Four-inch yellow and green flowers on tulip poplars bloom over several weeks in early summer.

Flowering Tulip Poplar Trees Are Fast Growers

Tree names can be misleading. Take the tulip poplar, which is neither related to the tulip nor the poplar. Instead, these magnificent trees belong to the magnolia family and got their name from their flower-shaped leaves, which turn a sunny yellow in the fall.

The Liriodendron tulipifera, also called the tulip tree, American tulip tree, whitewood, fiddle-tree, and yellow poplar, is native to the Eastern U.S. and ranges from New England to Louisiana and Florida.

Tulip poplars are known for their rapid growth. They can grow over 100 ft., making them one of the tallest North American hardwoods and a prime lightning target during storms. Although the tree has a lifespan of more than two centuries, it can add 2 ft. to its height each year.

The tree is easily identified by its straight trunk covered in strips of light gray, furrowed bark. Tulip poplar wood is fine-grained and versatile, suitable for cabinetry, furniture, and general construction. The straight, large trunks were used by Native Americans for dugout canoes and by pioneers for building houses and barns. Today, the wood remains a popular choice for cabinetry.

Despite the floral-inspired name, you won't see blooms on tulip poplars until they're 15 years old. In fact, it's rare to spot them at all, as the trunks can grow 50 ft. before they develop branches. The 4-in. yellow and green flowers open gradually over several weeks in early summer. They emit a strong fragrance and produce plenty of nectar, which is popular with pollinators, including hummingbirds, butterflies, moths, beetles and bees.

Once the petals fall to the ground, the tree produces a cone-shaped fruit that's a favorite among birds and other animals. One tree can produce hundreds of cones and nearly 50,000 seeds. This is significant because the germination rate is notoriously low, sometimes as low as 1.5%. Nevertheless, tulip poplar seeds remain viable for four to seven years, and the seedlings can quickly colonize open, disturbed areas.

Although you're most likely to find tulip poplars in natural areas, these trees also make a beautiful landscaping choice. In the fall, they turn a stunning gold. Just be sure to consider their space requirements so you won't be surprised if a towering tree develops within a few decades.

Concept image of a massive hydroponic complex being built in Early Branch, S.C.

Hydroponic Mega Complex Coming To South Carolina

Construction has started on more than 400 acres of hydroponic greenhouses and a 165,000-sq. ft. processing facility in Early Branch, S.C. The huge complex is being built on a 1,000-acre Agriculture Technology Campus (ATC).

The projected goal is to produce locally grown, organic tomatoes with 90% greater water efficiency than traditional farming. Production is expected to reduce dependence on imports from Mexico, California and Canada.

Once completed, the project is expected to bring in $350 million in private capital investment and create over 1,000 direct jobs for the local county and surrounding region.

The ATC is developed and owned by Agricultural Scientific and leased to Lokal Harvest USA, a subsidiary of one of Europe's largest hydroponic greenhouse operators.

The project was first announced in 2020 and received over $46 million in loans from the USDA.

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Electric Lift Provides Tractor Cab Access

Getting run over by a tractor prevented Bill Powell from climbing into his tractor cabs. His electric lift helped him get back into his tractors, with only minor design adjustments for his Deere and Versatile models.

"I devised power steps that lift me to the tractor platforms and back down when I want to get off," says Powell. "A small electric winch, not much bigger than a pop can, does the lifting on both tractors."

The winch has a 2,000-lb. capacity and mounts to the cab roof. On his Deere, the step unit features a receiver hitch design that rides on a 2 by 2-in. square tube. This tube is attached to the cab roof and the OEM steps, as they're one unit.

The Versatile cab is rubber-mounted, allowing it to flex independently from the steps. Instead of a rigid mount, the step unit floats freely at the bottom. However, the cable passes through a retainer to help stabilize it as the step moves up or down.

The step units share a common design with a handhold made from 3/4-in. steel tubing. The lift steps that Powell rides differ slightly in how they're attached to the lift, due to the fixed and free-hanging designs.

"People have asked me to build similar units for them, but I've refused due to liability concerns," says Powell. "I recognize that there's no safety cable should the lift cable break. The lift could have a safety, so it couldn't drop more than a few inches."

Powell used a small electric winch to create his power step.

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Colorado State University researchers Ashok Prasad (left) and June Medford (center) examine plants that contain the luciferase gene pair.

Switch Turns Gene On And Off In Plants

Researchers at Colorado State University have identified the switch that turns a gene on and off. Their proof-of-concept research used the luciferase gene, which glows in fireflies. However, this knowledge can be broadly applied.

"We're interested in carrying the technique forward to regulate other genes," says June Medford, CSU Department of Botany.

Medford and Ashok Prasad, CSU Department of Chemical and Biological Engineering, led the research team. They synthesized relevant DNA parts, including the luciferase gene, and inserted them into plant tissue. The effort relied on two key genes identified through mathematical modeling. The pairing of these genes is crucial to the switch.

When one gene is on, the other is off. Applying a chemical signal to the plant causes the switch to reverse. In the case of the luciferase gene pair, the chemical made the cells glow. When the chemical was applied again, the glow gene turned off, and the other gene turned on.

When a plant experiences stress, it triggers a cellular response, such as boosting its immune system against disease. However, this reaction might be too late to fully counter the disease. A plant switch could accelerate the response when the disease is first detected.

"There's usually one gene that can be used to push a cellular activity forward," says Medford. "It's similar to the role of a linebacker on a football team. There may be 11 genes involved, but if we find the one, it'll push the process forward."

Other potential uses of the technology include triggering fruit ripening or early-season growth, or essentially any biological process in the plant. Others involve creating biofactories by triggering cells to produce specific components.

"This project is a true marriage between quantitative research and mathematical modeling to predictably engineer a plant's abilities for any number of needs," explains Medford.

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