





Root crop varieties to grow under extreme conditions in Fiji



It is crucial to develop and access crop varieties that can cope under extreme conditions like prolonged droughts, increased salinity, flooded conditions and extreme temperatures. Traditional crop varieties and wild relatives may have genes resistant to pests and diseases and characteristics to cope with extreme climatic conditions. We need to ensure conservation of agricultural biodiversity to meet food security challenges induced by climate change.






Characteristics of common root crop varieties in Fiji


1. Taro / Dalo and Tannia


The genera *Colocasia* (Taro) and *Xanthosoma* (tannia or new cocoyam) are the most important and common species in the Pacific. They play a substantial role in the food security of millions of people in the tropics. These crops are used as emergency or famine foods in times of food shortage. Some taro cultivars have extreme flood tolerance.

The starch rich corms are the main product, but the leaves can also be eaten. The taro corm has limited (approx. 2 weeks) shelf life. Most of the taro grown in Fiji is *Colocasia esculenta*. Most introduced taro varieties are susceptible to some pests and diseases including taro leaf blight, plant leaf hoppers, caterpillars and mites. In comparison, traditional taro varieties are more resilient to pests, diseases and various climatic conditions.

Some suitable varieties for prolonged dry seasons			
Local name		Scientific name	Characteristics
Vulaono (hybrid)		<i>Colocasia esculenta</i>	<ul style="list-style-type: none"> Vigorous growth, large leaf area surface It has some tolerance to dry spells Bigger corm sizes 0.9 – 2.5kg with good eating quality, light yellow flesh color
Via /via mila		<i>Alocasia macrorrhiza</i>	<ul style="list-style-type: none"> Vigorous growth, large leaf area surface can grow to more than 3 metres high Can tolerate semi - drought conditions It is a large erect herb 3 - 4 metres tall with a stout permanent stem
Dalo ni tana		<i>Xanthosoma sagittifolium</i>	<ul style="list-style-type: none"> Easy to grow and produces a relatively high yield within 6 to 12 months after planting More tolerant of drought than common taro Is resistant to many of the pests and diseases that affect <i>Colocasia</i> taro Can be stored for several months after harvesting Grows to 2 metres height and instead of making one big root or corm, it makes many small cormlets It is not considered salt tolerant Once harvested, the root may be stored in a cool dry place for several months

Some suitable varieties for prolonged wet seasons

Local name	Scientific name	Characteristics
<p>Uro ni vonu</p> 	<i>Colocasia esculenta</i>	<ul style="list-style-type: none"> Harvested from 7 – 9 months Can withstand water logging Grows well on lowland wetland areas

<p>Vavai dina</p> 	<i>Colocasia esculenta</i>	<ul style="list-style-type: none"> Harvested from 8 – 9 months Can tolerate water logging Grows well on lowland wetland areas
---	----------------------------	--

<p>Vavai loa</p> 	<i>Colocasia esculenta</i>	<ul style="list-style-type: none"> Harvested from 8 – 9 months Can tolerate water logging Grows well on lowland wetland areas
---	----------------------------	--






<p>Via kau (swamp taro)</p> 	<i>Cyrtosperma merkusii</i>	<ul style="list-style-type: none"> Most mature between 1 and 2 years of age Can tolerate water logging and can grow in brackish water Grows well but slowly on lowland wetland areas and swampy coastland areas In comparison to <i>Colocasia taro</i>, giant swamp taro is reputed to be more salt tolerant
---	-----------------------------	--

Taro varieties for both wet and dry conditions

<p>Wararasa (hybrid)</p> 	<i>Colocasia esculenta</i>	<ul style="list-style-type: none"> Matures 7 – 9 months Can adapt to various conditions in Fiji including dry conditions Can tolerate waterlogging Is the most common cultivated taro variety
--	----------------------------	---


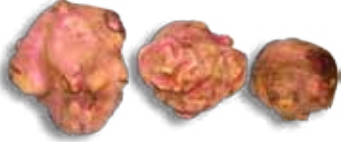




2. Cassava / Tavioka

Generally cassava can be grown throughout the year. It has low nutrient requirements and can be grown in relatively infertile soils. Most varieties can tolerate acidic soils of up to 3 - 4pH. It is often planted as a final crop in rotations prior to returning land to fallow. There is easy availability of planting materials after disasters. It has a very short shelf life.

Cassava varieties for prolonged dry season			
Local name		Scientific name	Characteristics
Beqa		<i>Manihot esculenta</i>	<ul style="list-style-type: none"> • Yellow flesh
Modre		<i>Manihot esculenta</i>	<ul style="list-style-type: none"> • Branching variety and semi-dwarf, can withstand wind damage
Nadelei		<i>Manihot esculenta</i>	<ul style="list-style-type: none"> • Commonly cultivated variety • Drought tolerant • Pink peeling with white flesh • Most varieties have a high yield (>30t/ha) depending on soil type
New guinea		<i>Manihot esculenta</i>	<ul style="list-style-type: none"> • Pink peeling with white flesh • Adaptable to acidic soils
Yasawa vumatolu		<i>Manihot esculenta</i>	<ul style="list-style-type: none"> • Grows well in atoll environment



3. Sweet potato / kumala

Sweet potato is a creeping plant. Colored kumala have nutritional benefits – the orange rich in beta carotene, and purple flesh have some anti-cancer properties. Sweet potatoes can be grown all year around, has a growing period of 15 - 17 weeks and so it can be harvested several times per year. Kumala suffers minimum damage by cyclones due to its nature of growth. Naturally kumala has some characteristics to tolerate drought conditions. Two commonly grown varieties are the spreading and erect types. Spreading types are recommended for the dry zones where as a vegetation cover it helps retain soil moisture. Erect type with branching nodes is recommended for wet zones.

