MY TOMATO DIARY

This season keep a record of what you did, what worked and what didn't. Review it at the start of next season, as relying on your memory is probably the worst plan you can make! If you plan on growing more than one variety, make copies of this diary and keep separate notes for each one. Keep this diary in a handy place for updating and reference.

Tomato planting

Tomato variety	
Date seed sown	Seed Container type
Number seedlings	Weeks till 4 leaf stage
Transplanted On	Temperature
Last frost date	Moon phase
No plants transplanted	Plant spacing
Size of bed	Number rows/spacing
Notes	

Soil

Soil pH	Soil type
Compost qty	Manure type Manure qty
Lime/dolomite qty	Sulphur qty
Notes	

Cultivation

Watering intervals	Method
Ave water time	Ave water volume
Rainfall notes	
Sun and Temperature notes	
Staking notes	
General notes	

Nutrition

Preplant fertiliser type N…….P…….K……	Amount added Date
Flowering fertiliser type N…….P…….K……	Amount added Date
Fruiting fertiliser type N…….P…….K……	Amount added Date
Trace elements Type	Amount added Date
Trace elements Type	Amount added Date
Notes	

Pests and Diseases

Symptoms	Diagnosis
Date	Treatment
Amount / Frequency	Result

Symptoms	Diagnosis
Date	Treatment
Amount / Frequency	Result

Crop

Date of first harvest	Date last harvest
Yield	Ave fruit weight
Notes on plants, fruit, quality, management etc	

Common Tomato Problems

Do not be put off by this large list of pests and diseases. In the home garden, especially where biological control is practiced, most of these organisms will not be a problem.

In the warm weather your gardening efforts will be rewarded with lovely bowls of juicy, red tomatoes that can be used in salads, sandwiches, soups or chutneys.

Tips for growing healthy tomatoes:

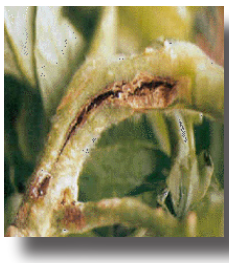
- Improve garden soil by adding organic material such as compost
- Use disease-resistant varieties (e.g., VFN which stands for Verticillium, Fusarium and Nematode resistance)
- Eliminate competition from weeds
- Keep the plant growing vigorously with proper water and nutrients
- Keep the garden clean of plant debris
- Rotate crops
- Space plants for maximum air circulation
- Monitor for pests

Failure to follow one or more of these steps can lead to pest problems.

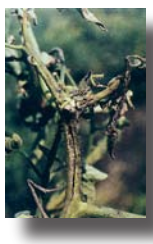
To manage pests, identify the source of the problem by assessing the symptoms. The key in the following table will help you narrow down the cause.

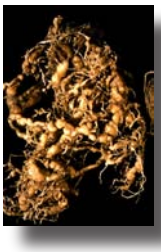
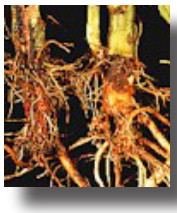
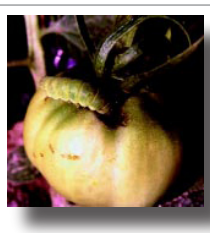
It is organized by affected plant parts: leaves, stems, roots and fruit. After identifying the potential problem, refer to the appropriate section (tomato diseases, pests etc) for more details on symptoms and control.

Area affected	Problem	Cause
Seedling death 	Blackening and withering of plant at soil level causing the new stem to collapse	Damping off disease
	Seedling stem cut off or eaten through at or close to ground level	Cutworm Crickets
Wilted plant or leaves (Check roots for rotting and cut stem open to check for discoloration)  *Photo by Caitilyn Allen, University of Wisconsin*	Wilting of plants; no discoloration of vascular system; slow recovery when watered; plant unthrifty with pale foliage	Nematode damage
	No root rot or discoloration of the vascular system	Lack of water
	Vascular system brown along length of plant and no streaming if dipped into water	Fusarium wilt
	Vascular system brown in lower 30cm or 1 ft of plant	Fusarium crown rot
	Midday wilt which turns to complete plant wilt, yellowing of lower leaves and 'v'-shaped lesion on lower leaves	Verticillium

