

PHILIPPINE NATIONAL STANDARD

PNS/BAFPS 95:2010
ICS 67.080.01

Fresh vegetables – Sweet potato – Classification and grading



BUREAU OF PRODUCT STANDARDS

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Foreword

The development of the Philippine National Standard for Sweet potato, PNS/BAFPS 95:2010 was undertaken by the Bureau of Agriculture and Fisheries Product Standards (BAFPS) in order to reflect the recent technology developments in the industry and the need for harmonization with Codex requirements in Heavy Metals, Pesticide Residues and Hygiene.

PNS/BAFPS 95:2010 was based on the recent studies conducted by the Philippine Root Crops Research and Training Centers, in the country such as Visayas State University, Baybay City, Leyte; Benguet State University, La Trinidad, Benguet; Institute of Plant Breeding, University of the Philippines at Los Baños; and other State Universities and Colleges .

A Technical Committee (TC) and Sub-Committee (SC) were organized by the Bureau of Agriculture and Fisheries Product Standards (BAFPS) through Special Orders No. 411, series of 2001 and 169, series of 2007 to generate the data and formulate the PNS for Sweetpotato. The draft standard was presented for technical reviews and public consultations in the three major islands of the country prior to finalization of the standard.

The PNS for Sweet potato aims to provide common understanding on the scope, definition, minimum requirements, nutritive values, classification, sampling, packaging, and marking and labeling.

Fresh vegetables – Sweet potato – Classification and grading

1 Scope

This standard establishes a system of classifying and grading sweet potatoes grown from *Ipomea batatas* L. to be supplied fresh to the consumers.

2 Reference

The titles of the standard publications and other references of this standard are listed on the inside back cover.

3 Definitions

For the purpose of this standard, the following definitions apply.

3.1**badly misshapen**

when the shape is badly curved, crooked, constricted, ridged or malformed

3.2**fairly clean**

not smeared or caked with dirt or other foreign materials

3.3**fairly smooth**

relatively free from veining or any defect that causes the skin to appear rough

3.4**fairly well-shaped**

insignificant deviation in shape of sweet potato

3.5**firm**

not flabby or shriveled

3.6**growth cracks**

healed deep cracks caused by over maturity

3.7**insect damage**

wireworm, weevil or similar injury

3.8**mechanical damage**

cuts, bruises or other damages caused by improper handling

3.9

similar varietal characteristics

have the same character of flesh and practically the same skin color. For example, dry type shall not be mixed with semi-moist or moist type, and deep red or purple skin color shall not be mixed with yellow or reddish copper skin color

3.10

sprouts

shoot growth

3.11

well-shaped

appearance of sweet potato in accordance to specific variety

4 Minimum requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, sweet- potato must be:

- whole, firm, clean and free from any visible foreign matter,
- free from visible rots, dead and living insects, mold and other contaminants,
- have well-developed roots, and
- roots must have normal appearance and of similar characteristics of the variety.

The development and condition of the sweet potato must enable them to:

- withstand transport and handling, and
- arrive in satisfactory condition at the place of destination.

5 Classification

Sweet potatoes are classified according to its general appearance, quality and condition, as follows:

5.1 Extra class – Sweet potatoes must be of superior quality; have similar varietal characteristics; firm; clean; whole; mature; smooth; well-shaped; free from diseases such as scab, soft rot and others; insect damage such as wireworms and weevils; and free from sprouts, cuts, bruises, scars, growth cracks and other damages, with the exception of very slight (2%) superficial defects, provided these do not affect the quality and general appearance of the produce.

5.2 Class I – This class includes sweet potatoes of good quality; have similar varietal characteristics; firm; whole; fairly clean; fairly smooth; fairly well-shaped; slightly free from diseases such as soft rot, scab and others; and free from sprouts, growth cracks, cuts, bruises, scars and other damages, provided these do not affect the quality and general appearance of the produce.

5.3 Class II – This class includes sweet potatoes which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Clause 4.

6 Size classification

The size classification is based on the diameter of sweet potato.

Size classification	Diameter (mm)
Extra large	>90
Large	71-90
Medium	51-70
Small	30-50
Very small	<30

7 Tolerances

7.1 Quality tolerance

7.1.1 Extra Class – Five percent (5 %) by weight of the sweet potato may fail to meet the requirements of the class but meeting those of Class I.

7.1.2 Class I – Ten percent (10 %) by weight of the sweet potato may fail to meet the requirements of the class but meeting those of Class II.

7.1.3 Class II – Ten percent (10 %) of the sweet potato by weight not satisfying the requirements of the class nor the minimum requirements, with the exception of produce affected by rotting.

7.2 Size tolerance

For all classes, ten percent (10 %) by number or weight of sweet potatoes corresponding to the size immediately below or above the size indicated on the package.

8 Sampling

Sampling to be used for ascertaining conformance shall be in accordance with PNS/ISO 874.

9 Packaging

Sweet potatoes shall be packed in suitable containers that will provide protection from normal hazards of transport and handling. The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of sweet potato. The use of material, particularly of paper or stamps bearing the trade specifications is allowed, provided the printing or labeling has been done with non-toxic ink or glue.

10 Marking and labeling

Each container shall be properly labeled with the following information:

- 10.1** Name of produce and variety;
- 10.2** Class and size;
- 10.3** Net weight (kg);
- 10.4** Date of harvest;
- 10.5** Name and address of producer, trader and exporter;
- 10.6** Origin of the produce; and
- 10.7** Product of the Philippines.

11 Contaminants

11.1 Heavy metals

Sweet potato shall comply with the maximum limits for heavy metals established by the Codex Alimentarius Commission and/or authority for this commodity.

11.2 Pesticide residues

Sweet potato shall comply with the maximum residue limits established by the Codex Alimentarius Commission and/or authority for this commodity.

