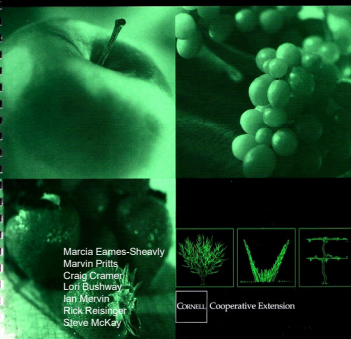


Information Bulletin 156, Revised Edition

Cornell Guide to Growing Fruit at Home

Presentation by:
Laura McDermott
 Eastern NY Commercial Horticulture Program

Powerpoint created by Lori Brewer with assistance from Dr. Marvin Pitts, Marcia Eames-Sheavly, Craig Grimes, Dr. Ian Merwin, Rick Reisinger and Steven McKay



Marcia Eames-Sheavly
 Marvin Pitts
 Craig Grimes
 Lori Bushway
 Ian Merwin
 Rick Reisinger
 Steven McKay

Department of Horticulture
HORTICULTURE

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Nutrient composition

Fruit	Calories (kcal)	Vitamin C (mg)	Calcium (mg)	Phosphorus (mg)	Potassium (mg)	Iron (mg)	Magnesium (mg)
Apple	55	12	7.1	12	144	.48	6.4
Banana	49	12	8.7	28	393	.55	36
Blueberry	62	22	10	9.1	65	.74	2.4
Cherry	60	12	8.0	7.0	114	-	8.0
Currant	45	36	29	27	238	.91	12
Elderberry	46	48	35	57	305	-	-
Orange	54	50	42	23	205	.48	9.2
Peach	46	9.5	7.8	23	205	.48	9.2
Pear	56	4.6	10	15	126	.26	7.8
Raspberry	40	26	40	44	170	1.0	30
Strawberry	40	64	26	29	147	.96	15

Approximate nutrient composition (per 100 g)

This is me!



- lgm4@cornell.edu
- 518-746-2562
- Cornell Cooperative Extension, Eastern NY Commercial Horticulture Program

Home grown flavor




Growing Fruit at Home

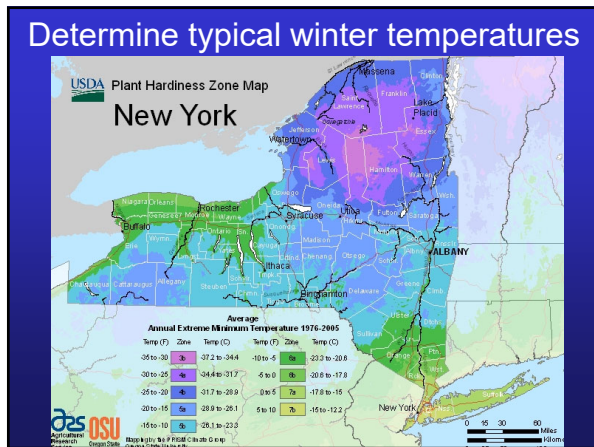
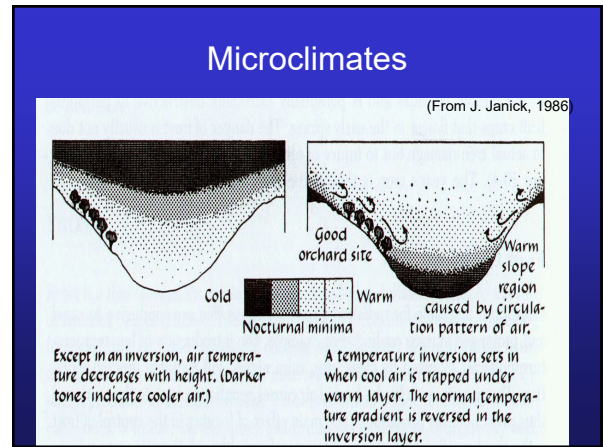
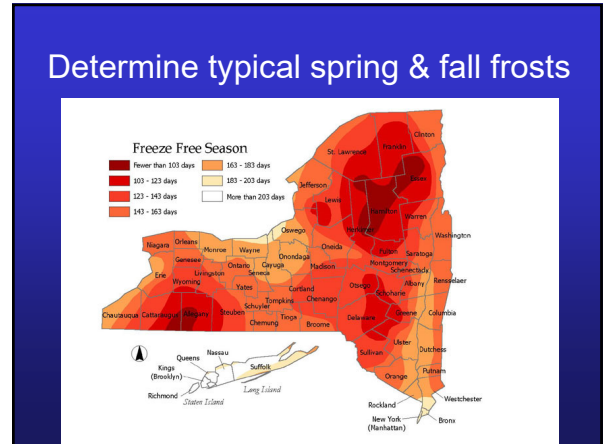


Keys for Success

- Plan ahead.
- Match plants to your site.
- Start small.
- Prepare the soil.


Plan ahead

www.cca.cornell.edu/cornell/ny.php
<https://blogs.cornell.edu/berric/>
Cornell Fruit Resources
 Department of Horticulture
Gardening resources
www.gardening.cornell.edu






- ### “Why won’t my plants set fruit?”
- Age.
 - Winter injury.
 - Late spring frost.
 - Cold or rainy weather during bloom.
 - Inadequate pollination.
 - Lack of cross-pollination in species that are not “self-fruitful.”
 - Poor plant nutrition or management.
 - Disease.

More site consideration...




- Adequate sun?
- Adequate space?
- Good air circulation?
- Access to water?
- Diseases & insects?
- Wildlife & weeds?

