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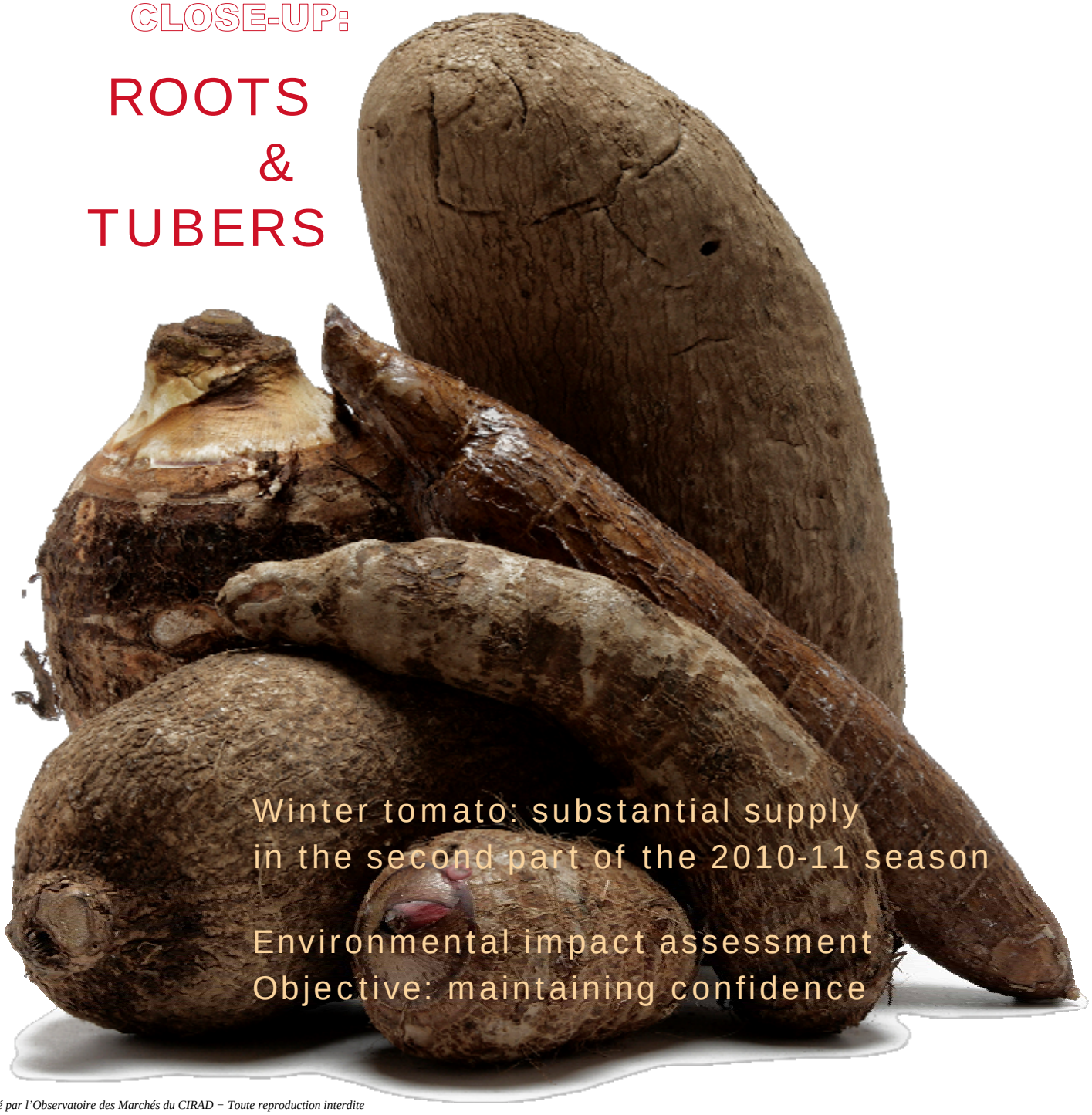
FRuiTROP

English edition

CLOSE-UP:

ROOTS & TUBERS



Winter tomato: substantial supply in the second part of the 2010-11 season

Environmental impact assessment
Objective: maintaining confidence

http://passionfruit.cirad.fr

Tropical roots and tubers

Pests and diseases

by Philippe Vernier

Both the aerial parts (stems and foliage) and underground parts of the plants can be attacked by biological pests. Photosynthetic capacity is reduced in the first case, resulting in production loss. In the second case, the quality of the produce itself may be affected.

