

Choosing apple varieties and rootstocks for your new orchard

Description:

With over 7500 known apple varieties in the world, how do we choose the right one for your orchard? Combine that with hundreds of rootstock selections and it can quickly become very confusing. Each cultivar and rootstock has very unique characteristics that need to be considered before planting a new orchard that could be in place for decades. Amy will help you understand apple cultivars and rootstocks that can be used in a 21st century orchard.

Instructor:

Amy Irish-Brown

MSU Extension Educator

Apple Tree Propagation

- Apple trees must be propagated vegetatively in order to preserve the variety.
- Seeds from apples are a recombination of genetic material and result in apples with traits not the same as the parents.

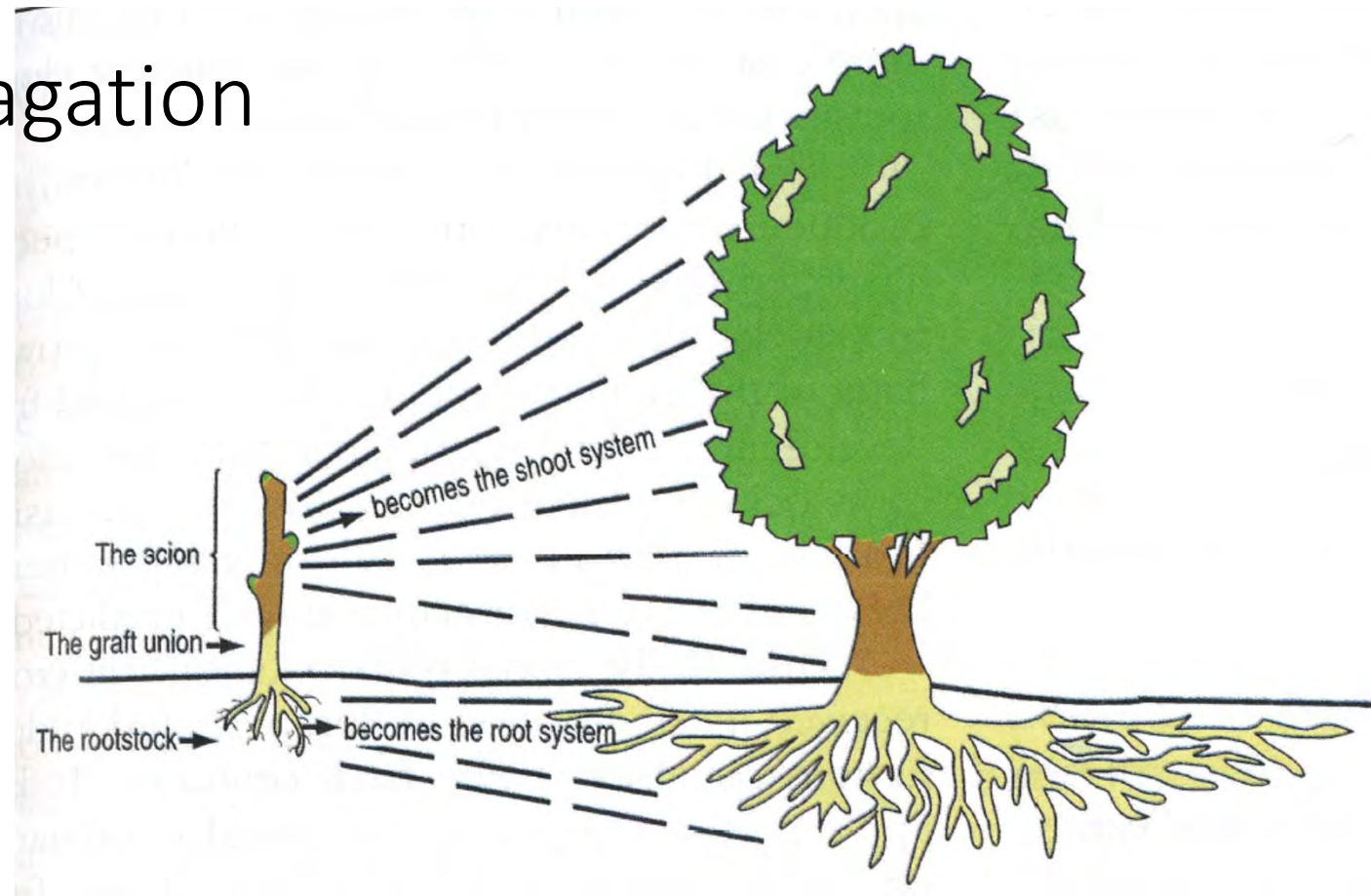
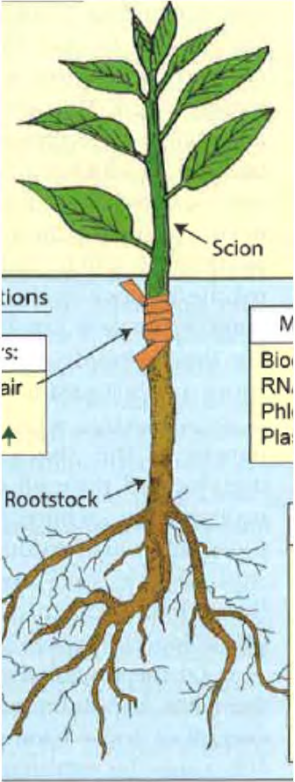