Grow a cover crop



Options include:

- Buckwheat**
- Annual Ryegrass
- Winter Rye
- Oats
- Winter Wheat
- Bird seed (millet)

For more info search for cover crops on www.gardening.cornell.edu

Start small

A little can go a long way

Fruit/rootstock	Spacing (ft)		Bearing age (years)	Potential yield at maturity (lb./plant)	Harvest period
	within rows	between rows			
Strawberry	2	4	2	1-2	June to early July
Raspberry	2	8	2	2-5	July or Sept
Gooseberry	4	10	2-4	6-8	July to Aug
Blueberry	4.5	10	3-6	3-10	late July to Sept
Blackberry	2	10	2	2-3	late July to Aug
Grapes-American type	8	9	3	20	early Sept. to Oct.
Apple/M.9	7	13	3-5	60	late July through Oct
Apple/MM.106	18	24	5	300	late July through Oct





The most important years for a productive home fruit garden are the years before planting.





Plan Prepare Produce

Before you plant

Complete a soil test




Consult your local Cornell Cooperative Extension Office
Or www.css.cornell.edu/soiltest

Growing Tree Fruits in New York






Red Jacket Orchards (southeast of Rochester) in 1917

Singer Farms, Appleton, NY

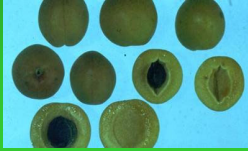
Pome fruits

Apples & Pears




Stone fruits

Cherries, Peaches, Plums, Nectarines & Apricots



Old Northeast Standbys: McIntosh and related

- Offspring include: Cortland, Macoun, Empire, Jersey Mac, Jonamac
- Still very popular in the Northeast, but....
- Getting harder to sell every year, less demand



Choosing cultivars (cultivated varieties)

- Jonamac
- Sansa
- Liberty
- Empire
- Golden Delicious
- GoldRush
- Paulared
- Honeycrisp
- Crimson Crisp
- Enterprise (tough skin)




Scab resistant for organic orchards

Crimson Crisp	Liberty
Crimson Gold	Modi
Florina Querina	Nova Spy
Galarina	Topaz
Goldrush	Winecrisp
Jonafree	William's Pride

*Vf Resistance beginning to break down in Europe and Midwest. Some have other resistance genes.

Modern, superior cultivars

- Studies show consumers prefer red, sweet apples
- Gala, Fuji, Honeycrisp, Ambrosia, Cripps Pink/Pink Lady, Jazz, Juici




Some apples to consider for cider

Bittersweets* Brown Snout Dabinett Chisel Jersey Ellis Bitter Somerset Redstreak Yarrington Mill Binet Rouge Michelin Harry Master's Jersey		Dessert Cultivars for Cider Liberty (SR) Golden Russet Haralson Winesap Northern Spy Baldwin Goldrush (SR) McIntosh Cortland
Bittersharps Porter's Perfection Kingston Black Hewes Virginia	Sharps Harrison Ashmead's Kernel Newtown Pippin Roxbury Russet Winesap	Crabapples for tannins Wickson Geneva Wild crabs

Pear Varieties

- **European Pears - *Pyrus communis***
D'Anjou, Bosc, Bartlett, Seckel etc.
- **Asian Pears - *Pyrus pyrifolia***
Niitako, Olympic, Atago, Hosui etc.






Cherries and Plums




Sweet

- Emperor Francis
- Royalton
- Hedelfingen

Sour

- Balaton
- Montmorency

European

- Green Gage
- Damson (cooking)

Japanese

- Santa Rosa
- Burbank
- Red Ace

Pears

European

Consider taste, fire blight resistance and (maybe) cold hardiness!

- Gem
- Harrow Crisp
- Harrow Sweet
- Potomac
- Shenandoah

Asian

- Hosui
- Olympic
- Shinko




Sweet Cherries

Choose good tasting, crack resistant varieties for East Coast production

- Black Gold
- Black Pearl
- Hartland
- Hedelfingen
- *Emperor Francis*
- Ulster




Suggestions for Home Orchardists
Flaming Fury® PF #58

Harrow Dawn

Gala

Redhaven

Coristar

Harrow Beauty

Loring

Redfest


Madison

FlamingFury

Rudgers NMS

Peaches and Nectarines

Comparison Chart of Peach Varieties with all Nectarine Varieties				
Ripening Date in Southern NJ	Best Peach Cultivars	Best Nectarine Cultivars	Promising Peach Cultivars for Trial	Promising Nectarine Cultivars
June 25 to July 5	Flamin Fury PF58 Delicia NJ 350 Sunbrite Spring Snow(W) Spring Prince Sugar May (W)	Hayfire	Rich May Queercrest Flamin Fury PF 58lg Sugar May(W) Carole/Hanson (W)	Westbrook
July 6 to July 12	Harrow Dawn Ruby Prince Sentry	ArcticStar (W)	Earlystar Scarlet Pearl (W)	Jade (W)
July 13 to July 19	Flamin Fury PF 7 Garrigo Ruby Prince Sentry Summer Saranada	Easterglo Jade Sweet (W) Arctic Ole (W) HoneyBlaze	Vulcan NJ 18 (PF) Flamin Fury PF 8Ball Snowbrite (W) Galaxy(PF)	Silver Gem (W) Arlington
July 20 to July 26	Satum (W) Flavorcrest Gala Arctic Sweet(W) Flamin Fury PF 11	Flamin Fury PF11 HartBlaze	Country Sweet Snowbrite (W) Vinegold NF 15 (PF) White Cloud (W) Rainbow Rose (W)	Honeykist
July 27 to August 3	Early Loring Flamin Fury PF15A Redstar Redhaven John Boy White Lady (W) Starfire Flamin Fury PF Lucy 13 Starfire	Hartflame Summer Beat	Blazing Star Tango NJ 16 (PF) Blaze Prince Snow Beauty (W) Flamin Fury PF 5a-007 Salem	Bradley



https://www.arkness.com/Fluc-Fruits/peach-fury/58/madison

Plums

Japanese Plums - choose for taste, disease resistance and winter hardiness in the Northeast. Consider bloom time.

