markets.

Market Specifications

Dasheen exported from the OECS to the UK, US, Canadian, and regional markets are mainly exported from Dominica and St Vincent. Dasheen exports from Dominica go mainly to the UK, regional, and to a lesser extent the Canadian markets; whereas dasheen exported from St Vincent go mainly to the US, UK, and regional markets. These markets, as expected, require different specifications. Some of these specifications are listed. Specifications for the UK market are listed in Table 1 while specifications for the US market are listed in Table 2.

Table 1 OECS Export Crop Specifications for the UK Market

Market:	United Kingdom Issued: 28 March 1994
Variety:	Any variety meeting the specifications.
Cleanliness:	Unwashed but free of soil clods.
Appearance:	Rounded and symmetrical; no elongated or deformed corms allowed; doubled headed corms allowed, but these must weigh more than 1 kg (2.5 lb). No triple- or quadruple-headed corms allowed.
Grading:	Mixed: 25% by weighty-large corms, 50% by weight-medium corms and 25% by weight-small corms.
Maturity:	All corms should be at least 6 months old.
Trimming:	Trim leaves to within two inches from where it joins the fleshy part of the corm, do not cut into the corm flesh.
Packing:	Pack in white, banana-type cartons with stapled base plate, pack 18 kg (40 lb) net, an extra 1 kg (2 lb) should be placed in the carton to allow for shrinkage. Plastic liner should completely wrap the corms. Cartons should be clean and dry.
Sizing:	Minimum corm weight – 0.5 kg (1 lb). Maximum corm weight – 4 kg (8 lb).
Labelling:	On one short side, printed on carton or label: Dasheen – 18 kg (40 lb), Importer's Name/Address. On long side, printed: Supplier's Name/Address. No hand-written labelling is acceptable.
Decay:	No surface mould or corm softening allowed.
Damage:	Small cormel attachment scars and tail cuts are acceptable.
Post-harvest Treatment:	Dasheen may be harvested up to two days before the shipment date. Dasheens should be treated with Ridomil MZ58 (14 g in 5 gallons of water for 5 seconds). Regardless of the harvest date, the corms should be treated within 6 hours of harvest.

Source: CARDI/TROPRO Quality Assurance Project. Da UK3/94

Table 2 OECS Export Crop Specifications for the US Market

Variety:	White dasheen.
Cleanliness:	Washed clean.
Appearance:	Cylindrical in shape.
Corm Flesh:	White
Maturity:	Corms should be seven months old.
Trimming:	Trim leaves to within two inches from where it joins the fleshy part of the corm. do not cut into the corm flesh.
Packing:	Pack in nylon, mesh bags. Bags must have air holes and should contain 25 kg (50 lbs).
Sizing:	Minimum corm weight – 1.2 kg (3 lb), Maximum corm weight – 3.0 kg (6 lb).
Labelling:	The label material should preferably be made out of plastic and fastened properly to the bag. On one side print: Importer's Name/Address, Dasheen – 25 kg (50 lb). On the other side print: Supplier's Name/Address. No hand-written labelling is acceptable.
Decay:	No surface mould or corm softening is allowed.
Damage:	
Post-harvest Treatment:	No post-harvest treatments should be applied.

Source: ADCU

Recommended Varieties

The dasheen cultivar called Comme or Common Dasheen shown in Plate 1, is the variety predominantly grown in Dominica and is recommended for export to the UK market. This cultivar forms a single corm, which tends to be oval to round in shape. Among the known cultivars, it suckers the least and therefore has the least scars (exposed areas on the corm surface resulting from removal of suckers). The flesh is light blue in colour after cooking. The Noir (black) dasheen is another cultivar grown in Dominica. It is not considered suitable for export because it produces the most suckers and gives low yields. The White Dasheen is the predominant cultivar grown in St Vincent. It is exported both to the UK and US markets.

Production

Site selection

Dasheen is tolerant to a wide range of soil types (clayey, clay loam, sandy, loam and sandy clay loams) and acidity, and can be grown in areas of moderate rainfall of 1,750 to 2,400 mm (70 to 97 ins) if the soil is deep and/or swampy.

