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### Outline


- 1. Production Practices**
- 2. Establishment**
- 3. Pruning**
- 4. Fertilizing**
- 5. Variety Selection**
- 6. Hang-ups**



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## Gordon & Emmalea's 5 Blueberry Commandments

1. Adjust pH to 4.5-5.0
2. Amend soil with low pH organic matter (e.g. peat moss, pine bark fines)
3. Apply mulch to the root zone
4. Irrigate
5. Control weeds



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## Adjust Soil pH to 4.5 – 5.0

(and keep it there!)

**Before Planting**  
Test soil pH and incorporate enough elemental sulfur to lower pH to 4.5 (or 5.0)

**After Planting**  
Test soil pH annually and maintain soil pH between 4.5 and 5.0 through choice of nitrogen sources, mulch material, sulfur application or additions to irrigation water.

**Keep in Mind**

- Sulfur will take 1 year or more to fully react to lower soil pH.
- Preplant is your last chance to incorporate anything for the life of the planting.
- It is possible to go too low.
- Consider getting set up to test soil pH yourself.

**Amount of Sulfur (lbs/acre) Required to Lower the Soil pH**

Starting Soil pH	Target pH 4.5			Target pH 5.0		
	Sand	Loam	Clay	Sand	Loam	Clay
4.5	0	0	0	-	-	-
5.0	175	520	610	0	0	0
5.5	350	1,050	1,130	175	520	610
6.0	520	1,520	1,610	350	1,050	1,130
6.5	650	2,000	2,090	520	1,520	1,610
7.0	830	2,530	2,610	650	2,000	2,090
7.5	1,000	3,010	3,090	830	2,530	2,610

Information from the Mid-Atlantic Berry Guide

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## Amend Soil With Low pH Organic Matter

There are options.

**Before Planting**

- Plant a cover crop in years preceding planting to increase organic matter (sudangrass, buckwheat, vetch, rapeseed)
- Incorporate low pH organic amendments such as pine bark fines. Manure or compost can be used if low salt and low pH.

**At Planting**

- Incorporate 1 (and only 1) gallon of peat moss with backfill soil for each plant. (Some alternatives exist.)

**After Planting**

- Mulch the blueberry root zone with low pH organic matter such as wood chips or pine bark.

**Keep in Mind**

- Heavy soils need organic matter to improve drainage
- Sandy soils need organic matter to increase water holding capacity

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## Planting Hole Amendment Study

**Annual Yield**

**Experiment Description**

- Incorporated 1 gallon of organic amendment at planting or no amendment (negative control)
- Used the variety 'Chandler'.
- 2 plants/plot with 4 reps per treatment

**Conclusions**

- No amendment produced 7.5 fewer lbs/plant over six years compared to peat moss.
- Peat moss, pine bark fines and chipped construction waste performed well

**Cumulative Yield**

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### Apply Mulch to the Root Zone


**Mulch is important.**

**The Functions of Mulch**

- Suppress weeds
- Keep roots cool
- Conserve moisture
- Increase soil organic matter over time