- » Early Golden
- » Shiro
- » AU Rosa
- » Methley
- » Santa Rosa
- » Fortune
- » Burbank
- » Vanier

Hybrid Japanese/American plums - more hardiness and disease resistance

- » Black Ice
- » Toka
- » Waneta
- » Superior
- » Obilnaya






https://www.arkness.com/Fluc-Fruits/black-ice-hybrid-plum-350

European Plums

Try to choose varieties based on their taste, hardness, and resistance to black knot and brown rot

- » Bluebyrd
- » NY9
- » Mont Royal
- » Greengage
- » Castleton
- » Longjohn
- » Stanley
- » Valor

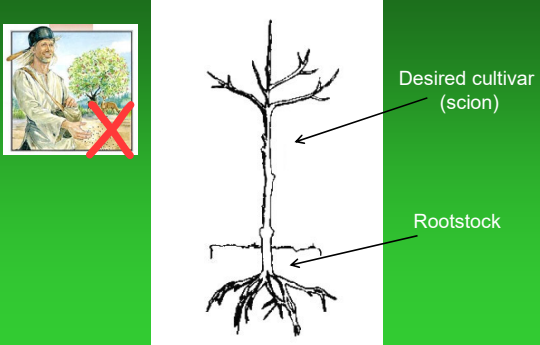


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Apple rootstock



Desired cultivar (scion)

Rootstock

Apricots

Choose varieties that taste good, are late blooming, cold hardy, and disease resistant

- Harcot
- Harogem
- Hargrande
- Early Blush
- Alfred
- Harlayne



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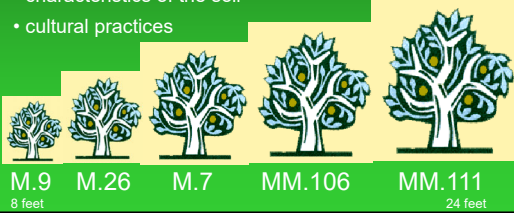
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How big?

Mature tree size depends on:

- vigor of the rootstock
- scion (cultivar grafted on rootstock)
- characteristics of the soil
- cultural practices



M.9 8 feet

M.26

M.7

MM.106

MM.111 24 feet

Choose two cultivars

Cross-pollination



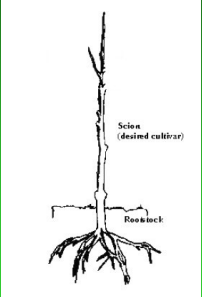
Rootstock for other tree fruit

Pears
Old Home x Farmingdale

Plums & Prunes
St. Julian A
Myrobalan

Peaches
Lovell

Cherries
Mahaleb
Mazzard



Scion (desired cultivar)

Rootstock

Nursery stock

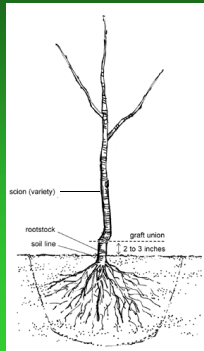


Get one or two year old nursery stock

Grass & Weed Management

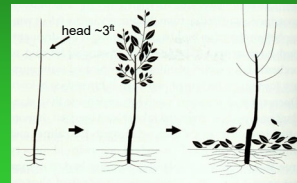


Plant in early spring



Pruning and Training basics

Start early in the plant's life



Fertilize only when needed

Planting year: Use starter solution
 Young trees: Fertilize if annual branch growth is < ~18"
 Mature trees: Fertilize if annual branch growth is < ~10"

	Nitrogen rate	Ammonium nitrate (33% N)	10-10-10 (10%N)	20-20-20 (20%N)
Young trees	.04 lb./tree	2 ounces	6 ounces	3 ounces
Mature trees	.08 lb./tree	4 ounces	12 ounces	6 ounces

Pruning and Training basics

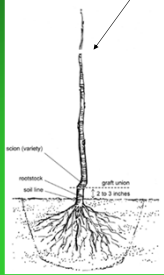
Sharpen essential pruning tools




Pruning and Training basics

Use three types of cuts

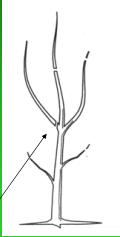
Heading



Pinching

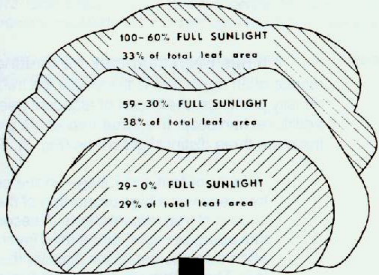


Thinning



Pruning & Training basics

Maximize light interception



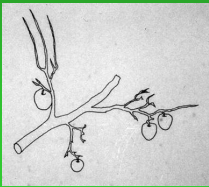

100-60% FULL SUNLIGHT
 33% of total leaf area
 59-30% FULL SUNLIGHT
 38% of total leaf area
 29-0% FULL SUNLIGHT
 29% of total leaf area

Figure 3. Light penetration into the canopy of a large apple tree (Heinicke, 1975).

(From: Forshey et al, 1992)

Pruning & Training basics

- Dormant Prune February to April
- Train spring to summer
- Encourage productive fruiting wood
- Encourage horizontal branches

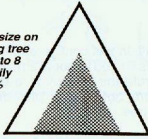



Pruning & Training basics

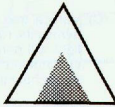
Maximize light interception

Figure 4. Effect of tree size on light exposure. Reducing tree size from 5 to 2.5 m (16 to 8 ft) reduces the heavily shaded interior from 24.4% of the total tree volume to 1.6%.


16 FEET
24.4%



12 FEET
10.5%



8 FEET
1.6%














Figure 6. Different tree shapes: (A) globular, continuous canopy; (B) conic shape with an open framework; (C) vertical tree wall; (D) horizontal canopy; (E) Y trellis.