However, deep sandy clay loam soils, with good fertility and a pH range of 5.5–6.5 are most suitable locations for growing export quality dasheen. Rainfall should be between 2,500 and 3,675 mm (102 and 150 ins) annually and evenly distributed. Areas with a long dry season should be avoided. For optimum yield, dasheen requires hot humid conditions with daily average temperature in the range of 25 to 27°C; altitudes of approximately 300 to 600 m are best suited for growing the crop.

Land preparation

Clear land of all brush and trees. Use Gramoxone (paraquat)* at the rate of 2.5L (1.75 ha/pt/acre) or Round-up (glyphosate) at the rate of 2.0L (1.5 ha/pt/acre) to kill off the remaining weeds. Since dasheen is normally grown in high rainfall areas, ensure adequate soil conservation methods are practiced on slopes. Minimum till methods as commonly practised, is recommended. These include no ploughing and the maintenance of a ground cover by allowing the grasses to die and remain after spraying.



Plate 1: Dasheen Variety Comme Satisfying the Export Specifications described in Table 1



Plate 2: Healthy Sucker

Planting material

Suckers, as shown in Plate 2, are the most common forms of planting material used. They must be selected from the most vigorous and healthy growing plants, then cleaned of all roots, dead tissue and soil. Farmers normally obtain planting material from their own fields after harvesting or they purchase from other farms.

Suckers are prepared for planting according to the following specifications (see Plate 3):

- The upper 2 to 4 cm (1 to 1.75 ins) of the corm intact
- A basal diameter of 5 to 7 cm, (2 to 2.75 ins) weighing approximately 250g (40 oz)
- Petioles should be cut back to a length of 25 to 30 cm (10 to 12 ins).

Dipping suckers in a solution containing 90 ml (6 tbsp.) Bleach (e.g. Chlorox) in 45L (1 gal/min) of water for 15 to 20 min, prevents planting material from rotting. Dipping tanks which can be a 45 gal drum cut in half, such as that shown in Plate 4, can be used.



Plate 3 Diagram of Prepared Planting material



Plate 4 Dipping Dasheen Suckers in Bleach

Time of planting

In areas where annual rainfall levels are high (between 3,500 and 4,500 mm) and evenly distributed, planting can be done throughout the year. To ensure that dasheen supplies are regular, plantings should be done monthly. In areas where rainfall levels are lower (approximately 2,500 mm) and unevenly distributed, planting should be just before the onset of, or coinciding with the beginning of the rainy season (mid-April/June).

Planting

Spacing and depth

Minimum till methods is recommended. In sandy clay loam soils, where annual rainfall levels are high (3,500–4,500 mm), spacing of 55 x 55 cm and planting depths of 30 cm are appropriate. Where soils are clayey and annual rainfall is less than 2,500 mm, spacings of 55 x 55 cm and planting depths of 20 to 25 cm are recommended. Corm shape changes are experienced when dasheen is planted on different soil types and moisture regimes. In clayey soils, the higher average bulk densities and lower porosities offer greater resistance to tuber bulking as compared to sandy clay loam soils which have lower average bulk densities and higher porosities. Irregular rainfall patterns cause irregular growth patterns and may cause tubers to develop 'dumb-bell' shape. Consistent and higher rainfall levels are more conducive to normal plant growth and uniform corm development.

Hole making

Ploughing is not advised. Sink a round graduated planting stick with a circumference of approximately 35 cm and pointed at the tip to the required depth (see Plates 5 and 6). While rocking from side to side create a hole of approximately 15 cm in diameter. Plants can then be placed in these holes and partially covered with soil. On clayey soils in drier areas, a fork may be used.



Plate 5 Planting Sticks



Plate 6 Farmers using Planting Stick

Plant depth, plant spacing, and soil type and rainfall patterns are factors, which affect size and shape of the corm obtained.

Weed control

Dasheen plots must be kept weed free during the first three months of growth. During land preparation, Round-up or Gramoxone may be used to control weeds. Round-up is more expensive but its effects are longer lasting. Shielded sprays of Gramoxone at a rate of 2.5L/ha are recommended for the control of weeds before canopy formation. Subsequent weeding should be manual and carried out as necessary. It is not always economical to weed after the crop is six months old.

