



A Simple Guide for Hot Pepper Production



Partners in Sustainable Community Development



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Preface

This manual is designed as a resource guide to the participants of the Turtle Village Trust Agricultural Training Programmes. It is intended to give an intermediate approach to guide the reader/farmer in the agronomy of Hot Peppers with the intention of establishing a sustainable enterprise.

Turtle Village Trust would like to acknowledge our partners in sustainable community development; BHP Billiton, JB Fernandes Memorial Trust and Atlantic LNG without whom this valuable resource would not be possible. Turtle Village Trust would also like to thank the Ministry of Food Production for their support in this project and all others who contributed in making this endeavor possible.

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Introduction

Hot Peppers presently are being consumed domestically in the fresh and processed forms. There is an increasing demand for fresh peppers in the local and export market.

Emphasis will be given to hot peppers that are grown locally belonging to the *Capsicum chinense* species.

The information provided in this manual is intended to give a basic scientific approach for hot pepper production utilizing Integrated Pest Management Methods where practicable.

The content of the manual can be interpreted as a guide and may require adaptations or modification to the information provided herein to suit different situations that may arise due to differences in environmental conditions. The information provided here have been applied and tested practically with resulting production obtained.

Feasibility Study

The following factors should be researched and considered with adequate planning before eventual investment for production of the commodity.

(1) What market the farmer is targeting and how much should be produced?

This information would determine the amount to be supplied, the time schedule for planting, harvesting as well as any special criteria to be met e.g. Packaging, grading and labeling for export markets.

(2) What times of the year are prices the highest and lowest?

Timing of the market is essential and data can be obtained from agencies such as NAMDEVCO.

(3) Cost of Production per unit area?

Identifying all inputs and expenses will definitely determine the size of production unit and potential profitability that can be obtained from the venture.

Cost for 1 acre of Hot Pepper Production

The cost of production for 1 acre of Hot Peppers is based on the feasibility study done with the following assumptions:

- a. A basic land preparation valuation was conducted and the costs were divided for two (2) crops.
- b. Seedlings were purchased from a supplier.
- c. Irrigation of crop being dependent on natural rainfall.
- d. A preventative approach for control of Pests (Thrips / Mites) and Fungal Diseases was adopted with preventative spraying every three weeks until bearing.
- e. Fertilizers were applied every three weeks (7 applications).
- f. Plants were established with a spacing of 3ft x 3ft.
- g. The crop life spanned for nine (9) months.

<i>Input/Activity</i>	<i>Amount</i>	<i>Man days</i>	<i>Unit Cost</i>	<i>Total Cost</i>	<i>Assumptions</i>
Land Preparation Clearing, Ploughing, Rotavating	1 acre		\$1,800.00	\$900.00	2 crop cycles
Liming	1000 lbs		\$85.00/ 20kg	\$2,125.00	
Seedlings (4800 plants)	40 crates	-	\$35.00	\$1,400.00	Spacing 3ft x 3ft
Manure	20 bags	-	\$10.00	\$200.00	
Transplanting	4,800 seedlings	4 days	\$100.00	\$400.00	
Fertilizer Application		6 days	\$100.00	\$600.00	
a. 10:45:0 (1/2 oz/plant)	3 bags (150 lbs)	-	\$200.00/bg	\$600.00	Six (6) applications (once every 3 weeks), for entire crop.
b. 12:12:17:2 (1/4oz /plant)	14 bags (1232 lbs) 21 bags (1050 lbs)		\$280.00/bg \$190.00/bg	\$3,920.00 \$3,990.00	
c. 15:5:20 (1/4 oz / plant)					
Pest and Disease Control					Six (6) applications at 6 five gallon charges per application.
a. Pegasus (2tsp/gal)	360 tsp		\$120.00/250ml	\$840.00	
b. Oberon (2tsp/gal)	360 tsp		\$175.00/gal	\$85.00	
c. Acrobat (2tsp/gal)	360 tsp		\$25.00/60g	\$151.00	
d. Bellis (2tsp/gal)	360 tsp		\$60.00/50g	\$432.00	
Weed Control		1day	\$100.00	\$100.00	1 st Spraying and Clearing weeds.
a. Round Up (3Tbs/gal)	1 gal		\$180.00/gal	\$180.00	
Harvesting	420 bags	14 days	\$100.00	\$1,400.00	
Total Expense			Round Off	\$17,300.00	Actual - \$17,323.00
Total Income	420 bags		\$200.00/bag	\$84,000.00	35bg s/ every 2 wks
Profit				\$66,700.00	

Varieties

Some main varieties produced are:

<p>The West Indies Red</p> 	<p>Seven Pod</p> 	<p>Scotch Bonnet</p> 
<p>Landrace</p> 	<p>Trini Congo</p> 	<p>Tiger Teeth</p> 

Problems arise with obtaining quality seeds that will ensure true to type and uniformity. Good quality seeds can be obtained from C.A.R.D.I.

