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Ageratum Production

Ageratum houstonianum Mill.

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I. Common Name: *Ageratum*, Floss Flower (*Eupatorium coelestinum* is known as 'Hardy Ageratum')

II. Botanical Description: Composite Family, Ovate to deltoid leaf shape to 4 3/4" in length, sometimes downy, apex usually rounded, base heart shaped, margin crenate or rarely dentate. Capitula 5-15 in terminal, usually loose clusters; involucre to 5 mm, densely hairy to subglabrous; flowers to 3.5 mm, tube white, lobes blue lilac, lavender, pink, or white.

III. Growth Habit: Most commercially produced cultivars are well branched forming a 4-6" tall plant with width equalling height. Some species/cultivars used for cut flowers can reach 12" in height.

IV. Native Habitat: *Ageratum houstonianum* is native to Mexico, Guatemala, and British Honduras.

V. Name Derivation: The name 'ageratum' is derived from the Greek "a" meaning without and "geras" meaning age. The name refers to the long lasting flower color of ageratum. The species name honours William Houston, a Scottish physician, who collected plants in Central America in the early 18th century.

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VI. Greenhouse Products

Grown: Ageratum are grown in bedding plant flats, 4" pots, and in mixed containers.

"Although ageratum are somewhat heat tolerant, flowering will stop if plants are water stressed."

VII. Landscape Use: Ageratum cultivars range in height from 4-24 inches. Therefore, landscape use is varied. Recent F₁ hybrid introductions are by far more vigorous and continuous flowering than older cultivars. These hybrids grow to 4-6" in the landscape and make excellent border plants. Common ageratum cultivars and performance ratings in Minnesota are shown in Table 1. Taller cultivars are usually grown as a cut flower. Ageratum are unique in

that the flower color of most cultivars is blue; blue is an uncommon color in bedding plants (with the exception of petunias and lobelia). Although pink and white flowering ageratum are available, they are typically less vigorous, grow taller, and have smaller flowers.

Ageratum are not drought tolerant and grow best in areas with morning sun only and/or filtered sunlight all day in a rich soil high in organic material, i.e. add peat to topsoil to 'lighten' soil prior to planting. Ageratum are susceptible to powdery mildew, and slug and snail attack in the landscape. Control powdery mildew by removing infested plants and avoid wetting the foliage and applying fungicides if necessary.

VIII. Companion Plants in Landscape: Impatiens, begonia, gerbera, lobelia, New Guinea impatiens, Tuberous begonia, any 'sun' annuals that are also not drought tolerant.

IX. Special Considerations in Production and Use: Ageratum is very frost sensitive, requires growth a retardant application in the

Table 1. Cultivar, source, and performance of a variety of *Ageratum houstonianum* cultivars across 3 Minnesota trial gardens.

Cultivar	Source	Performance (10=best, 1=poor)
Blue Blanket	Sluis and Groot	8.5
Blue Lagoon	Sluis and Groot	7.7
Danube Blue	Bodger Seed	7.0
Hawaii Blue	Bodger Seed	7.6
Hawaii Royal	Bodger Seed	5.9
Hawaii White	Bodger Seed	8.0
Horizon Tall Blue	Sakata Seed	8.4
Neptune Blue	Goldsmith Seed	9.0
Royal Blue	Bodger Seed	6.0
Royal Delft	Sluis and Groot	7.5
True Blue	Grimes Seed	7.5

greenhouse, and is very sensitive to high soluble salts.

X. Propagation: Ageratum are typically produced from seed. Most bedding plant producers purchase plug trays rather than sowing and germinating seed themselves to increase uniformity in final plant height and flowering time.

XI. Seed Description: Ageratum seed are very small, elongated and are grey in color with a small tan colored tail attached. There are 7,150 seed per gram or approximately 200,000 ageratum seed per ounce.

XII. Special Considerations: Ageratum seed germination is 'light aided' at temperatures greater than 68°F. In addition, ageratum seed germination is best when pH is adjusted to 6.0-7.0, soluble salts are low, and germination media has not been treated with methyl bromide.

XIII. Sowing Technique and Germination Environment: Ageratum are typically sown in a 288 plug tray. Sow seed onto premoistened media and place in a 22-24°C (72-76°F) environment under continuous lighting (10 footcandles minimum) supplied using fluorescent or high pressure sodium lamps. Humidity levels should be maintained at at least 65% during germination.

Remove germinating seed from the germination environment immediately after seed 'cracking' is visible on >80% of seed and place the plug tray under natural light conditions (not greater than 2000 footcandles) in an environment where germinating seed are misted at least once every 20 minutes during the day. Seed germination should occur in 3 days. Old seed can require as long as 7 days. Seedlings can be transplanted any time after 2 true leaves have formed.

XIV. Flower Induction and Development: Ageratum are primarily day-neutral, i.e. flower induction occurs irrespective of daylength. Flowering usually occurs in 8-10 weeks from seed germination.

Most rapid development occurs (7-8 weeks to flower) when plants are grown at constant 22°C (72°F). Ageratum should not be grown at temperatures less than 15°C (60°F). Time to flower is 11 weeks when plants are grown at constant 63°F.