**Mulch Material Options**

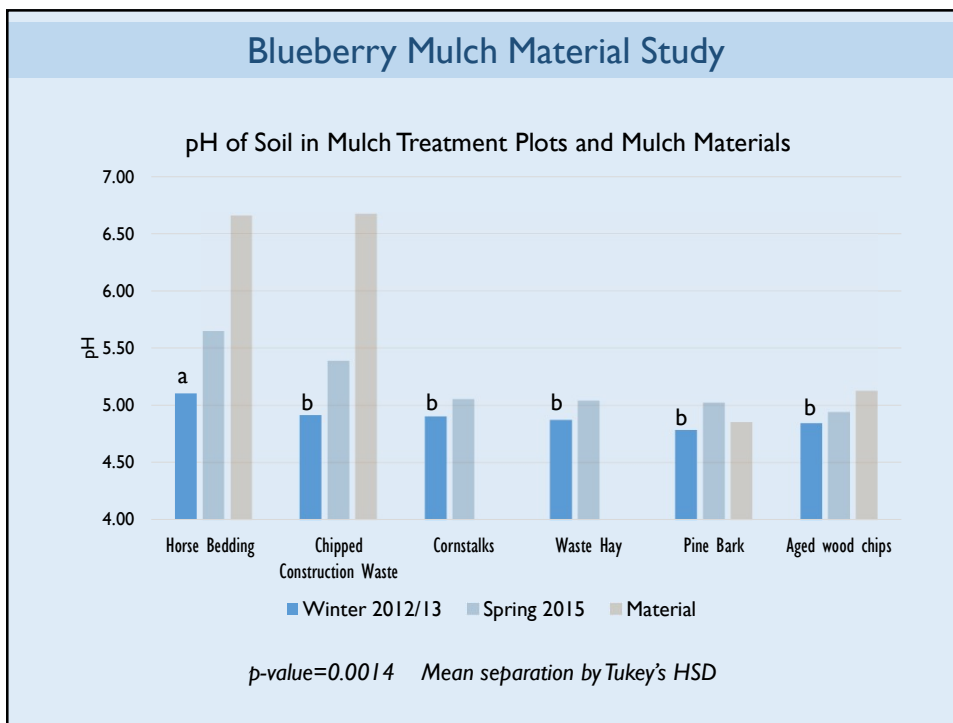
- Pine Bark
- Semi-Composted Wood Chips
- Waste Hay or Straw
- Other high lignin, low pH waste products.



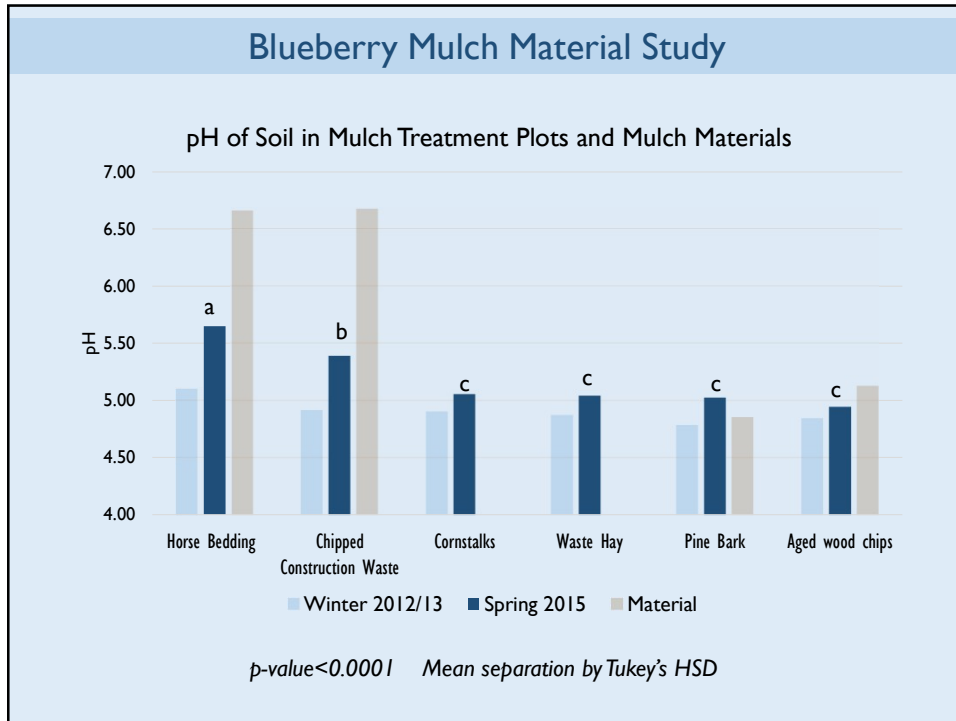
**Keep in Mind**

- Some materials will raise or lower soil pH
- Hay and straw are hard to spread mechanically and will not contribute to soil organic matter as much as wood or bark.
- Consider cost and availability. You may be able to get some materials for “free”.

