

CHARACTERISATION, CLASSIFICATION AND PRELIMINARY EVALUATION  
OF SWEET POTATO ACCESSIONS IN ST. LUCIA

*(Caractérisation, classification et évaluation préliminaire  
de cultivars de patate à Ste. Lucie)*

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SUMMARY

A total of 54 accessions of sweet potato (*Ipomea batatas*(L.) Lam) were collected island-wide and grown under uniform field conditions. After thorough screening at the end of the first crop season, it was found that there are as many as 46 distinct cultivars in St. Lucia. These cultivars were classified into different categories based upon vine pigmentation, storage-root skin colour and flesh colour, crop duration and yield. The characteristics of all these cultivars were documented for ready reference and comparison against possible new introduction.

RESUME

Un total de 52 acquisitions de patate a été collecté à travers l'île et mis en culture dans des conditions de terrain uniforme. A la fin de l'année le tri soigneux établit l'existence de 30 cultivars distincts à Ste-Lucie seulement. Ces cultivars sont classés à partir de la coloration des lianes, des racines tubérisées (peau et chair), de la durée du cycle et du rendement. Les caractères de tous sont enregistrés pour être rapidement utilisés et prévenir des introductions identiques.

INTRODUCTION

The cultivation of sweet potato is widespread in St. Lucia because it forms a source of food for most farm households. This same tuber crop provides a major farm activity in the south-western parts of St. Lucia (agro-ecological zones IV and V), consequently, its contribution to farm family

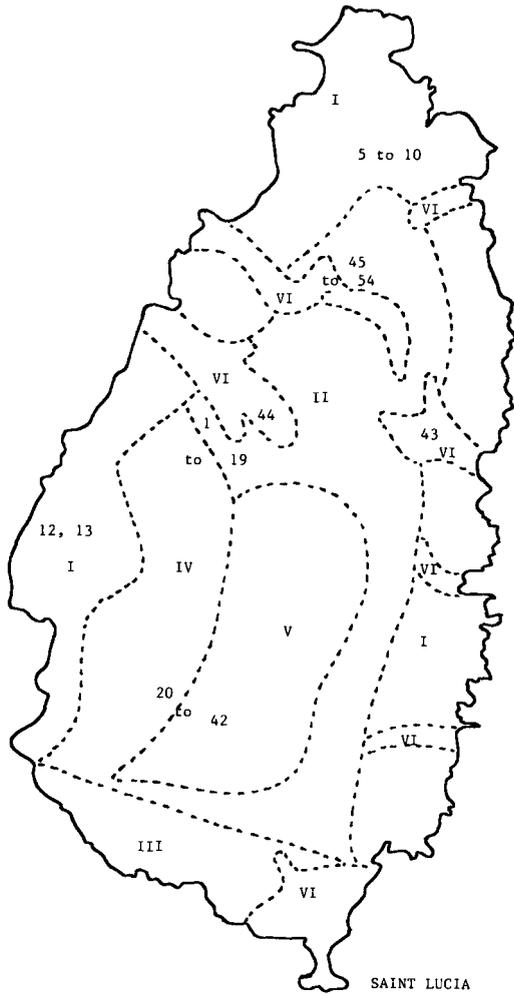


Fig.1 : Map showing the collection sites of sweet potato accessions in St Lucia

income is considerably high. A market study also revealed that of all the root crops, the volume of sweet potatoes, sold in the supermarkets and the central market and purchased by hotels, was the highest (Chase, personal communication). A reconnaissance Survey of the major sweet potato production areas was carried out (CHASE et al, 1985) to determine the production constraints and the agro-socio-economic environment of the sweet potato farmers. The results of this survey indicated (i) the presence of multiple names for the same cultivar and (ii) that different cultivars are referred to by the same name in different places. This underlined the urgent need to collect and characterize the entire sweet potato germplasm in the island.

## MATERIALS AND METHODS

Sweet potato germplasm was collected during the period October–November, 1984, by careful observation and by visiting the major sweet potato growing areas in the island. In all cases, vegetative material (10 – 15 slips each measuring 15–20 cm) was collected from the field and planted at the la Ressource Field Station for characterization and preliminary evaluation. The sites of collection of sweet potato germplasm are shown in Fig. 1 and their local names are given in Table 1. The characteristics of different agro-ecological zones of St. Lucia are presented in Table 1A. Each accession was planted on separate ridges 1m apart with an intra-row spacing of 50 cm and the germplasm was grown with no fertilizer. The sweet potato accessions were characterised from January to June 1985 following the descriptors for sweet potato (IBPGR, 1981). The tubers were harvested when the leaves turned yellow or by digging a couple of plants for tuber maturity.

## RESULTS AND DISCUSSIONS

During crop growth, extensive data on both quantitative and qualitative characters were collected on all sweet potato accessions. However, only the following six characters were used, because it is believed that the others may vary depending upon tuber maturity and soil fertility, to compare the similarities among different accessions.