12 Hygiene

12.1 It is recommended that the produce covered by the provisions of this standard be prepared and handled in accordance with appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1 – 1969, Rev. 4 – 2003), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

12.2 The produce should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

Annex A

Nutritional contents of sweet potatoes

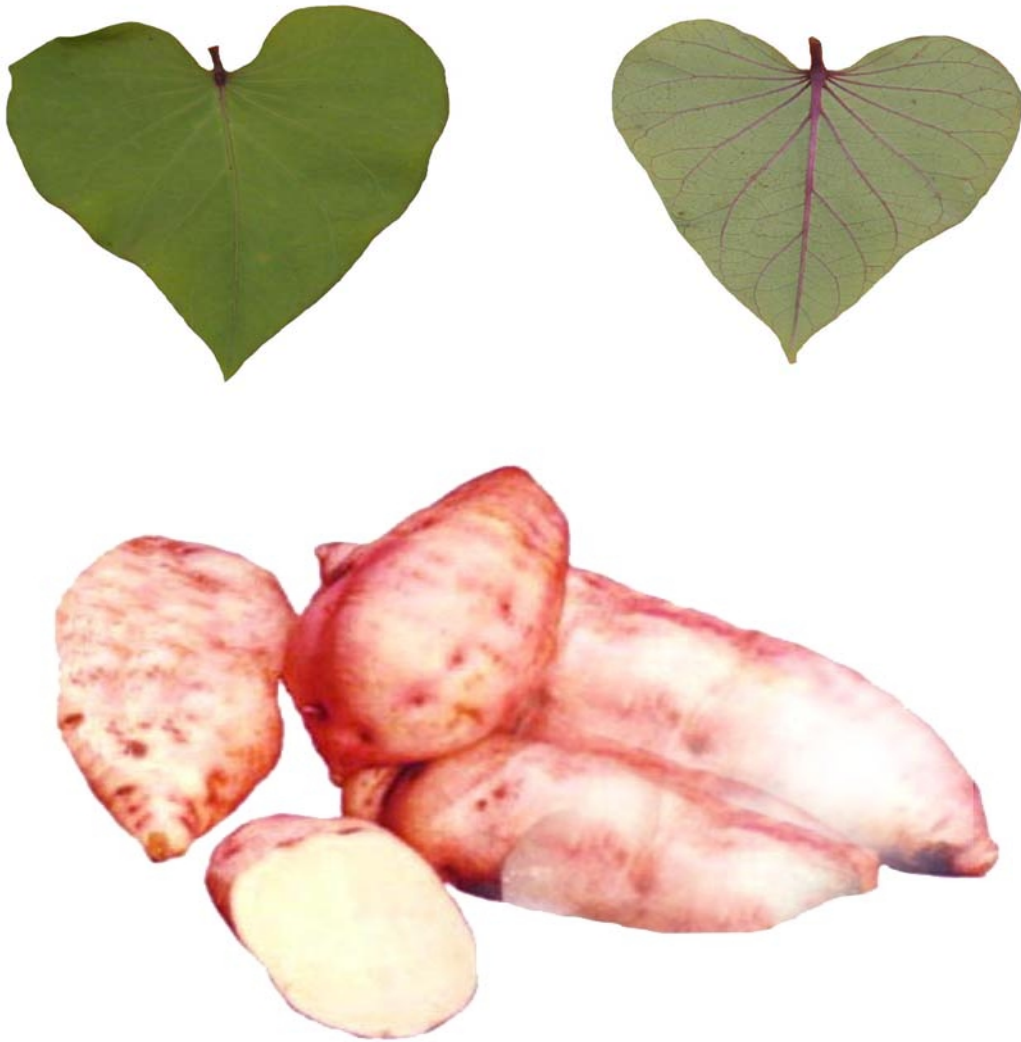
Nutritional contents	Part of plant		
	Tuber	Leaves	Yellow fleshed tuber
/100 g of edible portion			
Water (ml)	70	87	70
Calories	114	42	121
Protein (g)	1.5	3.2	1.6
Fat	0.3	0.7	0.2
Carbohydrate (g)	26	8	28
Fiber (g)	1.0	1.6	1.0
Vitamin A (µg)	60	2700	1255
Vitamin C (mg)	30	21	37
Iron (mg)	1.0	4.5	2.7
Calcium (mg)	25	86	33