Most of the Red and Yellow hot peppers seeds that are obtained locally are not true to type and will exhibit variance as farmers obtain their supply of seeds from previous crop.

Land Preparation

(a) Site Selection

Lands should be free from flooding as hot pepper cannot tolerate water logging conditions. Accessibility to a good water source and road infrastructure will allow for greater efficiency in being able to use machinery for land preparation and transport.

The land should be located such that security can be carried out easily in order to prevent predial larceny.

(b) Land Preparation

The field should be cleared of all trees and stumps. Minimal displacement of the top soil should be encouraged. The soil should be deep ploughed (Chiseled) at a depth of 18-24 inches and rotavated. Limestone can be applied at a rate of 1-2 tons/acre to reduce soil acidity.

Weeds seed that sprouted after the first application of an herbicide can be controlled when they reach 3-6 inches in height by spraying with a systemic herbicide.

Tip ó The first application of a Systemic herbicide can be applied two months before land preparation.

Cambered beds can be constructed with dimensions of 1.5 ft high x 6-10ft wide.

Drains (2ft ó 2.5ft deep) should be constructed to ensure removal of excess water. Land preparation activities must be carried out with consideration for the prevention of soil erosion by adopting contour ploughing / drainage on steep slopes

Seedling Production

Preparation of Seeds for planting from the fresh (berries) fruits:

- a. Remove the flesh of the ripe or half ripe fruits from around the seeds still attached at the center.
- b. The seeds (still attached) should be placed in a bucket fully submerged in water and stirred gently (at least two times per day).
- c. After three (3) days the seeds would be completely detached from the center. Drain the water out carefully leaving the seeds settling at the bottom.
- d. The seeds should not be placed in direct sunlight but allowed to be air dried naturally.
- e. Viability of seeds start decreasing after a month.

Seedlings should be at least 4-6 weeks old before transplanting in fields. The following can be done to produce good quality seedlings.

- Sow seeds in sterilized seed tray using promix as the rooting medium. A soil fungicide (Rhizolex/Banrot) should be applied in the rooting medium before filling the trays.
- Stifle the seeds for three days after sowing ensuring that the medium remains moist.
- Application of Phytan 27 (1-2tsp/gal) at age 3 weeks and 6 weeks.
- Fertilizer Application for Seedling Production.
-

Type	Rate	Time	Remark
Nutrex (20:20:20)	3 Tsp/4 gallon	Weekly	1 week after germination
12:12:17:2	150 g / 4 gallon (1 sausage tin)	Weekly	2 weeks after germination Until transplanting
Maricle Grow		Weekly	2 weeks old until transplanting
Greenstim	2-3 tsp/gallon	3 weeks old	Every 14 days

Planting

Seedlings should be at least four to six (4-6) weeks old at transplanting and is best done in the afternoon. Seedlings can be placed in holes filled with well cured manure to cover the root system of the plants. Care should be taken to avoid damage to the roots. The transplanted seedlings can be drenched with a soil insecticide. (e.g. Fastac) to prevent attack by mole cricket. A fertilizer e.g. 10:52:10 or 12:24:12 should be applied to encourage good rooting.

Spacing

Spacing may vary with variety, soil type and inputs available. Recommended distances should be considered to prevent competition between plants, allowing for good crop coverage and reduced soil surface area for weed growth. Higher planting densities will require more specialized irrigation system to obtain maximum production.

The following spacing allows for the approximate plant densities per acre of land:

2ft x 2ft ó 10,800 plants

3ft x 2ft ó 7,000 plants

3ft x 3ft ó 4,800 plants

Fertilizer Application

Timing	Fertilizer	Rate	Method
At Transplanting	10:45 : 0	½ oz per plant	Circular
	Or 12:24:12	1 oz per plant	Circular
1 week after transplanting and every three weeks until harvesting is completed	12:12:17: 2	¼ oz per plant	Circular
	15:5:20	¼ oz per plant	Circular

Cultural Practices

- (1) Weed Control ó Manual weed control should be encouraged during the entire crop life, the use of plastic mulches depresses weed growth significantly. Care should be taken when spraying herbicides between plants from spray drifts.
- (2) Irrigation ó This can be done early in the morning or late afternoon. The water should be of good quality and of optimal amount to obtain maximum production. Special emphasis should be placed at transplanting (the two weeks that follows) and during the onset of flowering /fruit production in providing an adequate water supply. Irrigated fields yield an approximate (15 ó 20 %) more in production than rain fed fields.