XV. Media and Fertility: Ageratum should be grown in a soilless media or a media composed of not more than 15% sterilized soil. Media pH should be maintained at 6.0-6.8. Media may have to be pH adjusted prior to sowing seed to increase percent germination as seed germination is greatest when pH is greater than 6.0 and most soilless media pH is initially 5.3-5.7.



"Supplemental lighting aides in ageratum seed germination."

Ageratum do not require high fertility. Excessive fertilizer (especially ammonium forms of nitrogen) promote stem elongation, and soft growth. In addition, nitrogen levels in irrigation water >300 ppm N can cause leaf burn, i.e. leaf spotting.

Lastly, salt levels higher than 1.5 using Spurway analysis can cause soluble salts injury which is typified in ageratum with a leaf edge burn.

Recommended media nutrient levels for ageratum are shown in Table 2. Recommended leaf tissue nutrient content is shown in Table 3.

Height Control:

Ageratum stem elongation can be controlled using temperature/ growth retardants.

Ageratum stem elongation decreases as the difference between day and night temperature decreases.

Therefore, maintain day and night temperatures as close to constant as possible to limit elongation.

Ageratum stem elongation can also be reduced by dropping temperatures from sunrise from 68 to 60°F for the first 3 hours of the morning. Do not drop

Bonzi, or Sumagic. B-9 should be applied approximately 2-3 weeks after transplanting at a concentration of 2,500 ppm. A second application may

Table 2. Optimal media nutrient levels for *Ageratum houstonianum* production as identified using a Spurway extraction procedure for plants grown in a soilless medium.

Nutrient	Recommended Level
pH	6.2-6.8
Soluble Salts	70-90
Nitrates	125-150
Ammonium	<5
Phosphorus	5-7
Potassium	40-50
Calcium	120-200
Magnesium	40-50
Iron	0.20-0.50
Manganese	0.20-0.50
Zinc	0.20-0.50
Boron	0.20-0.50

"Spray B-9 early in ageratum production to control stem elongation and to darken leaf color."

temperatures below 60°F with ageratum.

Ageratum stem elongation can also be reduced by spraying B-9, A-Rest,

be necessary 2 weeks later. A-Rest can be sprayed approximately 2-3 weeks after transplanting at a concentration of 25 ppm. A single spray application of Bonzi or Sumagic can be applied 2-3 weeks after germination at a rate of 15-30 ppm or 5-15 ppm, respectively. Care must be taken to apply Bonzi and Sumagic to the stems as they both are not mobile in the plant and must be applied to the stem to be effective. Care must be taken to not allow A-Rest, Bonzi, or Sumagic to drip into the media as these materials are easily taken up by roots and stem elongation is strongly suppressed often more than what is desired.

B-9 is most commonly used on ageratum to limit stem elongation. Growth retardants also have other

beneficial effects on ageratum: darker green leaves, increased postharvest life and possibly greater pest and disease resistance.

Symptoms of over application of growth retardants on ageratum include puckering of leaves and very dark green leaf color.

XVIII. Other Considerations:

Ageratum is sensitive to ozone and sulfur dioxide. These compounds can be produced by incomplete combustion of heaters and/or gasoline powered motorized vehicles. Therefore, ageratum are not appropriate plants for use by roads, in L.A., or around parking lots.

Table 3. Recommended tissue nutrient levels for *Ageratum houstonianum*.

Nutrient	N (%)	P (%)	K (%)	Ca (%)	Mg (%)	Fe (ppm)	Mn (ppm)	Zn (ppm)	Cu (ppm)	B (ppm)
Recommended Concentration	4.4-5.2	0.3-0.4	3.4-4.2	1.3-2.1	0.6-1.0	100-260	90-130	50-65	10-15	30-40

XVI. Diseases: Ageratum are very sensitive to 'damping-off' early in development. 'Damping-off' is a generic term referring to an infestation of *Rhizoctonia* and/or *Pythium*. In most cases, 'damping-off' early in development is a result of a *Rhizoctonia* infestation at the interface between the stem and the media.

Control *Rhizoctonia* and/or *Pythium* by 1) not overwatering seedlings, 2) providing adequate aeration early in development, and 3) using only sterile seed, media, and containers, and 4) applying fungicides. Apply Subdue (1/2 oz/100 gallons) plus Cleary's 3336 (8oz/100 gallons) or Banrot (8oz/100 gallons). Ageratum are also infested by *Sclerotinia* wilt.

XVII. Pests: Whitefly and thrips are the 2 primary pests of ageratum. Ageratum can also be infested with red spider mite, leaf miner, and mealy bugs. Consult your state entomologist for what pesticides are registered for use in controlling these pests in your state (In Minnesota, call Mark Ascerno at 612-624-7785).

Ageratum are very cold sensitive. Chilling damage can occur if temperatures drop below 10°C (50°F).

Ageratum are very sensitive to drought stress. If plants are allowed to wilt, leaf edge burn can result.

Personal Notes: Ageratum along with French marigold are perhaps one of the more uniform in height and flowering time crops we grow. Finished flats should be dark green, in full or close to full bloom, and 'flat-as-a-table'. Major improvements in breeding of blue ageratum have been made. Regardless what the breeding companies say, ageratum are not drought tolerant. In contrast to blue ageratum, little improvement in white ageratum (except for Hawaii White, see Table 1) has been made.

