

# Blueberry Production

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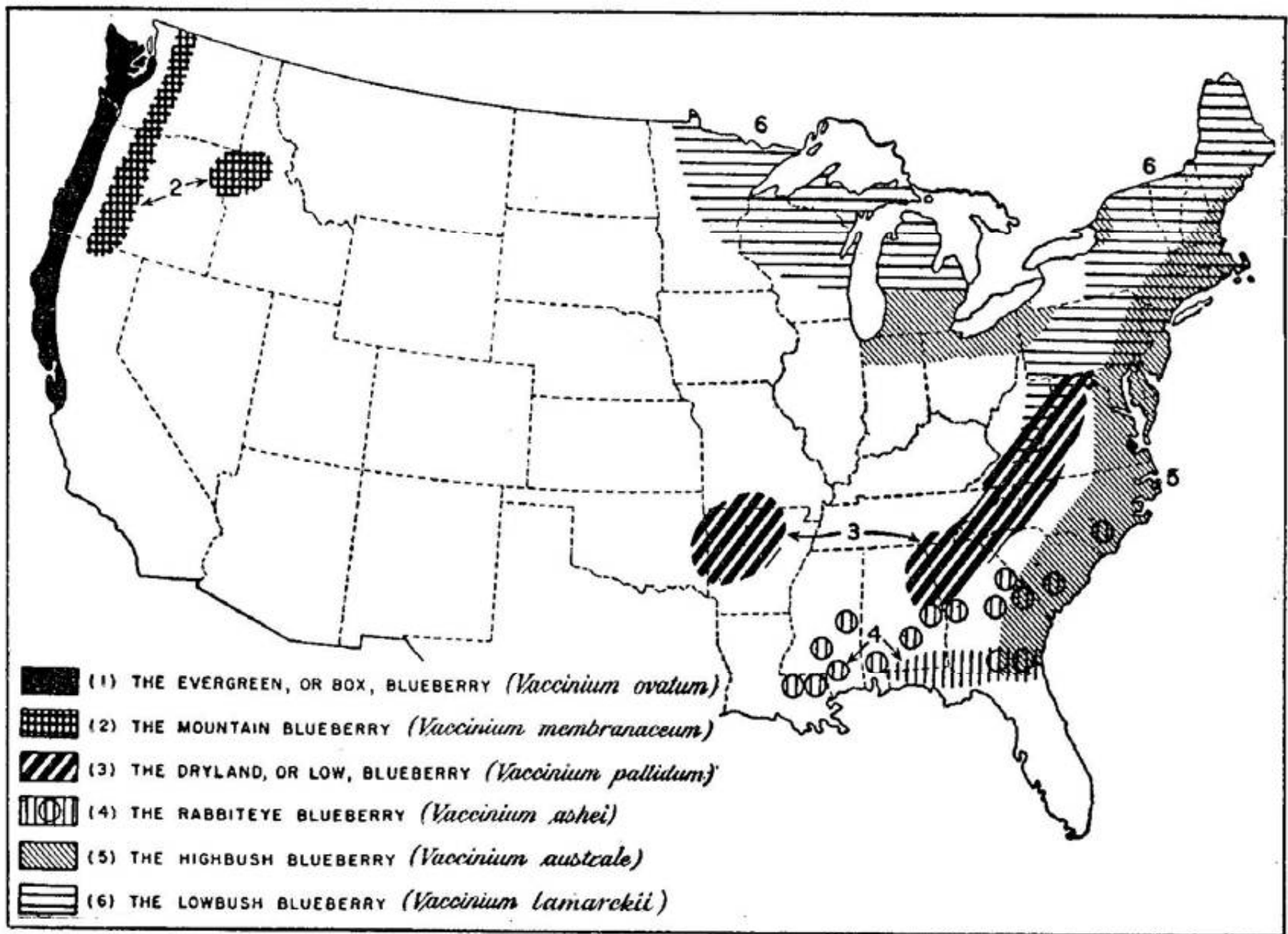


# Blueberries

- Excellent market potential
- Limited acreage now in KY
- Berries will hold for 10 days on the bush
- Will keep for 2 weeks in refrigerated storage
- Plants are long lived
- Limited spray schedule
- Plants very hardy
- Crop consistent from year to year

# Blueberry Production Needs

- **Good site**
- **Low soil pH**
- **Organic mulch source**
- **Irrigation**
- **Pest control, birds, including wild turkeys, deer, and rabbits**
- **Market**