(From: Forshey et al, 1992)

Pruning & Training basics

Maximize light interception

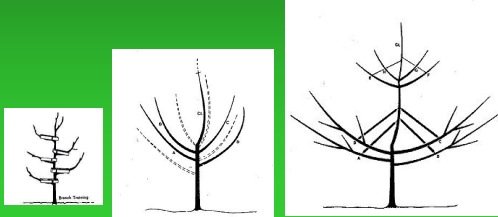



shade vs. sun

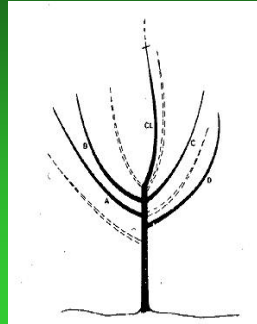


The Central Leader method

- Promote a single central trunk
- Create evenly spaced main branches
- Spread main branches towards horizontal

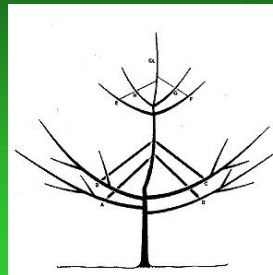


Year after planting

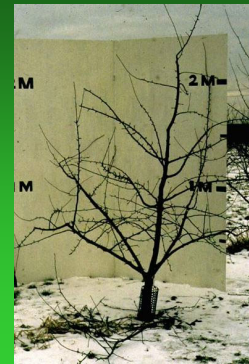
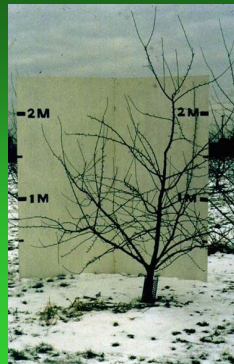


Training and Pruning Apple Trees C. G. Forshey www.eap.mcgill.ca/CPTFP_7.htm

Second year after planting



After fourth year



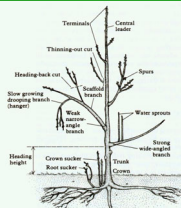

Planting year

- Head cut, remove some side shoots
- Choose leader, pinch competition
- Choose & spread scaffolds
- Stake



Pruning bearing trees

- Removed the diseased, broken or dead
- Avoid small cuts
- Focus on thinning cuts
- Remove side branches > 1/2 diameter of branch
- Remove suckers/water sprout


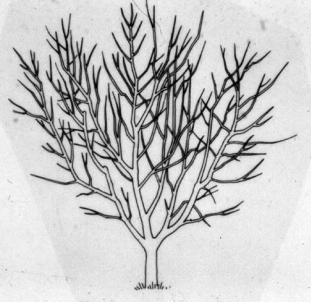
- > productive fruiting wood
- > horizontal branches
- > light interception




Avoid pruning too much




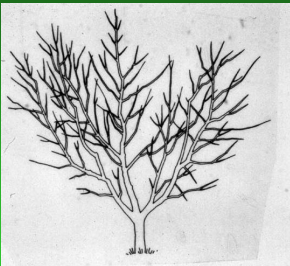
Cherries and plums







- prune when flowering
- good early training then minimal pruning

Pruning Peaches



- prune when flowering
- prune hard every year

Thinning fruit

- Keep trees healthy and bearing every year
- Optimize fruit quality (size, color, flavor)




Thinning fruit










- Thin fruit when about the size of a quarter
- Remove small and injured fruit
- Thin clustered fruit to one
- Space remaining fruit:
 - 4-6" apart for apples
 - 4-8" apart for peaches
 - 4" apart for plums
 - no thinning cherries



Fungal Disease Brown Rot




4. Apothecia of *Monilinia fructicola* on a peach fruit mummy removed from soil and shown next to peach blossoms and mummy that remained attached to tree. (Reprinted, by permission, from Ogawa and English, 1991)


		
Dormant	Silver tip	Quarter-inch green
		
Half-inch green	Tight cluster	Pink tip
		
Full bloom	Petal-fall	Fruit set

Fungal Disease Black Knot of Plum (*Dibotryon morbosum*)

- Prune out cankers during winter
- Beware of wild hosts
- 'Stanley' highly susceptible
- Fungicides at or before budbreak



Mammals



Technically not insect pest Mites



The pest European red mites being eaten by a more helpful mite

Fungal Disease Apple Scab

APPLE SCAB DISEASE CYCLE

PRIMARY PHASE

- Ascogonium developed from all ascospores that germinate and fertilize after pollination
- Young thiazes and ascospores form

SECONDARY PHASE

- Ascospores from leaves that fall during spring and summer months (about 1000 per tree)
- Secondary spores (ascospores) form on a number of scattered leaves throughout spring and summer
- Additional fruiting bodies developed on newly emerging leaves
- Additional full, young leaves become infected
- Fungus overwinters in sheltered places on the ground

Very resistant: Freedom, Liberty, Prima, Jonafree, Goldrush & MacFree

Insect pest Apple tree borer

Bacterial Disease Fire Blight

Pear: Seckel, Kieffer
Apple: Honeycrisp, Liberty

Brown Marmorated Stink Bug on Tree Fruit, Small Fruit & Vegetable

Tree fruit (apple, pear, peaches, cherry)

Small fruit (raspberry, blackberry)

Vegetables (tomato, pepper, sweet corn, lima beans, soybean).



Aphids

Green Apple Aphid and its natural predator (another aphid).

