



Research, Validation and Commercialization of Technologies

IFUS Blueberry Trial

Purpose:

To test the efficacy of (1) Nutri-Mastic™, (2) SupremeAG™ Mulch, and (3) SupremeAG™ Soil Amendment against (A) untreated Blueberry Plants and (B) Synthetic Fertilizer Treated Blueberry Plants so as to determine impacts on Performance Outcomes.

Performance Outcomes:

1. Growth Rate
2. Bloom Production
3. Fruit Production
4. Fruit Quality
5. Predation
6. Weed Management
7. Hydration Requirements

Experimental Design:

1. "Blueberry Plants" will be used in this experiment.
 - a. 8-Premier Blueberries
 - b. 10-TifBlue (Rabbit Eye) Blueberries
 - c. 1-Unknown Blueberry (believed to be a Premier Blueberry)
 - d. 1- Climax Blueberry
2. Per the picture below, 18 Blueberries are presented in the first three rows.
 - a. As a noted the next three rows are Freedom Blackberries
 - b. The last three rows are Washington Navels
 - c. The far-left side are Blazing Prince Peaches
 - d. The far-left rear has two (2) additional Blueberries



3. All Blueberry shrubs were blind sorted and located into a common area so as to create equal ambient conditions to include sunlight.
 - a. In general, the camera is facing the due West.
 - b. Hence, the trial receives sunlight throughout the day.
4. All Blueberry shrubs were planted in Standard Plastic Rooting Pots (14in x 14in x 14in / 10-Gal/37-l) and placed on 16" x 16" paver stones.
5. Groups Blueberry Plants (5-gal) were sorted as follows:
 - a. 5-each as Controls: 50/50 potting soil and organic humus and fertilized with Osmocote. (Trees 1-5 include 3-Tifbu and 2-Premiere as noted by the back row of the picture below)



- b. 5- each with SupremeAG™ 3" Mulch Only planted in 50/50 potting soil and organic humus. (Trees 6-10 include 2-Tifbu and 3-Premiere as noted by the center row of the picture below)



c. 5-each with SupremeAG™ Only (Trees 11-15 include 3-Tifbu and 2-Premiere as noted by the front row of the picture below)



- d. 3- each with Soil Amendment with 30/30/30 Potting soil / organic humus / SupremeAG™ and mulched with SupremeAG™ (Trees 16-18 include 2-Tifbu and 1-Premiere as noted by the front row of the picture below)