# Blueberry Types

- Lowbush
- Northern Highbush
- Southern Highbush
- Rabbiteye



Lowbush  
Blueberry

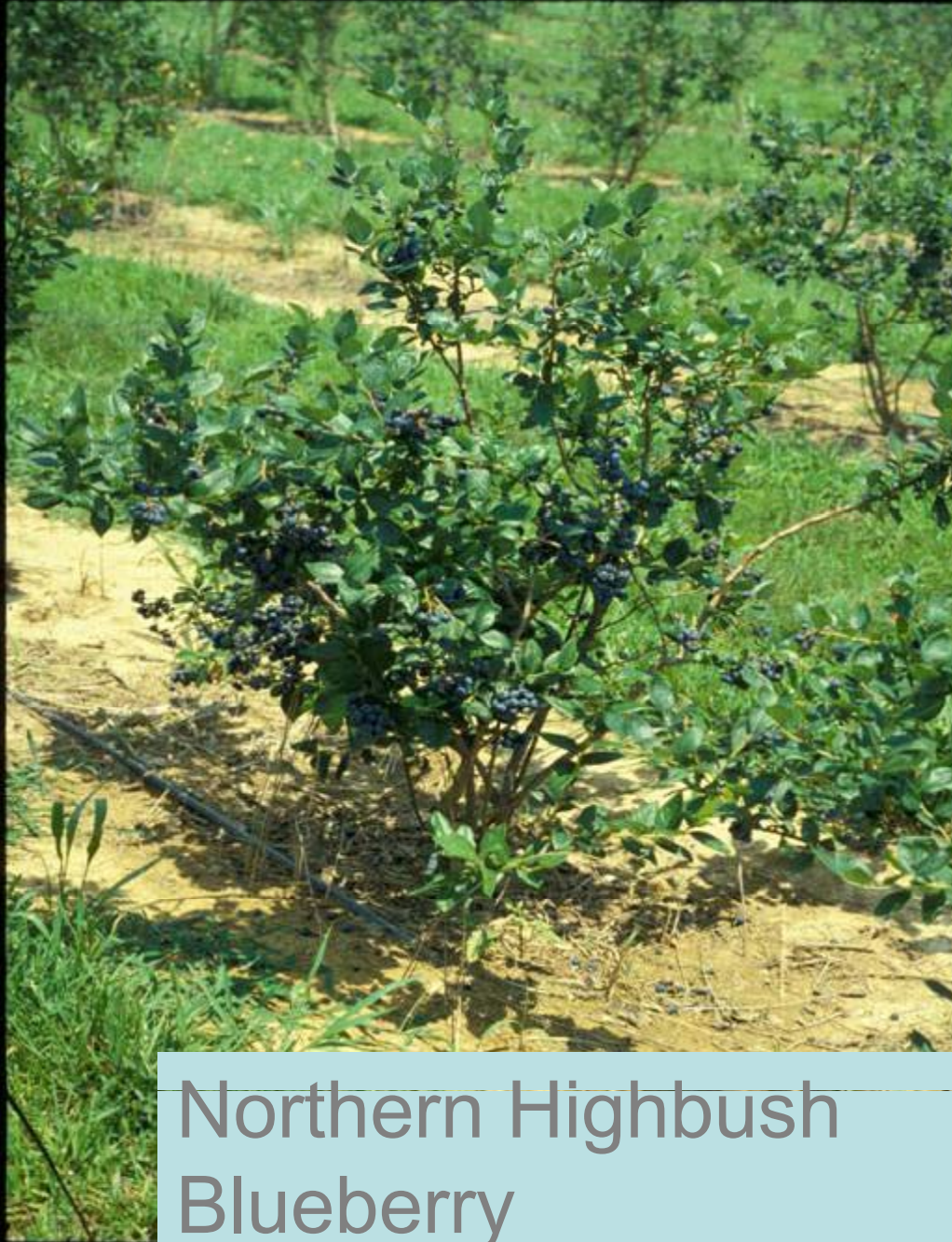


Lowbush  
Blueberry




Wild  
Highbush  
Blueberry





Northern Highbush  
Blueberry

A photograph of a Rabbiteye Blueberry bush in a field. The bush is green and has small, dark blue berries. It is surrounded by grass and some bare soil. The image is framed by a black border.

Rabbiteye  
Blueberry

# Site Selection

- **Good air drainage**
  - High elevation
- **Good internal soil drainage**
- **Soil Depth**
  - Minimum of 24 inches
- **Soil pH – acid (4.5-5.2)**

# Desirable Fruit Characteristics

- Large size
- Light blue color
- Firm fruit
- Small dry fruit scar
- Resistance to cracking
- Long shelf life
- Nice aroma and flavor
- Ability to hold on plant without dropping

# Blueberry Variety Selection

- Varieties differ as to when they ripen, so proper selection will provide a continuous supply of fresh berries throughout the fruiting season.
- Each variety will usually supply fruit for a 2-3 week period.
- As a rule, blueberries ripen 60 to 80 days after bloom.

TABLE 1.—*Percentage of fruit gathered each week during the ripening season for common highbush varieties*

Variety	First week	Second week	Third week	Fourth week	Fifth week	Sixth week	Seventh week	Eighth week	Ninth week
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Morrow .....	40	40	20	.....	.....	.....	.....	.....	.....
Angola .....	35	30	20	15	.....	.....	.....	.....	.....
Wolcott.....	20	40	25	15	.....	.....	.....	.....	.....
Earliblue.....	30	40	30	.....	.....	.....	.....	.....	.....
Weymouth .....	30	40	30	.....	.....	.....	.....	.....	.....
Bluetta .....	40	50	5	5	.....	.....	.....	.....	.....
Croatan .....	.....	40	40	20	.....	.....	.....	.....	.....
Harrison.....	.....	40	40	20	.....	.....	.....	.....	.....
Murphy .....	.....	20	30	30	20	.....	.....	.....	.....
Collins .....	.....	30	40	30	.....	.....	.....	.....	.....
Meader .....	.....	30	40	30	.....	.....	.....	.....	.....
Blueray .....	.....	30	30	20	10	10	.....	.....	.....
Rancocas .....	.....	30	30	20	10	10	.....	.....	.....
Bluecrop.....	.....	.....	20	40	30	10	.....	.....	.....
Bluehaven.....	.....	.....	20	40	30	10	.....	.....	.....
Berkeley .....	.....	.....	.....	40	30	30	10	.....	.....
Rubel .....	.....	.....	.....	20	40	30	10	.....	.....

# Blueberry Variety Selection

- **Spring frost hardiness is based on floral developmental stage.**
- **Earlier maturing varieties bloom earlier than later maturing varieties and are consequently more prone to frost injury.**
- **Blueberries can withstand 28 F at full bloom.**

# Purchasing Plants

- Purchase two-year-old bare root or potted plants.
- Purchase from reputable nurseries that practice virus testing.
- Blueberry viruses can destroy a planting if they are brought in.
- Plant more than one variety to provide for cross pollination and group varieties by ripening date to make harvest easier.



# Blueberry Yields, UKREC

Variety	Cum. Yield 1995-2003 (lb/bush)	Yield 2003 (lb/bush)	Yield 2003 (T/A)
Sierra	78.5	17.6	6.8
Nelson	76.3	17.0	6.6
Duke	75.7	15.8	6.1
Toro	75.7	18.3	7.1
Bluecrop	74.8	18.3	7.1
Bluegold	73.0	22.5	6.5
Sunrise	52.6	15.8	6.1
Patriot	50.1	15.9	6.2



# Blueberry Trials, Laurel Fork, 2002

Age: 6 yr-old	Yield (lb/bush)	Berry Size	Taste	Appearance
Bluecrop	4.8	M	B	A+
Nelson	4.6	L	S	A+
Bluejay	4.6	M	B	A
Blueray	3.7	M	BS	A
Toro	3.3	L	S	A+
Sierra	3.2	L	S	A+
Ornablue	3.1	S	BS	A
Patriot	3.1	S-M	T	A
Brigitta	3.1	L	S	A