Image from Hartmann & Kester, Plant Propagation, Principles and Practices, 2018.

Grafting Basics

- Stock
- Scion
- Methods
- Tools



Tongue and Groove Grafting or Cleft Grafting

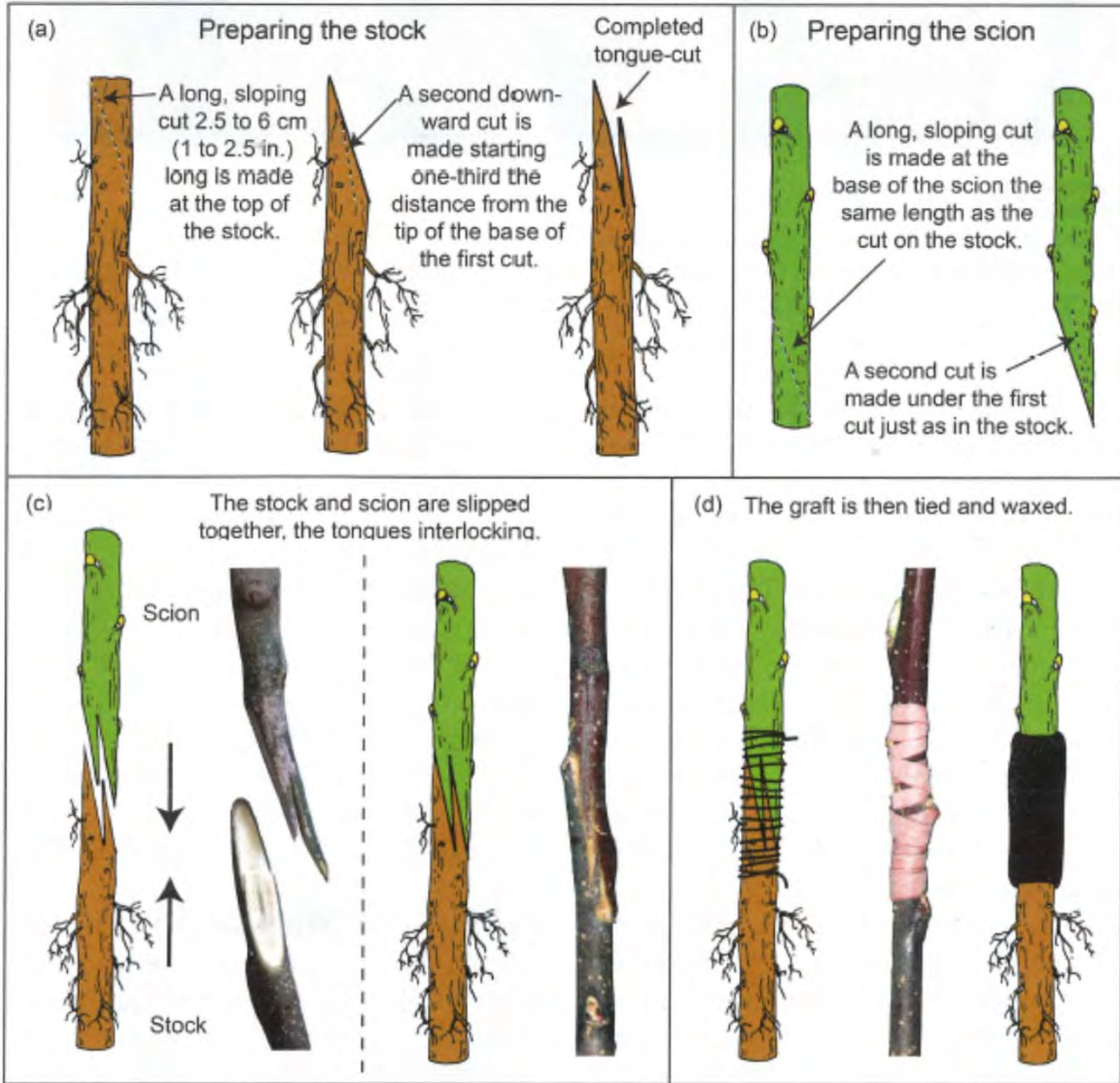


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Chip Budding

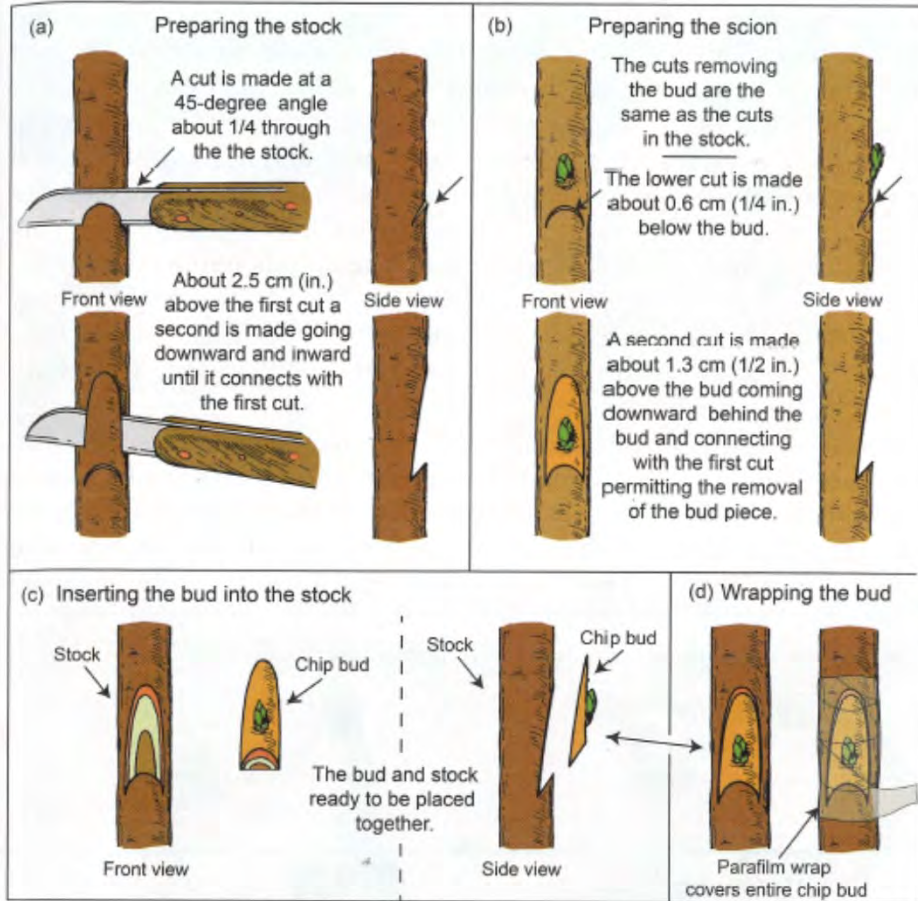


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T-budding

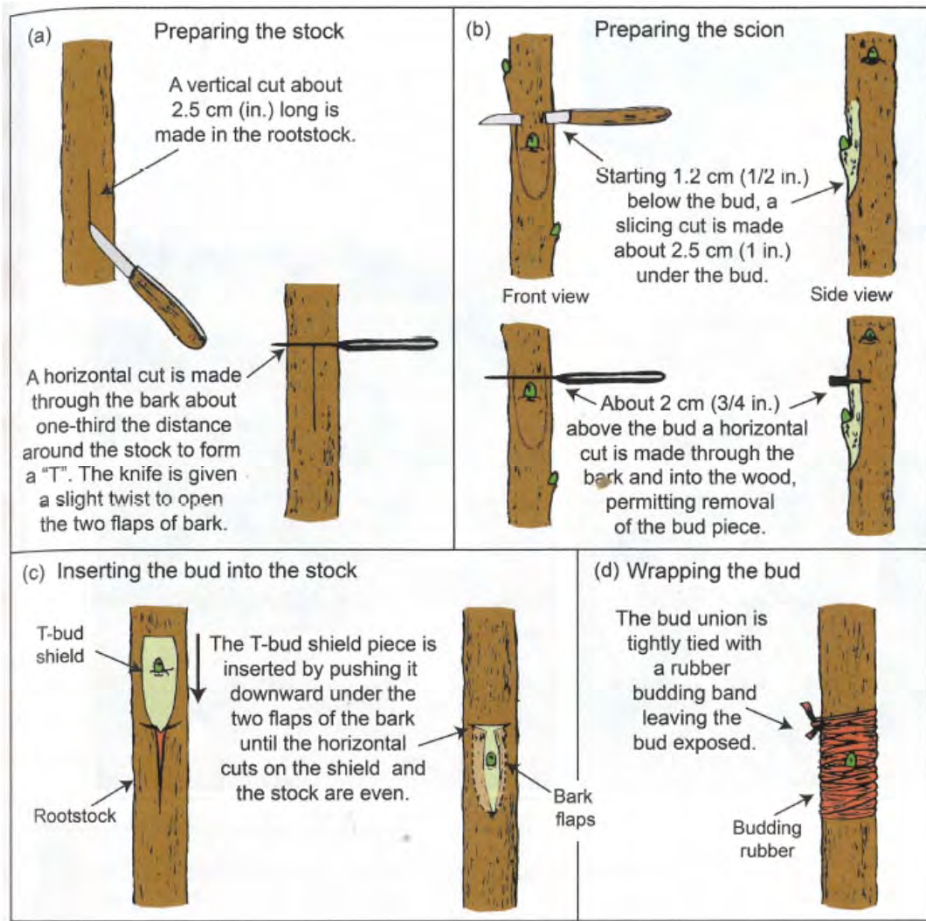


