DEPARTMENT OF AGRICULTURE

Regional Field Office No. 02

Tuguegarao City, Cagayan

UPO

PRODUCTION GUIDE

Upo

Production Guide

This Publication is a project of the **Department of Agriculture, Regional Field Office No. 02, High Value Crops Development Program.** It contains the most recently available and locally adaptable technical information on **Upo Production** in Region 02.

February 2017

Introduction

Bottle gourd (*Lagenaria siceraria* [Molina] Standley) is commonly called "*upo*" among the Tagalog. It is locally known as "*Tabungaw*" in Ilocano and "*Kandol*" in Ibanag. This is a herbaceous, annual climbing plant with long strong tendrils and simple leaves. When the fruit matures, the rind is hard and durable.

Young fruits are usually cooked as vegetable dish. Young shoots are also consumed as green vegetables and the seeds are popular snack food as "*kutchi*". Upo contains carbohydrates, minerals and vitamins.

The juice from green upo fruits is good for the treatment of chest pains, stomach acidity, indigestion, ulcer, epilepsy, insanity and other nervous diseases. The leaves are used to treat skin diseases. Boiled seeds are also good for the treatment of boils.

The hard rind of dried matured fruits can be made into containers, hats, decorative handicrafts, floats, and musical instruments.

ADAPTATION

Soil and Climatic Requirements

Upo is generally adapted to a wide range of environmental conditions but it is profitably grown in a relatively dry, warm climate. The crop performs well in both wet and dry seasons. Upo grows best in a well-drained soil.

Varietal Selection

Select varieties that are adaptable to local conditions and resistant to insect pests and diseases, with market preference. Table 1 presents the varieties of upo.

Table 1. Upo varieties adapted to Region 02 condition.

Variety	Days to Maturity	Features
Dalisay F1	65	All-season, early and very productive fruit setting; disease tolerant
Gauri F1	42-45	High yielding; early maturing; fruits are good for long distance transport
Valentina F1	65-70	Early maturing; high yielding; produces 12-16 fruits per plant
Magnifica	55	All-season; class "A" fruits; longer maturation period
Tambuli	60	All-season variety; resistant to fungal disease
Upo Grande	85	All-season; long pointed fruits, 7.6 x 69 cm. long
Native Upo	65-70	All-season; resistant to pests and diseases.

CULTURAL MANAGEMENT PRACTICES

Land Preparation

Prepare the field thoroughly to obtain good crop stand and optimum yield. Plow the field 2 - 3 times at one week interval to allow weeds to germinate before the next plowing. Plow at a depth or 15-20 centimeter for better root penetration. Harrow every after plowing to pulverize and level the field. A well-pulverized soil promotes good soil aeration and enhances root formation.

Make furrows after the last harrowing, at the distance of 2 – 3 meters apart.

Planting

Upo can either be direct-seeded or transplanted. For hybrids, transplanting is recommended to save on seeds and ensure seedling survival. One (1) hectare farm requires 2-3 kg of seeds.

To facilitate germination, soak the seeds overnight with clean water. Wrap with moist cloth and place in dark and cool place until the seed coat breaks and the radicals emerged.

Plant 1-2 pre-germinated seeds per hill at a distance of one (1) m. Cover seeds with thin layer of fine soil. During the wet season, plant upo in raised beds or in ridges to prevent rotting of seeds or seedlings.

For transplanting method, grow seedlings in seedling trays or potlets. Prepare growing media of one part compost or organic fertilizer, one part garden soil and one part carbonized rice hull (CRH). Mix thoroughly. Fill the holes of the seedling trays or potlets with the prepared media. Water the potting media before sowing. Sow one pre-germinated seed per hole of the seedling tray or potlet at least 1-2 cm deep and cover with fine soil. Place the seedling trays/ potlets under a temporary shade. Water the seedlings regularly.

Before transplanting, harden the seedlings by gradually reducing the frequency of watering and exposing them to direct sunlight. Seedlings are ready for transplanting 10-15 days after emergence (DAE) or when true leaves have developed. Transplant one seedling per hill at a distance of 1 meter between hills. Transplant in the afternoon or during cloudy days to prevent transplanting shock. Replant missing hills within three(3) days after transplanting (DAT).

Fertilizer Application

The kind and amount of fertilizer to apply depends on soil fertility and type of soil. For best result, submit soil samples for analysis at the Cagayan Valley Integrated Agricultural Laboratory (CVIAL), Department of Agriculture, RFO 02, Carig Sur, Tuguegarao City, Cagayan or at Ilagan Soils Laboratory, San Felipe, Ilagan City, Isabela to determine the right nutrient requirement of the soil.

In the absence of soil analysis, apply the following fertilizers at the right amount and time of application.

Table 2. Kind, amount and time of fertilizer application for Upo.

Time of Application	Kind of Fertilizer	Amount of Fertilizer
Basal	Complete (14-14-14) Fully decomposed animal manure or commercial organic fertilizer	2 bags per ha or 20 g per hill
Side-dress 30 Days (DAP)	Urea (46-0-0)	1 bag per ha or 10 g per hill
45 Days After Planting	Urea (46-0-0) Muriate of Potash (0-0-60)	2 bag per ha or 20 g per hill or 1 bag per ha or 10 g per hill

Trellising

Provide the plants with trellis to produce good quality fruits. Trellising is essential during the wet season to minimize fruit rotting and malformation.

Construct overhead trellises at a distance of 2 to 3 m wide and 2 m high using ipil-ipil or bamboo poles. Provide strong roof trellis by intertwining tie wire or nylon twine crosswise and lengthwise on top of the trellis. Provide a ladder-like trellis or vertical pole for each plant to facilitate the vines to climb.