- i. mature leaf lobing,
- ii. vine pigmentation
- iii. storage root skin colour
- iv. storage root flesh colour
- v. crop duration
- vi. tuber yield

From the data presented in Table 2, it is apparent that there are a few accessions showing similarities and it is

Table 1: Local names of Sweet Potato Accessions collected from different Agro-ecological zones in St. Lucia

| AGRO-ECOLOGICAL ZONES |                 |                         |                   |               |              |
|-----------------------|-----------------|-------------------------|-------------------|---------------|--------------|
| I                     | II/IV           | II/VI                   | III/IV/V          |               | VI           |
| 6. Sis-semen          | 1. Arsoon       | 37. St. Vincent         | 13. Auguste       | 31. Octavi    | 42. Lean Fin |
| 7. Ma-Eddie           | 2. Ma-Charley   | 38. Vaval Grand Orielle | 14. Ma-Ba-Lim     | 32. Day None  | 43. IITA     |
| 8. Pesar              | 3. Allen        | 39. Amaibait            | 15. Osmayid       | 33. Na-Do     |              |
| 9. A 26/7             | 4. Levernome    | 40. St. Joseph          | 16. Labourie      | 34. Semacent  |              |
| 10. Cataie            | 5. Osmayde      | 41. Tanyo               | 17. Petit Blanc   | 35. Harry     |              |
| 11. Patat Rouge       | 19. Go-lo       | 49. Timan               | 18. Ba Bard       | 36. David     |              |
| 12. Patat Blanc       | 20. St. Vincent | 50. Bethel              | 25. Chase         | 44. Govedma   |              |
|                       | 21. Unknown     | 51. Bois Duboit         | 26. Patat Zabico  | 45. Vaval     |              |
|                       | 22. Zo-noir     | 52. Leg man             | 27. Magritt Blanc | 46. Jerusalem |              |
|                       | 23. Dominique   | 53. Cushelish           | 28. Go-Blanc      | 47. Black Bay |              |
|                       | 24. Unknown     | 54. Line                | 29. Fa-Day week   | 48. Dan       |              |
|                       |                 |                         | 30. Patat-T-Fie   |               |              |

Table 1a : Characteristics of different agro-ecological zones of St. Lucia

| Agro-ecological Zone | Altitude<br>(m) | Annual Rainfall<br>(mm) | No. of dry months | Soils                                     |
|----------------------|-----------------|-------------------------|-------------------|---|
| I                    | < 150           | <1800                   | 2 - 4             | Heavy, shallow, montmorillonitre<br>clay  |
| II                   | 150 - 500       | 1800 - 2500             | 1 - 2             | Intermediate, Latosolics and<br>polysoils |
| III                  | < 150           | < 1800                  | 3 - 4             | Heavy, montmorillonitic with<br>clay pan  |
| IV                   | 150 - 600       | 2000 - 2500             | 1                 | Brown, latosolics                         |
| V                    | 300 - 900       | > 2500                  | NIL               | latosolics                                |
| VI                   | 30              | 1800 - 2500             | 2 - 4             | Alluvial                                  |

Table 2: GROUPING OF SWEET POTATO ACCESSIONS

| Accession Number | Mature Leaf Lobing |   |   |   | Vine Pigmentation |   | Storage root skin colour |    |   |   |   | Storage root flesh colour |   |   | Crop duration |   |    | Tuber yield |    |   |    |    |
|------------------|--------------------|---|---|---|-------------------|---|--------------------------|----|---|---|---|---------------------------|---|---|---------------|---|----|-------------|----|---|----|----|
|                  | N                  | S | M | D | G                 | P | PK                       | PP | W | C | R | B                         | Y | C | W             | O | Sh | Me          | Lg | H | Md | Lo |
| 1                |                    |   | + |   |                   | + |                          |    |   |   |   | +                         |   |   |               |   | +  |             |    |   |    | +  |
| 2                | +                  |   |   |   |                   |   |                          |    |   |   |   |                           | + |   |               |   | +  |             |    |   |    | +  |
| 3                | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    |    |
| 4                |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 5                | +                  |   |   |   |                   |   |                          |    |   |   |   |                           |   |   |               |   |    |             |    |   |    |    |
| 6                |                    |   | + |   |                   |   |                          |    |   |   |   | +                         |   |   |               |   |    |             |    |   |    | +  |
| 7                |                    |   |   | + |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 8                | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 9                | +                  |   |   |   |                   |   |                          |    |   |   |   | +                         |   |   |               |   | +  |             |    |   |    | +  |
| 10               | +                  |   |   |   |                   |   |                          |    |   |   |   |                           | + |   |               |   |    |             |    |   |    | +  |
| 11               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 12               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 13               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 14               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 15               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 16               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 17               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 18               |                    |   |   | + |                   |   |                          |    |   |   | + |                           |   |   |               |   |    | +           |    |   |    | +  |
| 19               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 20               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    | +           |    |   |    | +  |
| 21               |                    |   |   | + |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 22               |                    |   |   | + |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 23               | +                  |   |   |   |                   |   |                          |    |   |   |   | +                         |   |   |               |   |    |             |    |   |    | +  |
| 24               |                    |   | + |   |                   |   |                          |    |   |   |   |                           | + |   |               |   | +  |             |    |   |    | +  |
| 25               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 26               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 27               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 28               |                    | + |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 29               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 30               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 31               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 32               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 33               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 34               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 35               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 36               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 37               |                    | + |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 38               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 39               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 40               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 41               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 42               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 43               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 44               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   |    |             |    |   |    | +  |
| 45               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 46               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 47               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 48               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 49               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 50               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 51               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 52               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 53               | +                  |   |   |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |
| 54               |                    |   | + |   |                   |   |                          |    |   |   | + |                           |   |   |               |   | +  |             |    |   |    | +  |