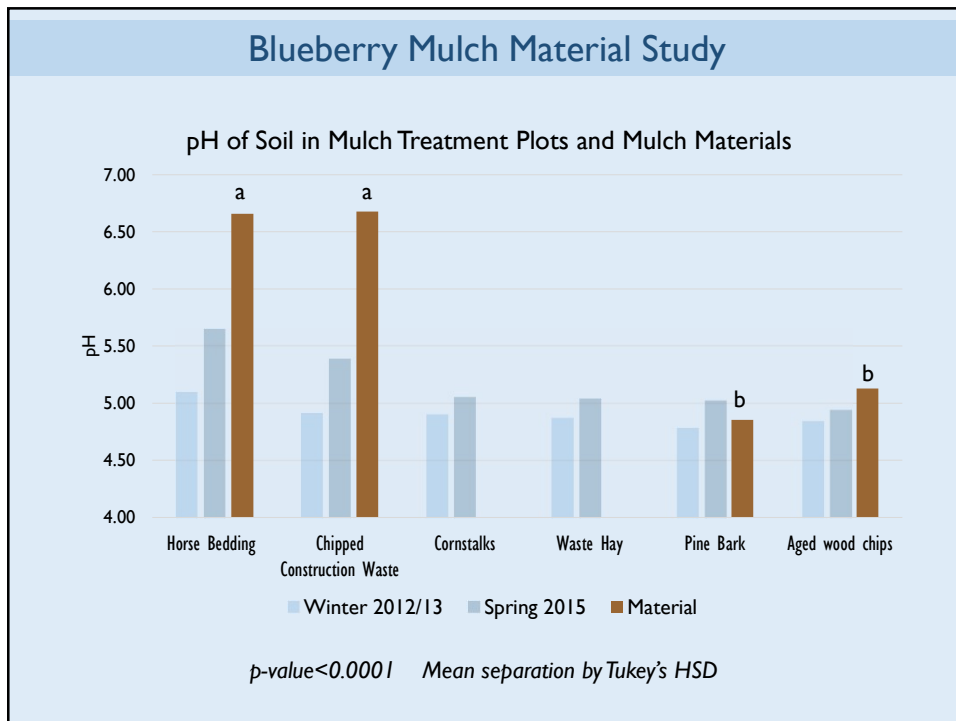
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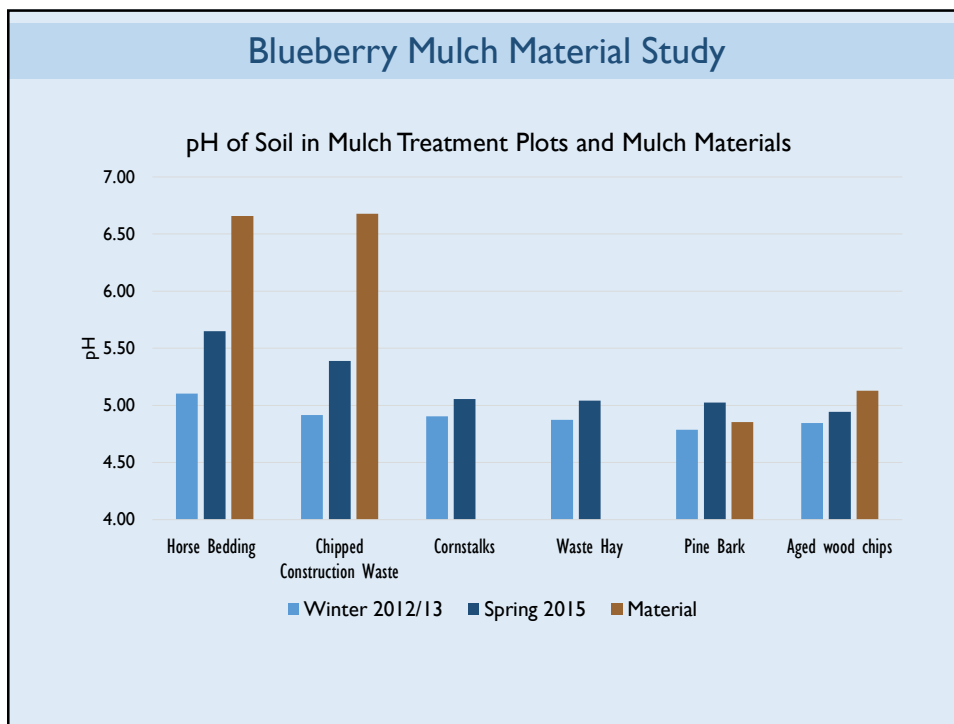