Train the vines to climb the trellis by tying the stem lightly on the vertical pole or ladder-like trellis until it reaches the overhead trellis.

Pruning

To promote branching and fruiting, remove all the lateral branches and female buds that appear on the climbing part of the main stem below the overhead trellis. Remove the tip of the main vine when it reaches the top of the overhead trellis and the lower lateral branches.

Water Management

Upo is sensitive to excessive soil moisture, which favors disease infection. Provide adequate drainage during wet season to avoid water logging. Furrow irrigation is recommended during dry season at weekly interval. Spread rice straw around the base of the plants as mulch to conserve moisture and minimize watering during dry season.

Weeding and Cultivation

Upo is moderately deep-rooted with extensive lateral root system. Hill-up at 15 -20 DAE. Minimize cultivation during the fruiting stage to avoid disturbing the roots, instead, hand weeding is recommended during this stage.

Pests Management

To prevent the occurrence of pest, practice good cultural management and sanitation to minimize the presence of hosts. The most common insect pests of upo are yellow beetle and leaf-footed plant bug. Fruit rot is the most common disease that attacks the crop.

Avoid applying pesticides in the afternoon because flowers of upo usually open in the afternoon thus protecting the insect pollinators which also appear at the same time.

Table 3. Pests Management Options for Upo

Pest	Symptoms	Management Option
• Yellow beetle	• Larva infests the roots while the adult beetles feed on the leaves, flowers and shoots	• Collect and crush the insects early morning or late in the afternoon
• Leaf-footed plant bug	• Young fruits show dark spot. • Immature fruits fall • In severe cases, plants wilt and die	• Remove infested plants after harvest • Practice crop rotation • Apply wood ash on the leaves • Use attractant
• Fruit rot disease	• Symptoms appear on foliage and fruits	• Collect infected fruits • Practice field sanitation • Practice crop rotation • Spray fungicides, if necessary

Harvesting and Postharvest

Fruits develop very fast and require much attention during harvest time. It usually takes 15 days to reach marketable size from fruit setting or 60 to 80 days after sowing (DAS).

Harvest fruits using a sharp knife by cutting the peduncle, leaving approximately 5 cm length. Put harvested fruits in a woven basket lined with banana leaves to avoid skin bruises. Pack marketable fruits in a rolled plastic bags or plastic crates.

COST AND RETURN ANALYSIS FOR ONE HECTARE UPO PRODUCTION

A. Labor Cost

PARTICULARS	Number 1/		Total (P)
	Man - days	Man-animal-days	
A. Labor Cost			
1. Land Preparation			
a. 1st Plowing		7	2,100.00
b. 1st Harrowing		4	1,200.00
c. 2nd Plowing		5	1,500.00
d. 2nd Harrowing		3	900.00
e. Furrowing		4	1,200.00
2. Making trellises	15		2,250.00
3. Basal Fertilizer application	4		600.00
4. Planting	8		1,200.00
5. Thinning	1		150.00
6. Care of the plants			
a. Watering (3x a week up to flowering)	18		2,700.00
b. Weeding and cultivation (4x)	20		3,000.00
c. Side dressing of fertilizer	5		750.00
d. Hilling-up		5	750.00
e. Control of pests and diseases (if necessary)	18		2,700.00
7. Harvesting	50		7,500.00
8. Sorting and packing	4		600.00
9. Hauling	4		600.00

B. Material Inputs

Materials	Quantity	Unit Cost (P) 2/	Amount P
1. Seeds (OPV) AT 600.00/kg	2	600.00	1,200.00
2. Fertilizer			
- Complete (14-14-14)	2 bags	1,900.00	3,800.00
- Organic fertilizer	20 bags	200.00	4,000.00
3. Insecticide	3 liters	850.00	2,550.00
4. Fungicide	2 kg	350.00	700.00
5. Fuel	40 liters	50.00	2,000.00
6. Polyethylene sacks	200 pieces	5.00	1,000.00
7. Bamboos	500 pieces	60.00	30,000.00
8. Tie wire	10 kg	75.00	750.00
9. Miscellaneous (straw, nails, needles, etc.)			
Sub-Total			**46,000.00**
Sub-Total (A&B)			**75,700.00**
C. Contingency (15% of the total labor & material inputs)			**11,355.00**
GRAND TOTAL			**87,055.00**
Yield/ha (kg)	20,000	3/	
Gross Income		10.00/kg	200,000.00
Net Income			112,945.00
Return on Investment (ROI)			129.74

1/ Man-days = P250
MAD = P400
2/ Cost of items as of December 2015
3/ Farm gate Price

EDITORIAL STAFF

Writers / Editors : **Cherrybel O. Cubero**
Prisca B. Baquiran

Technical Editors : **Leonida A. de Guzman**
Mayda P. Callueng

Layout Artist : **Erwin C. Cachero**

Editor-in-Chief:

HECTOR U. TABBUN
Information Officer III
Chief, Regional Agricultural & Fisheries Information Section
(RAFIS)

Consultants:

ROBERT B. OLINARES
OIC Regional Technical Director for Operations

ORLANDO J. LORENZANA
Regional Technical Director for
Research and Regulatory

LUCRECIO R. ALVIAR JR., CESO III
Regional Executive Director

Produced By:

High Value Crops Development Program (HVCDP)
Contact No. (078) 846-3379

Regional Agricultural and Fisheries Information Section (RAFIS)
Contact No.: (078) 304-0562
Email Address: da_agcom@yahoo.com / darfu02_agcom@yahoo.com