

The Sweet Pea

1. DESCRIPTION OF PLANT

Sweet pea (*Pisum sativum* L.), locally known as 'Chinese pea', 'snow pea', garden pea, or 'sitsaro', is the most expensive vegetable legumes in the country. It is grown for its edible pods or seeds. It grows very well in Benguet and Mt. Province, where the climate is cool throughout the year. Garden pea seeds contain considerable amounts of digestible protein, carbohydrates, and minerals, while the green pods are rich sources of vitamin A. Peas are grown for their green pods and dried seeds. The snow pea is the most common type in the Philippines. This group also includes the snap pea, a group of edible-podded peas that are differentiated from snow pea because of their round pods. Snap pea produces thick, full-bodied, edible pods, and sweet, full-sized peas. The pods snap when bent like fresh green beans. Snow pea generally has flat pods.



2. ORIGIN AND MAJOR TYPES

Sweet pea is a flowering plant in the genus *Lathyrus* in the family Fabaceae (legumes), native to the Sicily, southern Italy and the Aegean Islands.

It is an annual climbing plant, growing to a height of 1-2 meters (nearly six feet and six inches), where suitable support is available. The leaves are pinnate with two leaflets and a terminal tendrils, which twines around supporting plants and structures helping the sweet pea to climb. The flowers are purple, 2-3.5 centimeters broad, in the wild plant, larger and very variable in color in the many cultivars.

3. PRODUCTION TRENDS

In 2006, a total of 5,723 tons of sweet peas was produced 1.5% lower than the production in 2005. The Cordillera Administrative Region is the leading producer of sweet peas in the country.

4. PROPERTIES (NUTRITIONAL VALUES)

Its nutritional values per 100 grams edible portion are as follows.

Properties	Amount
Water	82.4
Energy (kcal)	67.0
Protein (g)	3.0
Fat (g)	0.4
Carbohydrates (g)	12.8
Dietary Fiber (g)	2.1
Ash (g)	1.4
Calcium (mg)	92.0
Phosphorous (mg)	48.0
Iron (mg)	1.2

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

5. USES (CULINARY, MEDICINAL...ETC)

Fresh peas are often eaten boiled and flavored with butter and/or spearmint as a side dish vegetable. Salt and pepper are also commonly added to peas when served. Fresh peas are also used in pot pies, salads and casseroles.

In modern times peas are usually boiled or steamed, which breaks down the cell walls and makes the taste sweeter and the nutrients more bioavailable.

6. VARIETIES

1. **Pole Type:** Chinese Dark Green, Kalantao, Chinese 60, Sugar Snap, Melting Sugar, Trinidad, CGP 14, CGP 15, CGP 19, Sweet Pea DK30, Green Smile, Mini White



2. **Bush Type:** Dwarf Grey. The common varieties in the Philippines are flat-podded. The varieties listed are all flat-podded except for Sugar Snap. However, Sugar Snap is becoming popular in Bukidnon. This type is more succulent and crisp. They can be harvested for fresh pods even green immature seeds are already well-developed.

7. CULTIVATION

Sweet pea grows well in humus-rich or volcanic soil. It thrives best in areas at least 1,000 m above sea level.

Sweet pea favors a cool climate with a temperature range of 10°-18°C, in lower elevations, the plants are less vigorous and are more prone to diseases including powdery mildew. Moreover, their pods are more fibrous. A well-distributed rainfall is also important in growing this crop.

- A. **Planting Materials.** Sweet pea is propagated from seeds. The recommended seeding rate is 40-50 kg/ha. Pre-soak the seeds for 12 hours in water prior to sowing to improve seed germination. In areas where sweet pea has not been grown before, treat the seeds with *Rhizobium* at 100 g per 6 kg of seeds to enhance nodulation for nitrogen fixation.
- B. **Land Preparation.** Plow and harrow twice the soil for more porous and friable soil condition and free from weeds. Make furrows 50-60 cm apart or plots 0.75-1 m wide for double row planting.
- C. **Fertilization.** The general fertilizer recommendation is 126 kg/ha N, 44 kg/ha P₂O₃ and 125 kg/ha K₂O. Apply manure at 3-5 t/ha before planting to contribute 50 kg NPK and micronutrients. Apply 3 bags/ha 14-14-14 at planting. Split the balance of the NPK requirement and sidedress at 30 and 60 days after sowing. If necessary, apply lime at least 2 weeks before planting to gradually set the soil pH level to 6.0-6.5.
- D. **Planting.** Drill the seeds in shallow furrows at 5-10 seeds per linear meter. If hill planting is desired, place 2-3 seeds/hill at a distance of 20-30 cm between hills. The space between rows in double-row plots is 20 cm.
- E. **Weeding and Hilling-up.** Control the weeds close to the plants to avoid competition. Usually, weeding 15 days interval for three times is enough for the whole planting season. Low weed coverage along the alleys will help minimize leaf miner population. Hill up once, during the first sidedressing.
- F. **Trellising.** Provide trellises to prevent the plants from lodging. Use bamboo, "rono" or wire #16, or any available local materials as substitute. In Benguet, rono is used in a crisscross fashion in between the adjacent rows at 40-50 pcs/10 linear meters. Synthetic straw is also used to support the growing vines.