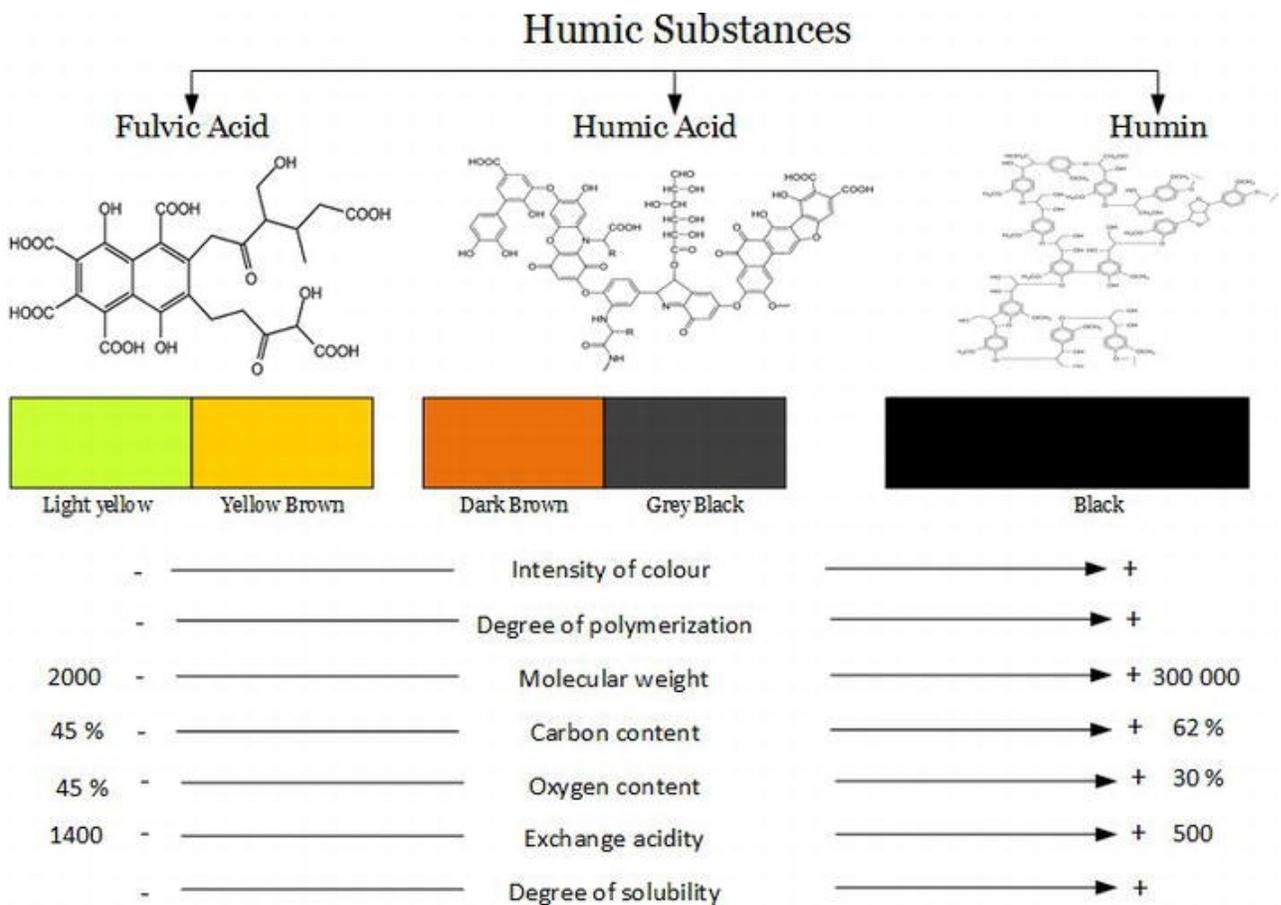
- e. 1- Unknown Variety (suspected to be a Premier) and 1 Climax Blueberry Soil Amendment with 30/30/30 Potting soil / organic humus / SupremeAG™ and mulched with SupremeAG™ (Trees 19 & 20 Unknown and Climax, respectively as noted by pictures below)





6. Note: We believe we have SupremeAG™ at different levels of maturity as indicated by shifts in color, texture, pH, fiber integrity/degradation, and the like. Of recent:
 - a. Lighter, more fibrous material is being used a mulch.

- b. Dark Brown and fiber degraded material is being used as soil amendment
 - c. Blackish material that resembles healthy dirt is being used as soil!
 - d. The science is suggesting to us that the coloration is indicative of higher concentration of Humic Acid to Fulvic Acid to Humin, respectively.
 - e. If product is available as indicated above, we may apply each respective product as mulch, soil amendment, and actual soil.
7. The science is suggesting to us that the coloration is indicative of higher concentration of Humic Acid to Fulvic Acid to Humin, respectively (see the illustration below).
- a. Hence, we have been applying the product as mulch, soil amendment, and actual soil, respectively.
 - b. The findings and results from application of SupremeAG™ are encouraging, albeit not enough statistical evidence accumulated as this time to create solid guidance. However, initial results are most-encouraging.



- i. Source: Humic Substances: Its Toxicology, Chemistry and Biology Associated with Soil, Plants and Environment, Rajneesh Kumar Gautam, Dimuth Navaratna, Shobha Muthukumaran, Amarendra Singh, Islamuddin and Nandkishor More. Submitted: 19 November 2020 Reviewed: 21 May 2021 Published: 07 June 2021 DOI: 10.5772/intechopen.98518\
9. Furthermore, with the guidance provided above, the application of SupremeAG™ with Nutri-Mastic™ could plausibly be applied as a technology based on Best Gardening Practices" for respective plants, trees, and shrubs. Color grading and pH could be applied to provide a level of qualitative determination of the specific phytochemical present.
10. Basic Measurements are being taken and placed into a spreadsheet. This will be uploaded as soon it is complete.
11. Furthermore, an IFUS Whitepaper will be created with a focus on Blueberries in relationship to SupremeAG™.