Area affected	Problem	Cause
	Sudden wilt. Vascular system brown and milky,white substance flows from stem when cut and dipped into a glass of water	Bacterial wilt
	Vascular system discoloured, discoloration of petioles, lower leaves turn down and edges also turn brown. Small, white scabby lesions on fruit like bird eyes	Bacterial canker
	Yellowing of leaves and browning and rotting of roots	Phytophthora root rot
Leaves - Spots 	Leaves with dark brown or black spots that have concentric circles in them. Lower leaves often affected first	Alternaria or Early Blight
	Small brown spots 1 – 2mm in diameter and grey or whitish centres possibly with yellowing of those leaves	Septoria leaf spot
	Water -soaked patches that turn brown and expand rapidly and become brown to purplish black as tissue dies	Late blight
	Leaf spot with small circular lesions about 0.5cm or ½ inch in diameter	Anthracnose
	Dark black raised specks on leaves (and fruit)	Bacterial speck or bacterial spot
	Leaves with spotting and concentric circles. Leaf tissue stiff. Fruit may also be mottled with concentric circles	Tomato spotted wilt virus/impatiens necrotic spot virus

Area Affected	Problem	Cause
	White powdery patches on leaves	Powdery mildew
Leaves: Insect injury  *Photo: Dept of Entomology, Texas A&M University*	Chewing injury on leaves and evidence of large caterpillars with tails	Tomato/tobacco hornworm
 *Photo:Canadian Dept of Agriculture*	Holes approx 0.5mm in size	Flea beetle
	Distorted new leaves	Thrips
 *Photo: University of Nebraska-Lincoln Extension*	Fine white speckling on leaves and small spider-like insects on the back of leaves	Spider mite
	Honeydew present. White insects fly away or green or black sedentary insects present	Whitefly Aphids
Purple Leaves 	Leaves with purple coloration and purple veins and. Early season, cool temperatures. No insects present	Phosphorus deficiency
	Leaflets become purple especially along veins and leaves roll upwards	Curly top virus

Area Affected	Problem	Cause
Yellowed leaves  *PHoto: Whitney Cranshaw, Colorado State University*	Slight distortion, purpling of veins. Zigzag stem and branching pattern. Check underside of leaves for insects	Psyllids
	Infected plants turn yellow and soon stop growing	Curly top virus
Mottled leaves  *Photo: American Phytopathological Society*	Mottled yellow patches on leaves and fruit	Various mosaic viruses
Leaf scorch	Check watering, ambient temperature, level of fertiliser applied, removal of leaves shading the fruit etc	
Distorted leaves 	Curling, shoestringing, cupping and herbicides applied recently plants stunted, no herbicides applied	Herbicide injury Cucumber mosaic virus
	Rolled leaves (inwards)	Differential varietal susceptibility to this condition, but may also be caused by overwatering or hard pruning
Stems 	Black or dark cankers on stem. (Submit samples to a diagnostic clinic for confirmation)	Early blight (Alternaria), tomato spotted wilt virus/impatiens necrotic spot virus, bacterial canker

Area Affected	Problem	Cause
Roots 	Roots with galls	Root Knot Nematode
	Roots discoloured, mushy. Check soil moisture and watering	Root rot
Flowers	Flowers dropping off before fruit sets	Plants that have dried out or are waterlogged, do not have enough light, too much nitrogen or thrips
Fruit Spots 	Ring spots on fruit	Tomato spotted wilt virus/impatiens necrotic spot virus
	Dark pinpricks surrounded by a light, discolored area on green fruit. These areas turn yellow or remain green on ripe fruit. The tissue under the spots is white and spongy and remains firm as the fruit ripens	Stink bugs
	White, leathery areas	Sunscald
	Blotches on the shoulder of the fruit	Green/yellow shoulders
	Holes in fruit and rotting around holes	Bollworm
	White speckling on fruit	Spider mite

Area Affected	Problem	Cause
	Rapid ripening of fruit; no visible fruit damage	Root knot nematode
 *Photo: American Phytopathological Society*	Mottled yellow patches on fruit	Various mosaic-type viruses
	Small, white to yellow, raised blotches on fruit, often called bird's eye	Bacterial canker
Distorted fruit 	Yellowing or not, with necrotic areas or not	Catfacing
	Blossom end flattened and black	Blossom end rot
	Yellowing	Psyllids
	Large scab-like lesions or distortion of new fruit	Thrips
	Poor fruit set (also related to flower drop, but may also be due to pollination not occurring)	May be caused by plants drying out, wilting in hot weather. (Pollination may have to be done by hand).
	Ring spots on fruit	Tomato spotted wilt virus/impatiens

Nutritional Disorders

Leaves	
Older leaves yellow, new leaves thin and small with purple veins	Nitrogen deficiency
Purple tinged older leaves and dark green, small fibrous leaves	Phosphorus deficiency
Older leaves dark green with curling and crinkling. Necrosis develops on leaf margins, tissue between veins breaks down	Potassium deficiency
Tip burn of young leaves which turn yellow and death of leaf margins	Calcium deficiency
Interveinal chlorosis of older leaves, green veins	Magnesium deficiency
New leaves small, sometimes long and narrow with interveinal chlorosis which can be almost white and also resulting in dead spots. Leaf margins roll upwards. Short internodes	Zinc deficiency
New leaves turn pale green with a soft mottled interveinal chlorosis which progresses to dead patches surrounded by a yellow ring.	Manganese deficiency
New leaves with spotted white areas. Tips and margins remain green, unless deficiency is severe. Leaves may curl upwards and drop.	Iron deficiency
Blue-green, curled flabby leaves	Copper deficiency
New leaves discoloured, distorted, crinkled, brittle and small	Boron deficiency
Curling of leaf margins, yellowing between veins and small new leaves	Molybdenum deficiency

