

Flowers

1. Anthuriums
2. Ginger Lily
3. Heliconias
4. Orchids

TECHNOLOGY PACKS

HELICONIAS



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exist on the various aspects of production and handling/ marketing of crops and livestock, the majority of which are outdated, not easily understood and lacking the where with all for addressing present day challenges such as good agricultural practices (GAPs) and food safety and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.

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Prepared by

Ronald Pilgrim, CARDI (Caribbean Agricultural Research and Development Institute)

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CARDI
PO. Bag 212, Frederick Hardy Building
University of the West Indies
St Augustine Campus,
St. Augustine Trinidad and Tobago, W.I.

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Introduction

This Technological Package (Tech Pack) deals with the production and post harvest aspects of heliconias.

Also included in the Tech Pack are appendices:

- Template for cost of production
- 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.

Botanical Description

Heliconias (*Heliconia spp.*) belong to the ginger family Heliconiaceae.

Varieties

A number of heliconia varieties exist and can be distinguished by the shape of their blooms and colour. These include Red Torch, Golden Torch, Lobster Claw, Bird of Paradise and Pink Heliconia (Plates 1 to 5).



Plate 1 Red Torch



Plate 2 Golden Torch



Plate 3 Lobster Claw



Plate 4 Bird of Paradise

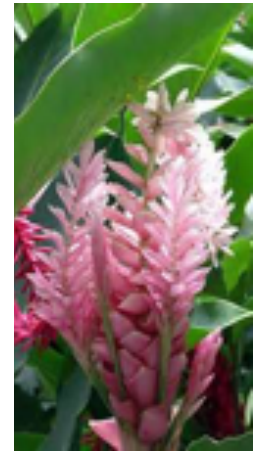


Plate 5 Pink Heliconia

Land Preparation

Clear the planting area of all weeds and loosen the soil so that the planted crop can spread its roots easily. If the site is sloping then the rows should be planted across the slope. Spread a 2 - 3 inch (5 - 8 cm) layer of mulch over the soil surrounding heliconia plants to insulate the soil, increase moisture retention and reduce the growth of weeds. Replenish the mulch whenever necessary to keep it at least 2 inches (5 cm) thick.

Spacing and Planting

To obtain planting material, select a section of the root that grows horizontally, just under the ground, from which the leaf stems grow 'up' and the feeder roots grow 'down'. Divide the section into pieces ensuring that each piece has several eyes (Plates 6 and 7). Treat the plant pieces in a pesticide/fungicidal dip to protect them from any pests and diseases that may exist. Sections can be directly planted in the soil or in potting bags.



Plate 6 Heliconia plant piece



Plate 7 Pieces for planting

Dig the planting holes twice the width and depth of the growing bags, space planting holes every 2 – 3 feet (60 cm to 90 cm) in rows 3 feet (90 cm) apart. In the planting holes mix three parts soil with one part rotted leaves, aged compost or manure. Place the heliconia plantlets into the planting holes. They should be planted at the same depth as they were grown in the potting bags, or just slightly higher (about 1 inch or 2.5 cm). Fill the planting holes by scooping in the remainder of soil and organic matter material. Water the plants thoroughly.

Irrigation

If irrigation is to be used install pipes and sprinklers or drip lines before putting in the plants. Water plants once every 5 days during the first 2 months of growth to help establish the roots. Reduce the frequency of watering thereafter to once every 7 - 10 days to prevent the soil from drying out completely.

Fertilization

Apply fertilizer in granular or liquid form to heliconia plants once every month using an all-purpose 10-10-10 or 12-12-12 NPK fertilizer. Apply at the rate recommended by the manufacturer's instructions. After fertilizing, water immediately to release the nutrients into the soil and prevent injury to the plant roots.


Crop Care



Control weeds using organic mulch 2 – 3 inches (5 - 8 cm) deep prior to planting and replenish when necessary. Weed control can also be done manually when required.

Pest and Diseases

Most species of heliconia are pest tolerant. However they are affected by a number of diseases. These diseases include fungi, bacteria and nematodes. The major diseases affecting heliconias, symptoms and control/management are indicated in Table 1.

Table 1 Causal agents, symptoms and control of diseases of heliconias

Diseases	Symptoms	Control/Management
 <p data-bbox="198 1682 587 1734">Plate 8 Rhizome and Root Disease caused by a fungus <i>Calonectria spathiphylli</i></p>	<p data-bbox="613 1333 1010 1860">The most common foliar symptom is leaf yellowing “firing” or drying of leaf margins, sheath spots, and petiole blights. The disease starts at the centre of clumps with old diseased stalks, which are dry and collapsed. The disease then develops outward. Root rots prevent proper anchorage, and taller diseased heliconia cultivars are prone to toppling.</p>	<p data-bbox="1029 1333 1414 1570">Control of the disease is through the use of chemical pesticides that inhibit or reduce the growth of fungal pathogens such as broad-spectrum fungicides.</p>