Fungal Disease Perennial Canker *Cytospora/Valsa/Leucostoma*

Bacterial Disease

Trunk cankers (sweet cherries & other stone fruits)





Pseudomonas syringae

Hardiness of grape cultivars

Low winter temperature	USDA Hardiness	Suitable Cultivars
0°F	Zone 7a	Most <i>vinifera</i> and American or hybrid cultivars
-5°F	Zone 6b	Most northern <i>vinifera</i> and American or hybrid cultivars
-10°F	Zone 6a	Hardy <i>vinifera</i> , moderately hardy hybrids and American cultivars
-15°F	Zone 5b	Hardy hybrids and most American cultivars
-20°F	Zone 5a	Hardy American cultivars

Growing Grapes at Home



American bunch grapes (*Vitis labrusca*)

cultivar	color	use	flavor
Ontario	white	juice, wine, table	
Delaware	red	wine, table	mild
Niagara	white	juice, wine, table	floral, strong
Concord	black	juice, wine, table	pronounced fruity
Catawba	red	wine, juice, table	spicy flavored

Grapes Types

- Vitis labrusca* (American bunch grapes)
- Vitis vinifera* (traditional European species)
- French-American hybrids
- Vitis rotundifolia* (Muscadine)



Vitis vinifera (traditional European species)



- Chardonnay
- Riesling
- Cabernet Sauvignon
- Pinot Noir
- Gewurztraminer


French-American hybrids

cultivar	wine type	flavor
Aurore	white	okay, used for bulk wine production or blending
Seyval	white	attractive grassy, hay & melon aromas
Cayuga	white	medium body & good balance
Maréchal Foch	black	from fruity, light to hearty, full bodied
Chancellor	red	quality excellent, makes strong Bordeaux style





Planting year

Winter	Early Spring	Spring	Rest of season
purchase or propagate grapevine	plant grapevines tie or stake	remove all but the strongest new shoot	as single cane grows remove flower clusters and side shoots



Planning & Preparing year



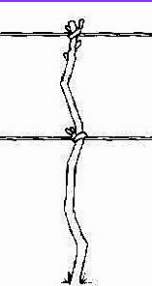
Evaluate your site and soil
 a growing season of at least 150 days
 winter temperatures above -25°F
 well-drained soil, ideally sandy loam
 good air drainage
 preferably a southern slope
 complete soil test

Prepare the soil
 adjust pH as needed (~ 6.0 -6.5)
 adjust nutrients as needed
 eliminate perennial weeds
 increase organic matter

Match plants to your site

After Planting year


Winter	Early Spring
pruning	training fertilize (10-10-10)



Planting year: no fertilizer
 Year 2: 2 ounces per vine
 Year 3: 4 ounces per vine
 Year 4: 8 ounces per vine
 Year 5 +: 16 ounces per vine

Planting year

Winter	Early Spring
purchase or propagate grapevine	plant grapevines, tie or stake



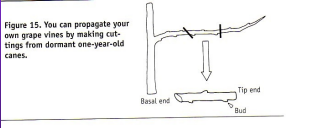


Figure 15. You can propagate your own grape vines by making cuttings from dormant one-year-old canes.

Pruning and Training Tips

- Don't let vines become overgrown.
- Removal up to 90% of the new growth.
- Buds on one-year-old wood bear fruit.



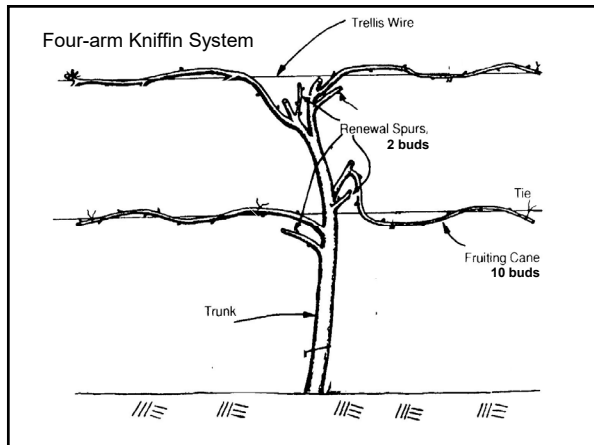
Pruning and Training

planting year Spring in year after planting

four-arm Kniffin system

Training Vines to an Arbor

Keep more fruiting canes and spurs.



Pruning Neglected Vines

Year 1: remove all but a few canes and all fruit clusters
 Year 2: select vigorous cane and train to four-arm Kniffin
 Year 3: remove old trunk

After planting year

Winter	Early Spring	Summer	Fall	Late Fall
pruning	training fertilize (10-10-10)	prune flower clusters as needed	harvest	protect canes of tender cultivars

Fungal Diseases


Powdery Mildew

Black Rot


Downy Mildew

Botrytis


Insect pests




Japanese Beetle



Grape cane girdler





Growing Strawberries at Home









Insect pest

grape leafhopper



Summer Form





Late Season Form



Strawberry

Fragaria x ananassa Duch.



June-bearing



Day-neutral

Everbearing




Seedless Table Grapes

- Concord seedless
- Candice
- Himond
- Einset
- Vanessa
- Reliance

Choosing June-bearing Cultivars

variety	season	flavor	resistance to	
			leaf diseases	root diseases
Earliglow	early	1	3	1
Cavendish	early mid	2	1	1
Jewel	late mid	1	1	3
Allstar	late	1	1	1



1= excellent 2= good 3=not so good

Planning & Preparing year




Evaluate your site and soil

- history of soil-borne diseases
- well-drained soil, ideally sandy loam
- good air drainage
- access to a suitable water supply
- preferably sunny
- complete soil test

Prepare the soil

- adjust pH as needed (~ 6.2)
- adjust nutrients as needed
- eliminate perennial weeds
- increase organic matter





Match plants to your site

- disease resistant cultivars

After planting year

Late Winter	Spring	Summer
rake off mulch (rowcover until bloom)	harvest	harvest
frost protection		renovation
		mow
		till
		narrow
		fertilize



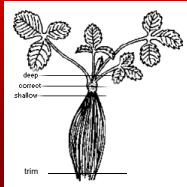
1-2 inches of water each week, either by rainfall or irrigation

