

Tree Crops

1. Avocado
2. Breadfruit
3. Citrus
4. Cocoa
5. Coconut
6. Mango
7. Plantain

TECHNOLOGY PACKS



AVOCADO

November 2015

Background

Production decisions concerning how much effort and resources to invest and which farming practices to follow, have consequences and create opportunities for the farm affecting production levels, input costs, time constraints, and the potentially size of the operation. They also may have implications for resource use and environmental quality.

Numerous information exist on the various aspects of production and handling/ marketing of crops and livestock, the majority of which are outdated, not easily understood and lacking the where with all for addressing present day challenges such as good agricultural practices (GAPs) and food safety and climate change that impact on the environment and rural livelihoods. These issues are also closely related to the importance of the role of primary producers in increasing the earnings of all actors along the value chain in supporting the development of a commercially viable and sustainable agricultural industry.

The production of high quality and easily understood information packages is critical as this forms a basis for farmers to obtain financing from lending institutions and to efficiently increase their production through the availability of modern technology. This will also result in a reduction of rural unemployment and will greatly help in alleviating poverty and other associated social ills.

TECHNOLOGY PACKS

AVOCADO



November 2015

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Introduction

This Technological Package (Tech Pack) deals with the production and postharvest aspects of avocado.

Also included in the Tech Pack are appendices:

- List of recommended pesticides and application rates
- Good Agricultural Practices data record sheet.

Notwithstanding the identification of any specific pesticide for the control of pests and diseases, this decision is for the discretion of the Ministry of Agriculture Area Extension Officer and the farmer.

However, the mention of any pesticides and other products used in the Tech Pack should strictly comply with local regulations and all instructions provided by the manufacturer. Also, the use of trade names in the Tech Pack is for the purpose of citing examples and is not meant to either endorse or discredit any particular product.

Description

Avocado, *Persea americana* Mill. is also known locally as “pear” or “zabouca”. It originated in southern Mexico and Central America. The fruit which is the part eaten is considered botanically as a large berry (Plate 1).



Plate 1 Avocado fruit Source: http://www.medicalhealthguide.com/healthbenefits/image/avocado_fruit.jpg

Ecology and Environmental Requirements

Avocado grows well on a wide variety of soils. However, it grows best on soils with neutral to slightly alkaline pH. Soils must also be well drained as excess soil moisture or even temporary waterlogged conditions can cause die-back or even death. Sites with around 60 - 80 inches (1500 – 2000 mm) of rainfall per annum are ideal. Windbreaks are useful since avocados are susceptible to wind damage.

Varieties

Choose varieties which best suit the market requirements and also which give you the longest harvesting period. For example, one can select from early to late bearing varieties, e.g. Simmonds, Lula.

Propagation

The best form of propagation of avocados is the method of grafting preferred varieties on to seedling rootstocks. Grafted plants can be purchased from the Ministry of Agriculture.

Land Preparation and Planting

Clear the area of all weeds. Space planting holes 30 feet x 30 feet (10m x 10m). Dig plant holes 12 inches x 12 inches (30cm x 30cm) putting adequate amounts of pen manure or compost and one ounce (30g) of Triple Super Phosphate in each hole. Mix soil, fertilizer and pen manure or compost thoroughly. Remove the plant carefully from the bag so that the roots are not disturbed, and place in the hole at the same depth as in the bag. Press the soil firmly around the base of the plant to prevent water settling in plant hole. Water plants in the dry season especially in the early stage of plant growth until the roots are well established. Mulch plants by placing materials a few inches (5 – 10 cm) away from the stem of the plant.

Fertilization

Apply 16.8.24+2 fertilizer annually at the rates shown in Table 1. Do not apply fertilizer when the trees are flowering.

For an organic approach, use pen manure or compost to supply additional nutrients.

<p>STICKS carry</p> <ul style="list-style-type: none"> •Mites •Thrips •Scales <p>LEAVES / PLANTS carry</p> <ul style="list-style-type: none"> •Eggs of pests 	<p>Infected STICKS carry diseases as</p> <ul style="list-style-type: none"> • Super-elongation disease • Cassava Bacterial Blight (CBB) • Frog skin disease • Cassava root rot • Anthracnose and others.
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Table 1 Annual fertilizer recommendations for each avocado tree

Weed Control

Weed control can be manual (e.g. cutlassing); mechanical (e.g. using a weed eater) or chemical (e.g. using herbicides). The weed control methods used depends on preference, but if an organic crop is desired chemical herbicides must not be applied.

Pests and Diseases

The major pests and diseases affecting avocado in St. Lucia are shown in Table 2.

Good Agricultural Practice (GAP) related to the use of pesticides, requires farmers to maintain up to date records on the application of pesticides to the crop. These records should include trade names, application rates and dates of application. During the harvesting period use pesticides with a very short harvest interval.