N: None, S: Slight, M: Moderate, D: Deep, G: Green, P: Moderately purple to purple, PK: Light pink to pink, PP: Light purple to purple, W: White, C: Cream, R: Red, B: Brown, Y: Yellow, O: Orange, Sh: Short (< 150 days), Me: medium (150-210 days), Lg: Long (> 210 days), H: High (> 400g/plant), Md: moderate (200-400g/plant), Lo: Low (< 200g/plant).

Table 3: Sweet Potato Accessions with similar Characteristics

| Accession Number | Local Name    | Agro-ecological Zone | Characteristics    |                             |                          |                           |                      |                       |
|------------------|---------------|----------------------|--------------------|-----------------------------|--------------------------|---------------------------|----------------------|-----------------------|
|                  |               |                      | Mature Leaf Lobing | Vine Pigmentation           | Storage root skin colour | Storage root flesh colour | Crop duration (days) | Tuber yield (g/plant) |
| 6                | Sis-semen     | I                    | Deep               | Moderately purple to purple | Light purple to purple   | White                     | Medium (150-210)     | Moderate (200-400)    |
| 29               | Fa-Day week   | IV/V                 |                    |                             |                          |                           |                      |                       |
| 34               | Semacent      | IV/V                 |                    |                             |                          |                           |                      |                       |
| 35               | Harry         | IV/V                 |                    |                             |                          |                           |                      |                       |
| 18               | Ba Bard       | IV/V                 |                    | Moderately purple to purple | Light purple to purple   |                           | Medium (150-210)     | Low (<200)            |
| 20               | St. Vincent   | II/IV                | Deep               |                             |                          | White                     |                      |                       |
| 41               | Tanyo         | II/VI                |                    |                             |                          |                           |                      |                       |
| 27               | Magritt Blanc | IV/V                 | None               | Green                       | White                    | White                     | Medium (150-200)     | Moderate (200-400)    |
| 31               | Octavi        | IV/V                 |                    |                             |                          |                           |                      |                       |
| 12               | Pata Blanc    | I                    | None               | Green                       | Light purple to purple   | White                     | Long (>210)          | Moderate (200-400)    |
| 14               | Ma-Ba-Lim     | IV/V                 |                    |                             |                          |                           |                      |                       |
| 30               | Patat-T-Fie   | IV/V                 | Moderate           | Green                       | Light purple to purple   | White                     | Medium (150-210)     | Moderate (200-400)    |
| 54               | Line          | II/VI                |                    |                             |                          |                           |                      |                       |

likely that these accessions are the same (Table 3). It is also evident that there are multiple names for some cultivars either within the same or different agro-ecological zones. This multiple naming is more prevalent in zones IV and V because it is in these zones that sweet potatoes are cultivated extensively.

There seems to be a vast diversity in the sweet potato germplasm in St. Lucia. The matured leaves of about 40 per cent of the sweet potato accessions showed no lobing. About half the accessions had green vines, the other half having moderately purple to purple pigmentation (Table 2). Thirty-nine percent of the accessions had a storage root skin colour of light pink to pink, while the storage root flesh colour of about 60 per cent of the accessions was white. The percentage of accessions with short duration (<150 days), medium (150-210 days) and long (>210 days) duration was 14.8 per cent, 44.4 per cent and 40.8 per cent, respectively, while those with high (>400 g/plant), moderate (200-400 g/plant) and low (<200 g/plant) tuber yield was 27.8 per cent, 46.3 per cent and 25.9 per cent respectively. Most (87.5 per cent) of the short duration cultivars are high yielded while medium and long duration cultivars are either moderate or low yielders.

There appears to be no correlation between the accession characteristics and agro-ecological zones.

#### PRACTICAL IMPLICATIONS

This characterisation exercise helped to identify sweet potato cultivars with short duration and high yield together with storage root skin colour and flesh colour. These cultivars will be evaluated, multiplied and distributed to farmers in order to satisfy export market.

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