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Tissue Propagation of Scions and Rootstocks



www.goodfruit.com

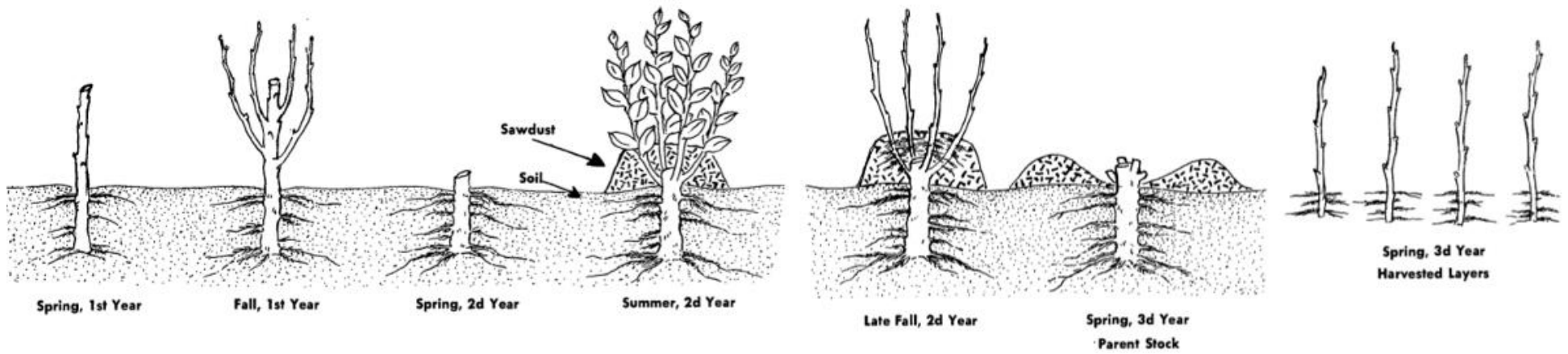


<https://i.imgur.com>



Photo credit: Amy Irish-Brown

Rootstock Stool Beds



1957 Oregon Extension Service document "Propagating Clonal Rootstocks,"



Photo credit: Christina Herrick

2nd Year Stool Bed with 1st hilling



Photo credit: Steve Hoying

2nd Year Stool Bed Summer Growth



Photo credit: Steve Hoying

Mature Stool Bed Ready for Harvest



Photo credit: Steve Hoying



Photo credit: Amy Irish-Brown

Choosing Rootstock

- The rootstock on which a tree is propagated has enormous influence on the tree's growth and fruiting habits.
- The rootstock determines the tree's size, how one manages the tree and influences disease resistance.
- The success of a new tree depends primarily on having reliable, virus-free rootstock.



