Purple tomatoes are rich in anthocyanin pigments which are also present in blueberries, blackberries and cranberries.

Photo courtesy of Norfolk Plant Sciences

World's First GMO Purple Tomato Approved For U.S. Sales

A new genetically modified tomato has been approved by the USDA for sale in the United States. It will stand out on store shelves for one clear reason - the tomato is deep purple.

This tomato owes its color to genes from snapdragons incorporated into its DNA. This triggers the fruit to produce more anthocyanin, creating a deep purple hue.

This distinctive fruit was developed over the past 14 years by a team of scientists, including Professor Cathie Martin of the University of East Anglia. Their reasoning for its color is multi-faceted. "Purple tomatoes are rich in anthocyanin pigments which are also present in many 'superfruits' like blueberries, blackberries, and cranberries," says Professor Martin.

The team's goal, in part, was to create a fruit that maximized these health compounds for humans. Martin explains, "When we undertook intervention studies in 2008 with cancer-prone mice, the mice lived 30 percent longer on the purple tomato-supplemented diet than the red tomato-supplemented diet or a standard diet." Americans' love for tomatoes made them an obvious choice to ensure the result would actually get eaten.

Further research in 2013 revealed that these purple tomatoes had double the shelf life of standard red fruit. This is because anthocyanins help to delay over-ripening and reduce the fruit's susceptibility to fungus attack post-harvest.

The bright color also attracts pollinators, which helps ensure reproductive success for the species. Tastewise, the team claims they are indistinguishable from standard red ones.

Martin believes shoppers should keep an open mind with this new tomato. "We want to give consumers a choice. If they're fearful of eating them, then no one will force them on consumers, but if they would like to try them, then we hope to offer people that choice as well," she explains.

U.S. shoppers in test markets can expect to see Martin's purple tomato on store shelves before the end of 2023.

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Split screen showing knife thrower being fired (left) and knives sticking (right).

Custom-Built Knife-Throwing Robot

FARM SHOW reader Austin Elliott suggested we check out a knife-throwing machine on his YouTube channel. It introduced us to an engineer with a knack for explaining complex projects.

Quint is an engineer with 20 years of experience, a lifetime of curiosity, and a desire to share knowledge. His website provides links to more projects, all designed to educate, inform and interest kids and adults alike.

The knife-throwing video provides overviews of the building process. It also includes challenges and mistakes, including frying a $150 LiDAR sensor.

Quint built the knife-throwing machine to better understand the physics behind the process, something he didn't understand when he started. He also enlisted the aid of his teenage son to program the electronics and learn alongside him.

The goals were to stick 10 consecutive knives, make it mobile and cordless, and weigh less than 20 lbs. They achieved the first two but overshot the third by 50 percent.

The video starts with the metal framework Quint built to hold the various components. It covers their choice of high-performance servo motors to power two double-sided timing belts that provide propulsion and their use of 3D printing and machining of parts.

Quint's son wrote code for a computer processor to control the servo motors and other electronics. High-speed starts and stops were needed, as was a way to hold, rotate and release knives on command.

Quint designed a toothed carriage to travel between the belts with an electromagnet to hold and release knives. He outfitted it with electric motor brushes to power the magnet and a solenoid with a custom-designed plunger to help keep the knife in place until release.

A LiDAR sensor provided distance data to the controller, which then adjusted the targeting laser for the trajectory of the knife. Soon the father/son team was able to stick five knives in each of two targets at different distances. The process took about 8 mos., starting with a spreadsheet of calculations on things like the mass of the knife and the force needed to achieve velocity.

Quint gives a lot of credit to an online learning platform called Brilliant. He noted that their lesson on axe throwing taught him engineering concepts his 20 years of work experience had not provided. The website uses hands-on, interactive problem-solving (like ax throwing) to teach math and science fundamentals.

A final set of videos will be of value to anyone engineering their own projects. Quint is one of only five people in his home state of Oregon and about 500 around the world to hold a senior-level certificate in Geometric Dimensioning and Tolerance (GD&T). This is the engineering standard governing mechanical fit of parts. Those videos can be found on his channel Quint GD&T and are well worth a visit.

Thrower uses servo motors, double sided timing belts and an electromagnet to control knives.

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FARM SHOW® Ag World®

PVC vertical gardens are easy, inexpensive, and save space.

How To Create A Vertical PVC Garden

A vertical garden is a smart idea if you're short on space but looking to maximize your access to fresh-grown produce. One strategy is to build a growing setup out of PVC pipe. You can follow this general design plan and modify it as needed for your space needs.

To start, you'll need PVC pipe that's at least 4 in. wide (larger allows for bigger plants and growing in multiple directions). A large planter, potting soil, and pea gravel are also necessary, as well as a power drill with a 1 1/4-in. spade drill bit.

Begin by cutting your PVC down to your preferred planting height, accounting for the fact that the bottom will be buried in the pot. Around 5 ft. tall usually works best for easy maintenance. Note that the longer you leave the pipe, the more challenging watering will be without a built-in irrigation system.

Next, drill holes in the side for planting. Make the holes large enough for easier transplanting without being so large that soil (or young plants) falls out of the opening.

Then place the pipe within the pot, filling the base with pea gravel to anchor it. Start adding the rest of the gravel into the top of the pipe, stopping when you reach a hole to add in about 6 in. of potting soil. This ensures the plants have plenty of growing space and good drainage. Add some soil to the top of the pot as the last step to hide the pea gravel and add some extra planting space.

Choose small, hardy plants with well-developed root structures. Seeds don't tend to work well, as they can get washed out or dislodged from a hole.

Some of the best plant varieties for a vertical garden include succulents, lettuce, spinach, green onions, and chives. Hardy perennials like strawberries and most herbs work especially well because their longer lifespan allows the roots time to fully spread through the pipes.

Weeds rarely get established, but you can pull any out that emerges from the planting holes. Just take care not to dislodge any soil or pull out any established plants. Most can handle being left in wintry weather, though you'll prolong the lifespan of the plastic if you take it down. Expect to refresh the potting soil every growing season or so to ensure things stay fresh.