Planting year

Winter Early Spring

purchase plants plant adequate water

Winter injury

Renovating Strawberries

- Mow or clip to height of ~3"
- Till between rows & narrow row width
- Rake soil to cover crowns ~1"
- Fertilize





After planting year
10-10-10 fertilizer
at renovation:
~ 1/2 ounce per foot
early September:
~ 1/4 ounce per foot

Planting year

Winter	Early Spring	Spring	Summer	Early Fall	Late Fall
purchase plants	plant	fertilize		fertilize	straw mulch
		WEED	WEED	weed	weed
		remove flowers as desired			
		maintain narrow rows			

1-2 inches of water each week, either by rainfall or irrigation




10-10-10 fertilizer
6 wks after planting:
~ 1/3 ounce per foot
early September:
~ 1/3 ounce per foot

After planting year

Late Winter	Spring	Summer	Early Fall	Late Fall
rake off mulch (rowcover until bloom)	harvest	harvest	narrow rows	straw mulch
frost protection		renovation	fertilize	
		mow		
		till		
		narrow		
		fertilize		

1-2 inches of water each week, either by rainfall or irrigation





~3 years of harvests

Strawberry


Fragaria x ananassa Duch.




June-bearing

Day-neutral


Everbearing



Fungal Diseases





verticillium wilt




red stele


DN Planting year

Winter	Early Spring	Spring	Summer	Early Fall	Late Fall
purchase plants	plant	fertilize	fruiting begins in mid-July		Fruiting continues through fall
		plastic mulch remove flowers (or not!)			
		remove runners until fruit set begins			
1-2 inches of water each week preferably via trickle irrigation					
<p>Fertilize through trickle regularly</p> 					

Fungal Diseases



Botrytis fruit rot / gray mold




leather rot


After planting year


Late Winter	Spring	Summer	Early Fall	Late Fall
No straw mulch	harvest	By June, during the pause in production, remove plants and cover crop		
rowcover until bloom - for frost protection				
		<p>1.5 years of harvests</p> 		


Insect pest

Tarnished Plant Bug











Insect pests



bud weevil



spittlebugs

Family: Rosaceae Genus: *Rubus*

Idaeobatus (Raspberries)

- R. occidentalis* black
- R. idaeus* red and yellow
- R. neglectus* purple

Eubatus (Blackberries)

erect
semi-trailing
trailing

Backberry-Raspberry hybrids
(such as Loganberry)

Mollusk pest slugs

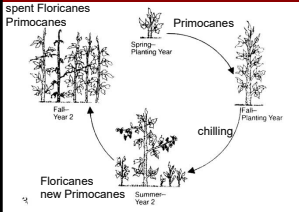


LESS FILLING!
TASTES GREAT!



Choosing Raspberry Cultivars

Summer-fruiting summer-bearing



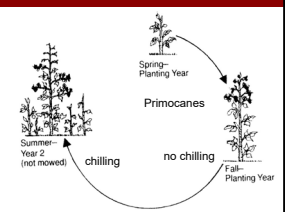
spent Floricanes Primocanes

chilling

Floricanes new Primocanes

red yellow black purple

Fall-fruiting fall-bearing, everbearing



Primocanes

chilling no chilling

red yellow

Growing Brambles (raspberries & blackberries) at Home









Choosing Raspberry Cultivars

Summer-fruiting summer-bearing

Red: Prelude
Reveille
Killarney
Canby
Titan
Encore

Yellow: Amber

Black: Allen
Bristol
Alleghany
Jewel

Purple: Brandywine
Royalty

Fall-fruiting fall-bearing, everbearing

Red: Heritage
Autumn Bliss

Yellow: Kiwigold
Fallgold
Goldie



Planning & Preparing year



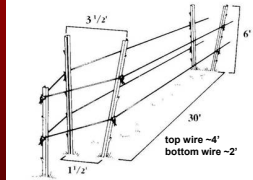
Evaluate your site and soil
 sun sun sun
 avoid wild brambles areas (diseases)
 well-drained soil, ideally sandy loam
 good air drainage
 adequate water but no water accumulation
 complete soil test

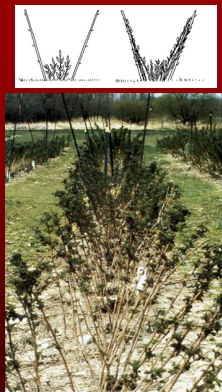
Prepare the soil
 adjust pH as needed (~ 5.5 to 6.5)
 adjust nutrients as needed
 eliminate perennial weeds
 increase organic matter

Match plants to your site
 hardy, disease resistant cultivars

Trellising

summer-bearing
floricane-fruiting





V-trellis


- Reduces winter cane breakage
- Keeps berries off the ground
- Makes harvesting easier
- Reduced interference among canes

Planting year


summer-bearing

Winter


purchase plant material



dormant suckers or transplants
one vs. two year old red & yellow raspberries



tip-layering
black & purple raspberries




tissue culture


After planting year

summer-bearing

Early Spring

prune & trellis
fertilize





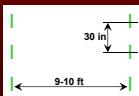
10-10-10 fertilizer:
not more than 1 1/2 oz
per foot of row


Planting year

summer-bearing

Winter	Early Spring	Spring	Summer	Fall
purchase plant material	plant	fertilize	tip black & purple weed (3") and mow alleys	trellis

Irrigate as needed throughout season (avoid wetting foliage)




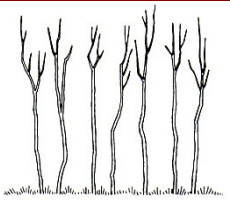


10-10-10 fertilizer:
weeks after planting,
not more than 3/4 oz
per foot of row

Pruning & Trellising

summer-bearing
RED raspberries





3-4 canes per linear foot of row

Pruning & Trellising

summer-bearing
BLACK & PURPLE raspberries

2-3 canes per hill

Trellising

fall-bearing

After planting year

summer-bearing

Early Spring	Spring	Summer	Fall
prune & trellis fertilize	weed	weed harvest remove spent floricanes	tie canes to trellis