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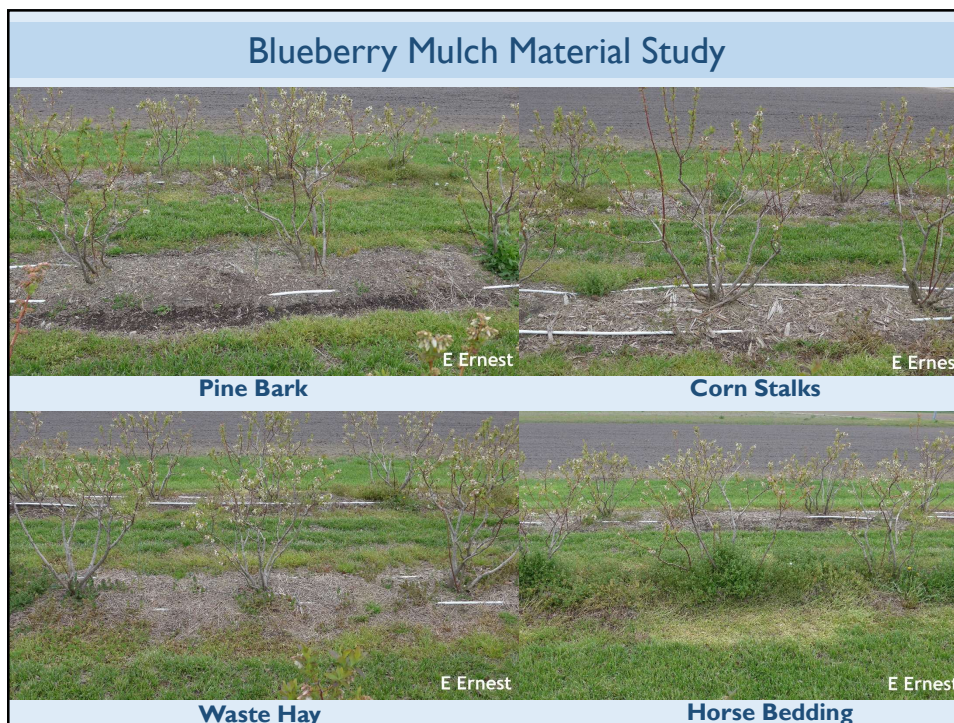
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## Irrigate