8. CROP PROTECTION

Pest Management

1. Pea Aphids (*Myzus persicae* S.).

This sucking insects and adults are about 1.5 to 2 mm long, shiny black, soft bodied and colorless wings. They are usually found in groups underneath young leaves, shoots and pods.



They sucked the sap of the plants causing it to curl having abnormal growth and becomes dwarf and unproductive.

Management

- a. They are controlled by some predatory insects like lady beetles
 - b. Rouging of infested plants could be practiced.
 - c. Use of yellow traps
 - d. Spraying could also be practical control measure.
 - e. Spray hot pepper extract (100 g macerated hot pepper/16 L waterPod borer (*Helicoverpa* spp.)
 - f. Handpick the larvae and pupae during the early stages of infestation.
2. **Cutworms (*Agrotis ipsilon*).** Cutworms are grayish, fleshy caterpillars up to 5 cm long, which curl up when disturbed. Plants may be chewed off above or below ground level and may be damaged higher up by climbing cutworms. Most of the cutworm damage is to newly set plants in the field, but they are often found attacking seedlings in plant bed and greenhouses. Late infestation of variegated cutworm occasionally occurs. Often a nuisance during the dry months, the pests attacks the young plants by nibbling or cutting off the stem near the ground level, they attack at night.

Management

- a. Prepare the soil two weeks before planting to cultivate in cover crops and destroy weeds.
 - b. Check plants frequently and treat when damage is first observed.
3. **Leafminer (*Liriomyza huidobrensis* Blanchard).** The larvae makes serpentine or curled mines on the leaves . The mines start to appear on matured leaves, first

on the lower mature leaf then towards the upper leaves as the plant mature. The female adult also makes pinholes on the leaves.

Management

- a. Use yellow sticky traps apart from the cultural management practices A community wide use of sticky traps is recommended.
 - b. Encourage natural enemies like spiders, lacewings, and symphid flies.
 - c. If needed, spray with cyromazine or cartap hydrochloride following the recommended rates.
 - d. Intercrop with leek, lettuce, pechay, and other shallow-rooted and short-season crops.
 - e. Maintain low weed population along alleys.
4. **Powdery mildew (*Erisiphe polygon*).** Covers a plant with a downy, white fungal coating that sucks nutrients out of the leaves.

Management

- a. Bicarbonate sprays can help to prevent mildew.
- b. Destroy seriously affected vines, or place them in sealed containers for disposal with household trash.
- c. Avoid powdery mildew by planting resistant cultivars.



5. **Ascochyta leaf spot.** Symptoms first appear as small, purplish-brown, irregular flecks. Under continued humid conditions, the flecks enlarge and coalesce, resulting in the lower leaves becoming completely blighted. Severe infections may lead to girdling of the stem near the soil line, which is known as foot rot . Foot rot lesions are purplish-black in color and may extend above and below the soil line. Foot and stem lesions girdle and weaken the stem, leading to crop lodging and yield loss. Disease lesions develop on pods under prolonged moist conditions or if the crop has lodged. Pod lesions are initially small and dark, but may become extensive and lead to early pod senescence. Severe pod infection may result in small, shrunken or discolored seed; or alternatively, seed may show no symptoms.

Management

- a. Practice field sanitation and crop rotation
- b. Crop rotation
- c. Stubble management practices such as straw-chopping during combining, or

- harrowing to spread out residue on the soil surface, can help speed the decomposition of pea residue.
- d. Variety Selection
 - e. Plant the best seed available to reduce the risk of disease-related losses.
 - f. Seed treatments provide protection against both seed- and soil-borne diseases.
 - g. It is important to scout for early symptoms as well as determine the economics of a fungicide application.
6. **Fusarium rot/ Fusarium wilt (*Fusarium oxysporum f. sp. pisi*).** Plants may become infected at any stage of growth. The first symptoms are usually yellowing of the lower leaves and stunting or dwarfing of plant growth. The stipules and margins of the leaflets curl downward and inward. The stems at or near the soil line may be slightly thickened and brittle. Affected plants may wilt and die either slowly or rapidly soon after the first symptoms are noted due to destruction of the feeder roots. Affected plants die more rapidly in very dry than in moist soils. If infection occurs when the plants are fairly young, they often wither and die without producing any pods. If they are larger when infected, a few flattened and poorly filled pods may form. The disease occurs in circular to oval areas in the field.

Management

- A. Prepare land properly.
- B. Use resistant or tolerant varieties
- C. Rotate planting with non-host crops such as crucifers and corn
- D. Apply compost
- E. The only economical control in wilt-infested soil is to grow pea varieties with resistance to *Fusarium* wilt or both diseases
- F. Plant as early as possible using only disease-free seeds
- G. A 5-year rotation or longer, using crops other than peas, plus the prevention of movement of all pea vine debris to other fields, will help to prevent buildup of wilt fungi in the soil.