Whole plant	
Slow growth, hard, thick stems which brown off and die	Nitrogen deficiency
Stems are thin, fibrous and hard. Plants are stunted, have a purplish tinge and yields are poor	Phosphorus deficiency
Foliage dark green with crinkled, curled appearance. No insects	Potassium deficiency
Slow growth, thick, woody stems, flabby plants	Calcium deficiency
Vegetative growth stage, overall pale appearance of plant	Magnesium deficiency
Whorl-type growth pattern of leaves and short internodes	Zinc deficiency
Soft, mottled interveinal chlorosis that gives plant a light mottled appearance	Manganese deficiency
Death of new shoots	Iron deficiency
Stunted shoot and root growth and soft stem	Copper deficiency
Bushy looking plants with blackened areas on the tip of the stem which is stunted. Terminal shoots curl, yellow and die	Boron deficiency

Flowers and Fruit	
Flower buds turn yellow and drop off, small fruit which is pale green	Nitrogen deficiency
Fruit is pale and yield is poor	Phosphorus deficiency
Uneven ripening of fruit, blotchy colour and small amount of flesh. Sepals and stems on fruit yellow, become necrotic and fruit drops as soon as it is mature	Potassium deficiency
Fruit are small and soft with poor shelf life. Blossom-end rot	Calcium deficiency
Soft, pale fruit	Magnesium deficiency
Poor fruit set and fruit has poor texture	Zinc deficiency
Fruit may not mature properly and drop off	Iron deficiency
Few or no flowers	Copper deficiency
Misshapen fruit which split, are corky and die in patchy patterns	Boron deficiency

Growth Stage Cultivation Guide

					
Plant stage	**Pre-plant to final seedling or transplant in ground**	**Seedling to flowering and early fruit set**	**Early fruit set to first harvest**	**During harvest**	**Post harvest**
Time from planting*	Up to 40 days	Up to 80 days	Up to 100 days	Up to 160 days	
Cultivation guide	Prepare seedling trays or ground for transplants, plant or buy seedlings, and plant into final site in ground or pot	Establish good, healthy plants with nice leaf coverage. Trellis or stake and start pruning if necessary	Maintain plant health and control pests where necessary. Maintain plants on stakes or trellises. (This will be ongoing). Continue pruning, if this is your choice	Continue to check and treat for bugs and diseases and continue trellising and staking plants. Harvest carefully in order not to cause bruising to fruit and pick at the best possible stage for maximum flavour	Remove trellis, stakes, trickle tape and plastic mulch.
Pest and disease control	Ensure all plant residue has broken down, and treat for nematodes or insects where necessary	Scout for and control cutworm, aphids, bollworms and other bugs and diseases	Continue to monitor for pests and diseases. Control aphids, fruit fly, bollworm and mites. Apply sprays every 7 – 10 days to control diseases where weather conditions encourage them (eg lots of rain or prolonged periods of leaf wetness).	Continue to monitor for pests and diseases. Control aphids, fruit fly, bollworm and mites. Apply sprays every 7 – 10 days to control diseases where weather conditions encourage them (eg lots of rain or prolonged periods of leaf wetness). Destroy disease or pest affected tomato fruit.	Remove and destroy old plants. Check roots for nematodes for the next crop.
Plant nutrition	Apply compost, lime or dolomite if required and pre-plant fertiliser	Apply trace elements if necessary and first top dressings of nitrogen and potassium prior to flowering	Apply 2nd top dressing of nitrogen and potassium and check trace element status	Monitor plant nutrients, especially potassium and calcium and top up if necessary	

* Actual time spans will vary depending on climate and tomato variety

Conversion Guide

Area Measurements	
1 Link = 0.33 Feet	9 Square Feet = 1 Square Yard
25 Links = 16.50 Feet	4,840 Square Yards = 1 Acre
1 Rod = 25.00 Links	43,560 Square Feet = 1 Acre
100 Links = 1.00 Chain	640 Acres = 1 Square Mile
144 Square Inches = 1 Square Foot	1 Square Mile = 1 Section
66 Feet = 1 Chain	1 Square Mile = 2.59 Square Kilometres
80 Chains = 1 Mile	