# Blueberry Trials, Quicksand, 2002

<b>Age: 6 yr-old</b>	<b>Yield (lb/bush)</b>	<b>Berry Size</b>	<b>Taste</b>	<b>Appearance</b>
<b>Brigitta</b>	<b>5.6</b>	<b>L</b>	<b>ST</b>	<b>A+</b>
<b>Blueray</b>	<b>3.8</b>	<b>L</b>	<b>ST</b>	<b>A+</b>
<b>Ozarkblue</b>	<b>3.8</b>	<b>L</b>	<b>ST</b>	<b>A+</b>
<b>Toro</b>	<b>3.2</b>	<b>L</b>	<b>SB</b>	<b>A+</b>
<b>Reka</b>	<b>2.5</b>	<b>M</b>	<b>ST</b>	<b>A</b>
<b>Bluejay</b>	<b>2.4</b>	<b>M</b>	<b>SB</b>	<b>A</b>
<b>Sierra</b>	<b>2.3</b>	<b>ML</b>	<b>ST</b>	<b>A+</b>
<b>Patriot</b>	<b>2.2</b>	<b>L</b>	<b>ST</b>	<b>A+</b>
<b>Bluecrop</b>	<b>1.8</b>	<b>L</b>	<b>SB</b>	<b>A+</b>



# Blueberry Varieties for Kentucky

(In order of ripening)

- Duke
- Spartan
- Patriot
- Bluejay
- Ozarkblue (S. H.)
- Sierra
- Bluecrop
- Bluegold
- Toro
- Nelson
- Brigitta
- Darrow
- Elliott