Harvesting

Harvesting begins at 2 ½ - 3 months and can be done on a weekly or bi-weekly basis depending on the market demand and can continue for up to 6-8 months.

The fruit stalk should be pulled slightly in an upward motion at the point where the stalk is attached to the plant stem minimizing branch breakage and damage to the plant. Harvesting is best done in cool dry conditions with great care to ensure delivery of good quality produce.

Pest Control

Name of Pest	Symptoms/ Damage	Control
<p style="text-align: center;">Mole Cricket</p> 	<p>Attacks seedlings by cutting stems at or just under the soil surface</p>	<p>Use of soil insecticide at transplanting e.g: Fastac, Diazinon</p>
<p style="text-align: center;">Aphids</p> 	<p>Serve as vector for viral diseases</p>	<p>Biological e.g. Neem products, Azadirect</p> <p style="text-align: center;">Acctelic, Pegasus</p>
<p style="text-align: center;">Cut Worm</p> 	<p>Eats holes in leaves resulting in defoliation</p>	<p>Biological e.g. Dipel DF Pegasus, Pirate</p>

Pest Control (cont'd)

Name of Pest	Symptoms/Damage	Control
<p>White Flies</p> 	<p>Severe Flower drop, wilting of leaves, Vector for viral disease</p>	<p>Pegasus, Pirate</p>
<p>Thrips</p> 	<p>Scarring/ Bronzing of leaves, Flower drop, stunting of plant</p>	<p>Pegasus, Pirate</p>
<p>Mites</p> 	<p>Bronzing, scarring of leaves and fruits. Downward curling and rosetting of leaves.</p>	<p>Pegasus, Pirate</p>

Disease Control

Name/Type	Symptoms	Spread	Control	Remarks
<p>Bacterial Wilt</p> 	<p>Sudden wilting of plant. Discoloration of vascular tissues.</p>	<p>Soil borne disease, rain splash, contaminated tools and equipment.</p>	<p>Liming of Soil, Rogueing of diseased plants, Crop Rotation. Phyton 27</p>	<p>Bacteria thrives best in acidic conditions</p>

Name/Type	Symptoms	Spread	Control	Remarks
<p>Phytophthora Root Rot (Fungal)</p> 	<p>Dark brown lesions on stems, loss of leaves.</p>	<p>Infected seeds</p>	<p>Proper Drainage, crop rotation Acrobat, Alliete, Ridomil Gold.</p>	

Name/Type	Symptoms	Spread	Control	Remarks
<p data-bbox="436 383 627 412">Bacterial Spot</p> 	<p data-bbox="709 383 995 488">Tiny brown irregular spots on leaves, stem, flowers and fruits.</p> 	<p data-bbox="1035 383 1178 451">Seed / soil borne</p>	<p data-bbox="1272 383 1478 488">Use of copper based fungicide e. g Kocide</p>	

Name/Type	Symptoms	Spread	Control	Remarks
<p data-bbox="422 979 646 1008">Blossom End Rot</p> 	<p data-bbox="730 979 932 1117">Dark leathery spotting at the blossom end of fruit</p>	<p data-bbox="974 979 1213 1084">Inadequate Calcium available to plant</p>	<p data-bbox="1241 979 1463 1117">Apply calcium via fertilizers from early stages of growth</p>	

Name/Type	Symptoms	Spread	Control	Remarks
<p data-bbox="457 386 606 451">Antracnose (Fungal)</p> 	<p data-bbox="716 386 909 483">Small sunken water soaked lesions on fruit</p>	<p data-bbox="978 386 1184 410">Wind and water</p>	<p data-bbox="1236 386 1451 524">Crop rotation, wider spacing. Use of copper based fungicides</p>	

Name/Type	Symptoms	Spread	Control	Remarks
<p data-bbox="443 865 625 889">Viral Diseases</p> 	<p data-bbox="730 865 936 1003">Crimpling and chlorotic discoloration of leaves</p>	<p data-bbox="995 865 1194 971">Insect vectors ó Aphids, White flies</p>	<p data-bbox="1247 865 1451 971">Destroy infected plants, control vectors</p>	