

once by pulling the entire plant by the roots or they may be harvested repeatedly by priming the shoots. Whole plants are uprooted from the soil, washed, and tied in bundles.

Postharvest Handling

Saluyot wilts rapidly. A common market practice is to sprinkle the shoots with water to retain freshness. If harvested with the roots intact, shoots can be kept fresh for 3–5 days by letting them stand in a basin of water.

Seed Production

Saluyot has a high outcrossing rate. To keep the seeds pure, provide isolation distance of 1000 m or encase selected plants in nylon nets. Seeds are ready to harvest when the capsule starts to turn brown. Maturity of plants for seed production varies widely at 3–7 months depending on season of planting and harvesting intensity. Harvest pods by priming or by uprooting the entire plant. Sun-dry to around 10% moisture content. To determine if the moisture content is acceptable, put some seeds inside a plastic bag and place under the sun. If condensation occurs after 20–30 minutes or more depending on how intense the heat of the sun is, continue sun-drying the seeds. Pack the dry seeds in moisture-proof containers and store in a cool, dry place. If properly stored, seeds can remain viable for about 2 years.

Cost and Return Analysis per Hectare	
Items	Amount (P)
VARIABLE COSTS	
<i>Labor (P220/man-day [MD])</i>	
Clearing (20 MD)	4,400
Bed preparation (20 MD)	4,400
Manure application (10 MD)	2,200
Sowing (2 MD)	440
Transplanting (20 MD)	4,400
Topdressing (20 MD)	4,400
Spraying (20 MD)	4,400
Weeding (30 MD)	6,600
Irrigation (300 MD)	66,000
Harvesting/sorting (240 MD)	52,800

Miscellaneous (e.g., hauling, repairs, etc.) (10 MD)	2,200
Subtotal	152,240
<i>Materials</i>	
Seeds (3 kg)	1,000
Manure (40 sacks)	3,200
Fertilizer	
- 14-14-14 (6 bags)	4,938
- 46-0-0 (20 bags)	19,420
Pesticides	4,000
Fuel and oil	4,000
Packaging materials	3,000
Miscellaneous (e.g., pail, gloves, etc.)	2,000
Subtotal	41,558
<i>Interest on Production Loans at 21% p.a.</i>	
Total (Variable Costs)	10,500
	204,298
<b>FIXED COSTS</b>	
Land rental	20,000
Depreciation	
Sprinkler (5 pairs)	2,500
Knap sack sprayer (1 unit)	500
Scythe (5 pcs)	83
Hoe (5 pcs)	417
Shovel (3 pcs)	320
Plastic drum (2 pcs)	533
Total (Fixed Costs)	24,353
<b>Total Costs</b>	228,651
<b>Gross Income</b>	
Regular season (at P8/bundle with 80,000 bundles/ha)	640,000
Offseason (at P12/bundle with 40,000 bundles/ha)	480,000
<b>Net Income</b>	
Regular season	411,349
Offseason	251,349

References:

Baheyeldin, K. Molokheya: An Egyptian national dish, 2004. - (<http://baheyeldin.com/egypt/molokheya-an-egyptian-national-dish.html>)

Bureau of Plant Industry. Production guide on saluyot. (<http://www.bpi.da.gov.ph/Publications/productionguides/saluyot.htm>)

Palada, M.C.; Chang, L.C. Suggested cultural practices for basella. AVRDC International Cooperator’s Guide. AVRDC Pub # 03-546, May 2003. 4p.

Sukprakarn, S.; Juntakool, S,; Huang, R.; Kalb, T. Saving your own vegetable seeds—a guide for farmers. AVRDC publication Number 05-647. Shanhua, Taiwan: AVRDC-The World Vegetable Center, 2005. 25p.

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**DEPARTMENT OF SCIENCE AND TECHNOLOGY**  
Small Enterprise Technology Upgrading Program (SET-UP)



# Saluyot Production Guide



Introduction

Saluyot (*Corchorus olitorius* L.) is an erect, glabrous, annual shrub, growing up to 2 m high. It is also called ‘tugabang’ (Bisaya), jute mallow or Jew’s mallow, jute, nalta jute, bush okra (English), and ‘molokheya’ (Egyptian). Its leaves, varying from light green to green with purple tinge, are ovate, lanceolate with toothed margins. Its flowers are solitary with yellow petals on the axils. The fruit is a capsule, green when young turning dark brown when mature, with many black angular seeds. Saluyot is native to Africa where it is widely cultivated in both wet regions of the Sub-Sahara and drier areas of North Africa.

In 2006, 1,949 tons (t) of saluyot were produced from 692 hectares (ha) throughout the country. The top producing regions were Ilocos (213 ha) and Western Visayas (154 ha) although market gardens around Metro Manila are increasing and are more productive (Bureau of Agricultural Statistics [BAS], 2006).

Uses and Nutritional Value

Saluyot is grown mostly as a potherb, but it is also famous in other countries such as India for its sturdy natural fiber. The leaves are used fresh or dried, as soup thickener. They can be stored after drying for future use. The leaves become mucilaginous when cooked, a trait highly appreciated for this crop. Saluyot leaves are rich in iron, protein, calcium, thiamine, riboflavin, niacin, and folate.