Irrigate as needed throughout season (avoid wetting foliage)






Plant viruses

Mosaic virus



Ringspot

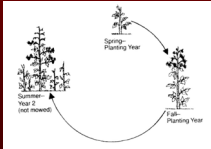




Planting year

fall-bearing


Winter	Early Spring	Spring	Summer	Fall
purchase plant material	plant	fertilize weed	weed trellis	harvest mow

Irrigate as needed (avoid wetting foliage)






Fungal Diseases

Phytophthora root rot






Verticillium wilt




Insect pests

raspberry cane borer
(cane girdlers)

Japanese beetle



spider mites (technically not an insect)

Growing Blueberries at Home







Brand new pest

Spotted Wing Drosophila (SWD)






U.C. Riverside IPM Program
© 2009 University of California

Blue berries


Huckleberry
Whortleberry
Hurtleberry
Sparkleberry
Bilberry






Monitoring and Exclusion Netting

Spotted Wing Drosophila (SWD)





Choosing cultivars

Blueberries

- Northblue
- Northcountry
- Northland


Zone 3

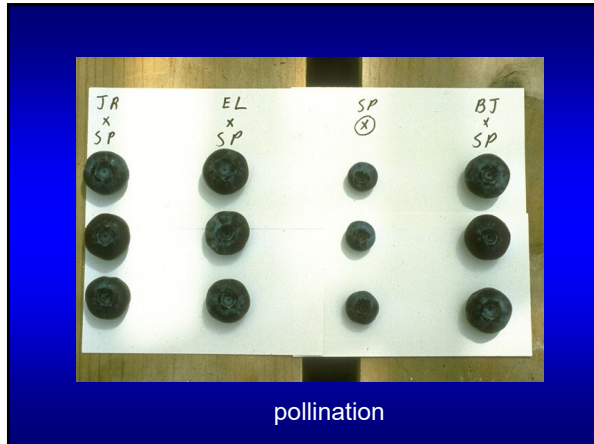


- Blueray
- Berkeley
- Bluecrop
- Jersey
- Elliot

Zone 4

- Duke
- Herbert
- Darrow
- Spartan
- Bluejay







After planting year

Early Spring	Summer	Fall
prune	harvest	weed
fertilize	weed & mow alleys replenish mulch	

Adequate water throughout season

Fertilize with ammonium sulfate :
 4 oz per plant, increase by 1oz
 each year up to 8 oz .

Planning & Preparing year




Evaluate your site and soil
 a growing season of at least 140 days
 well-drained soil, ideally sandy peat
 access to a suitable water supply
 preferably sunny
 complete soil test

Prepare the soil
 adjust pH to < 5 (sulfur takes time)
 adjust nutrients as needed
 eliminate perennial weeds
 increase organic matter

Match plants to your site
 hardy cultivars

Pruning Basics


- Prune in early spring
- Do not "hedge" prune, remove canes from point of origin
- Start with removing diseased, broken or dead branches
- Keep ~2 new canes per year up to 8 years
- Remove old, large canes > 1 in
- With neglected bushes, remove up to 20%

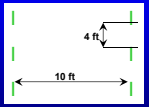



Planting year

Winter	Early Spring	Summer	Fall
purchase plants	plant & prune	weed & mow alleys remove flowers mulch	weed

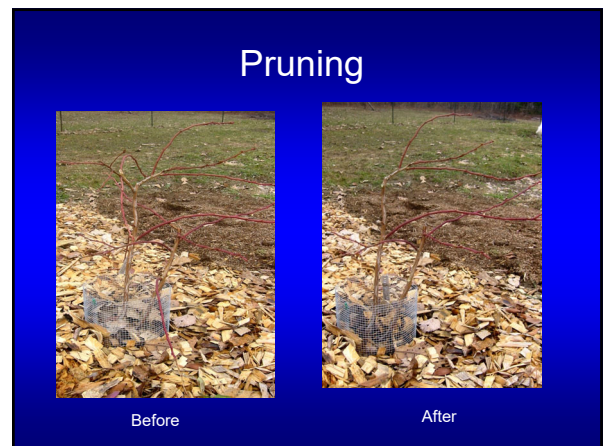
Adequate water throughout season

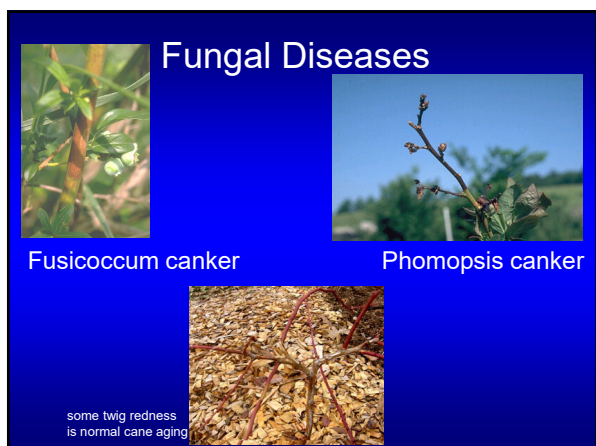
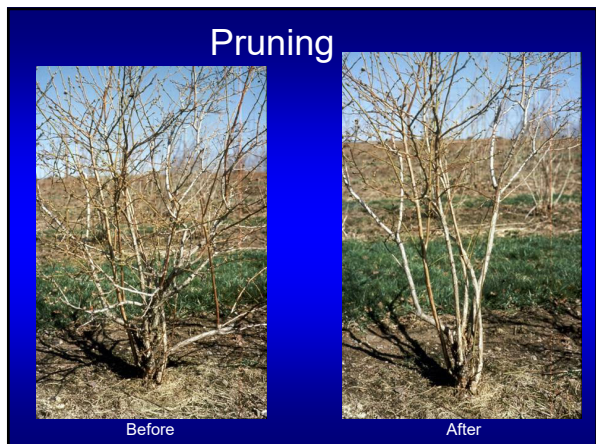







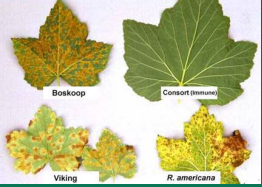
2-3 year-old plants





Growing ^{most} ribes in NY is now legal!