Volume Measurements	
1,728 Cubic Inches = 1 Cubic Foot	1 Cord Wood = 128 Cubic Feet
1 Cubic Foot = 7.4805 Gallons	231 Cubic Inches = 1 Gallon
27 Cubic Feet = 1 Cubic Yard	1.244 Cubic Feet = 1 Bushel
CordWood=4Rx4ftx8R	

Dry Measurements	
2 Pint = 1 Quart	4 Pecks = 1 Bushel
3 Quarts = 1 Peck	16 Ounces Avoirdupois = 1 Pound

Liquid Measurements	
1 Pint = 16 Fluid Ounces	4 Quarts = 1 Gallon (US)
2 Pint = 1 Quart	1 Gallon (US) = 0.8327 Gallons Imperial
1 Level Tea Spoon = 1/6 Ounce	1 Quart = 2 Pounds (Approx.)
1 Level Table Spoon = 1/2 Ounce	1 Gallon = 8 Pounds (Approx.)
1 Level Cup = 8 Ounces (Approx.)	1 Pint = 1 Pound (Approx.)

Application Rate Calculation Factors	
1 Acre-foot of soil	4,000,000 pounds (approximately)
1 Ton per acre	20.8 grams per square foot
1 Ton per acre	1 pound per 21.78 square feet
1 Ton per acre	25.12 quintals per hectare
100 Spare feet	0.002296 acre
1 Gram per square foot	96 pounds per acre
1 Pound per acre	0.01 04 grams per square foot
1 Pound per acre	1.12 kilograms per hectare
100 Pounds per acre	0.2296 pounds per 100 square feet
Tons per acre-foot	0.00136 parts per million
Cubic feet per second	0.002228 x gallons per minute
Parts per million x 0.00136	1 ton per acre-foot
Kilograms per 48 square feet	tons per acre
Pounds per square foot x 21.78	tons per acre
1 ton per acre to a 6 inch depth	1 gram per 1000 grams of soil

To convert Degrees Fahrenheit to Degrees Centrigrade

$^{o}C=5/9\ (^{o}F-32)$

5/9 = 0.555555

To convert Degrees Centigrade to Degrees Fahrenheit:

$^{o}F=9/5\ (^{o}C)+32$

9/5 = 1.8000

To Convert	To	Multiply	By
Acres	Hectares	Acres	0.4050
Acres	Square Feet	Acres	43,560
Bushels	Cubic Feet	Bushels	1.2440
Centimetres	Feet	Centimetres	0.0328
Centimetres	Inches	Centimetres	0.3940
Centimetres	Metres	Centimetres	0.0100
Centimetres	Millimetres	Centimetres	10
Cubic Feet	Gallons	Cubic Feet	7.4805
Cubic Feet	Cubic Inches	Cubic Feet	1,728
Cubic Feet Water	Pounds Water	Cubic Feet Water	62.4270
Cubic Feet	Litres	Cubic Feet	28.3200
Gallons Water	Pounds Water	Gallons Water	8.3453
Gallons	Litres	Gallons	3.7850
Hectares	Acres	Heactares	2.4710
Inches	Centimetres	Inches	2.54
Kilograms	Ounces	Kilograms	35.2740
Kilograms	Pounds	Kilograms	2.2050
Kilograms / Hectare	Pounds / Acre	Kilograms / Hectare	0.8920
Kilometres	Miles	Kilometres	0.6214
Litres	Gallons	Litres	0.2642
Miles	Feet	Miles	5,280
Metres	Feet	Metres	3.2810
Metres	Inches	Metres	39.37
Metres	Yards	Metres	1.0940
Millimetres	Feet	Millimetres	0.0033
Millimetres	Inches	Millimetres	0.0394
Pounds	Grams	Pounds	453.5924
Pounds	Kilograms	Pounds	0.4536
Pounds/Acre	Kilograms/Hectare	Pounds/Acre	1.1211
Square Feet	Square Metres	Square Feet	0.0929
Square Miles	Acres	Square Miles	640
Square Miles	Square Kilometres	Square Miles	2.59
Tons, Metric	Tons, Short	Tons, Metric	1.1025
Tons, Metric	Pounds	Tons, Metric	2,205
Tons, Long	Tons, Short	Tons, Long	1.12
Tons, Long	Pounds	Tons, Long	2,240
Tons, Short	Tons, Metric	Tons, Short	0.9072
Tons, Short	Tonnes, Canadian	Tons, Short	0.9072
Tons (Metric)/Ha	Tons (short)/Acre	Tons (Metric)/Ha	0.4464
Tons (short)/Acre	Tons (Metric)/Ha	Tons (short)/Acre	2.2397
Yards	Metres	Yards	0.9144
Yards	Inches	Yards	36