Annex B

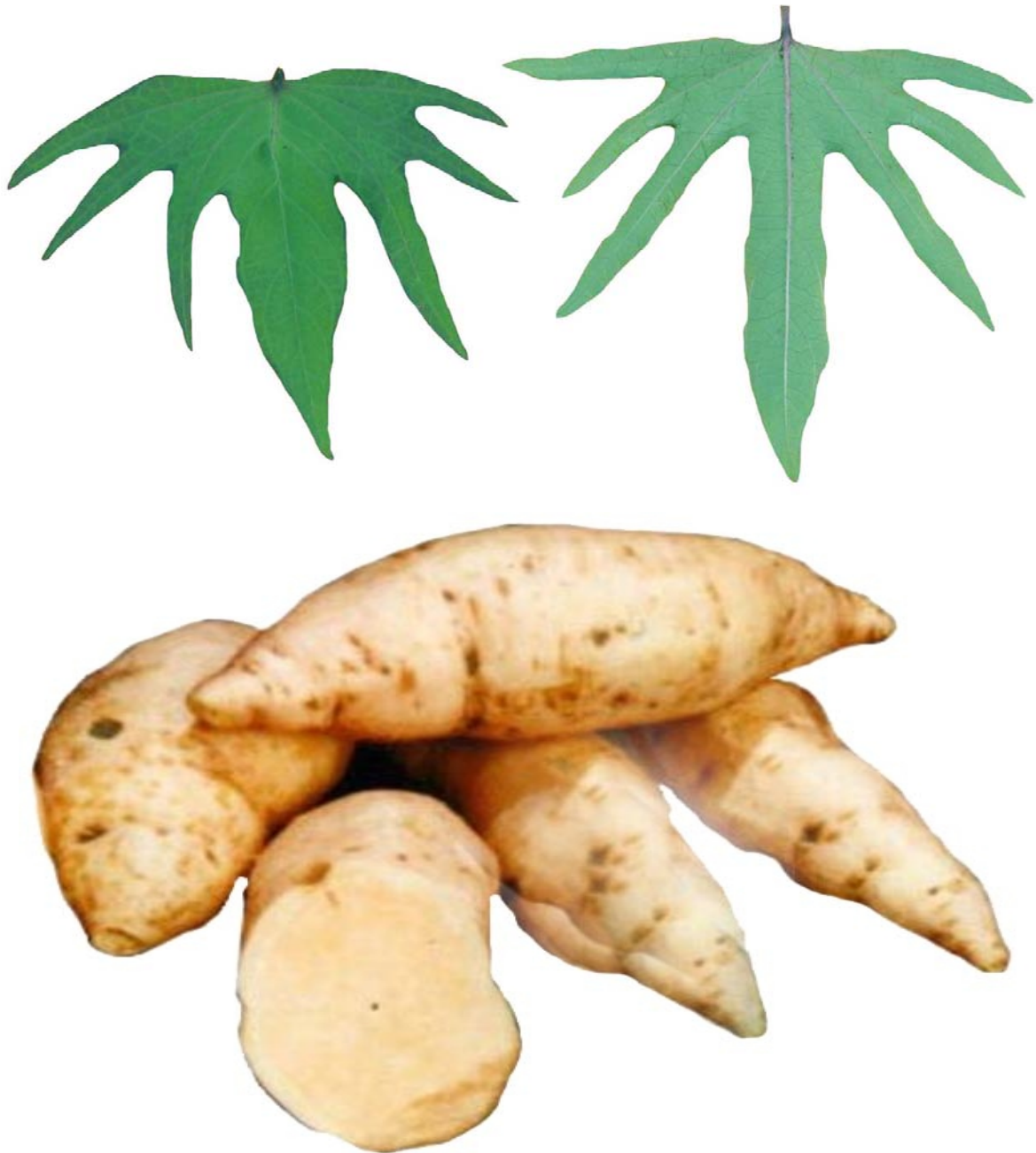
Varieties of sweet potato

1	VSP 1 (V2-1)	17	PSB SP 17 (88WS-630)
2	VSP 2 (V2-27)	18	PSB SP 18 (90-06-03)
3	VSP 3 (V2-3)	19	PSB SP 19 (OPS-100)
4	VSP 4 (V2- 27)	20	PSB SP 20 (LG19A-10)
5	BPI SP 1 (LO-328)	21	PSB SP 21 (G46-1A)
6	UPL SP 1 (Kinabakab)	22	PSB SP 22 (SG94-1303)
7	UPL SP 3 (Tinipay)	23	PSB SP 23 (SG94-1717)
8	VSP 5 (V10-595)	24	PSB SP 24 (SG96-3503)
9	UPL SP 5 (G113-2B)	25	NSIC SP 25 (JK 018)
10	BPI SP 2 (C1693-9)	26	NSIC SP 26 (JK 024)
11	VSP 6 (V20-209)	27	NSIC SP 27 (BSU SP 2) (Bengueta)
12	VSP 7 (V20-429)	28	NSIC SP 28 (SG98-03-02)(UPL SP 7)
13	PSB SP 13 (OPS-88)	29	NSIC SP 29(SG98-18-01)(UPL SP 9)
14	PSB SP 14 (G48-15A)	30	NSIC SP 30 (JK 027)
15	PSB SP 15 (V37-151)	31	NSIC SP 31 (SG 99-09-02)
16	PSB SP 16 (V30-595)	32	NSIC SP 32 (JK 02-20-4)

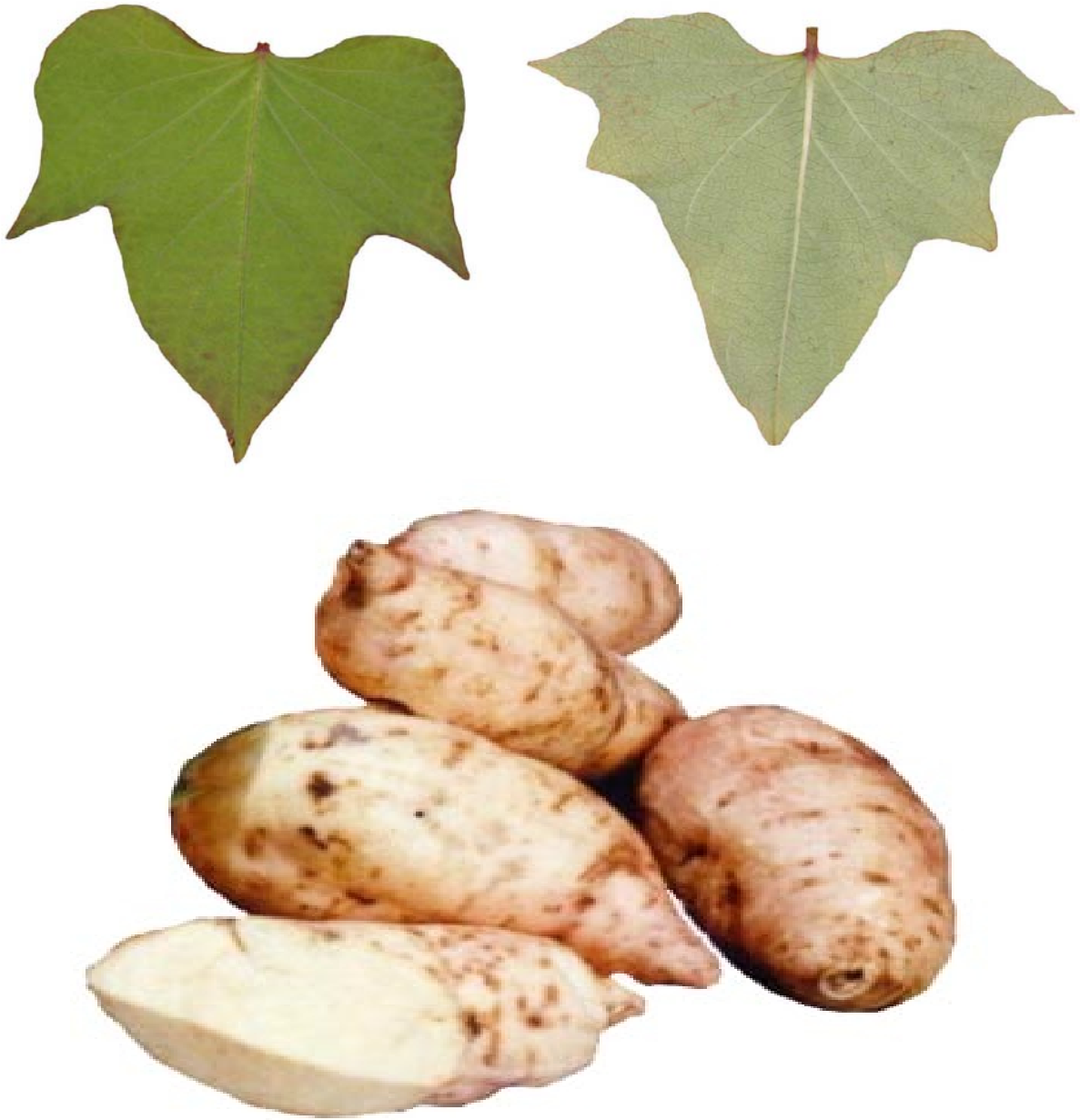
These varieties of sweet potatoes are recommended by the Philippine Seed Board and the National Seed Industry Council.