Duke



Spartan



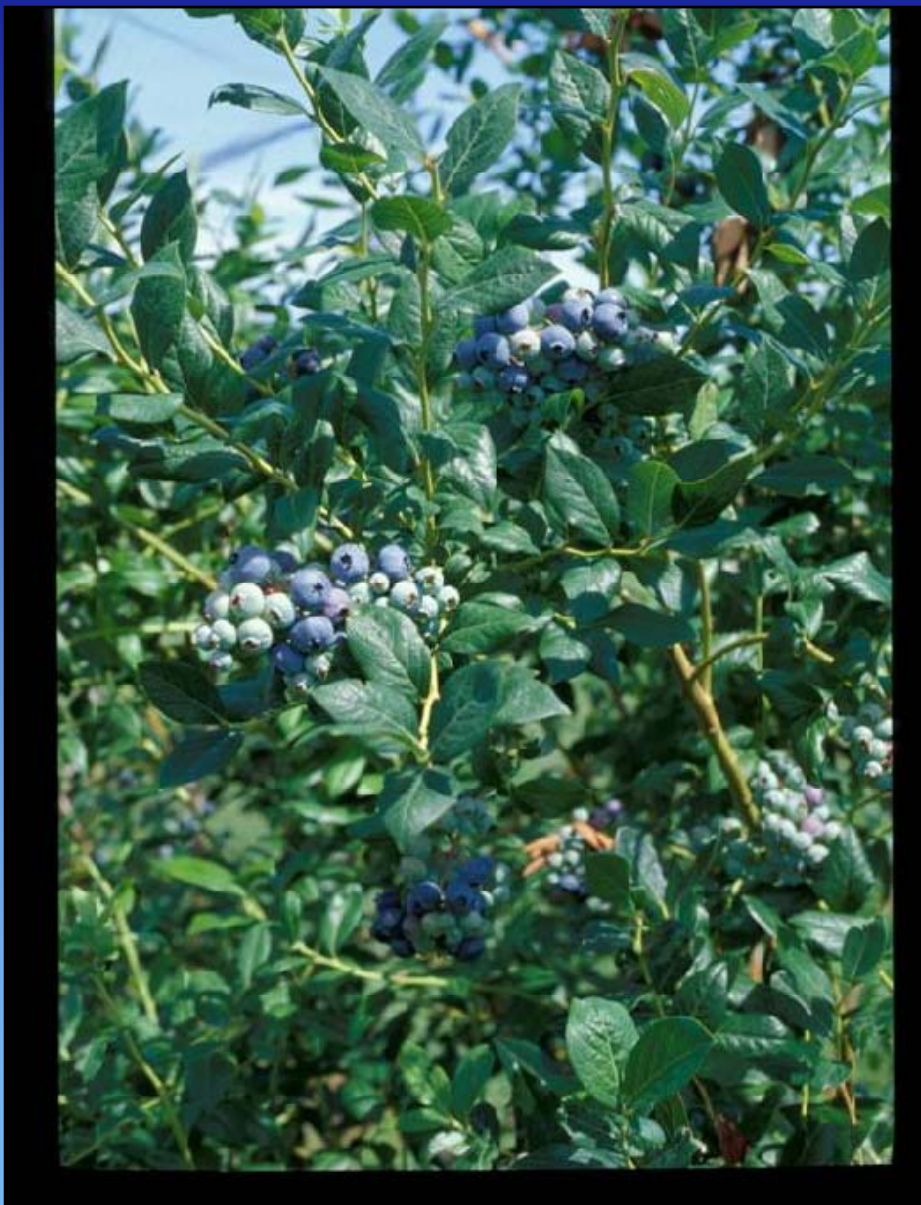
Patriot



Bluejay



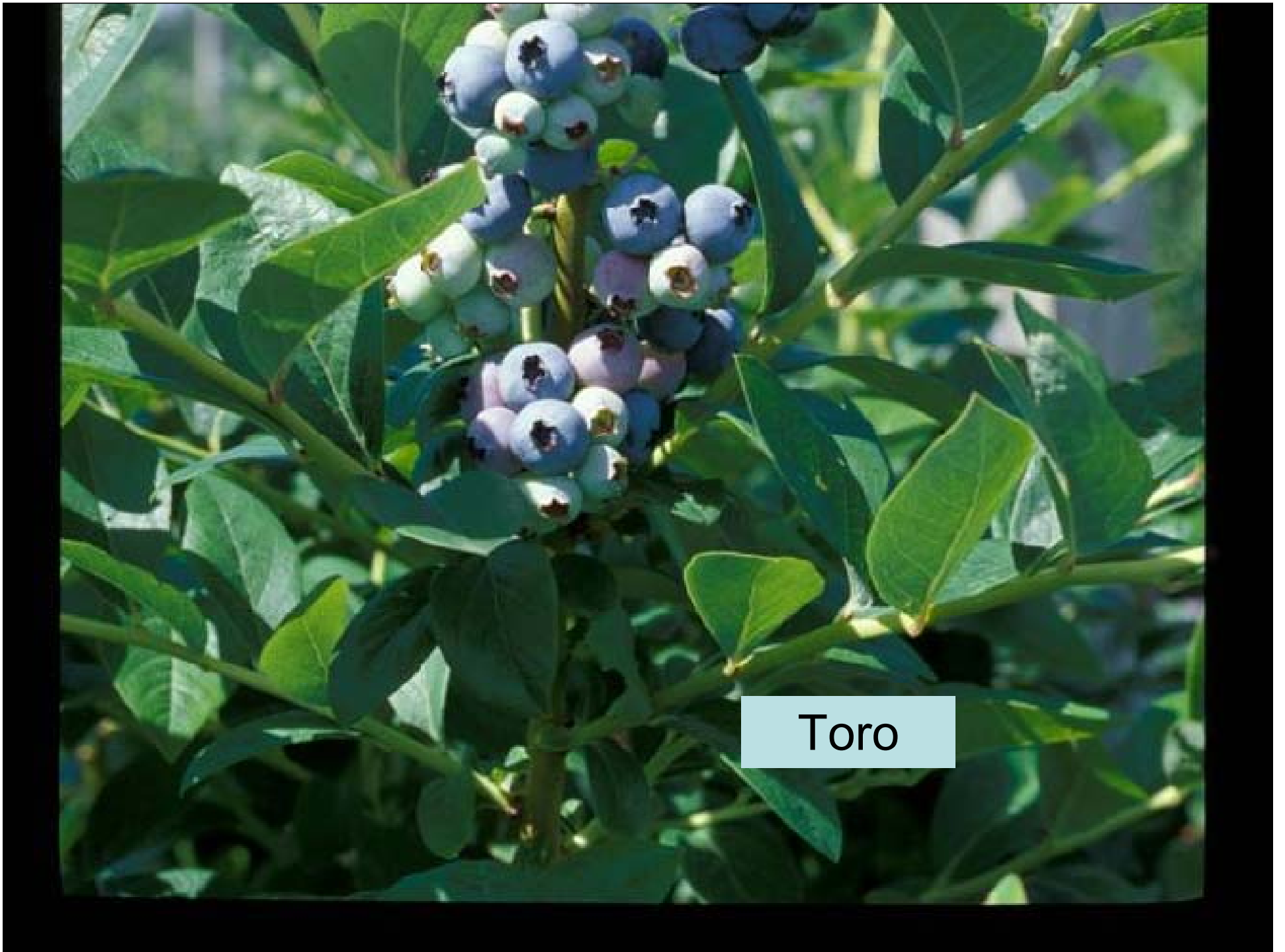
# Bluecrop



Joe Masabni



BlueGold



Toro



Nelson

A close-up photograph of a person's hand holding several ripe, dark blue blueberries. The hand is positioned in the lower half of the frame, with the fingers slightly curled. The blueberries are clustered together, showing their characteristic waxy bloom. The background is split: the left side shows a field of green grass, and the right side shows a light blue, textured fabric, possibly a shirt or apron. The lighting is bright, suggesting an outdoor setting.

Darrow

# Soil Fertility & pH (4.5-5.2)

- If the soil calcium level is below 2,500 lb/A then the soil pH can be economically lowered with sulfur.
- Submit soil samples for potential sites through your local county extension office.
- Based on the soil sample analysis broadcast needed P, K, Mg and S and plow this in preferably at least 2 months before planting.

# Amending Soil to Reduce the pH\* by 1 full unit

Soil Texture	Sulfur (lb/100 sq ft)	Aluminum Sulfate (lb/100 sq ft)
Light sandy	0.78	4.5
Medium sandy loam	1.50	9.0
Heavy clay loam	2.25	13.5

\* Based on soil sample water pH



# Planting

- Plant in late fall or early spring
- If possible run rows in a North-South direction with crosswalks every 200-300' for U-Pick operations.
- Subsoil each row and if the soil is heavy, prepare a raised bed (6-8 inches high) prior to planting.
- Plant rows far enough apart to accommodate equipment.
- Recommend 9-14' between rows and 4-6' between plants.