Avoid susceptible **black** currants.


Fungal Disease – White Pine Blister Rust

Choosing *Ribes* Cultivars

Gooseberries

American type:

- Poorman
- Oregon Champion
- Hinnonmaki
- Captivator







European type:


- Invicta
- Leveller
- Careless
- Catherina

Choosing *Ribes* Cultivars

resistant or immune black currants




- Titania
- Ben Sarek
- Coronet
- Crusader



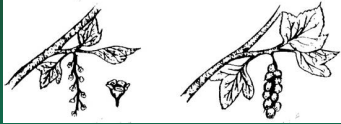
Pruning Currants and Gooseberries

- **1st year** - keep 6-8 vigorous shoots
- **2nd year** - keep 4-5 one year olds & 3-4 two year olds
- **3rd year** - keep 3-4 shoot in each age class
- **4th year** - remove oldest shoots & keep 3-4 shoot in each age class
- Always remove diseased & broken shoots.






Choosing *Ribes* Cultivars

Red & White currants



- Rovada
- Red Lake
- Blanka
- White Imperial
- Primus

Fungal Disease

Anthracnose or Leaf spot



Insect pest

Currant aphids



9 - 40 species




Growing Elderberries





Planning & Preparing year



Evaluate your site and soil
 moist, fertile, well-drained soil
 good air circulation
 complete soil test

Prepare the soil
 adjust pH to ~ 5.5 and 6.5
 eliminate perennial weeds
 increase organic matter

Choosing Elderberries Cultivars

- Adams No. 1
- Adams No. 2
- York
- Johns
- Kent
- Nova
- Scotia



Planting year

Winter	Early Spring	Summer	Fall
purchase plants propagate	plant 2 cultivars	weed & mow alleys mulch	weed

Adequate water throughout season



After planting year

Early Spring	Summer	Late summer
prune	hand weed mow alleys replenish mulch	harvest

Adequate water throughout season

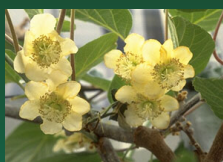


For each year of plant's age apply
1/8 lb ammonium nitrate (up to 1lb per plant)
or 1/2 lb 10-10-10 (up to 4 lb per plant)

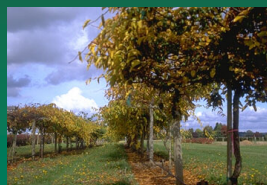
Choosing cultivars Hardy Kiwi- *Actinidia arguta*



- Ananasnaya
- Meader
- Geneva
- Michigan State



Growing Hardy Kiwi



Courtesy of Marvin Pritts

Keys to success

- Choose cultivars of *Actinidia arguta* (NOT *A. chinensis*)
- Plant 1 male for every 9 female plants
- Avoid planting in frost pockets
- Support vines (trellis system, arbor...)
- Prune plants at least 2 or 3 times during the growing season and once late winter



More fruits...

- Persimmons
- Pawpaws
- Mulberries
- Juneberries
- Highbush Cranberries
- Cornelian Cherries
- Beach plums
- Buffaloberries
- Quinces

North American Fruit Explorers (NAFEX) www.nafex.org

Paw Paw

PRO

- Easy to grow
- Unusual flavor and texture
- Natural pesticides (annonaceous acetogenins)



CON

- Unusual flavor and texture
- Potential link to Parkinson Disease-like effects
- The FDA does not currently have any evidence that pawpaw is unsafe to eat



Persimmon

PRO

- Large shade trees/Fall foliage
- Persimmon pudding
- Wildlife
- Fruit hangs on trees after trees defoliate
- Disease and pest resistant

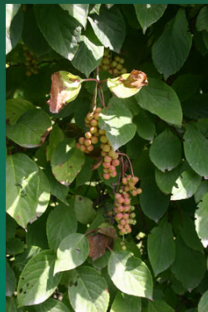


CON

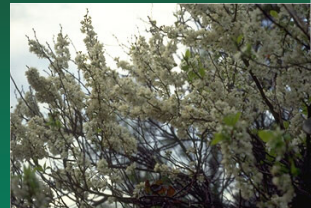
- Very astringent



Schisandra chinensis



Beach Plum



Seaberry or Sea buckthorn
Hippophae rhamnoides



Autumn Olive

PRO

- Berries are rich in carotenoids, particularly lycopene
- Can thrive in poor soils and has nitrogen fixing root nodules. Drought, salt and low pH (down to 4.0) tolerant

CON

- Invasive, readily spread by birds and grows almost anywhere it germinate




Figs








In New York they must be grown in containers and brought inside during the winter
 In some southern counties you may be able to over-winter figs in gardens by protecting the trees
 Figs are grown on their own roots, but branches can be pruned to keep the trees at a manageable height
 'Chicago Hardy', 'Brown Turkey',


Chokeberry





Highbush Cranberry

Buffaloberries



Quince

Juneberries





Cornelian cherry



Good Luck!

Mulberries

PRO

- Easy to grow
- Shade tolerant, and provides shade
- Pies, preserves, wine
- High antioxidant and resveratrol concentration
- Silk (only the White mulberry; *Morus alba*)



CON

- Large trees
- Messy

Kousa Dogwood