**Figure 1 – VSP 1
(V2-1)**



**Figure 2 – VSP 2
(V2-27)**



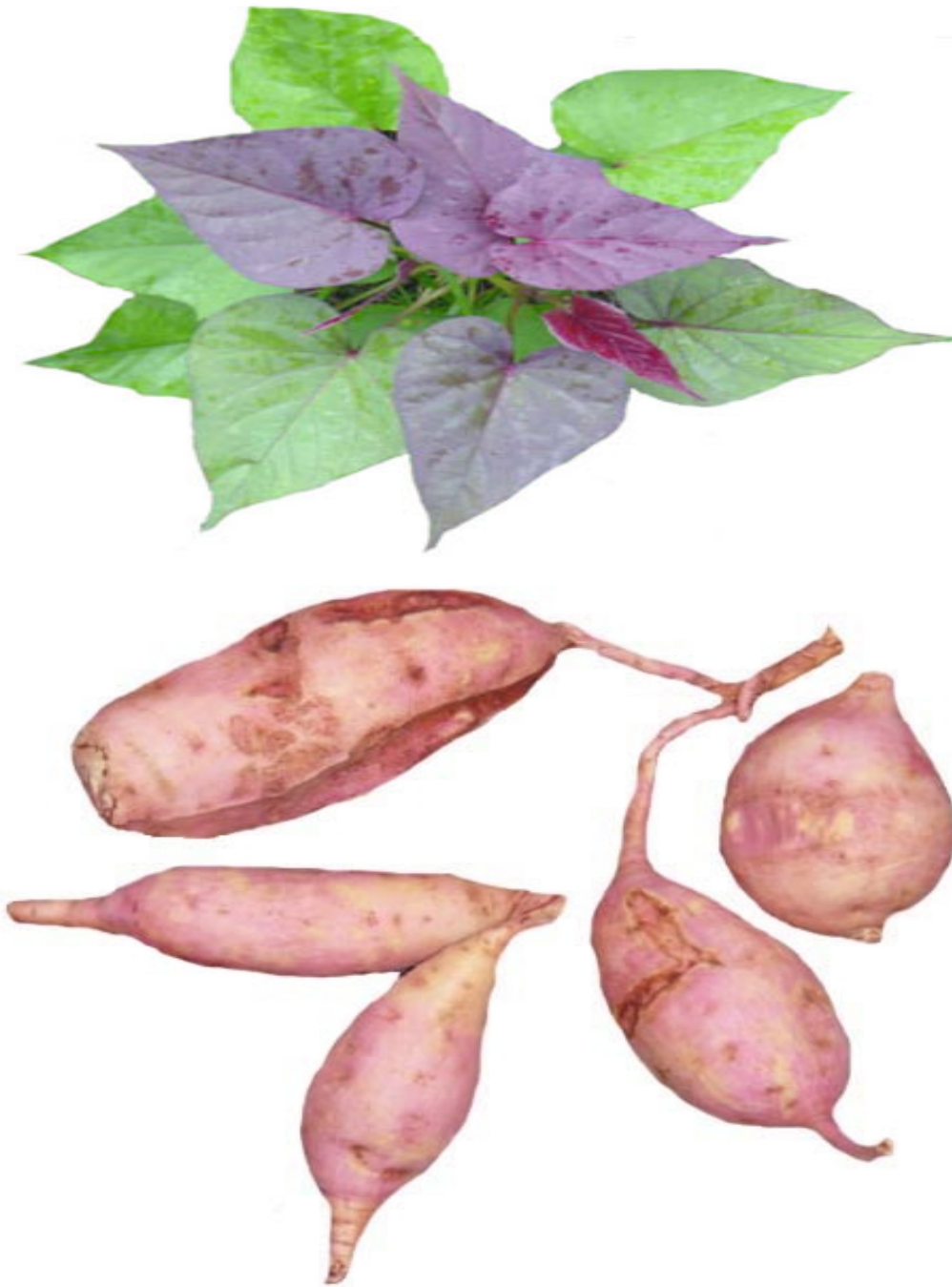
**Figure 3 – VSP 3
(V2-3)**



**Figure 4 – VSP 4
(V2-27)**



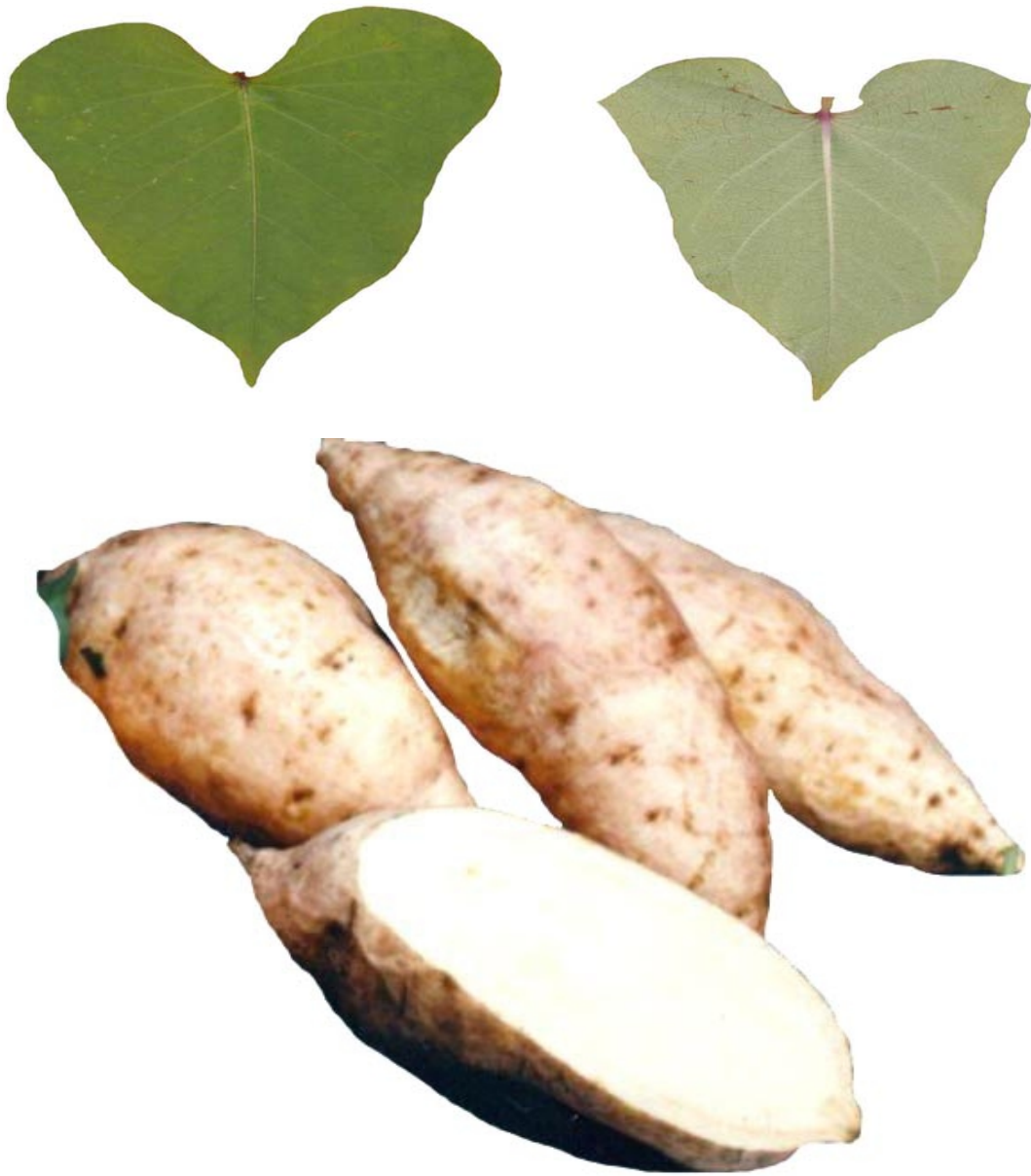
**Figure 5 – BPI SP 1
(LO 328)**



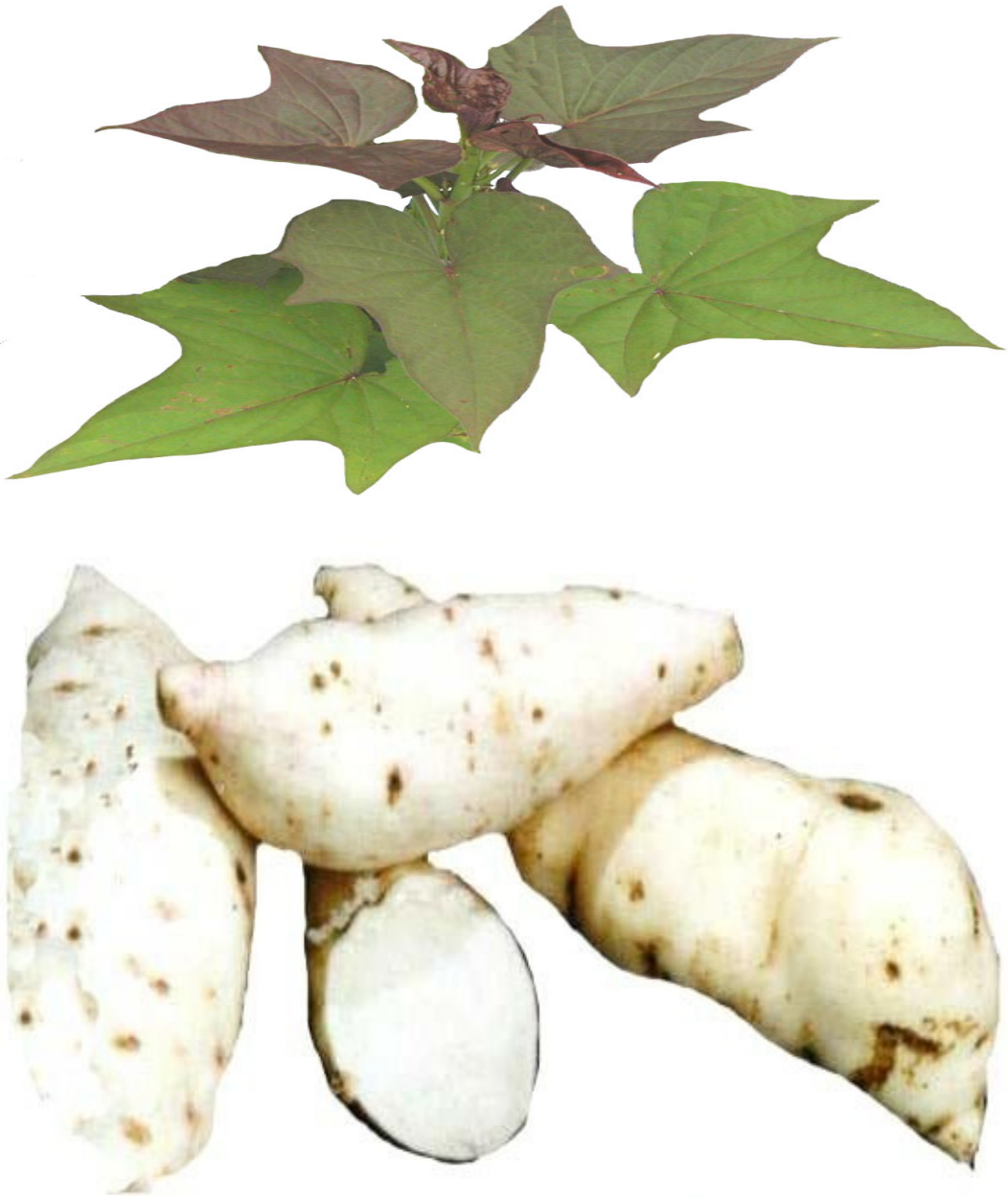
**Figure 6 – UPL SP 1
(Kinabkab)**



**Figure 7 – UPL SP 3
(Tinipay)**



**Figure 8 – VSP 5
(V10-595)**



**Figure 9 – UPL SP 5
(G113-2B)**



**Figure 10 – BPI SP 2
(C1693-9)**



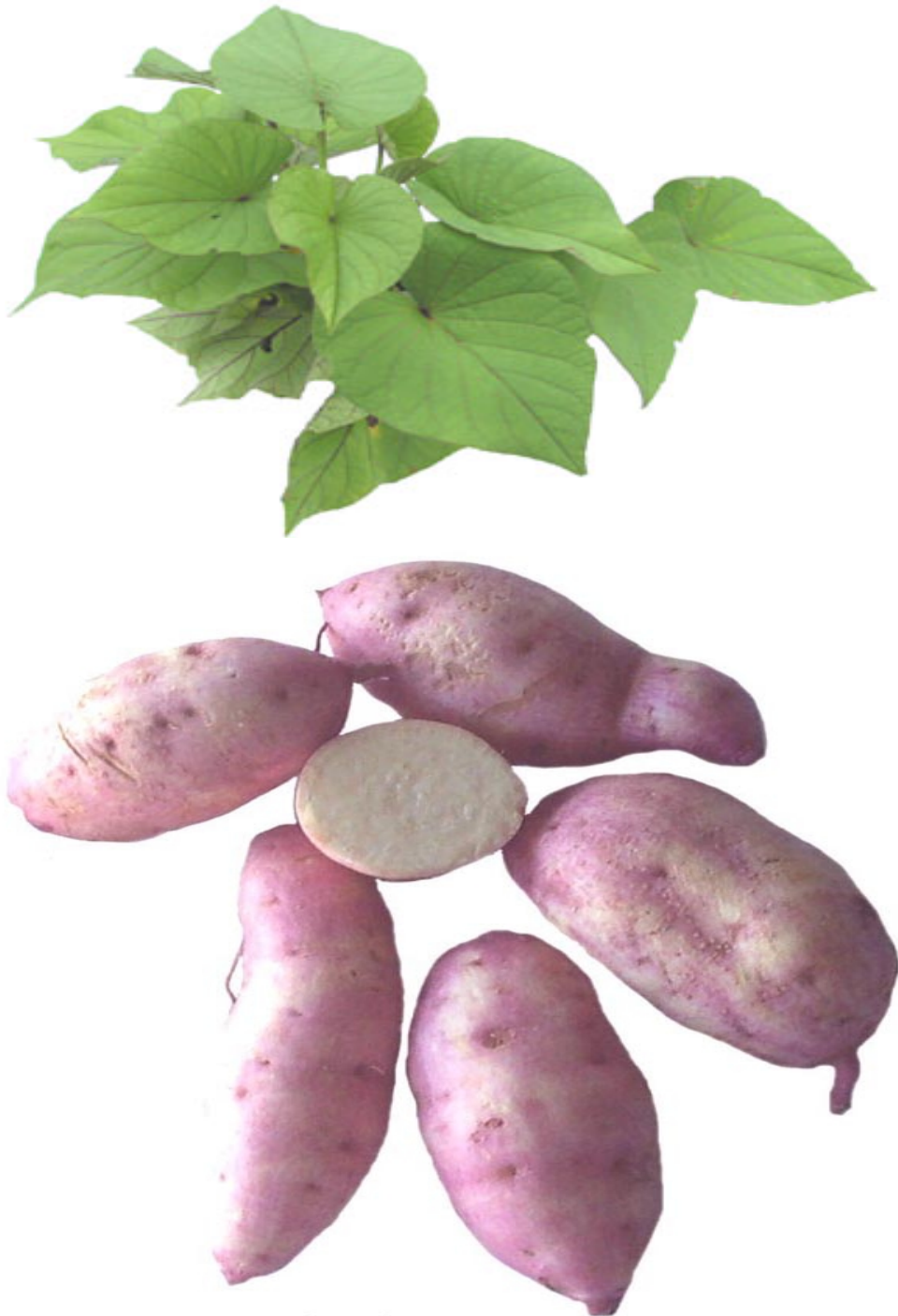
**Figure 11 – VSP 6
(V20-209)**



**Figure 12 – VSP 7
(V20-429)**



**Figure 13 – PSB SP 13
(OPS 88)**



**Figure 14 – PSB SP 14
(G48-15A)**



**Figure 15 – PSB SP 15
(V37-151)**



**Figure 16 – PSB SP 16
(V30-595)**