Per 100 grams (g) edible portion, saluyot leaves contain:		
Properties	Amount	
Water (g)	83.0	
Energy (kcal)	65.0	
Protein (g)	6.5	
Fat (g)	1.0	
Carbohydrates (g)	7.5	
Fiber (g)	2.0	
Ash (g)	2.0	
Calcium (mg)	488.0	
Phosphorus (mg)	114.0	
Iron (mg)	11.6	
Vitamin A (µg)	1,221.0	
Thiamine (mg)	0.15	
Riboflavin (mg)	0.28	
Niacin (mg)	1.5	
Ascorbic acid (mg)	95.0	

Source: The Philippine Food Composition Tables, 1997. Food and Nutrition Research Institute-Department of Science and Technology (FNRI-DOST).

Production Management

Varieties

There are several species and varieties of saluyot in other countries. In the Philippines, there are two common types: the purplish ‘Pula’ and the light green ‘Puti.’ Pula is more common, but Puti is more popular in commercial production areas around Metro Manila. A stopgap variety named ‘Sagisag’ was released by the Institute of Plant Breeding-University of the Philippines Los Baños (IPB-UPLB) through its Germplasm Registration and Release Office in 1981. Sagisag has a purplish tint in the stems and leaves similar to Pula.

Soil and Climate Requirements

Saluyot is cultivated over a wide range of environments. It grows well under hot and wet conditions of the lowland tropics. It grows best in loam or silty-loam soil with high organic matter. It can tolerate soil pH ranging from

4.5 to 8.0. Being a short-day plant, it flowers profusely during November to February. Some strains, such as the light green types, are more photoperiod sensitive.

Land Preparation

Saluyot is best managed if grown in raised beds and in rows. Plow and harrow the soil thoroughly. Prepare raised beds 0.75–1.0 m wide. Incorporate organic fertilizer or compost at 2–3 t/ha during land preparation.

Planting

Saluyot is planted either by direct seeding or transplanting. The seeds are drilled uniformly in rows 20–30 cm apart. Seeding rate is 3–5 kg/ha, depending on viability and seed size. There are about 500 seeds/g. In field plantings, broadcast seeds evenly and lightly then cover with fine soil by passing a wooden harrow. If transplanted, sow the seeds in seedbeds and cover lightly with rice straw or dry cogon grass. Water regularly. Seeds germinate in about four days. Transplant after three weeks. Uproot the seedlings and transplant at 12 cm x 12 cm between plants. Water immediately and frequently after transplanting.

Fertilization

Saluyot grows well even without fertilization, but in market gardens nitrogen fertilizer is used liberally to produce succulent tops. A combination of inorganic and organic fertilizers is recommended to increase soil fertility and yield. The rate of fertilizer application depends on soil fertility, soil type, and soil organic matter. A soil test is highly recommended to determine the available N, P, and K and soil pH. In addition to organic fertilizer, topdress with urea at 2 bags/ha after each harvest. Tea manure and fermented plant juice (FPJ) may also be used to improve soil fertility. To prepare tea manure, soak ¾ sack of dried cow or horse manure in a ¾ plastic drum (200-L capacity) of water. Soak for 5–7 days with frequent stirring. To prepare FPJ, mix three parts chopped plant shoots or banana trunk with one part raw sugar or molasses. Ferment mixture for 5–7 days. Dilute 1 part tea manure or FPJ to 20 parts water and drench on the plots or use as foliar fertilizer.

Irrigation

Saluyot is sensitive to drought and water logging. Irrigation is essential after sowing or transplanting to ensure good plant stand. Drought triggers early flowering, which inevitably leads to reduced yield. Use furrow or manual irrigation during the dry season. Mulch with locally available materials such as grass clippings or rice straw to conserve moisture. Provide canals to facilitate quick drainage of excess water after heavy rains.

Weeding

Weeding is done at 15 days and 45 days after planting. As soon as the foliage overlaps, weeds will be unable to compete with the saluyot plants.

Pest and Disease Management

The common pests of saluyot are cutworms and spider mites. Frequent harvesting can greatly minimize these pests. Good soil moisture will also minimize spider mites. Cutworms can be controlled with biological pesticides such as *Bacillus thuringiensis* (Bt) and Nuclear Polyhedrosis Virus (NPV). Recommended insecticides may also be used following product labels. Nematodes (*Meloidogyne* spp.), which cause stunting of plants, can be prevented through crop rotation with corn and planting of marigold. Damping-off caused by *Rhizoctonia*, *Pythium*, or *Phytophthora* spp. can be managed through proper watering and drainage and the use of compost or *Trichoderma*.

Harvesting

Saluyot can be harvested 30 days after transplanting by cutting the crop at 20–25 cm from the ground. Subsequent harvesting is done at 1–2 weeks interval for up to 7 months. Harvesting is best done in the late afternoon in time for the next day’s early morning market. Sort, pack, and store tops under shade. Some traders in Cavite tie 16 stalks at the base to form a bunch, and tie five bunches together to form a bundle. These are packed in plastic bags for the wholesale market. Around one bundle can be harvested per square meter per harvest. Plants may also be harvested