Diseases	Symptoms	Control/Management
 <p data-bbox="201 667 583 716">Plate 9 Bacterial Disease caused by the bacterium <i>Pseudomonas solanacearum</i></p>	<p data-bbox="613 254 1010 1341">Foliar symptoms include leaf rotting and wilting, leaf margin firing (browning of edges), and eventual dieback of the shoot. Leaves curl initially due to water stress caused by vascular plugging following infection of roots and rhizomes. As the disease advances in the rhizome, drying and browning of leaf edges occurs, followed by formation of large patches of necrotic tissue towards the midrib. Usually, these symptoms are more pronounced on older leaves. Eventually, the entire leaf turns dark brown with an oily appearance, resulting in leaf loss. Within the rhizome, a dark brown discoloration of the vascular tissue runs longitudinally down the centre. Often, milky ooze is associated with this brown vascular discoloration.</p>	<p data-bbox="1029 254 1425 709">Control measures include use of disease free plants, immediate roguing of infected plants or killing them with herbicide and keeping that area undisturbed. The adjacent areas should also be plant-free for several months. Cover the ground with a tarpaulin and divert water flow away from contaminated areas.</p>
 <p data-bbox="201 1659 583 1707">Plate 10 Burrowing Nematode <i>Radopholus similis</i></p>	<p data-bbox="613 1354 1010 1520">The most common nematode affecting heliconias is the burrowing nematode (<i>Radopholus similis</i>).</p> <p data-bbox="613 1568 1010 1770">The burrowing nematode destroys root tissue, leaving plants with little to no support or ability to take up water and translocate nutrients.</p>	<p data-bbox="1029 1354 1425 1644">Control is mainly by applying hot water treatment to untrimmed or trimmed heliconia rhizomes at 120°F (50°C) for 15-30 minutes and then immediate dipping into cold water.</p> <p data-bbox="1029 1692 1425 1858">Application of nematicides used for the control of nematodes in bananas can also be applied to heliconias.</p>

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.

Harvesting/Maturity

All flowers should be picked when market ready, keeping the flower plants clean of old flowers to encourage new growth. Cut the flowers at the base of the stem just above the soil retaining two to three leaves. Discard any flowers that are too old, marked or damaged. Trim unwanted material such as leaves and extra stem and deposit, together with any discarded flowers, at the base of the plant as mulch.

Post Harvest Care

Trim all flowers to the same length to fit into the holding water bucket or box. Carefully place cut flowers upright in the shade until ready to be taken to the treatment area. At the treatment area, all flowers should be kept cool and placed in clean water at least 4 inches (10 cm) deep at all times. Select flowers that are clean, unblemished and neatly trimmed. Foliage should be clean with no spots or insect damage.

Yields

Yields vary depending on the management practices adopted. Highest yields are obtained when heliconias are cultivated under optimum conditions required for plant growth such as proper growth media, adequate light, temperature, water and fertilizer regimes.

Storage

Heliconias can be stored at room temperature for 7 - 12 days. Avoid storing or placing blooms near ethylene producing sources such as injured plants, ripening fruits and vehicle exhaust, as the ethylene gas released will age blooms prematurely.

APPENDICES



APPENDIX I: TEMPLATE FOR COST OF PRODUCTION ANALYSIS: HELICONIAS

	Input	Quantity	Units	Unit Cost	Total Cost
1.	Planting material				
	Heliconia roots				
	Potting bags				
	Growing media				
	Pesticide/fungicide dip				
	Total cost for planting material				
2.	Land preparation				
	Mulch				
	Compost				
	Other land preparation costs (e.g. equipment rental)				
	Total cost for land preparation				
3.	Crop maintenance				
	Water/irrigation				
	Organic mulch for weed control				
	Fertilizer (specify types used)				
	Pest and disease control (specify chemicals etc. used)				
	Total cost for crop maintenance				
4.	Harvest/storage				
	Cardboard boxes/packing material				
	Estimate any utility costs				
	Transport to market				
	Total cost for harvest/storage				
5.	Labour				
	Planting material				
	Land preparation				
	Crop maintenance				
	Harvest/storage				
	Total cost for labour				
6.	Rent/insurance				
7.	Miscellaneous costs				
	Total cost of production				

Notes

1. It is recommended that the above data be completed on an annual basis.
2. The cost of any fixed structures should be considered. For example if a structure is solely used for anthurium production in the year and is expected to last for 10 years, then one tenth of the cost of construction (plus any annual maintenance) should be added at item 7.
3. The revenue obtained from sale of the crop should be compared with the cost of production to determine the profit/loss on the operation.

APPENDIX II: LIST OF RECOMMENDED PESTICIDES AND APPLICATION RATES

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 (Perfethion, 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

APPENDIX II: LIST OF RECOMMENDED PESTICIDES AND APPLICATION RATES

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 III: GOOD AGRICULTURAL PRACTICES DATA RECORD SHEET

Grower name:

*Name of applicator	Date	Brand and product name	Rate	Size of area/no. of plants treated	Total application (amount of the product used)	Notes/target pest	Start/finish time

*The applicator should be trained or, if not, supervised by a trained or certified person. Proof of training required