Rootstock manages tree size

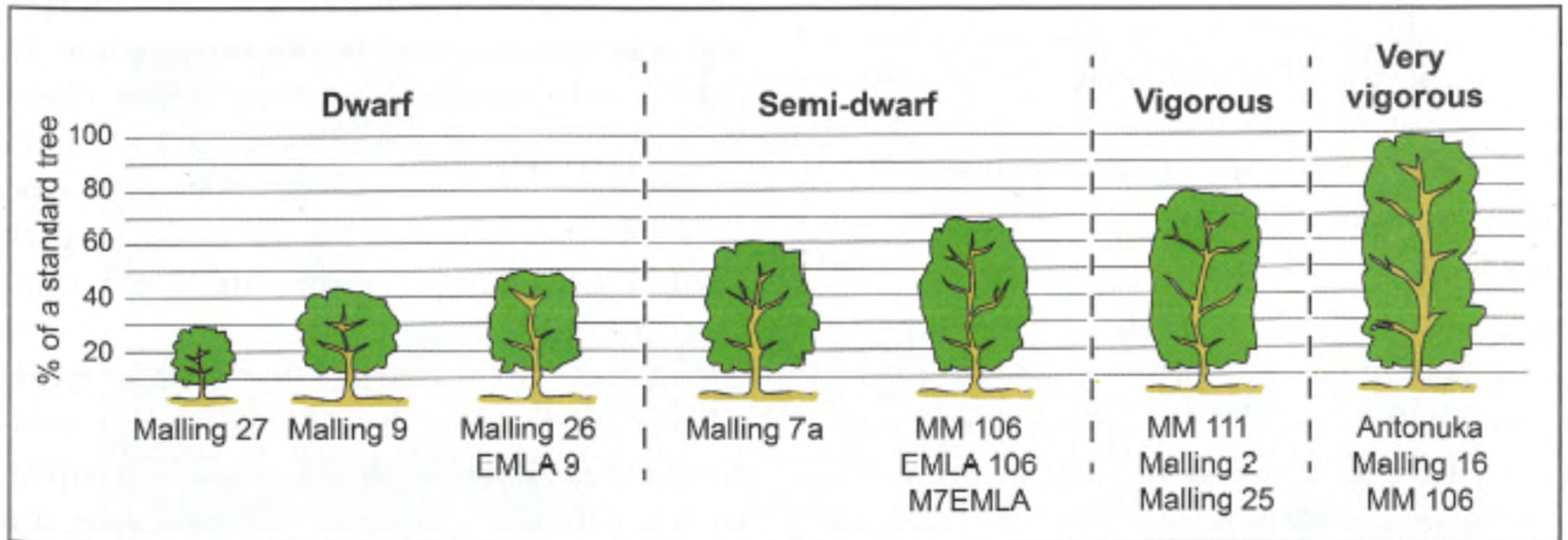


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Apple Rootstocks – Smallest to largest

- Malling 27 (M.27)
- Geneva 65 (G.65)
- **Budagovsky 9 (B.9 or Bud9)**
- **Malling 9 (M.9)**
- MARK
- Geneva 16 (G.16)
- Geneva 41 (G.41)
- Budagovsky 10 (Bud 10 or B.10)
- Ottawa 3 (O.3)
- Vineland 1 (V.1)
- **Malling 26 (M.26)**
- Geneva 214 (G.214)
- Geneva 935 (G.935)
- Geneva 11 (G.11)
- Geneva 202 (G.202)
- Geneva 210 (G.210)
- Geneva 890 (G.890)
- Geneva 969 (G.969)
- Pillnitzer Supporter 4 (Pi.80)
- Interstems
- Geneva 30 (G.30)
- Geneva 222 (G.222)
- **Malling 7 (M.7)**
- **Malling-Merton 106 (MM.106)**
- Malling 2 (Poland 18 (P.18)
- **Malling-Merton 111 (MM.111)**
- Budagovsky 118 (B.118)
- Seedling

Selecting Apple Varieties for Commercial Production

- The driving force behind selecting varieties is high market value and high yields.
- Desirable variety traits for commercial production should be focused on:
 - Long shelf life / storability
 - Ease of production
 - Few pack-out problems – pests, disorders, rots, bruising, etc.
 - The harvest window is another aspect to consider when deciding on fruit varieties. Harvest is the single most demanding labor activity in orchards, so planting varieties that allow a broader harvest window, allows fewer laborers to pick over a longer period of time.





2017 MICHIGAN APPLE HARVEST SCHEDULE



PAULA RED
First-available and eagerly awaited. Pleasingly tart.
Available: Aug. 20



GINGER GOLD
Sweet-tasting, with a hint of tartness. Stores well.
Available: Aug. 20



GALA
A consumer favorite. A soft bite over a mellow sweetness.
Available: Sept. 6



MCINTOSH
A classic by any standards. Juicy with a lightly tart flavor.
Available: Sept. 6



JONAMAC
Cross between a McIntosh and Jonathan. Rich and spicy.
Available: Sept. 8



GOLDEN DELICIOUS
A gingery-smooth taste. Known for its sweetness.
Available: Sept. 8



HONEYCRISP
Sweet as honey, with a crisp bite. Creating quite a buzz!
Available: Sept. 15



EMPIRE
Versatile with a firm texture. Sweet, yet tart flavor.
Available: Sept. 18



JONATHAN
A crisp, spicy tang that blends well with other apples.
Available: Sept. 18



CORTLAND
Tender, juicy white flesh with hint of tartness.
Available: Sept. 20



RED DELICIOUS
America's most popular. Full-flavored sweetness.
Available: Sept. 25