**Figure 17 – PSB SP 17
(88WS630)**



**Figure 18 – PSB SP 18
(90-06-03)**



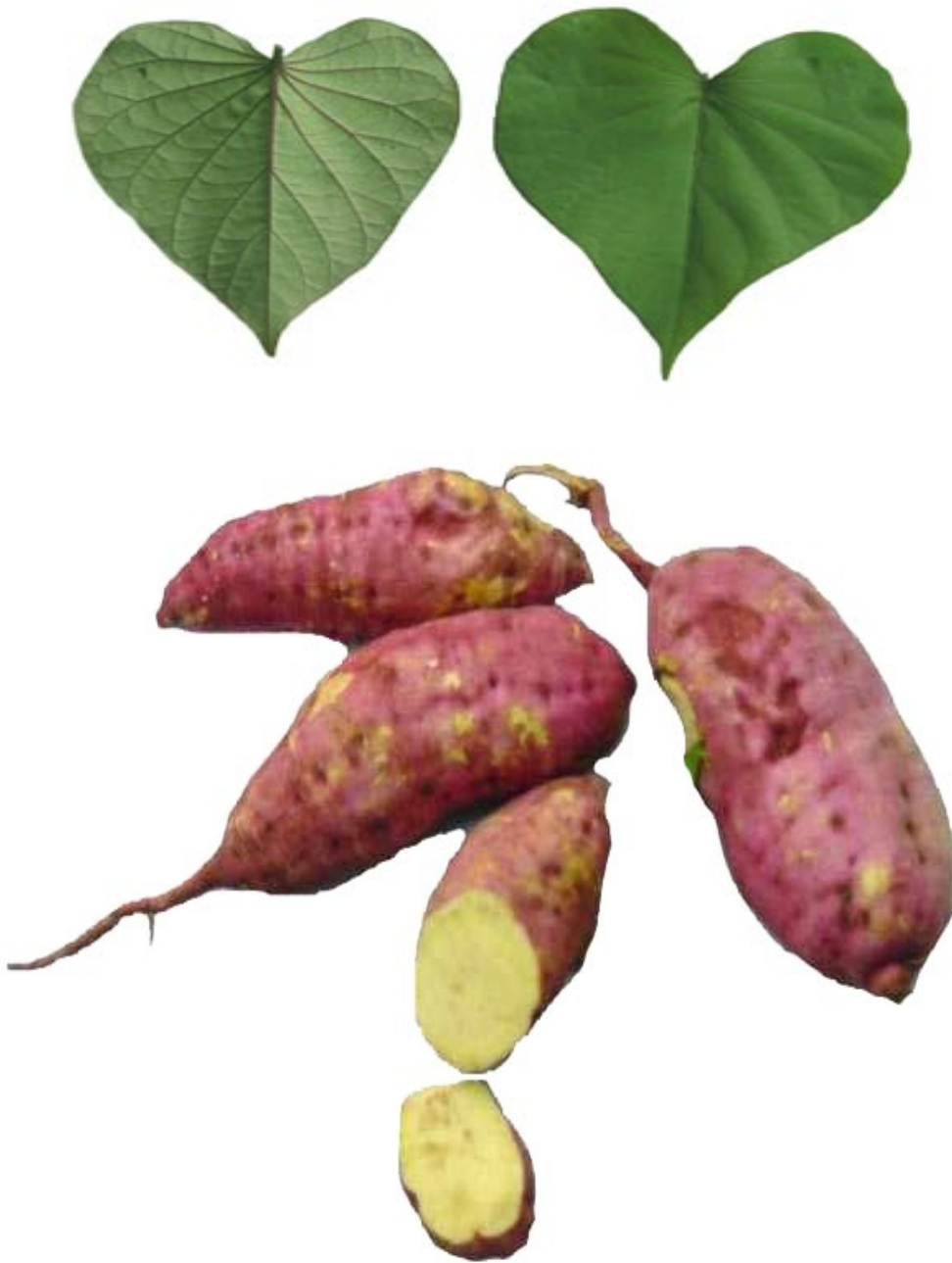
**Figure 19 – PSB SP 19
(OPS 100)**



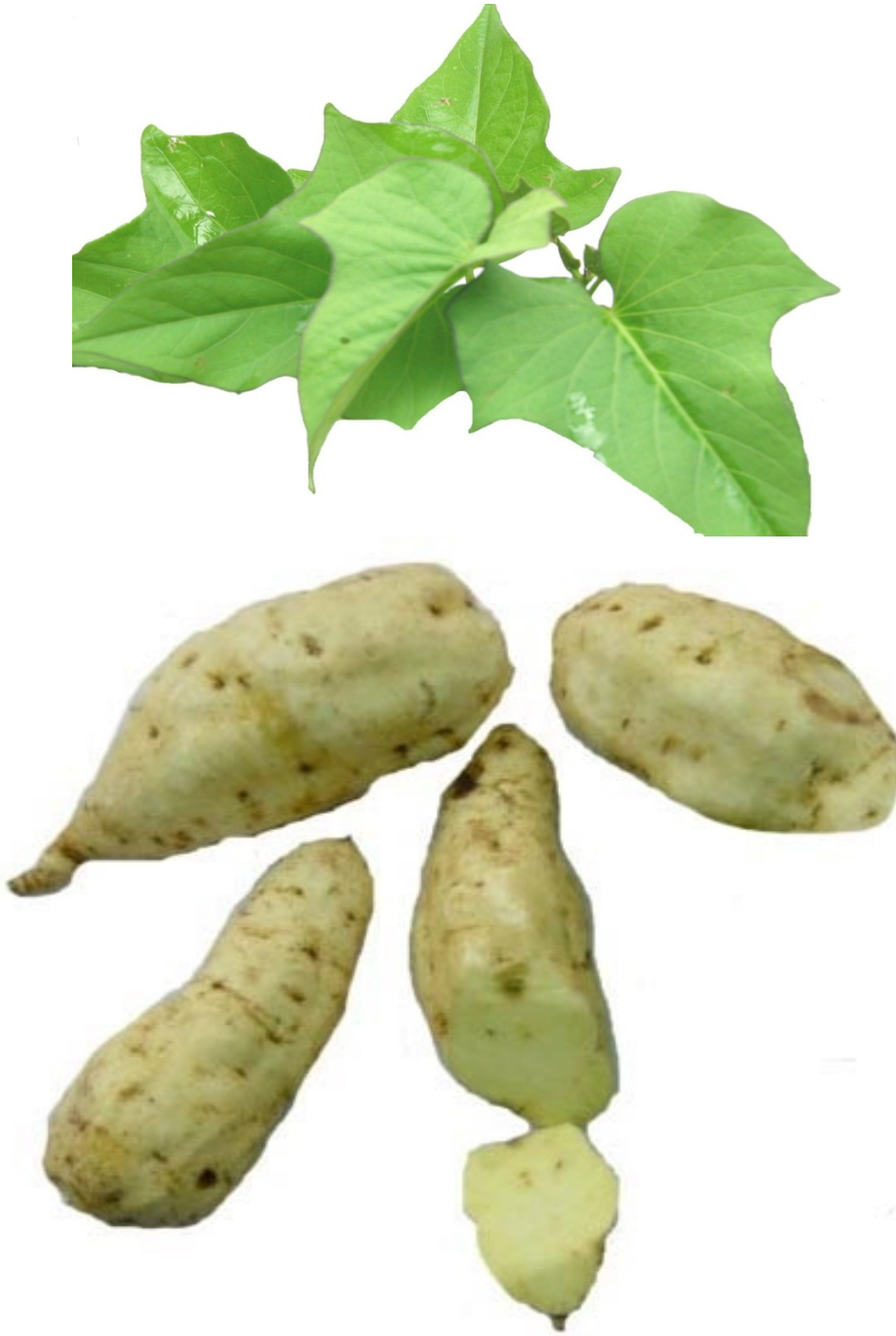
**Figure 20 – PSB SP 20
(LG19A-10)**



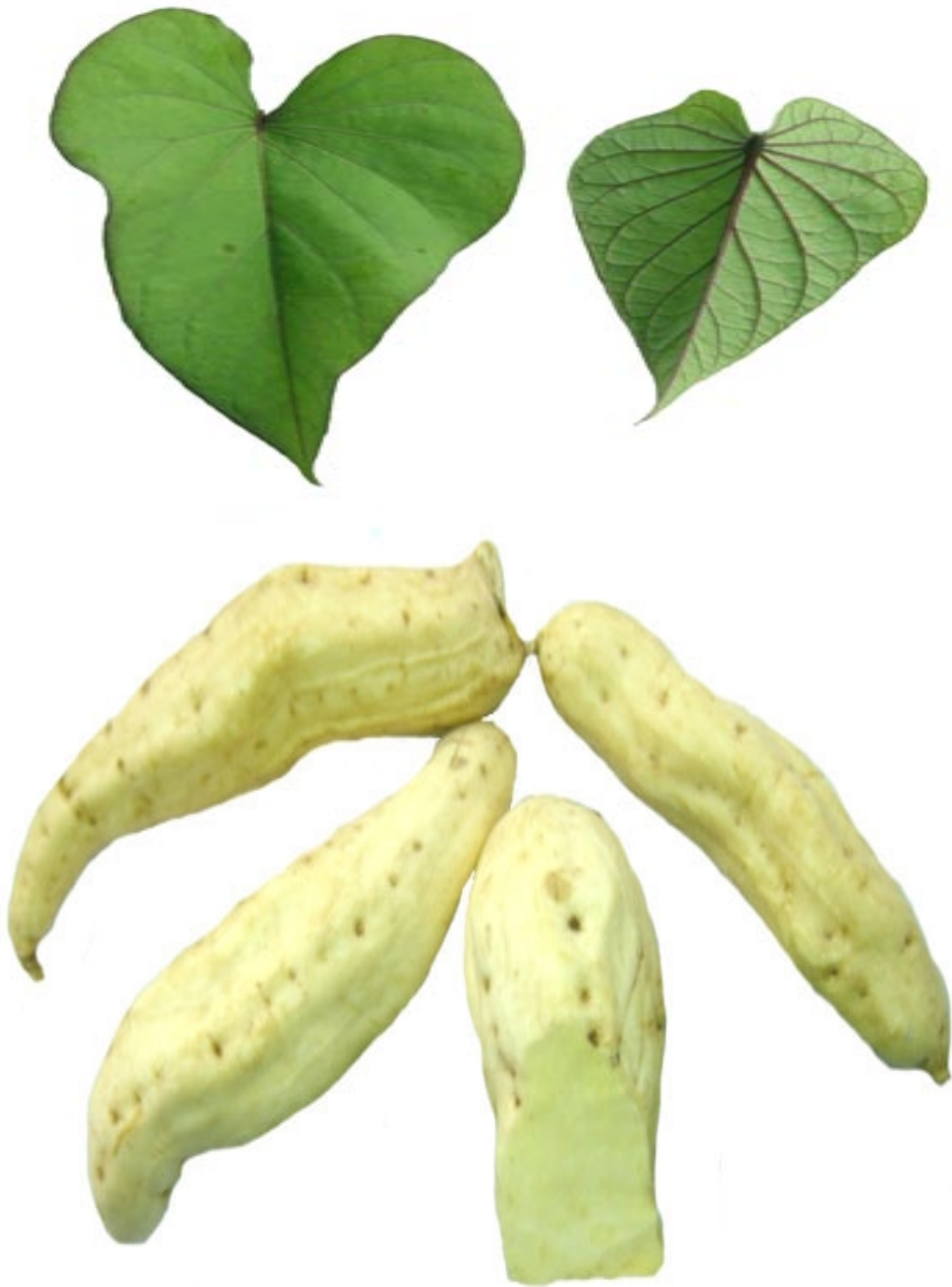
**Figure 21 – PSB SP 21
(G46-1A)**



**Figure 22 – PSB SP 22
(SG94-1303)**



**Figure 23 – PSB SP 23
(SG94-1717)**



**Figure 24 – PSB SP 24
(SG963503)**



**Figure 25 – NSIC SP 25
(JK 018)**



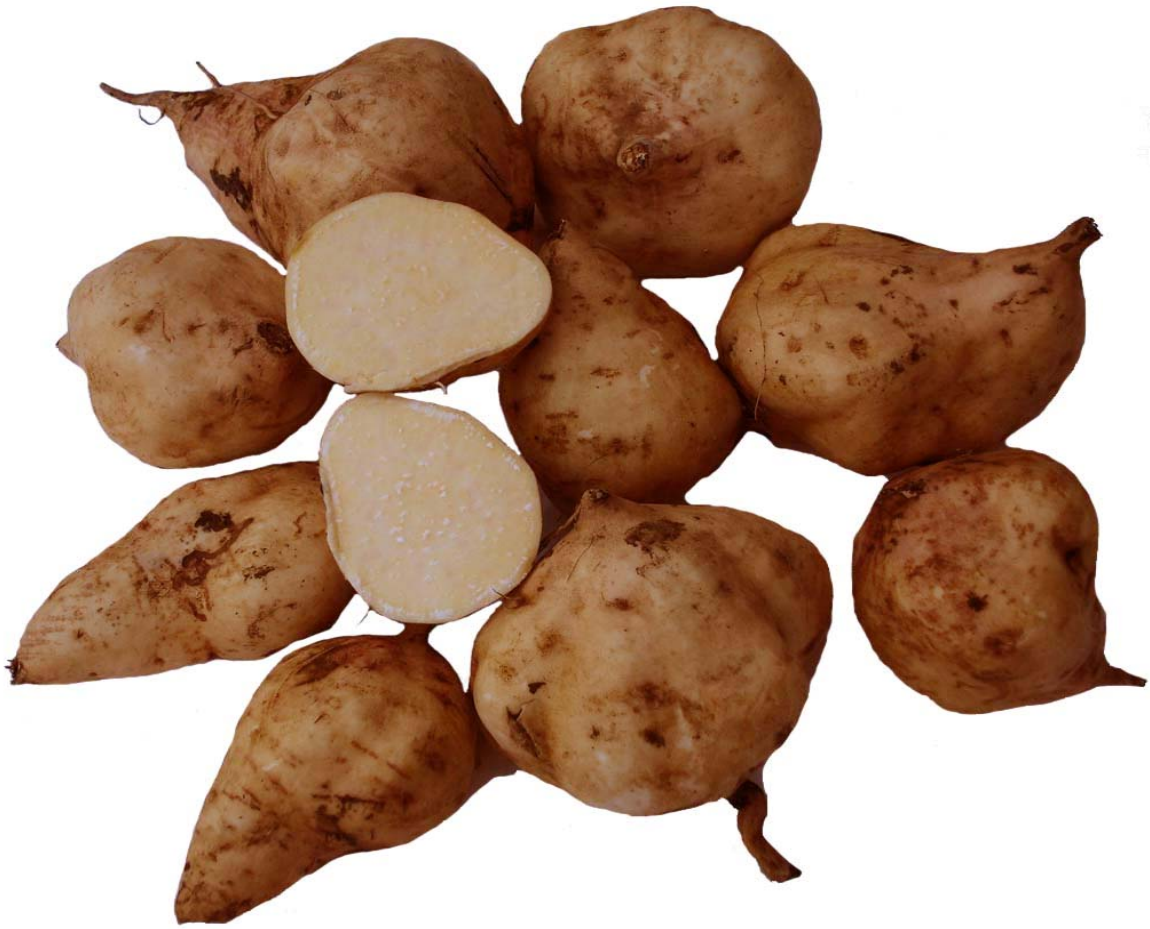
**Figure 26 – NSIC SP 26
(JK 024)**



**Figure 27 – NSIC SP 30
(JK 027)**



**Figure 28 – NSIC SP 31
(SG 99-09-02)**



**Figure 29 – NSIC SP 32
(JK 02-20-4)**

Annex C