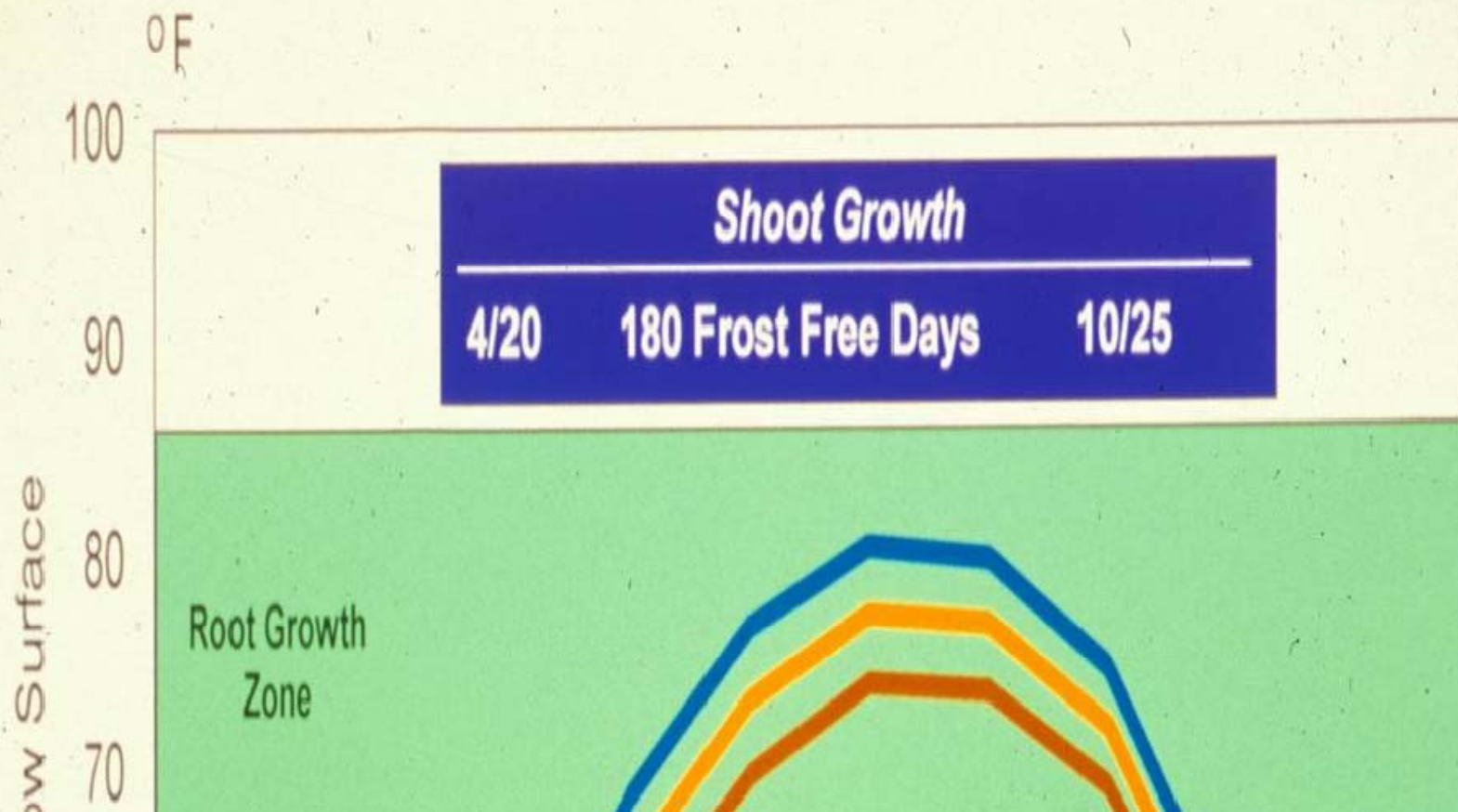
# Planting Holes

- Plants set in deep narrow holes produce more fruit (UI, Urbana –Champaign,1991).
- Holes are dug by hand or with a tractor mounted auger.
- They are 18” diameter and 24” deep.
- Soil from holes is mixed 50/50 with moist peat moss at planting.
- It is thought that the deeper holes reduce plant stress.
- **Do not** put fertilizer in the hole at planting as it will burn the roots.

# Planting

- Blueberries grow best on soils that have a higher organic matter content.
- Standard recommendations are to mix 1 gallon of moist peat moss with the soil in the bottom of the hole prior to planting.
- One 6 cu ft bale of peat moss will do 45 plants.
- Water plants to settle soil around the root system.
- **Do not substitute** sawdust, hay or compost for the peat as this will stunt or slowly kill your plants.

## Chart 2. Relationship between blueberry shoot and root growth in Lexington, Kentucky.\*




# Mulching

- Mulch should be applied to a depth of 4-6 inches and reapplied when it rots to a depth of 3 inches.
- Remulching is necessary every year or two.
- Blueberry roots grow at the mulch/soil interface and if the mulch decomposes too much and is not replaced the roots will be exposed.
- Mulch is applied in a 3-4' wide band down the row.

# Mulching

- **Mulch moderates soil temperature, conserves moisture, releases nutrients, and helps with weed control.**
- **Producing plants are generally mulched after harvest to avoid removing blossoms and fruit during application.**
- **Woodchips, sawdust, pine needles, ground corn cobs, and straw**