JONAGOLD
Michigan grows them best! A must-try.
Available: Sept. 25



FUJI
A popular late-season variety. Crisp and sweet.
Available: Oct. 4



IDA RED
Tastes tangy and tart. Great for sauces and pies.
Available: Oct. 9



ROME
An old-time favorite. Excellent for baking.
Available: Oct. 11

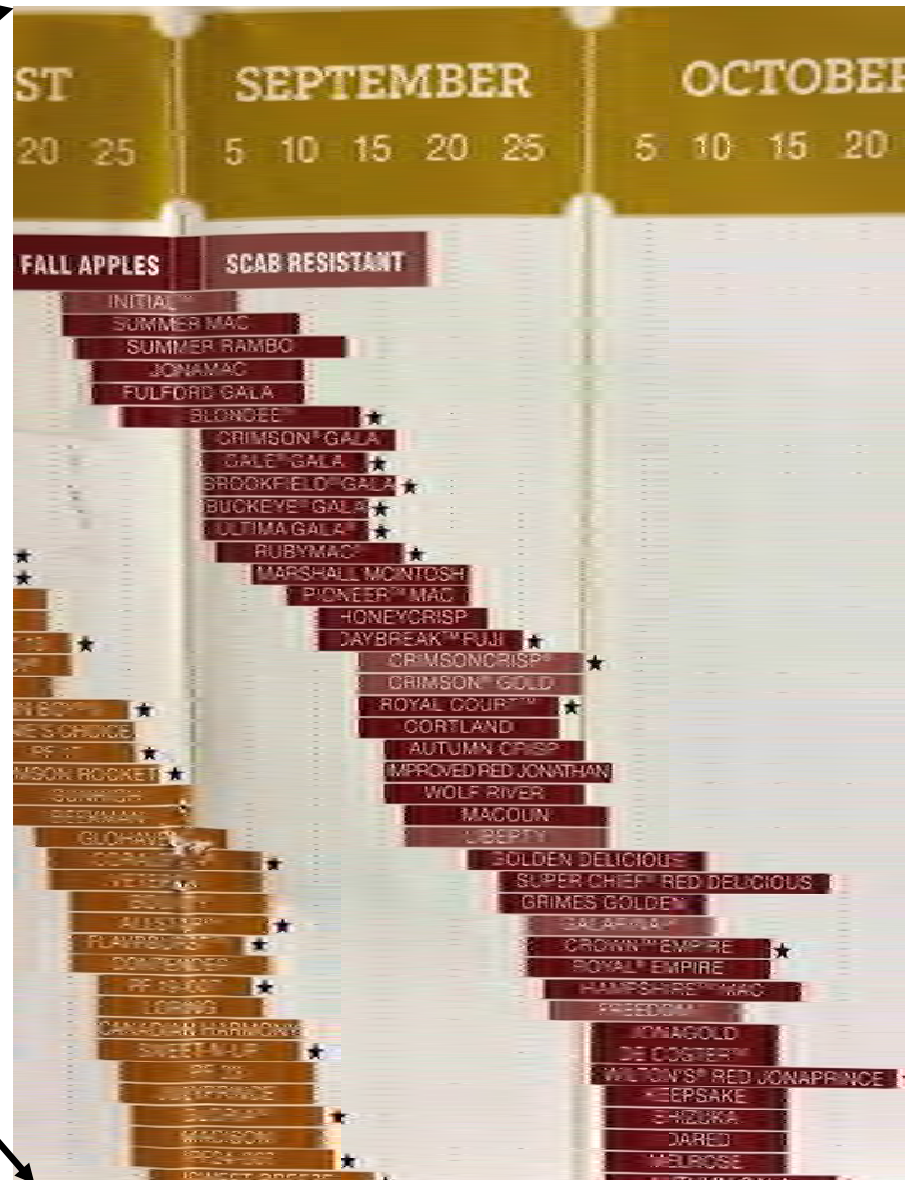
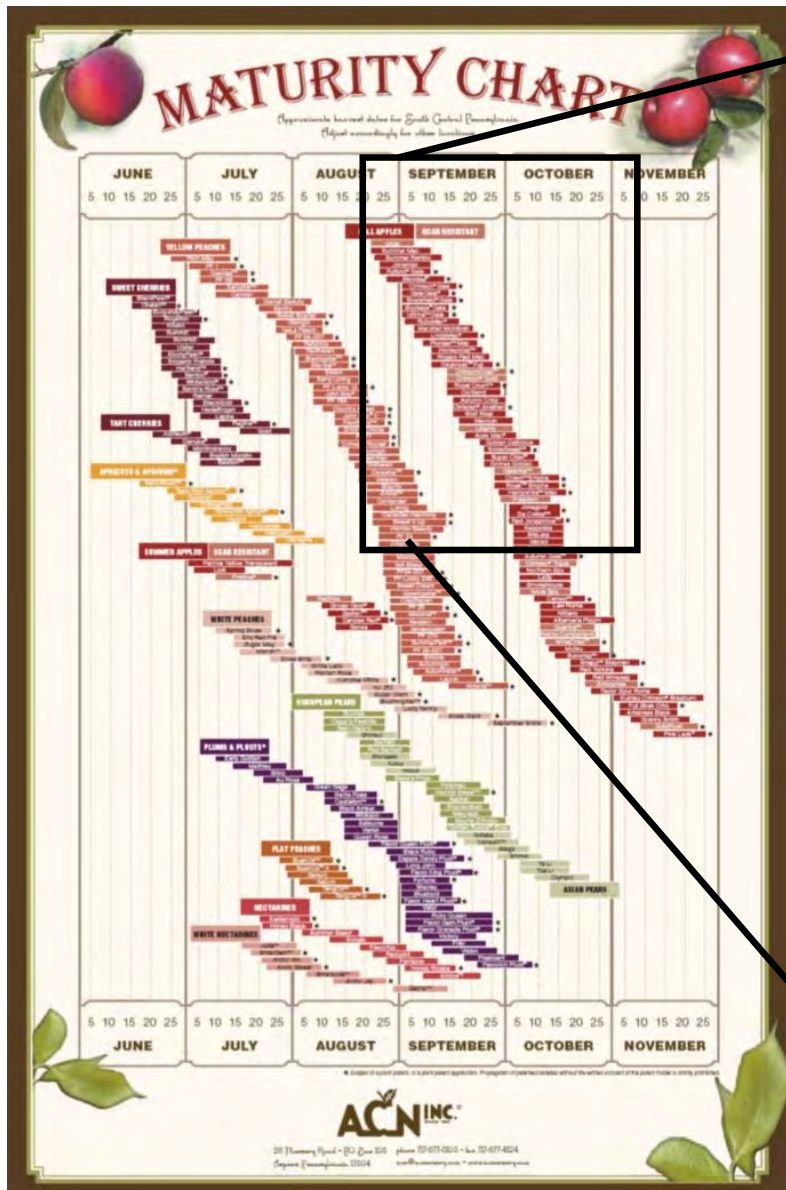


