

All About Your Liners

Varieties

- Currently we list nine varieties available from the Hydrangea Breeder's Association in Germany.
- A full range of colors in blue, pink, red, white and bicolors.
- Compact habits, good breaking action with strong stems.
- Excellent keeping quality in the store and the home.

Product Specs- measured from the bottom of the pot.

- 4½" liner: minimum 4 canes, 6 to 9" in height (**Bela, 3+ canes**).
- 6½" liner: 4+ canes, 9" to 11" in height (Bela, 3+ canes).
- **NEW!** 32 cell pinched: minimum of 3 canes, 6" to 8" in height.
- 21 cell non-pinched: 6" to 8" in height. For a single stem plant with one big flower.

Availability

- December 29, 2014 through April 27, 2015

Quality Control

- Liners are machine pinched for best uniformity and consistency.
- Only strong terminal canes are counted for cane count.
- Grading is a 5 step process from planting to pack.
- Aluminum sulfate is applied up to 8 times **ONLY** on **BLUE** varieties (Early Blue, Bela and Bavaria) during liner production.

Starting Out

- See Chart 1 for recommended finished pot size by variety.
- Use soilless media, mostly peat, pH 5.0. Some Perlite or Haydite can be added for better aeration. Add gypsum to provide calcium on all varieties without effecting pH.
- **POT IMMEDIATELY UPON RECEIPT** at the same level as the crown of the liner. If you must delay, unbox, and refrigerate at 35°F (2°C) to avoid Botrytis and

1. Recommended Finished Pot Size By Variety

Variety	Color	4.5"	6.5"	8"	10"
First White	white		x	x	
Pink Picotee	light pink		x	x	x
Pink Sensation	pink		x	x	
Hot Red*	red	x			
Tivoli	red/white	x	x		
Bela	blue		x	x	x
Early Blue	blue	x	x		
Bavaria	blue/white		x	x	
Sweet Dreams (Lacecap)	pink	x	x	x	

*Hot Red is not recommended for 6" or larger pots without use of Fascination (usually required for adequate height).

2. Average Time to Sepal Color by Response

(For April 1st flowering in the north, grown at 65°F (18°C) without the use of PGR'S)

Variety	Color	Response in days with no B-NINE	Response Group
Bela	blue	65	EARLY
First White	white	68	
Early Blue	blue	72	
Hot Red	red	72	
Sweet Dreams	pink	72	MID
Bavaria	blue/white	75	
Pink Sensation	pink	77	
Pink Picotee	lt. pink	79	LATE
Tivoli Red	red/white	78	

- stretch.
- Saturate liners before potting.
- Scoring root balls is optional.
- Water in thoroughly.

Timing The Crop

- Grown as recommended, a range of 60 to 80 days are needed till sepal color by April 1st, in the North, for our HBA varieties. Mother's Day crop time is shorter. See Chart 2 for details.
- For flowering varieties together, plant later varieties first and the earlier varieties later.
- Also make use of warmer and cooler locations in your

greenhouse for plants ahead or behind schedule.

- B-Nine can add up to 7 days in crop time if applied after buds are more than 2" in diameter. If height control is still needed, use Bonzi at 1-2 ppm applied as a drench.

2-4-6-8 Crop Development Guidelines

- 2 weeks before sales – sepal color showing
- 4 weeks before sales – buds are quarter sized
- 6 weeks before sales – buds are nickel sized
- 8 weeks before sales – buds are dime sized

Growing The Crop

Light Intensity

High levels – up to 5,000 to 7,000 foot candles (fc) for most of the crop.

Reduce to 2,500 to 3,000 fc when sepals begin to enlarge, to prevent sepal burn and color fade.

Spacing

- Near pot-to-pot the first 2 to 3 weeks
- Minimum spacing afterward:
4.5" Pot Single Stem 8" x 8"
4.5" Pot Pinched 10"x 10"
6.5" Pot 16"x 16"
8.0" Pot 20"x 20"
10.0" Pot 24"x 24"
- Crowding will contribute to uneven flowering, stretch, Botrytis and Powdery Mildew.

Temperature

- Bottom heat is a plus the first 4 weeks.
- First 7 days keep a constant average of 65°F (18°C), day/night temperature, in order to promote and activate rooting.
- Day 8 onward. Maintain a 65°F (18°C) day/night temperature with a 5° positive or negative DIF depending on growth and pot size. Reference the Crop Development Guidelines (see Timing the Crop section) and Graphic Tracking (see PGR section) for guidance.

Fertilization – pH and Color Control Guidelines

It all goes together, fertilizer used influences pH and pH determines color.

Starting Out: Use a constant feed of 150 to 200 ppm nitrogen with drip or tube irrigation, and 100 to 150 ppm with sub irrigation. Get to an EC reading of .6 to 1.0 using a 2:1 ratio.

In winter and early spring, you generally will irrigate more on drip or tube irrigation than sub irrigation, so getting to the desired EC will take longer with sub irrigation.

Color Control Chart

Required	Blue Varieties	Pink, Red And White Varieties
Ph	5.0 to 5.5	5.8 to 6.2
Phosphorous	Low	High
Potassium	High	Low
Fertilizer	Use 20-2-20, 14-0-14 or 15-0-30	Use a high P fertilizer such as 15-30-15
When using acid injection	Use Sulfuric Acid	Use Phosphoric Acid

Growing On: After reaching the desired nutrient level, cut back to 100 to 150 ppm nitrogen on a constant basis.

Finishing: Reduce feed to every other irrigation at first color.

- Keep in mind Aluminum Sulfate moves rather slowly through the plant, so stay with the process. Any fix is not a quick fix.
- Again, if acid injection is used, use Sulfuric acid. NOT Phosphoric acid!