Pests and diseases of sweet potato

Pest	Description	Control measure
Scab	Occurs during rainy days infecting the leaves and vines	Spray with copper oxychloride or Maneb (2.008g ai) every 10-14 days
Weevil	Most serious anthropoid pest infecting the roots; infected roots cannot be eaten by man	Burn all infected plant. If need, apply Furadan 3 g granules with fertilizer or use healthy plant materials.
Disease	Description	Control measure
Stem and foliage scab	Oblong to elongated scabby lesions on the stems and leaves.	Cut off the infected stem.
Cercospora leaf spot	Circular lesions with a diameter of 0.5-1.0 cm which are conspicuous on both surfaces of the leaf. Spots are dark brown to almost gray centers.	Practice sanitation and crop rotation and use disease-free planting materials. Use resistant varieties.
Blight	Stems are rolled below or above the soil and the organism produces a soft brownish rot. Leaves turn yellow and plants are stunted, stem separate easily from the mother plant when pulled gently. Moldy growth appears at the base of the stems.	Observe farm sanitation and destroy infected plants. Deep plowing and maintain good drainage facilities to minimize disease infection.
Nematode	Roots are galled with several egg masses on the surface. Lesion, necrosis and rotting appear usually in cracked, deformed roots.	Treat soil with nematocide which can reduce infection by 85 %. Practice crop rotation every 5-10 years with non-host crops, or use resistant varieties
Soft rot or ring rot	Soft and stringy when opened. Color of the tissue turns from cinnamon to chocolate brown as the rotting advances; forms a ring or band measuring 2.5 cm wide which makes the roots to shrivel and shrink.	Store roots in clean, dry and well-ventilated storage areas. Care must be taken not to bruise or injure roots during harvest and transport.
Storage rot	Infection is limited to wound presidium which is formed when injured and infected.	Avoid root injury during harvest and transport. Store in well-ventilated storage house.

References

PNS/BAFPS 95:2010

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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