9. HARVESTING

Pod Production. Harvest the crop at about 60-65 days after planting. For best quality pods, sweet pea should be harvested before physiological maturity or before the peas deform the hull. Pods should be harvested after they have developed young, immature seeds.

Harvest by priming twice a week. Harvesting can be extended up to 10 times for the entire growing period depending on crop management.

10. POST HARVEST

Preserve any surplus as soon as possible by canning or, preferably, by freezing, which retains that fresh-from-the-garden flavor. To freeze peas, just shell and blanch for 1½ minutes, then cool, drain, pack, and freeze. Snow peas, which are frozen whole, are treated the same way, but don't forget to string them first if necessary. Peas have a freezer life of about 1 year.

If peas become overripe, shell them and spread them on a flat surface for 3 weeks or until completely dry. Store them in air tight containers and use as you would any dried bean.

Keep the produce under shade and pack in plastic crates. Sweet pea can be stored for 1-2 weeks at 0°C (32°F) with 95-58% relative humidity.

11. COST OF PRODUCTION AND ROI FOR A ONE-HECTARE LAND

SWEET PEA COST OF PRODUCTION

A. Labor Cost	Man-Day (325.00/day)	Value (P)
Land Preparation	40	13,000.00
Digging/plot preparation	40	13,000.00
Furrowing	20	6,500.00
Fertilization (basal)	20	6,500.00
Mixing/covering	20	6,500.00
Planting	25	8,125.00
Care and Maintenance		
Irrigation (8x)	10	26,000.00
Weeding	25	8,125.00
Side-dressing/hilling-up	40	13,000.00
Spraying (8x)	10	26,000.00
Tying/supporting of the vines		
1 st tying	10	3,250.00
2 nd tying	10	3,250.00
3 rd tying	10	3,250.00
Harvesting, hauling, threshing grading and packing (4x) <u>1/</u>	7	9,100.00
Sub-Total	156,000.00	145,600.00
<u>1/</u> if prod. of seeds: 15 man-day	(seeds)	(pods)

B. Material Inputs

Items/Quantity	Unit Price (P)	Total Value (P)
Good seeds/30 kgs.	250.00	7,500.00
Fertilizer		
Chicken dung/100 bags	120.00	12,000.00
Complete fertilizer/14 bags	1,200.00	16,800.00
Insecticides/10 li.	1,000.00	10,000.00
Fungicides/10 kgs.	800.00	8,000.00
Plastic twine/straw/30 rolls	50.00	1,500.00
Rono sticks <u>1</u> / 66,000 pcs.	1.30	85,800.00
Sub-Total		141,600.00
<i><u>1/to be used 3x cropping</u></i>		

C. Fixed Cost	Amount (P)
Land rent (2 months) <u>2</u> /	30,000.00
Depreciation on tools/equipment	985.00
Sub-Total	30,985.00
<i><u>2/land rent is based on 3.00/m²/cropping</u></i>	

D. Miscellaneous	Amount
1. Transportation	10,000.00
2. Seeds/packing materials	5,000.00
Sub-Total	15,000.00
Total Cost of Production	343,585.00
	(seeds)
	333,185.00
	(fresh pods)

E.a. Gross Income (Fresh Pods)

Price Level	Price/kg	Ave. Yield kg	Amount (P)
Level 1	45.00	8,000.00	360,000.00
Level 2	50.00	8,000.00	400,000.00
Level 3	55.00	8,000.00	440,000.00
E.b. Net Income (Fresh Pods)			
Price Level	Gross Income (P)	Total Production Cost (P)	Net Income (P)
Level 1	360,000.00	333,185.00	26,815.00

Level 2	400,000.00	333,185.00	66,815.00
Level 3	440,000.00	333,185.00	106,815.00
F.a. Gross Income (Seeds)			
Price Level	Price/kg	Ave. Yield kg	Amount (P)
Level 1	250.00	1,500.00	375,000.00
Level 2	250.00	2,000.00	500,000.00
Level 3	250.00	2,500.00	625,000.00
E.b. Net Income (Seeds)			
Price Level	Gross Income (P)	Total Production Cost (P)	Net Income (P)
Level 1	375,000.00	343,585.00	31,415.00
Level 2	500,000.00	343,585.00	156,415.00
Level 3	625,000.00	343,585.00	281,415.00

* Modified from cost and return analysis of major commodities for modern farm diversification (1990). Cost of labor, inputs and equipment were based on 2011 prices.

** Man-day computed at PhP350/day

12. OTHER INFORMATION

Seed Production. Select plants that are vigorous and are free of damage from pests and diseases. Harvest dry pods and extract the seeds. Dry pods can be harvested 120 days from planting. Sun-dry to around 10-15% 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 30 minutes, 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 up to 2 years.

13. REFERENCES

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