Sweet potato varieties for prolonged dry season/dry zones		
Local name	Scientific name	Characteristics
Local purple 	<i>Ipomoea batatas</i>	<ul style="list-style-type: none"> Is a spreading type and suitable for the dry zones Grows well in a variety of well-drained soil types but does not tolerate shading
Papua 	<i>Ipomoea batatas</i>	<ul style="list-style-type: none"> Most kumala varieties are drought tolerant Can be harvested within 4 - 6 months. Earlier harvest can reduce the incidence of pest and disease problems. Resilient to cyclone damage High yielding (20 - 25t/ha)
Sweet potato varieties for wet conditions		
Kabara 	<i>Ipomoea batatas</i>	<ul style="list-style-type: none"> Erect type with branching nodes makes it suitable for wet zones Can be harvested within 4 - 6 months. Earlier harvest can reduce the incidence of pest and disease problems.
Korolevu red 	<i>Ipomoea batatas</i>	<ul style="list-style-type: none"> Resilient to cyclone damage High yielding (20 - 25t/ha)
Sweet potato varieties for dry and wet conditions		
Carrot 	<i>Ipomoea batatas</i>	<ul style="list-style-type: none"> Erect type with branching nodes Yield of 16 - 18t/ha Can be harvested within 4 - 6 months. Earlier harvest can reduce the incidence of pest and disease problems
Vulatolu 	<i>Ipomoea batatas</i>	<ul style="list-style-type: none"> Semi-erect type with branching nodes Resilient to cyclone damage

4. Yam / Uvi

Yams are a high value food that are easily grown and mature quickly in the right soil conditions. Unlike most other tropical root crops, yams exhibit good storage qualities and may be harvested well in advance of eating. The shelf life of tubers and planting materials is long as they can be stored for 3 – 6 months. Most varieties of yams require a minimum 6-month growing season and do not tolerate poorly drained soils or waterlogging. All cultivars observed to date are susceptible to rose beetle attack and often the leaves are badly damaged with many holes.

Yams grow well under dry conditions		
Local name	Scientific name	Characteristics
<p>Kaile (aka aerial potatoes)</p> 	<p><i>Dioscorea bulbifera</i></p>	<ul style="list-style-type: none"> • Commonly found in the wild • Non – bitter type is edible • Immature bulbils may be harvested 3 - 4 months after planting, and picking may continue for the life of the plant, up to 24 months
<p>Bulou</p> 	<p><i>Dioscorea bulbifera</i></p>	<ul style="list-style-type: none"> • Underground tubers are normally harvested when the vine dies back, after about 15 - 24 months • Grows in a wide range of soils, most varieties require long rainy seasons • These varieties are wild relatives of yams • Susceptible to leaf spot and nematode (<i>Scutellonema bradys</i>) has been reported to attack the subterranean tubers

Local name	Scientific name	Characteristics
------------	-----------------	-----------------

Lokaloka



Dioscorea alata

Vurai



Dioscorea alata

Veiwa






Dioscorea alata

Kivi



Dioscorea alata

- Maturity is normally reached in 9 - 10 months, though some 'early' varieties can be harvested at about 6 months
- Can tolerate dry conditions to some extent
- One of the most troublesome diseases affecting this species is anthracnose
- Have longer shelf life for up to 2 - 3 months

Local name		Scientific name	Characteristics
Tivoli		<i>Dioscorea nummularia</i>	<ul style="list-style-type: none"> • Annual crops with the ability of natural regeneration • Has a longer lifespan underground • Resistant to yam anthracnose • Has a long shelf life • Good disaster and food security crop due to its resilience to yam anthracnose and adaptability (regenerates well)
Kawai		<i>Dioscorea esculenta</i>	<ul style="list-style-type: none"> • Similar to Tivoli, has a longer lifespan underground and can be continually harvested over 2 - 3 years • Annual crop with the ability of natural regeneration • Resistant to yam anthracnose • Short shelf life after harvesting
Yam for both wet and dry conditions			
Filipai (aka African white yam)		<i>Dioscorea rotundata</i>	<ul style="list-style-type: none"> • Vigorous growth • Can be grown during dry season • Adapts well to wet and dry conditions • Resistant to yam anthracnose • Short shelf life • Rots very quickly when tubers are damaged or bruised • Very good eating quality

For more information contact:

Koronivia Research Station, Ministry of Agriculture, Fiji
Land Resources Planning & Development Division, Ministry of Agriculture, Fiji

Supported by:

SPC/GIZ Coping with Climate Change in the Pacific Island Region Programme

