

### Angular leaf spot

This is a bacterial disease caused by *Xanthomonas fragariae*. This bacterium infects only strawberries. The disease causes leaf, petiole and calyx spots but has been reported to occasionally kill plants. It is favored by wet, cool (day temperature of 18°C, and night temperature of 1°C) weather.

Powdery Mildew is a fungal disease of strawberry, caused by *Sphaerotheca macularis*. It occurs worldwide, wherever strawberries are grown. It can affect leaves, flowers, and fruit. This disease is favored by dry weather. It is significant on only a few highly susceptible varieties.

### Control measures

1. Spray Acapulco extract weekly at rate of 50 ml of the stock solution per liter of water.
2. Use healthy plant materials
3. Use of resistant cultivars

Several virus diseases affect strawberry plants, such as strawberry crinkle virus. However, at present their occurrence is still very limited. Use healthy plant material and control of insect vectors such as aphids are recommended to prevent its spread.

### Harvesting and Post Harvest handling

One time harvest is recommended.

## Cost and Return

Inputs	Unit	Quantity	Unit Cost (Php)	Cost per /ha (Php)
<b>A. MATERIALS</b>				
Runners	pcs	37,000	2.00	74,000.00
Commercial organic Fertilizer	bag	100	400.00	40,000.00
Fermented Fruit Juice	liter	4	300.00	1,200.00
Bio-pesticides (Agro-power)	liter	1	3000.00	3,000.00
Fermented plant juice	liter	4	300.00	1,200.00
Foliar fertilizer (Bio-green)	liter	2	750.00	1,500.00
Perla soap	grams	600	35.00	330
Yellow sticky trap	pcs	200	28.00	5,600.00
<b>SUB TOTAL</b>				<b>126,830.00</b>
<b>B. LABOR</b>				
Land Preparation				
Plowing	Man-days	56	285.00	15,960.00
Furrowing	Man-days	44	285.00	12,540.00
Organic fertilizer application	Man-days	20	285.00	5,700.00
Planting	Man-days	20	285.00	5,700.00
Hand weeding	Man-days	30	285.00	8,500.00
Deleafing	Man-days	24	285.00	6,840.00
Irrigation	Man-days	35	285.00	9,975.00
Spraying of FPI, FFJ & Agro power	Man-days	24	285.00	6,840.00
Harvesting, handpicking	Man-days	12	285.00	4,400.00
<b>SUBTOTAL</b>				<b>76,455.00</b>
Contingency Allowance (10%)				20,328.50
<b>TOTAL PRODUCTION COST (plus contingency)</b>				<b>223,613.50</b>
<b>GROSS INCOME</b>			370,000 runners at Php 2.00/pc	<b>740,000.00</b>
<b>NET INCOME (Php)</b>				<b>516,386.50</b>
<b>RETURN OF INVESTMENT (%)</b>				<b>231</b>



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## Bureau of Plant Industry Organic Seed Production

*Best Organic Practices For Propagating  
STRAWBERRY (Fragaria x ananasa L)  
Runners*

Technique developed by  
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This production guide is made for the purpose of providing information for those who wish to engage in the multiplication of strawberry (*Fragaria x ananasa* L) runner using techniques adhering to organic agriculture.

### Variety selection

The following varieties are recommended for runner production using organic agriculture technique.

- June bearing  
'Tioga', 'Haronoka', 'Toyonoka', 'Guardian', 'Aliso', 'Florida'
- Ever bearing  
'Fort Laramie', 'Ozark Beauty'
- Day neutral  
'Sweet charlie', 'Camarosa', 'Festival', 'Tristar', 'Chandler', 'Earlibrite', 'Whitney', 'Winter Dawn'

### Ecological Requirement

#### Site Selection

Upland plain or slightly rolling areas, well-drained, with available water source and easily accessible by roads is an ideal site for runner production. Make sure that the site is free from contamination of synthetic chemicals by choosing land that has not been previously applied with artificial fertilizers or pesticides. You may also use an area that has not been cultivated before (ie. virgin land).

#### Temperature requirement

Strawberry is a product for highland agriculture and requires cool temperatures (14 – 23°C) for flower bud development. Runners are produced from May to August requiring high temperature (above 25°C) and long day (16-hr daylength).

#### Soil requirement

Strawberry thrives best in clay loam and loamy soils with good drainage and good water holding capacity and pH ranging from 5.5 to 6.5.

### Cultural Management

#### Land Preparation

A good tilt is promoted by hoeing the land 2-3 times before planting, soil texture and degree of weed infestation. Raised beds are prepared 16-20 cm high and about 1.5 meters wide.

#### Fertilization

The kind, amount and method of application would depend on the fertility level of the soil. Under average conditions, the ideal recommendation is 5 MT organic fertilizer per ha. to be applied in split. Spray either vermitea at 50ml per liter of water or certified organic foliar fertilizer at 1 ML per liter of water every 2 weeks.

#### Planting

Disease-free, vigorous one year-old mother plants are planted in raised beds spaced 25 cm apart. Runners should be planted facing the outside part of the bed to have a uniform side of developing runners.

#### Roguing

Remove off-types and diseased plants during the growth period.

### Common Pests of Potato

Slugs (*Arion hortensis*, *Deroceras reticulatum* and other species) are slimy and have bodies that are flexible in shape. They move by gliding along on a muscular "foot." This muscle constantly secretes mucus, which later dries-up to form the silvery slime trail that signals the presence of these pests. They are sensitive to dryness, and will seek out moisture, making dry environments unsuitable for them.

Aphids (*Chaetosiphon fragaefolii*) feed on the young foliage, stems, and crown of the plants. Aphids are important carriers of diseases, especially viruses.

Cutworms (*Agotis ipsilon*) and army worms can occasionally be present in strawberries.

Two-spotted spider mite (*Tetranychus urticae*) feeds on the undersurface of strawberry leaves, causing curling and discoloration of the leaves. Attacked foliage is covered with fine webbing. Eggs are also laid on the undersurface, usually along the veins. The complete cycle may only take 10 days if the temperature is cold or up to 30 days at high temperatures.

### Control measures

1. Spray hot pepper, kakawate (*Glirecidia sepium*) extract, oriental herbal nutrient at the rate of 50ml of the stock solution per liter of water every week.
2. Use yellow sticky trap
3. Spray mineral oil at the rate of .50ml per liter of water at 7 days interval.
4. Spray soap (perla) at 25 grams per 16 liters of water at 7 days interval.
5. Entomopathogenic fungi such as *Beauveria bassiana* are reported to be effective control in organic farms.
6. Crop rotation is necessary to reduce the incidence of soil borne diseases, to reduce weed populations and to retain a nutrient balance throughout the farm.

### Potato Diseases and Their Control

#### Fungal Leaf Spot

There are several fungal leaf spots affecting strawberry. These fungal diseases have similar life cycles. They do not generally cause severe damage, but many weaken plants enough to cause problems. These diseases can affect plants from the time the first leaves are unfolding until dormancy. All are favored by warm, moist weather.

Off-type  
Seed or plant that  
is not a part of the  
variety and deviates in  
one or more charac-  
teristics  
from the variety