BRAEBURN
Firm apple with spicy-sweet flavor. Stores very well.
Available: Oct. 23

MICHIGAN APPLE COMMITTEE
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PURE MICHIGAN

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Common Apples for Michigan Production

Apples: Acres and percent of total by variety

Variety	2003		2006		2011		2014	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Cortland	470	1.1	420	1.1	345	0.9	300	0.8
Empire	2,490	5.9	2,080	5.6	1,730	4.7	1,560	4.4
Fuji (all seasons)	600	1.4	670	1.8	1,240	3.4	1,550	4.4
Gala	2,320	5.5	2,800	7.6	3,950	10.8	4,650	13.1
Ginger Gold	290	0.7	260	0.7	280	0.8	310	0.9
Golden Delicious	5,180	12.2	4,600	12.4	4,100	11.2	3,600	10.1
Honeycrisp	800	1.9	1,350	3.6	2,250	6.2	2,800	7.9
Idared	3,650	8.6	3,050	8.2	2,800	7.7	2,510	7.1
Jonagold	1,150	2.7	1,120	3.0	1,800	4.9	2,160	6.1
Jonathan	4,000	9.4	3,250	8.8	2,600	7.1	2,250	6.3
McIntosh	2,840	6.7	2,230	6.0	2,470	6.8	2,370	6.7
Mutsu	600	1.4	520	1.4	435	1.2	370	1.0
Northern Spy	2,350	5.5	1,900	5.1	1,470	4.0	1,220	3.4
Paula Red	650	1.5	560	1.5	540	1.5	510	1.4
Red Delicious	9,500	22.4	7,700	20.8	6,600	18.1	5,690	16.0
Rome	3,430	8.1	2,650	7.2	1,970	5.4	1,630	4.6
Sweetango	(¹)		(¹)		240	0.7	340	1.0
Other	2,180	5.1	1,840	5.0	1,680	4.6	1,680	4.7
Michigan	42,500	100	37,000	100	36,500	100	35,500	100

¹ Not yet planted or included in other.

Common Apples for Michigan Production

**Apples: Acres and trees planted
by variety, 2010-2014**

Variety	Acres	Trees
Blondee	28	19,700
Crimson Crisp	28	23,400
Empire	26	7,500
Fuji	555	375,500
Gala	1,315	924,000
Ginger Gold	44	17,700
Golden Delicious	45	16,100
Honeycrisp	750	711,200
Idared	155	62,000
Jonagold	735	464,000
Jonathan	65	21,800
McIntosh	215	149,100
Paulared	32	19,000
Pink Lady	88	100,000
Red Delicious	300	143,400
Sweetango	145	108,000
Zestar	29	16,600
Other	145	107,000
Michigan	4,700	3,286,000

Paula Red



PAULA RED

First-available and eagerly awaited. Pleasingly tart.