Wild blueberries live in wetlands. They need 2 acre-inches of rain/irrigation per week.

**Drip Irrigation**

- Use heavy duty tubing suitable for multiple year installation
- Install two drip lines per row
- Can be used to fertigate
- Plan to clean the system out annually

**Overhead Irrigation**

- Can be helpful in establishment year(s)
- Can be used for frost protection



**Keep in Mind**

- Blueberries don't tolerate flooding. Create raised beds if field is flood prone.
- Blueberry roots are sensitive to drought and will only explore/persist in moist soil.

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## Control Weeds

Blueberry plants do not compete well with weeds.

**Weed Control Strategies**


- Start with a clean field.
- Keep mulch in good shape.
- Mow weekly or maintain bare mulched row middles. Keep problem species out of row middles.
- Plant varieties that mature at the same time in the same block to facilitate timely post-harvest weed

**For Specific Herbicide Recommendations:**

- Commercial Blueberry Pest Control Recommendations for New Jersey
- Mid-Atlantic Berry Guide

**Keep in Mind**


- Hand weeding and/or spot spraying is nearly unavoidable
- Landscape fabric is used in some areas but has not been used extensively in the Mid-Atlantic.



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## Establishment Tips

### Follow the 5 Blueberry Commandments

**Be Ready Before Plants Arrive**


- Start soil preparations at least one year in advance.
- Have irrigation installed and ready to go.
- Dig holes before plants arrive.
- Have a plan for moistening the peat moss.
- Have mulch on hand.

**Obtaining Plants**

- Plants are usually delivered in early spring for dormant planting.
- Larger plants will establish faster, to a point. Two-year old plants generally recommended.
- Plants with soil on the roots are less sensitive than bare root plants

**Keep in Mind**

- You may need to order early to get the varieties you want.



Georgetown Planting, Fall of 1<sup>st</sup> Year

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## Establishment Tips

### A few more tips:

#### Promote Vegetative Growth

- Remove all flower buds, flowers and fruit as early in the growing season as possible during the planting year and in the second year.
- Remove about 50% of flower buds in the third year.
- Irrigate frequently and monitor soil moisture in the root zone.
- Provide timely N fertilization.

#### Keep in Mind

- If plants do not establish and put on significant growth they will never produce a significant yield.

Georgetown Planting, Fall of 1<sup>st</sup> Year



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## Pruning

### Prune in February or March

#### Pruning Goal

- Keep ~15 canes, all less than 5 years old.

#### Pruning Strategy

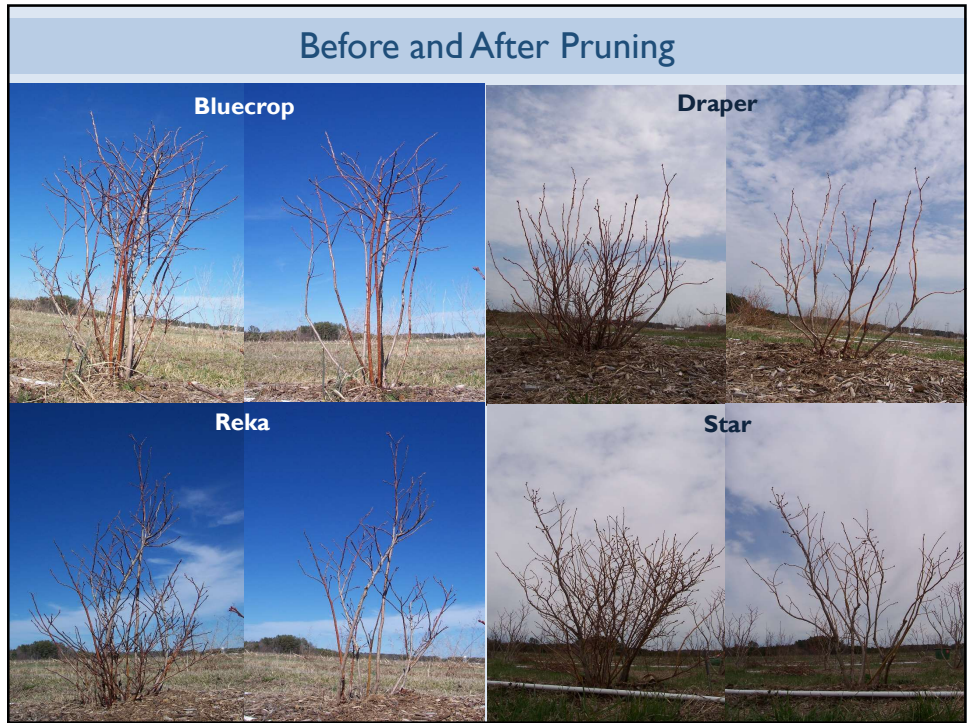
- Remove all dead wood.
- Keep the 3 best one-year old canes and remove the rest.
- Remove one out of six old canes. Prioritize the oldest ones for removal.
- Remove all low branches that are hard to pick and are "mower-bait".
- Thin twiggy wood as time allows.