Tifblue Blueberry:

The Tifblue blueberry is a cold-hardy, high-yielding rabbiteye variety known for its large, sweet-tart berries and attractive seasonal foliage.

Overview: The Tifblue blueberry (*Vaccinium ashei* or *Vaccinium virgatum* 'Tifblue') is a rabbiteye blueberry developed by the University of Georgia and released in 1955. Native to the southeastern United States, it thrives in warm climates but is also cold-hardy, tolerating temperatures down to -10°F. It is a deciduous shrub that can grow 6–10 feet tall and wide, making it suitable for hedges, privacy screens, or as a specimen plant. (1,2,3,4)

Source 1: <https://minnetonkaorchards.com/tifblue-blueberry/>

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Source 4: <https://johnysfarm.com/how-to-grow-tifblue-blueberry/>

Fruit Characteristics:

Berry size and color: Small to medium, light blue when ripe. (1,3)

Source 1: <https://minnetonkaorchards.com/tifblue-blueberry/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Flavor: Sweet-tart, becoming fully sweet when allowed to ripen on the bush. (2,5)

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Source 5: <https://www.plantingtree.com/products/tifblue-blueberry-bush>

Ripening season: Mid-June to late July, with berries ripening unevenly within clusters, requiring multiple harvests over 4–6 weeks. (1,2)

Source 1: <https://minnetonkaorchards.com/tifblue-blueberry/>

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Yield: A mature Tifblue plant can produce up to 15 pounds of berries per year. (2,3)

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Uses: Ideal for fresh eating, baking, jams, jellies, and freezing. (2)

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Growth and Care:

Sunlight: Full sun (6–8 hours) is optimal, though partial shade is tolerated. (4,3)

Source 4: <https://johnysfarm.com/how-to-grow-tifblue-blueberry/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Soil: Acidic (pH 4.5–5.5), well-drained soil is essential; amend with peat moss, pine bark, or sulfur if needed. (4)

Source 4: <https://johnysfarm.com/how-to-grow-tifblue-blueberry/>

Watering: Avoid waterlogged areas to prevent root rot. (4)

Source 4: <https://johnysfarm.com/how-to-grow-tifblue-blueberry/>

Fertilization: Sensitive to excessive fertilizer; use low rates 2–3 times per year, preferably organic or slow-release. (2)

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Pruning: Trim older canes to maintain airflow and berry production; routine pruning helps control size. (3)

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Pollination: Tifblue is not fully self-pollinating; cross-pollination with varieties like Brightwell or Brightblue improves fruit set. (2,5)

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Source 5: <https://www.plantingtree.com/products/tifblue-blueberry-bush>

Seasonal Features:

Flowers: Delicate, bell-shaped white flowers in spring attract bees. (2,3)

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Foliage: Shiny green in summer, turning burgundy or red in fall, adding ornamental value. (1,3)

Source 1: <https://minnetonkaorchards.com/tifblue-blueberry/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Landscape and Garden Use: Tifblue blueberries are excellent for home gardens, mixed borders, or orchards. They can be planted in clusters for cross-pollination or as a single specimen. Their size and seasonal color changes make them both productive and visually appealing. (1,3)

Source 1: <https://minnetonkaorchards.com/tifblue-blueberry/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Summary: The Tifblue blueberry is a versatile, high-yielding, and cold-hardy rabbiteye variety prized for its flavorful berries, ornamental foliage, and adaptability to home gardens and small orchards. Proper sunlight, acidic soil, cross-pollination, and routine care ensure maximum fruit production and plant health. (1,2,3,5)

Source 1: <https://minnetonkaorchards.com/tifblue-blueberry/>

Source 2: <https://txmg.org/hendersonmg/plant-library/blueberry-tifblue-rabbiteye/>

Source 3: <https://plantaddicts.com/tifblue-blueberry/>

Source 5: <https://www.plantingtree.com/products/tifblue-blueberry-bush>

Premiere Blueberry:

History of the Premiere Blueberry:

The Premiere Blueberry is a Rabbiteye variety of blueberries that has been around since 1978. It was developed through a breeding program at South Carolina State University in partnership with the Agricultural Research Service of the US Department of Agriculture. The Premier Blueberry is known for its flavor and ease of growth, making it a popular choice for blueberry enthusiasts. It thrives in warmer climates and requires 500-550 chill hours to mature. The fruit is typically harvested in late May through early June, providing a mid-season option for those in warmer regions. The Premier Blueberry is a compact bush, reaching 6 to 8 feet tall, and yields 3-8 quarts of large, deep blue, sweet berries each year. It is suitable for planting in zones 7, 8, and 9, and requires other varieties of Rabbiteye blueberries for cross-pollination. (1)

Source: <https://minnetonkaorchards.com/premier-blueberry/>

The Premier Blueberry bush is a Rabbiteye variety known for its large, sweet berries and adaptability to warmer climates, thriving in USDA zones 7 to 9.

General Characteristics:

Type: Rabbiteye blueberry (*Vaccinium ashei* 'Premier')

Height: Grows to about 6 to 8 feet tall and wide.

Yield: Once mature, it can produce 3 to 15 pounds of blueberries per season, depending on growing conditions and care. (1,2)

Source 1: <https://minnetonkaorchards.com/premier-blueberry/>

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

Chill Hours: Requires only 500-550 chill hours (hours below 45°F) to produce fruit, making it suitable for warmer climates. (1,2)

Source 1: <https://minnetonkaorchards.com/premier-blueberry/>

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

Growing Conditions:

Soil Requirements: Prefers acidic soil with a pH of 4.5 to 5.2. It's beneficial to conduct a soil test before planting. (3,2)

Source 3: <https://plants.ces.ncsu.edu/plants/vaccinium-corymbosum-premier/>

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

Sunlight: Needs at least 6 hours of direct sunlight daily for optimal growth and fruit production. (4,2)

Source 4: <https://www.yarden.com/product/premier-blueberry/?zipcode=78505>

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

Watering: Moderate water needs; allow the top few inches of soil to dry out before watering. Mulching with organic material helps retain moisture. (2,5)

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

Source 5: <https://chestnuthilltreefarm.com/shop/premier-blueberry/>

Care and Maintenance:

Pruning: Minimal pruning is required, but it can be done in late winter to maintain shape and remove dead wood. (3,4)

Source 3: <https://plants.ces.ncsu.edu/plants/vaccinium-corymbosum-premier/>

Source 4: <https://www.yarden.com/product/premier-blueberry/?zipcode=78505>

Cross-Pollination: While the Premier Blueberry is self-fertile, planting it alongside other compatible blueberry varieties can enhance fruit size and yield. (3,5)

Source 3: <https://plants.ces.ncsu.edu/plants/vaccinium-corymbosum-premier/>

Source 5: <https://chestnuthilltreefarm.com/shop/premier-blueberry/>

Pest and Disease Resistance: Generally resistant to many pests, but watch for issues like spotted wing drosophila and fungal diseases such as anthracnose and root rot. (5,4)

Source 5: <https://chestnuthilltreefarm.com/shop/premier-blueberry/>

Source 4: <https://www.yarden.com/product/premier-blueberry/?zipcode=78505>

Harvesting:

Blooming and Fruiting: The bush blooms in early spring (February to March) and produces ripe berries from late May to early June. The berries are large, firm, and sweet, making them ideal for fresh eating, baking, or preserving. (1,5,2)

Source 1: <https://minnetonkaorchards.com/premier-blueberry/>

Source 5: <https://chestnuthilltreefarm.com/shop/premier-blueberry/>

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

The Premier Blueberry bush is an excellent choice for gardeners in warmer regions looking to enjoy a bountiful harvest of delicious blueberries with relatively low maintenance. (5,2,1)

Source 5: <https://chestnuthilltreefarm.com/shop/premier-blueberry/>

Source 2: <https://plantaddicts.com/premier-blueberry-bush>

Source 1: <https://minnetonkaorchards.com/premier-blueberry/>

Climax Blueberry:

History of Climax Blueberry:

The Climax Blueberry was first introduced in 1974 by researchers at the University of Georgia. This variety is a Rabbiteye blueberry and has become the gold standard for early ripening Rabbiteye berries planted throughout the south and southeast regions. The Climax Blueberry bush requires between 400-450 chilling hours but performs poorly during late spring freezes. It ripens in the early season between late May and July and can bear fruit within its first year. The berries are round with small scars, firm dark blue flesh, and a taste with just a touch of spice within a very sweet flavor. Climax Blueberries are round with small scars, firm dark blue flesh, and a taste with just a touch of spice within a very sweet flavor.