7 yrs old  
no mulch

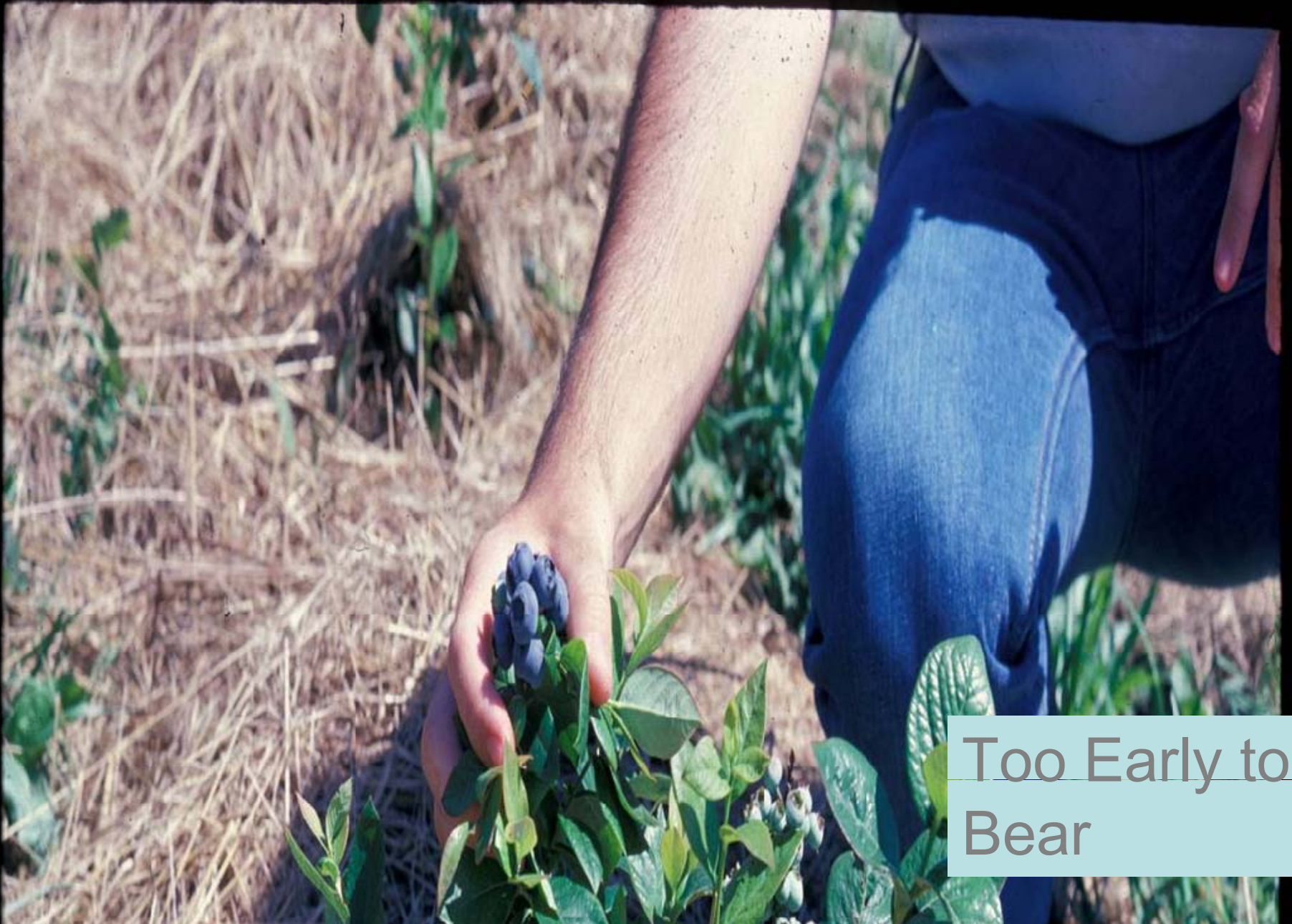


4 yrs old  
with mulch

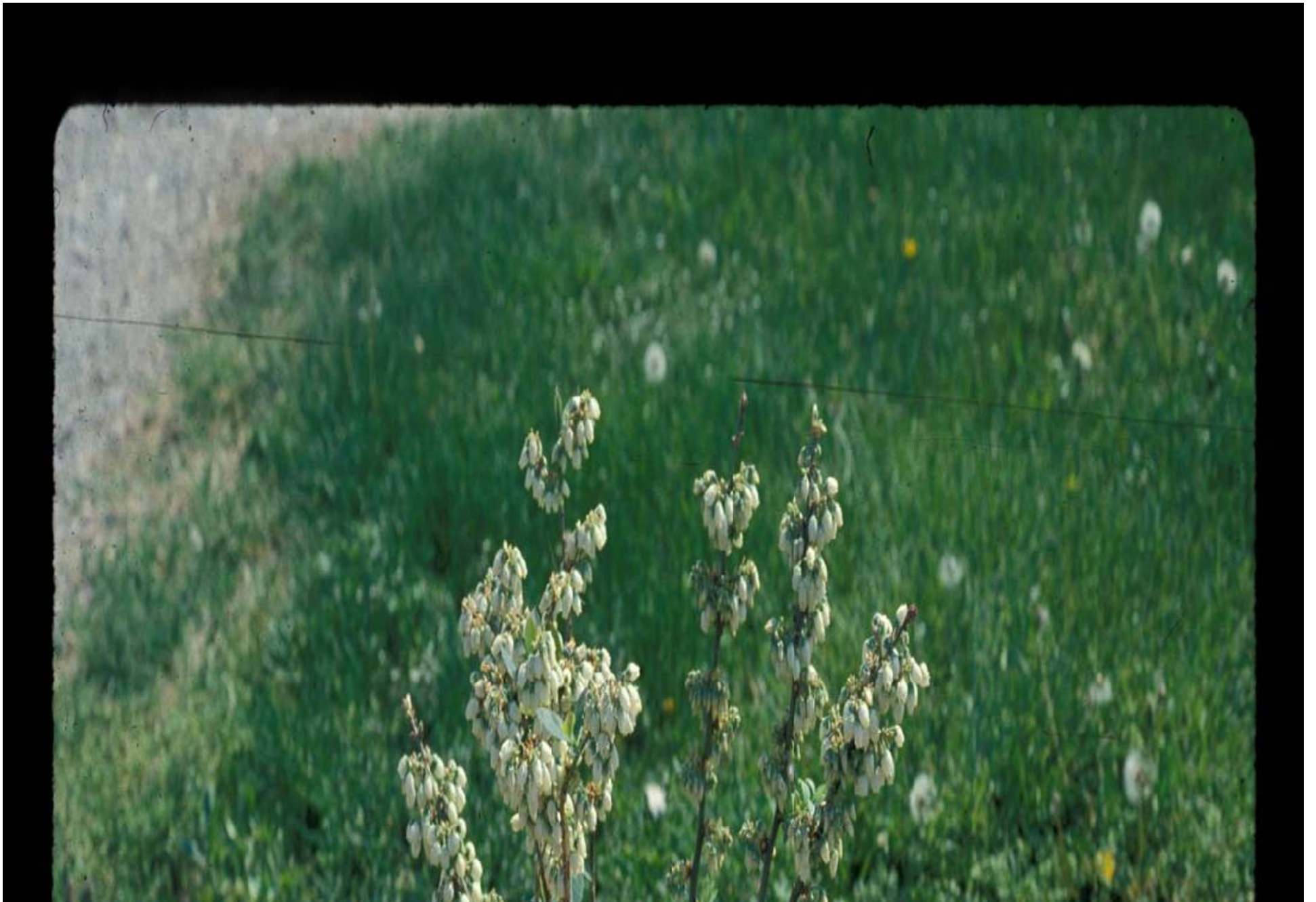




Mulch  
Spreader



Too Early to  
Bear



Good Time to Remove Flowers on Young Plants

# Fertilization

- Sidedress at bloom and 6 weeks later with 0.1 lb of ammonium sulfate per bush each time.
- Increase the amount of ammonium sulfate by 0.1 lb each year until 0.3 lb of ammonium sulfate is being applied per bush per application.

# Fertilization

- Be careful to apply fertilizer completely around each bush as little lateral transport of nutrients occurs from one side of the bush to the other.
- If you mulch with wood chips or sawdust, plants may need additional N at the rate of 0.1 lb of ammonium sulfate per plant for the first few years.

# Osmocote Plus 15-9-12 (5-6 months)

- N,P,K, Mg, Fe, Mn, Cu, Mo, and B
- Two sources of Fe
- Apply 2 oz/plant:
  - Mar., Apr, May, Jun. and Jul.
- Premium Horticultural Supply, Inc., Louisville  
Phone (502)582-3897



# Bud Swell



# Green Tip





# Bud Break



**Full Bloom**



# Bumble Bee Pollinating



# Flower Cross-Section



# Pollination

- Recommend 2 hives of honeybees per acre
- Fruit with more seeds tend to be larger
- No variety should be separated by more than 2 rows from a variety with a similar bloom or fruit maturity period.
- Move the bees into the field after blooms have begun to open.
- When temperatures are in the 70s and 80s°F, pollination will be adequate if you see 4-8 bees per bush.

# Pruning

- Remove any diseased or injured wood.
- Remove some of the less vigorous canes at ground level or cut these back to young shoots to that the bush never has canes that are over 5-6 years old
- Weak, brushy or twiggy wood should also be removed.