Available: Aug. 20

- One of the earliest to ripen.
- Available only into October. Pleasingly tart flavor and good aroma. Great in back-to-school lunches, or early season baking.
- Discovered in Sparta, Michigan!

Ginger Gold



- This sweet-spicy apple has a succulent texture and rich taste. A cross between the Golden Delicious and Albermarle Pippin, this early-season variety is best served fresh. Its mildly tart flavor definitely gets the Michigan autumn apple harvest off to an exciting start.

Gala



GALA

A consumer favorite. A soft bite over a mellow sweetness.

Available: Sept. 6

- Crisp snappy bite over a mellow sweetness. Michigan's 3rd most popular apple for fresh eating or cooking.
- Gala has many strains available, medium sized, sweet, with some spicy characteristics tracing back to Cox's Orange Pippin, good for fresh and for pies, medium shelf life, susceptible to fire blight, Fulford is somewhat larger, earlier, Imperial is older still popular variety, Many newer varieties are available that have more red skin color but otherwise not much better than Imperial.

McIntosh



MCINTOSH

A classic by any standards.
Juicy with a lightly tart flavor.

Available: Sept. 6

- Classic large, round apple for eating out of hand!
- Ultra-juicy white flesh, lightly tart flavor and excellent fresh apple aroma. A perky addition to salads. Excellent in applesauce and cider. Also used in pies.
- McIntosh - many strains are available. Ruby Mac, Linda Mac, Miracle Mac are some of the newer strains with better skin color.

Golden Delicious



GOLDEN DELICIOUS

A gingery-smooth taste.
Known for its sweetness.

Available: Sept. 8

- A gingery-smooth, sweet taste treat lies under a thin skin. The most popular yellow apple, Golden Delicious may be eaten fresh or cut up in salads.
- Professional's choice for applesauce or cider, baking pies and other desserts.

Honeycrisp



HONEYCRISP

Sweet as honey, with a crisp bite.

Creating quite a buzz!

Available: Sept. 15

- The apple industry darling right now.
- Sweet and crisp like none other.
- Combines unusual color and excellent sweet flavor with a great bite. Use it for fresh eating, fresh-cut slices or cut up in salads.
- Difficult to grow.

Empire



EMPIRE

Versatile with a firm texture.

Sweet, yet tart flavor.

Available: Sept. 18

- Sweet and tart at the same time.
- Use for fresh-cut slices, candy and caramel apples. Also used in baking. Texture remains very firm, a good storing apple.
- Popular in Great Britain.

Jonathan



JONATHAN

A crisp, spicy tang that blends well with other apples.

Available: Sept. 18

- Used for fresh eating, but mainly a cooking apple
- Medium size, sweet, but acidic, favorite for pie and applesauce
- Fire blight and powdery mildew susceptible, many varieties including the popular Jonee, Nured, and Ruby Jon
- Juicy flavor has a spicy tang that blends well with other apples. Michigan's cooler climate produces superb Jonathans. Discovered in Woodstock, New York!

Red Delicious



- America's most popular apple, known for the "five little bumps" on the bottom.
- Best for fresh eating and snacks. Full-flavored sweet taste, yellowish flesh and crisp texture. Discovered over 100 years ago in Iowa.
- Not recommended for cooking.

Jonagold



JONAGOLD

Michigan grows them best!

A must-try.

Available: Sept. 25

- Large fruited, dual purpose eating and cooking, sweet, juicy, somewhat tart, medium shelf life, medium fire blight susceptibility.
- Some of the older strains have a green skin background that may be considered unattractive. Some of the better coloring varieties are Jonagored, Rubinstar, and Crimson. However, ripening time and flavor of most Jonagolds are similar.

Fuji



FUJI

A popular late-season variety.

Crisp and sweet.

Available: Oct. 4

- New to Michigan's apple line-up, Fuji is Japan's favorite apple for good reason! Fantastic sweet and tart flavor, with a low acid content. An incredibly good keeper, Fuji stays crisp for weeks and becomes better with storage.
- Early season Fuji - ripening approximately 1 month before standard Fuji – varieties include Rising Sun, Early Auvil, Daybreak, Nickell, Morning Mist. Not quite the quality of standard main season Fujis, but particularly useful in more northern areas with shorter growing seasons.
- Main season Fuji - firm, productive, older strains with greenish hint to the background when ripe.