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

The Climax Blueberry is an early-season, heat-tolerant rabbiteye variety known for high yields, sweet medium-sized berries, and adaptability to southern climates.

Overview:

The Climax Blueberry is a Rabbiteye variety first introduced in 1974 by the University of Georgia and is highly valued in the southern United States for its early ripening and reliable harvests. It thrives in USDA Hardiness zones 6-10, depending on the source, and is particularly suited to warm climates with mild winters. The berries are medium-sized, dark blue, firm, and sweet with a subtle spicy note, ideal for fresh eating, baking, or jams. (1,2,3)

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

Source 2: <https://purelogic.blog/climax-blueberry>

Source 3: <https://plantaddicts.com/climax-blueberry/>

Growth and Plant Characteristics:

Size: Climax bushes grow 6-8 feet tall and 5-8 feet wide, requiring spacing of at least 6-8 feet between plants for optimal growth and harvest access. (1,2,3)

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

Source 2: <https://plantaddicts.com/climax-blueberry/>

Source 3: <https://www.plantingtree.com/products/climax-blueberry-bush>

Flowers: Small pink and white blossoms appear in late February to early March, attracting bees and butterflies for pollination. (2)

Source 2: <https://plantaddicts.com/climax-blueberry/>

Leaves: Leaves turn a striking orangey-red in fall before dropping. (2)

Source 2: <https://plantaddicts.com/climax-blueberry/>

Chilling Requirement: Requires 400-450 chilling hours, making it suitable for warmer regions but sensitive to late spring frosts. (1)

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

Pollination and Fruiting: Climax Blueberries are not self-fruitle and require cross-pollination with other early-blooming rabbiteye varieties, such as 'Premier', for optimal fruit set and larger yields. The berries ripen early in the season, typically from late May to July, and can produce up to 15 pounds per bush annually. For best flavor, berries should fully ripen on the bush, as they do not continue to ripen after harvest. (1,3)

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

Source 3: <https://www.plantingtree.com/products/climax-blueberry-bush>

Soil and Sun Requirements:

Soil: Prefers acidic, well-drained soil with a pH between 4.0-6.0. Soil amendments like compost or elemental sulfur can help if pH is too high.

Sunlight: Thrives in full sun but can tolerate partial shade. (1,3)

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

Source 3: <https://www.plantingtree.com/products/climax-blueberry-bush>

Watering: Regular watering is essential, especially during dry periods or when first planted. (3,2)

Source 3: <https://www.plantingtree.com/products/climax-blueberry-bush>

Source 2: <https://plantaddicts.com/climax-blueberry/>

Pests and Diseases: Climax Blueberries are generally heat-tolerant and pest-resistant, but potential issues include spotted wing drosophila, stem blight, root rot, anthracnose, mildew, botrytis, and mummy berry. Birds and deer may also damage the fruit, so protective netting is recommended. (4)

Source 4: <https://plants.ces.ncsu.edu/plants/vaccinium-corymbosum-climax/>

Uses: The berries are versatile and can be eaten raw, added to cereals, baked into muffins, pies, or pancakes, and are considered a superfruit due to their high antioxidant and vitamin C content. (3)

Source 3: <https://www.plantingtree.com/products/climax-blueberry-bush>

Summary: The Climax Blueberry is an early-ripening, high-yielding, and heat-tolerant rabbiteye variety ideal for southern gardeners and commercial growers. With proper cross-pollination, soil management, and frost protection, it produces sweet, firm, and juicy berries suitable for fresh consumption and culinary uses. (1)

Source 1: <https://minnetonkaorchards.com/climax-blueberry/>

Blueberry General Trials:

To date, the IFUS Test Farm has been unsuccessful in cultivating Blueberries. Where this beautiful shrub with delicious fruit thrives in locations just to the north, these are uncommon for this particular area in SE Louisiana.

However, Blueberries have never been cultivated in pots, nor have the Blueberry shrubs been amended or mulched with SupremeAG™. Hence, the current trial will be a first for the IFUS Test Farm.