# Pruning

- **Up to 20% of the wood in a bush can be removed without decreasing yields.**
- **The number of berries will be decreased, but the size of the berries will be increased.**
- **Most growers do not let bushes get taller than 6 feet.**

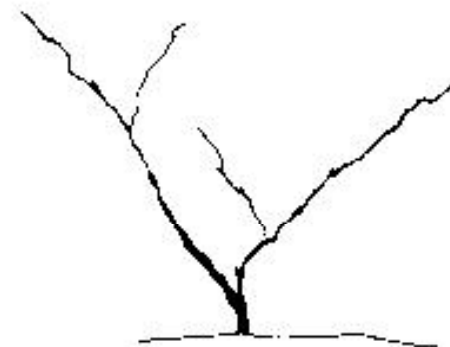
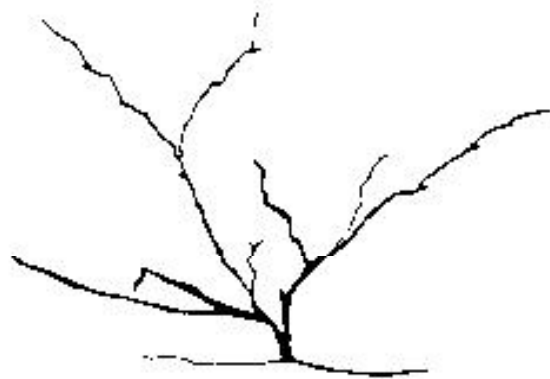
# Neglected Bush



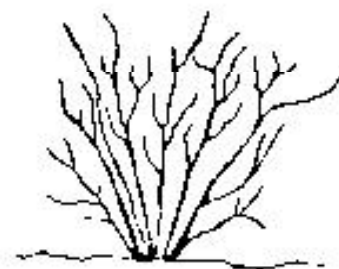
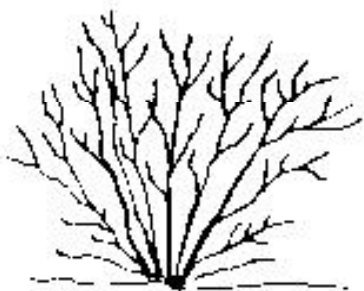


**BEFORE PRUNING**

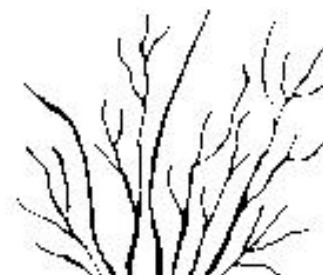
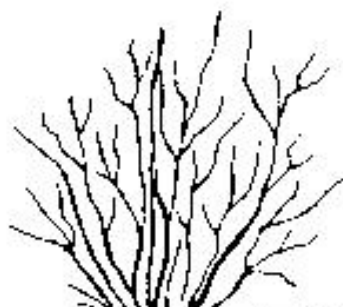
**AFTER PRUNING**



**1A. one-year old plant**



**1B. three-year old plant**





**Unpruned (left) and Pruned (right)**



**Desirable Pruning**



**Remove Dead Wood**



*Figure 56. Pruning recommendations.*  
a. A 15-year-old June bush before pruning. Right top section of the bush shows poor current wood growth, resulting from insufficient pruning and heavy crop production the previous year. Center part of the bush shows new vigorous growth caused by severe pruning a year ago.

b. The same bush after the bulk of poor wood has been removed by 5 lopper cuts and 14 cuts with the small shears. Scattering of small fruiting twigs is not sufficient to require further work. In fact these smaller twigs will increase the total crop if they are not too numerous to compete for soil moisture during hot, dry weather.



c. The same bush after a detailed finishing job was done by removing weak twigs and making a few additional small cuts. (Norman F. Childers, Rutgers University, New Brunswick, N.J.)

# Pruning

- Regular pruning is necessary to establish plants and to develop vigorous plants that produce consistent crops of large berries.
- Pruning may be done from leaf drop in the fall to bud break in the spring.