#### Keep in Mind

- Some varieties are easier/faster to prune than others.
- Pruning is a good time to evaluate plant vigor and decide if you need to recheck soil pH or your fertilization program.



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### Fertilizing

New Canes Should Meet or Exceed Height of Old Ones

**Fertilization Recommendations**

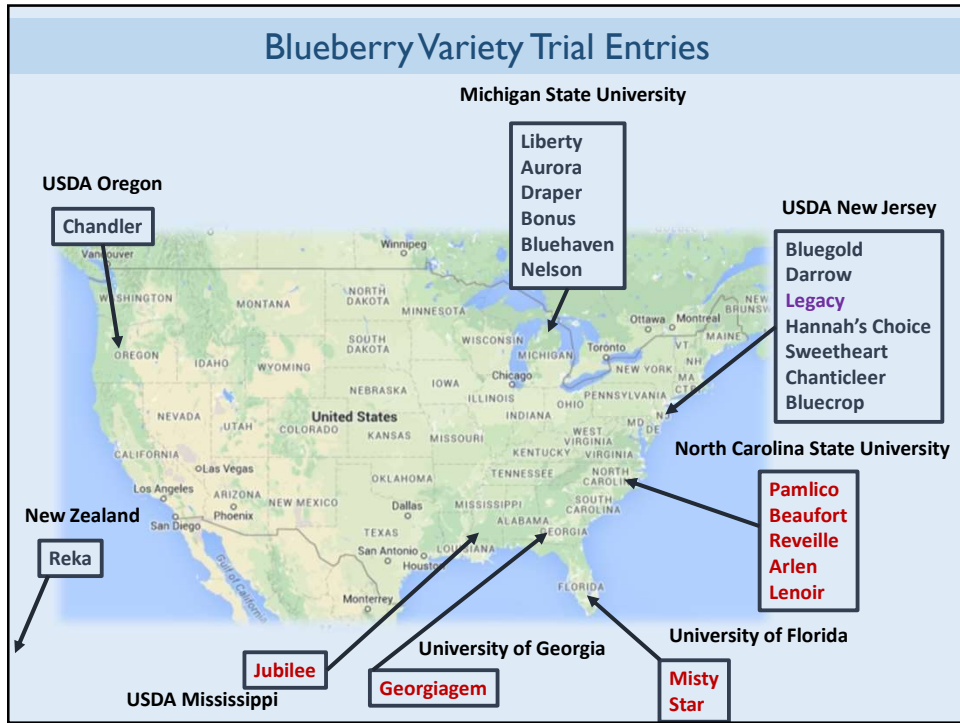
- Apply P and K before planting, based on soil test results
- Apply N annually as Urea (to maintain soil pH) or Ammonium Sulfate (to lower soil pH)
- Split N applications with half applied at bloom and half applied 6 weeks after bloom (I tested these N recommendations and there is no benefit to more N.)

Age of Planting	Actual N per Acre (lbs)
<b>Planting Year</b>	10
<b>2</b>	20
<b>3</b>	30
<b>4</b>	40
<b>5</b>	50
<b>6</b>	60
<b>7+</b>	65