Yam — Pests and diseases

Biological pests		Observations	Damage	Control strategies
Virus diseases Mosaic 	**Mosaic** Yam Mosaic Virus (YMV), Yam Mild Mosaic Potyvirus (YMMV), Cucumovirus (CMV)	Several types of virus are involved and often interact.	Leaf discoloration and deformation, decreased yield; *D. rotundata* is often more susceptible than *D. alata.*	• Resistant varieties. • Use of planting material from healthy plants.
	Internal Brown Spot (ISBV)		Brown spots on tubers, affecting especially *D. alata* in the Caribbean.	
Leaf fungi Anthracnose 	**Anthracnose** Fungal complex including *Colletotrichum gloeosporioides*	Mainly attacks the yam *D. alata.*	Leaf spots. Decrease in yield. Destruction in case of severe attack.	• Crop rotation. • Destroy lianas after attacks. • Avoid sprinkler irrigation during wind. • Fungicide application to foliage.
	Other leaf spots *Alternaria*, *Curvularia cercospora*, *Sclerotum rolfsii*, *Rhizoctonia*	Impact on *D. rotundata* strong locally.	Leaf spots. Decreased yield. Destruction in case of severe attack.	
Tuber rot	**Wet rots** *Botryodiplodia theobromae, Rhizopus nodosus* and other	Internal rot during storage resulting from wounding by insects and harvesting tools.	Rot, oozing, smell of rot. Decreased commercial value.	• Avoid harvest wounds. • Sort and separate wounded tubers. • Apply wood ash to tuber wounds. • Disinfection, aeration et ventilation of storage premises. • Crop rotation: plant yam at intervals of several years.
	Green rot *Penicillium* spp.	Develops on wounds during storage	Powdery greenish spots. Decreased commercial value.	
Nematodes in tubers Nematodes 	**Nematodes causing wounds** *Scutellonema bradys*, *Pratylenchus coffea*,	Infection via tubers and the soil aggravated by irrigation. Stronger attacks towards the head of the tuber.	Small cracks in tuber skins continuing with black patches beneath the epidermis. Decreased commercial and seed value.	• Rigorous selection of seed material. • Discard all contaminated material (galls, lesions, nematode cracks). • Remove weeds that form hosts for nematodes. • Rotation Crop rotation. Avoid crops susceptible to nematodes (Solanaceae for *Meloidogyne*). • Plant nematifuge-nematicide crops (*Crotalaria*, groundnut, etc.) as the preceding crop. • Thermotherapy (soaking planting material in hot water).
	Gall nematodes *Meloidogyne* spp.	More on yam *D. alata.*	Galls on tuber surfaces. Decreased commercial and seed value.	

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Cassava — Pests and diseases			
Biological pests	**Observations**	**Damage**	**Control strategies**
Virus diseases (African Cassava Mosaic Disease - ACMD), (Cassava Brown Streak Virus - CBSD), etc.	More virulent strains have appeared in Africa, spread by insect vectors and cuttings.	Foliage discoloured and deformed, decreased root production. Leaves affected by mosaic are often preferred for consumption!	• Creation of resistant varieties. • Cutting selected from healthy plants.
Bacterial Blight (Cassava Bacterial Blight - CBB)	Spread in planting material.	Wilt of aerial parts of plants, decrease in production.	Prevention: • Healthy planting material, • destruction of infected plants after the harvest, • disinfection of cutting tools.
Root rot	Numerous fungi are involved: *Fusarium*, *Phytophthora*, *Pythium*, *Sclerotium*, etc.	Browning of root flesh, smell of rot.	• *Phytophthora:* thermotherapy of cuttings (immersion in water at 49°C for 49 min). • Biological control: *Trichoderma* (antagonist fungi).
Pests Cassava mealybug (*Phenacoccus manihoti),* green mites	Accidental introduction from Latin America, periodic outbreaks.	Serious damage to foliage, growth halted, yield loss.	• Chemical: risky and expensive. • Biological control using an entomophagous wasp (*Epidinocanis lopezi*) for mealybug and a predatory mite from Brazil for green mite. Success varies from country to country in Africa.

Mosaic

Mealybugs

Sweet potato — Pests and diseases			
Biological pests	**Observations**	**Damage**	**Control strategies**
Leaf viruses (various viral complexes)	Often spread by insects (aphid, whitefly).	Stunted stems, foliage mosaic and dwarfing, cracks in tubers.	• Use of resistant varieties. • Select healthy cuttings. • Protection against insect vectors.
Fungi on stems and tub	Scab	Leaf spots, yield loss of up to 60%.	• Crop rotation. • Fungicide spray on cuttings and foliage.
	Fusarium wilt	Foliage yellows and then wilts.	
Soil insects	Weevils: *Euscepes batatae* and *Cylas formicarius*	Galleries in tubers making them unsuitable for sale.	• Pheromone traps to catch and destroy males.
Root node nematodes	*Meloidogyne*, *Rotylenchulus*	Nodes on tubers.	• Avoid crops susceptible to nematodes (Solanaceae) in the rotation.

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Taro: cocoyam (*Colocasia escuelenta*) and tannia (*Xanthosoma sagittifolium*) — Pests and diseases				
Biological pests		**Observations**	**Damage**	**Control strategies**
Virus diseases	**Dasheen Mosaic Virus** (DMV) on cocoyam and tannia	Serious yield loss may occur.	Mosaic discoloration of foliage.	• Grub up infected plants as soon as the first symptoms appear. • Control the vectors (aphids).
	Alomae Bobone Virus Complex (ABVC)	ABVC is fatal for taro. Very few resistant varieties.	Leaves become small, dark green and remain crumpled.	
Fungi	**Taro leaf blight disease** *(Phytophthora colocasiae)*	Does not attack tannia.	Small circular leaf spots that become larger and sometimes destroy the harvest entirely.	• Elimination by burning infected leaves. • Fungicide application. • Isolate the fields from other taro fields. • Above all, use resistant varieties.
	***Pythium* spp.**	Fungus enhanced by soil hydromorphy.	Corm rot especially in tannia and sometimes in cocoyam.	• Avoid waterlogged and poorly drained soils. • Plant tannia on ridges. • Use healthy cuttings. • Use tolerant cultivars. • Fungicide treatment. • Banana is good as a preceding crop.
Insects	**Taro beetles** (*Papuana* spp.) on cocoyam	The proximity of cleared forest and river banks enhances reproduction of beetles.	Larvae (white grubs) tunnel into corms, reducing their commercial value.	• Use clean cuttings (with no trace of soil). • Biological control with an entomo-pathogenic fungus. • Crop rotation. • Fallow with *Glycine wightii* for two years.

Phytophthora