**Fe Deficiency**



Fe Deficiency

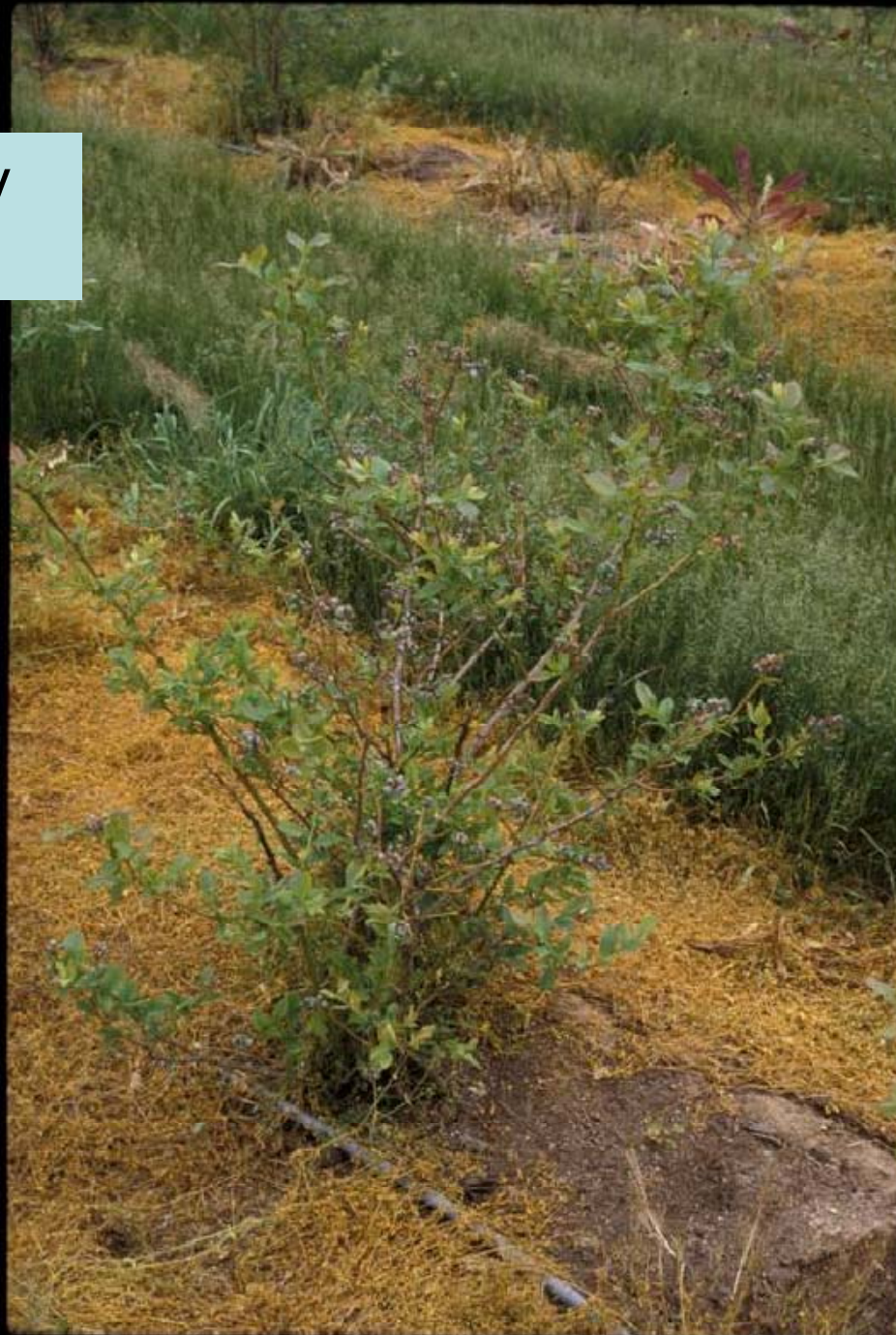






**Fe Deficiency**

Mn Deficiency  
pH 3.6





N Deficiency



Harvest



U-Pick

Pre-Picked



# Blueberry Harvest

- Fruit should be dry when harvested.
- Remove ripe berries with the thumb and forefinger, keeping the hand cupped under the berry to avoid dropping it.
- The whitish bloom on the fruit should not be rubbed off.
- Buckets should be no larger than 5 quarts and be rigid to reduce mashing and berry heating.
- The number of pickings per variety can vary from 3-7.

# Blueberry Harvest

- Most commercial operations pick a field once per week.
- Under normal conditions blueberries may remain on the bush for up to 10 days after ripening without a loss in size.
- Blueberries will develop blue color both in the light and dark at a suitable temperature. Color development is best at 70-80°F.



# Rules for Blueberry Pickers

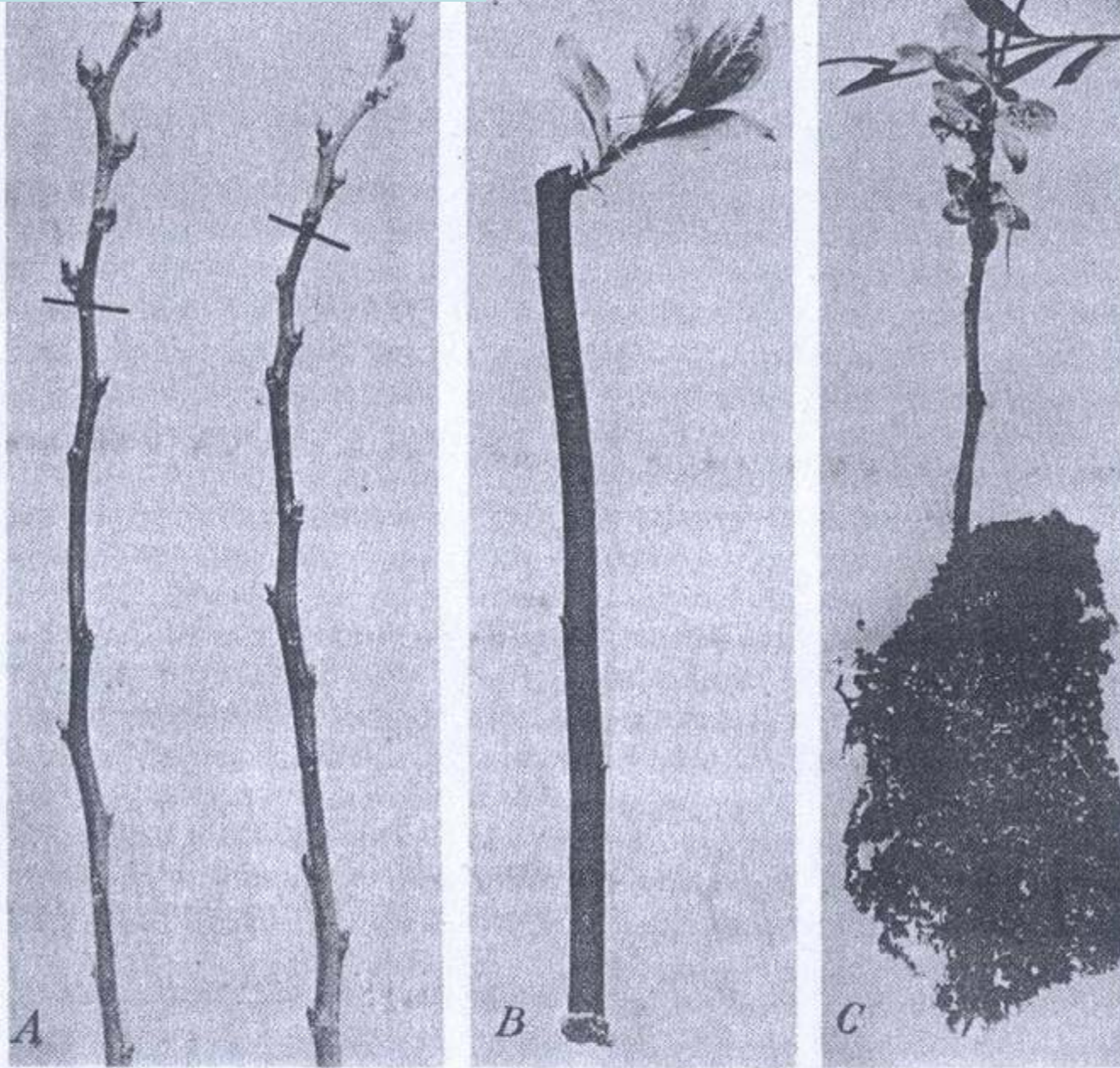
- **Keep your hands clean.**
- **Pick all ripe blueberries on the bush before moving on to the next bush.**
- **Harvest only well-ripened fruit and leave immature fruit for the next harvest.**
- **Place hands under clusters to avoid dropping berries.**
- **Avoid overfilling your hands; do not squeeze or roll the fruit.**
- **Do not put trash or cull berries into the container.**
- **Never allow harvested fruit to remain in the sun.**



# Blueberry Storage

- Fresh blueberries keep best at 32°F & 85% relative humidity.
- Packaged blueberries will hold with 5% waste for:
  - 2 weeks at 32°F
  - 1 week at 40°F
  - 2 days at 70°F

# Propagation





Hardwood cuttings

A photograph of a garden bed. On the left, there is a dense patch of green and brown weeds. A wooden border runs diagonally across the middle. To the right of the border, a white PVC pipe is laid out. Further right, a blue tarp is partially visible, with some white plastic or fabric debris on top of it. The scene is outdoors with natural lighting.

## Propagated Cuttings

1 Year  
Old



**2 Year Old**

**Ideal for  
Purchase**