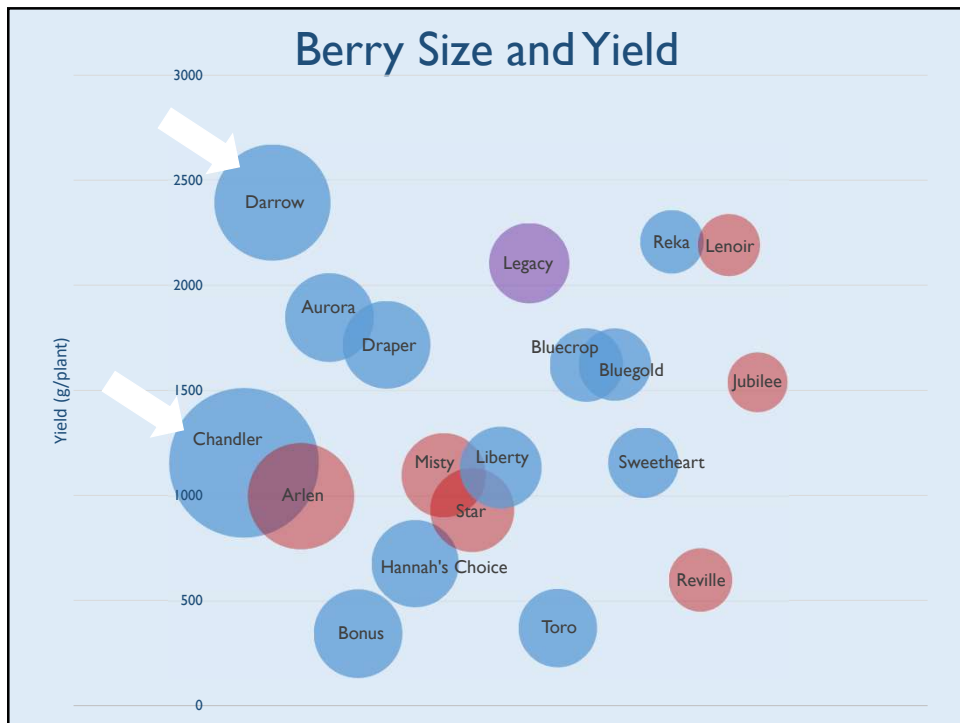
**Keep in Mind**

- Leaf tissue tests taken in August are recommended to monitor status of other nutrients as the planting matures.

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## Variety Recommendations

### Lenoir



### Legacy



- Vigorous, established well
- Good yield
- Excellent quality fruit

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## Variety Recommendations

### Draper



- Good yield
- Moderate size fruit
- Established well
- Good flavor ratings

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## Variety Recommendations

### Reka



### Darrow



- Vigorous, established well
- Good yield
- Fruit quality caveats

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## Variety Recommendations



### Aurora



- Slow starter, but established well
- Good yield
- Late flowering and fruiting
- Low flavor ratings

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### Variety Recommendations

<h4>Bluegold</h4> 	<h4>Bluecrop</h4> 
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- Moderate yield
- Moderate vigor
- Good flavor ratings

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### Variety Recommendations

<h4>Chandler</h4> 	<h4>Jubilee</h4> 
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<ul style="list-style-type: none"><li>• Moderate yield</li><li>• Good vigor</li><li>• Good flavor ratings</li><li>• Very large berries</li></ul>	<ul style="list-style-type: none"><li>• Moderate yield</li><li>• Excellent vigor</li><li>• Good flavor ratings</li><li>• Small berries</li></ul>
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## Hang-Ups & Other Stuff

### Bugs, Birds, Diseases, Deer & Marketing

#### Bugs

- Spotted wing drosophila can be an issue, especially in later varieties, be prepared.
- Other insect pests can become an issue in established plantings.

#### Birds

- They will show up. Level of issue depends on surrounding environment and time of year.
- Options are netting, scare devices, deterrent sprays or an overwhelming number of blueberries.

#### Deer

- Deer browsing can really stunt or kill establishing plants. (electric fence)

#### Diseases

- Start with plants from a reputable nursery!!!!
- Diseases can come from wild plants nearby.
- Root diseases can come in on pine bark mulch.

#### Marketing

- People are interested in U-Pick, but you will have to pick too.
- Make variety selections based on your marketing plan.
- Small scale grading equipment can help.

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## Resources for the Mid-Atlantic

#### Mid-Atlantic Berry Guide

- Possibly available from Penn State?  
<https://extension.psu.edu/the-mid-atlantic-berry-guide-for-commercial-growers>

#### Commercial Blueberry Pest Control Recommendations for New Jersey

- Available online for free.  
<https://njaes.rutgers.edu/pubs/publication.php?pid=E265>

#### Watch Emmalea Prune Blueberries on YouTube

- <https://www.youtube.com/watch?v=eJS3JKHPccE>

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