



Christensen has been working on drought tolerant high nutrient value corn for over 50 years.

50-Year-Old Nutrient-Rich Black Corn

There are several purple corn varieties on the market but none of them are like Montana Morado Maize, which is more black than it's purple. Dave Christensen has been working on the variety for 50 years. Drought tolerant and bred for short-season production, the unique corn's nutrient content is off the charts.

Christensen moved with his family to Montana after his military service and he began raising corn for cornmeal. He quickly discovered commercial corn couldn't handle the dry growing conditions and short seasons

of central Montana. He also discovered that the corn most likely to survive an early frost had thin, long cobs.

Over the next 15 years, he worked to breed a line of corn that would thrive in his area. He gathered seeds from more than 70 varieties grown by Native American tribes. His work resulted in Painted Mountain, a multi-colored corn that is high in protein and antioxidants, as well as ideal for milling.

The Climate Science Center, Pagosa Springs, Colo., describes it as one of the most widely adapted and genetically diverse corn

varieties today. It cites its impressive cold hardiness, early maturing, drought tolerance and ability to thrive at high altitudes.

Christensen has been supplying seed companies with Painted Mountain seed for more than 35 years. Baker Creek Seed is one of the few that still gives him credit for the seed.

"It's grown on every continent, mostly by small farmers living in tough climates or on the fringes of farmable soil," says Christensen. "People rave about Painted Mountain for its soft flour, which makes the best cornbread and tortillas."

While developing Painted Mountain, he obtained some corn from the Navajo, hoping it would be more drought-tolerant. While that variety didn't survive in Montana, he was able to introduce its drought-tolerant genes into his breeding lines. Several dark, cherry-colored seeds in the Navajo corn caught his eye.

Over the next 35 years, he added the color genes to those of Painted Mountain and selected for even darker kernels. Today only 1/8 of 1 percent of the original Navajo corn remains, and it's this color.

"Many years ago, a Navajo elder told me that black corn was the color of healing," says Christensen. "Today we know it's loaded with many special antioxidants that aid in heart health and fighting many other diseases."

There are other Morado-type corn varieties available. However, his stands out. "Montana Morado Maize is the only one in the world with two layers of pigment," says Christensen. "I think this is why it tests higher for anthocyanins than any others."

Montana Morado Maize matures quickly and productively yields astonishingly soft flour. It's a diverse, open-pollinated corn that Christensen feels will adapt to a wide range of growing conditions. It will produce dry



Black corn is drought resistant and grows in a wide range of conditions.

grain in 90 to 110 days from planting and has produced a crop even in recent droughts.

He says the black corn is easy to grow, reaching only 4 to 5 ft. in height. The ears are long and slender with eight uniform rows of shiny black kernels.

Montana Morado Maize is available under Christensen's trademark "Seed We Need" through North Frontier Farms. Owner and longtime organic farmer Ole Norgaard has partnered with Christensen for the past 17 years, growing out the seed and helping select each new generation.

Montana Morado Maize is available in packages of approximately 135, 270 and 540 kernels. The price ranges from \$6.50 to \$21.00.

The unique, nutrient-rich corn is also available as cornmeal in several Montana stores and online or by mail. One-pound packages are priced at \$5.65.

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Front-drive wheels with their 47-in. width can telescope out to a 63-in. wheelbase for greater stability.

"Big Helper" Designed To Fit Tight Spaces

The Big Helper from Eltschinger Industries is ideal for arborists, tree services, and landscapers. The unit's narrow 47-in. profile gets into tight spaces, and with its three points of contact, the hydraulic claw system holds onto whatever it grabs. The design has proven even more useful than expected.

"The Big Helper was designed to get into tight areas and pick up sections of log, carry them away safely and load them onto trucks," says Paul Eltschinger, Eltschinger Industries. "One day we discovered it worked to grab branches and feed them into a chipper. Our crews went from five to three immediately. At \$40,000 per crew member, the savings were twice the cost of the Big Helper."

The concept grew out of Eltschinger's uncle Phil's 20 years of tree service. After seeing the damage done by articulated

loaders and full-size skid loaders, he wanted something better.

"The damage just made extra work for him and his crews, and tree removal was often dangerous as materials were lifted high into the air," says Eltschinger.

His uncle and sons, along with an employee, designed the machine they needed and wanted to use in their business. After working their way through three prototypes, it's now available for sale.

"The first three were very simple, belt drive machines, made with surplus parts we had on the place and are still in use," says Eltschinger. "For our production model, we invested in forestry grade hydraulics with hydrostatic drive. Currently, we offer a gas engine, but plan to go to diesel."

Initially, they experimented with turf tires

versus treads and weighted tires versus no weight. "Eventually we realized that with the engine in front of the operator and just behind the drive wheels, plus 500 lbs. of steel in the claw system, no extra weight was needed," says Eltschinger.

Some things were not negotiable, such as the zero-turn style with front-wheel drive and rear swivels. Safety was key to the design. The front-drive wheels with their 47-in. width can telescope out to a 63-in. wheelbase for greater stability.

The operator platform is a chariot design with a pressure sensor/weight plate under the operator's feet. Should a problem develop, the operator simply steps out and away from the machine. The sensor immediately activates brakes to stop the machine. However, the claw can continue to be operated.

Another safety feature counters what the Eltschingers saw as an opportunity for risky behavior. Other tree handling equipment could raise material 10 ft. or more in the air. The Big Helper is limited in height to reduce the risk to the operator and overbalancing.

The design of the claw ensures the load is carried almost directly over the wheelbase. It's mounted over the center bar of an H-shaped frame. Two tines or hooks are mounted near the bottom of the frame. Hydraulic cylinders on the claw raise and lower it and tip the tines upward. Other cylinders pivot the frame up, tipping it back up to 45 percent.

"As the claw comes down, it puts tension on three springs connected to the tines, helping to tip them up toward the claw," says Eltschinger. "As the claw grabs material and pulls it toward the frame, the tines grab from below and secure the material. The three points really grab everything."

Movement of the claw and tines' frame up and to the rear adds another safety factor. The load is carried almost directly over the wheelbase.

The Big Helper weighs in at 2,500 lbs., is 52-in. high and 100-in. long. It has a maximum load rating of 1,500 lbs. and a maximum speed of 5 mph loaded or 8 mph empty. It's powered by 23 1/2-hp. Kohler engine and priced at \$40,000, equipped with the claw and tine system.

Eltschinger points out that while the Big Helper was designed by and for arborists and tree services, it fits other industries as well. In addition to the claw and tine system, the Big Helper can be equipped with buckets and forklifts.

"Buckets can be made to order and are ideal for moving mulch or dirt," says Eltschinger. "We're working on a stump grinder and have ideas for other attachments as well."

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