Table 2 Major pest/ disease problems in St Lucia

Pest & Diseases	Symptoms	Control/ Management
<p>Plate 1 Anthracnose <i>Colletotrichum gloeosporioides</i> (Penz.) Sacc.</p>  <p>Source: http://entnemdept.ufl.edu/creatures/orn/mealybug/coconut_mealybug01.jpg</p>	<p>Black spots on the fruits.</p>	<ul style="list-style-type: none"> • Well aerated fields • Spray foliage and immature fruits with fungicides such as Bellis,™ manzeb, benomyl, benomyl + propineb, zineb and mancozeb.
<p>Plate 2 Thrips <i>Scirtothrips Perseae</i> (Nakhara)</p>  <p>Sources: http://biocontrol.ucr.edu/images/avothrips_thumb.jpg http://www.americaninsectaries.com/Images/AvRel2.jpg</p>	<p>Scarring of fruits and bronzing of leaves.</p>	<p>Apply an insecticide containing abamectin as the active ingredient</p>

Pest & Diseases	Symptoms	Control/ Management
<p>Plate 3 Root Rot caused by the fungus <i>Phytophthora cinnamomi</i> (Rands)</p>  <p>Source: https://s-media-cache-ak0.pining.com/236x/82/ef/35/82ef35d007864bd745cf1b-4cbc2f7198.jpg</p>	<p>Die-back of twigs and branches.</p>	<p>Preventative is best: select well drained sites.</p>
<p>Plate 4 Termites (<i>Neotermes</i> spp.)</p>  <p>http://coralspringstree.com/wp-content/uploads/2012/05/tree-termite-adult-soldier-bro-ward.bmp</p>	<p>Nests, eaten bark and wood.</p>	<p>Apply neem oil to nests and infected areas. Use insecticides containing alphacypermethrin.</p>

Harvesting

Harvest fruits when mature. Maturity of most varieties is detected by the skin colour changing to a lighter green. However a number of selections

have the same colour in both immature and ripe stages. Therefore, it is important to be acquainted with the variety being cultivated. Mature fruits are also detected by the ease in which the fruit is detached and the months of the year in which the variety matures. Harvest fruit using a kali (picking pole and bag). Discard any fruit which drops to the ground during harvesting as these will have internal damage even if there is no visible external damage.

Post Harvest



- Place harvested fruits in field crates (not in bags) and store in shade to avoid sunburn and buildup of field heat.
- Carefully transport to avoid damage. Move fruits carefully from one container to another when packing for export or local distribution as fruits can shatter easily when dropped.
- Mature fruits will ripen within 4 days when stored at room temperature.

APPENDICES



INSECTICIDES	APPLICATION RATE
Pronto 35 SC	3 - 5 teaspoons/gallon of water
Target	1 - 2 teaspoons/gallon of water
Pirate	½ - 1 teaspoons/gallon of water
Fastac	1 - 2 teaspoons/gallon of water
Caprid	½ - 1 teaspoon/gallon of water
Diazinon (Basudin)	¾ - 1½ pints/acre
Admiral	¼ teaspoon/gallon of water
Dipel	1½ - 2 teaspoons/gallon of water
Aza-direct	1 - 2 teaspoons/gallon of water
Cure	½ - 1 teaspoon/gallon of water
Danitol	1 - 2 teaspoons/gallon of water
Cypro	½ tablespoon/gallon of water
Dimethoate (Perfecthion, Rogor 40)	1 pint/acre
Phosvel	1¼ - 2 pints/acre
Orthene	3.2 ounces/acre
Permethrin (Ambush)	½ teaspoon/gallon of water
Padan 50 WSP	2 - 3 teaspoons/gallon of water
Lannate	1 teaspoon/gallon of water
Decis	½ teaspoon/gallon of water
Kelthane 42%	1¼ lb/acre
Orthene 75S	1 lb/acre
Malathion	½ - 1 pint/acre
Sevin	1½ lb/acre
BT(<i>Bacillus thuringiensis</i>)	Label rates
Rotenone	1 - 2 teaspoons/gallon of water
Neem X.	8 - 10 oz/gallon of water
FUNGICIDES	APPLICATION RATE
Bellis	2 teaspoon/gallon of water
Acrobat	2 - 4 teaspoon/gallon of water
Mancozeb (Dithane M45)	1.5 lb/acre
Cabendazim	2 teaspoon/gallon of water
Daconil	1½ - 2 pints/acre
Benomyl (Benlate)	6 oz/acre
Captan	2 - 3 teaspoons/gallon of water
Peltar	3 teaspoons/gallon of water
Manzate DF	2 - 4 teaspoons/gallon of water

Bravo	1½ - 2 pints/acre
Tri-Miltox-Forte	3 teaspoons/gallon of water
Botrilex	5 - 200 lbs/acre
Kocide 101	2 - 4 teaspoons/gallon of water
Cupravit	2½ lb/acre
WEEDICIDES	APPLICATION RATE
DCPA (Dacthal W-75)	10 lb/acre
Diphenamide	4 - 10 lb/acre
Paraquat (Gramoxone)	1 - 2 pints/acre
Dymid 80W	5 lb/acre
Atrazine 80 (Gesaprim).	1¼ - 1½ lb/acre
Linuron (Lorox)	1 pint/acre
Prometryn (Caparol)	0.8 - 1.6 lb/acre
Sethoxydim (Poast)	1¼ - 3½ lb/acre
Clethodim (Select)	0.094 - 0.25 lb/acre
Prometryn 50WP (Geagard)	2 - 3 lb/acre
Herbicidal Oil (Stoddard Solvent, Kerosene oil)	40 - 80 gallons/acre

APPENDIX I: LIST OF RECOMMENDED PESTICIDES AND APPLICATION RATES