Tips For Best Blue Color

- If you had trouble with a steady 5.0 pH, try going a bit lower but not below a pH of 4.5.
- **Be aware:** Aluminum Sulfate applications have been applied during liner production on the blue varieties (Early Blue, Bela and Bavaria).
- You must continue Aluminum Sulfate applications, in addition to the regular feeding program, beginning about 14 days after potting when the root system has become established.
- The rate is 8 lbs/100 gallons applied to thoroughly drench the media. This should provide an EC of 2.5 to 2.7.
- If you apply by hose, and your media is up to the rim of the pot, 2 applications may be necessary to thoroughly drench the media.
- Apply to a moist media.
- 3 to 4 applications of Aluminum Sulfate is only a guideline.
- Monitor pH and continue to maintain the required pH of 5.0 to 5.5. Go to 4.5 if you have had blue color problems at 5.0 in the past.
- Aluminum Sulfate does not dissolve well. Try putting it in a bucket and make a slurry, then add it to HOT water in the barrel, using an agitator to minimize precipitation.

Tips For Best Pink, Red And White Colors

- If media pH moves above 6.2, you may experience chlorosis.
- Iron chelate applications such as Iron Sequestrene 330 or Sprint 138 can be effective.
- It is difficult to green up foliage once flowering begins.

Tips For All Colors

Check pH and EC weekly, and on the day before you feed to adjust for chlorosis, pH, fertilizer analysis and concentration.

Water Management

- Plants require frequent applications as they grow and develop flowers, so soft growth is best avoided with proper spacing and low humidity.
- Avoid overhead irrigation.
- Avoid wilting at all costs, and at all times.

Plant Growth Regulators (PGR)

Good light, proper spacing, temperature and a good root system are always basic tools to control height.

Use Graphic Tracking to guide your PGR usage

Track height weekly, by variety, to determine if you are on schedule.

Make adjustments in temperature and PGR if needed.

1. Determine the height of your liners at potting, the finished height required, and the number of weeks till sell date.
2. The difference in the finished height required, less your measured height of the liner, divided by the number of weeks you have will give you the average number of inches or centimeters of growth required each week to be on track.

Easter

6½" pots and larger usually require little B-Nine. Bela and Bavaria may require some B-Nine if you see some stretch developing.

4½" pots will require B-Nine, since the dormant liner is about two-thirds the finished height desired for most markets.

Mother's Day and beyond:

Flowerings will require B-Nine applications for all sizes.

Applications of B-Nine can begin when true leaves begin to unfold and internode length is about ½ inch. Start with 750 to 2000 ppm of B-Nine and increase, if needed, by variety every 10 days, while considering weather and final height required.

Bela, Bavaria and Sweet Dreams are the more vigorous varieties, and should be monitored for more applications than others, with concentrations up to 5000 ppm.

B-Nine can be applied until buds reach the size of a quarter (1") on early spring crops with a minimal amount of delay and up to 2" on Mother's Day and later crops.

Bonzi at 1 to 2 ppm can be used as a DRENCH to stop growth, but is usually not needed on the HBA varieties.

Fascination can be used if the desired plant height is behind schedule.

IT IS MOST LIKELY TO BE NEEDED WITH HOT RED IN 6" POTS OR LARGER.

It can be applied TWICE if needed at 5 ppm, 10 days apart in combination with a positive DIF of 68°F (20°C) day temperature and a 62°F (17°C) night temperature.

The time frame Fascination can be applied is from about Week 2 (after potting), when roots are established, until the buds are ¼" in diameter.

DO NOT apply later, or over use it, as that can cause splitting of the flower head.

Before using any pesticides, be sure they are registered for use. Follow label directions. The label is the law.

Insect and Disease Control

Insects

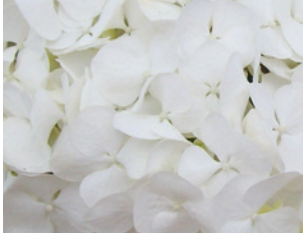
Scout regularly. Primary concerns are aphids, spider mites and thrips.

Disease

Powdery mildew and botrytis are the most common. Provide good cultural practices of ventilation, heating and air flow to keep relative humidity low. Avoid water on leaves and flowers.

Hydrangea Varieties

Hydrangea Breeders Association (HBA) Varieties



First White

(USPP# 16204)
An early, pure white with very large flowers and moderate vigor.



Pink Picotee

Light pink which also has late response, but more vigor than Pink Sensation.



Pink Sensation

(USPPAF)
Our number one pink. Best described as a bright bubble gum pink color, with a late response and moderate vigor. Flowers have a unique quilted appearance. Heavily branched. Late response is due to heavy branching.



Hot Red

(USPPAF)
Red with a compact habit and early response. Not recommended for 6" or larger pots unless Fascination is properly used.



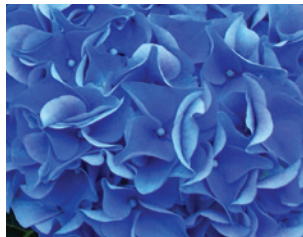
Tivoli

(USPPAF)
Dark pink to red flowers with a white picotee edging. Tivoli has a compact growth habit and a late response.



Bela

(USPP# 16099)
Without any B9, Bela will flower earlier than Early Blue. It's vigor may require PGR's which can delay response to a few days later than Early Blue. Better suited for larger pots.



Early Blue

(USPP# 16441)
Our number one blue for its compact, easier-to-control habit. It's early like Bela, but has a more compact habit.



Bavaria

(USPPAF)
Blue flowers with white edging



Sweet Dreams

(USPP #16264)
Lace-cap type with pink flowers



4½ Round



6½ Round



NEW!
32-cell pinched



21-cell single stem



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