Fertilizer use

It is important to determine the nutritional status of the soil before planting. If a ratoon dasheen crop exists in the area designated for planting, fertilizer recommendations should be based on soil and leaf analyses.

Your extension officer will assist you in obtaining soil and leaf analyses.

Assuming there is no inherent soil nutritional deficiency, the compound fertilizer NPK MgO (15:8:12+2), applied at 2 and 8 weeks after planting, at the rate of 57 g (2 oz) per plant on each application is recommended 1# for Dominica. Fertilizers should be applied in a circle approximately 18 cm from the base of the plant. Where possible, the fertilizer should be covered with soil to avoid washing away by heavy rains.

Moulding (optional)

If implemented, moulding should be carried out within 1 to 2 weeks of the second fertilizer application. Soil may be moulded to a height of 6 to 8 cm around the base of the plant, by moving soil from within a radius of 30 to 35 cm around each plant. Moulding prevents washing away of the fertilizer, and allows the corm to remain covered with soil as it pushes to the surface during maturity.

Pests and diseases

Presently there are no major pests or diseases of economic significance affecting dasheen production in the OECS.

Harvesting

Corms are normally ready for harvest when most of the leaves begin to turn yellow. Other signs of maturity are when the rain corms become clearly visible after pushing up to the surface. Since the time to harvest is affected by different agro-ecological zones, corms should be harvested between 7 and 8 months in drier areas (annual rainfall below 2,500 mm) and between 9 and 10 months in the wetter areas (annual rainfall between 3,500–4,500 mm). When corms are harvested at the immature stage, yields are reduced. Corms harvested past the maturity stage can sometimes be unpalatable.

Corms can be harvested using a fork, which is placed about 30 cm away from the base of the plant, then pushed into the soil and lifted gently at an angle. The fork is moved in a circle until the soil surrounding the base of the plant is completely loose. The main plant and suckers are then held by the petioles and pulled gently from the soil.

Be careful not to damage the corms, as injuries may lead to infections, which reduce corm quality and shelf life.

Yield

Yields of 12 to 14 t/ha can be expected where rainfall levels are above 2,500 mm and evenly distributed. In the drier areas where rainfall levels are between 1,750 and 2,400 mm, where yields of 8 to 12 t/ha can be expected.

Cost of production

The cost of producing one kilogram of dasheen ranges from 66 to 70 cents (EC).

Post-harvest treatment

Any corms showing signs of decay should be rejected. Suckers, roots, and soil are then carefully removed from the main corm. Ideally, suckers should be cut off rather than broken off. Though this is time consuming, it reduces decay. Corms should then be cleaned in running water within 4 hours of harvest and excess petiole trimmed without cutting into the corm. For extra-regional export, British markets, corms should be treated for 2 to 3 seconds with a solution of Ridomil MZ 58 or MZ 72 (14g/23 litres of water) to prevent fungal attack (see Plate 7). This should be implemented within 4 hours of harvest. For regional exports, where corms are consumed in a shorter space of time, a solution of bleach (19ml/10L) is recommended or corms can be treated with a solution of Ridomil MZ 72 (2.8g/5 litres of water) to prevent fungal attack. Excess solution should be drained from the corms but the corm surface should not be allowed to dry out before packing; it should preferably remain moist. For the US market no post-harvest fungicide or any other chemical treatments are required. However, all other sanitary and handling procedures such as washing with clean water should be implemented.



Plate 7 Dipping Corms in Fungicide Solution

Packing

For the UK market corms should be kept moist by wrapping in polythene, and then placed in the recommended boxes (see Plates 8 and 9). The maximum recommended box weight is approximately 20 to 25 kg (40 to 50 lb) per box. Boxes should be properly labelled (see Plate 10) using the specifications listed in Table 1. For the US market corms should be kept moist, then placed in well ventilated, properly labelled nylon mesh bags, as detailed in Table 2.



Plate 8 Packing Dasheen Corms for Export



Plate 9 Properly Packed Boxes



Plate 10 Properly Labelled Boxes

Storage

Corms should be stored between 7 and 10° C during shipping.