

Citizen Scientist

Dave Christensen wants to feed the world's hungriest people, one handful of colorful corn at a time. Now, the corn he breeds is landing on American tables, too.

BY SCOTT McMILLION | PHOTOGRAPHY BY JOHN ZUMPANO

BY THE MIDDLE OF OCTOBER 2012, Dave Christensen found himself exhausted. He'd just spent many weeks traveling Montana, sleeping when and where he could, harvesting corn from dawn to dusk. No machinery. Just his two hands, and any others he could recruit.

"I'm one tired crop picker right now," he says. "I'm tired of camping and traveling."

When he got home, to a trailer park just south of Big Timber, he spread the cream of his crop across towels on the floor of his aging trailer house. Midday sun pounded through a window, highlighting hues of lemon and tangerine, cranberry and blueberry, dark red wine and coffee beans.

This isn't supermarket corn, or even the stuff you spent the summer weeding, cultivating and irrigating. This is the real stuff, the food that helped keep Indians alive for thousands of years through droughts and frosts



and summers that seemed like they'd never get started.

Christensen has spent 40 years rescuing this corn from extinction and breeding it to find or create the hardest, most nutritious varieties. Someday, he hopes, it could feed millions.

He works very hard and earns very little, only about \$8,000 a year for his countless hours. He says he's a lucky man.

"I have a privileged life, compared to people who are starving," says Christensen.

Those are the people he targets, those unlucky ones relegated by politics or racism or some other hard twist to a life in marginal places, where land is steep, soil is thin, weather is harsh, cash is scarce and food sometimes disappears before winter does. The Andes. Mongolia. Siberia. North Korea. His corn grows

Dave Christensen grows multicolored heirloom corn on 12 different plots scattered across Montana. Mainly dried and ground, the kernels are highly nutritious and chock-full of antioxidants.



on every continent except Antarctica.

For some of these people, Christensen's Painted Mountain Corn could spell the difference between life and death, when winter comes yet again.

"I'm not going to pretend that you can have a healthy diet on grain alone," he says. "But for people who live on grain, who don't even have beans, I'm trying to put all the nutrition I can in my corn."

But before it can be eaten, it must be grown and harvested. And most modern corn cannot tolerate cold, dry places, such as most of Montana.

But Christensen's corn can prosper here. Other scientists, people with advanced degrees in genetic work, say he's leading the scientific pack and doing it mostly alone, with no think tanks or universities, with almost no money.

"He lives it and eats it and breathes it," says Perry Miller, a professor of cropping systems at Montana State University-Bozeman. "There's a lot of dreamer in Dave, but that's what I like best about him. I want to do what I can to help him. I know there's genius there."

He says he's known Christensen for years and he makes

a little space available for him on campus so he can work on improving his corn strains. But his generosity is more than just kindness. It includes no small amount of curiosity.

"He's got some precious genetic resources in his hands and I'm anxious to see how he applies them," Miller says. "His dedication is incredible."

"His intensity of inquiry is beyond anybody I've ever met," said Frank Kutka, another man with a Ph.D. in plant sciences. "I think he deserves a MacArthur genius grant. With that kind of funding, and with his knowledge, anything could happen."

A POWERFUL DREAM

CHRISTENSEN, NOW 68, says a dream came to him when he was a teenager. The dream told him he was meant to grow long, thin ears of black corn. He'd never heard of corn like that, and it puzzled him, this dream, but its memory never faded.

Later he studied cattle breeding at Cal Poly in California, where he descended from pioneer stock and grew up listening to stories of the Golden State's early years. After college he spent four years in the Air Force, then moved his young family to Montana's Flathead Valley, where he wanted a back-to-the-land lifestyle, but not like the one the hippies of his youth embraced. Too much dope and too much complaining in that lifestyle, he said. Rather, he lived more like a mountain man and became a noted tanner of buckskins (his email address remains buckskin@mtintouch.net).

Self-sufficiency became a major goal and he wanted to raise his own grain, but the Flathead's growing season didn't last long enough for modern corn plants to mature. So he started collecting Indian corn seeds, reaching out to old homesteading families and Native Americans. Summer after summer, he experimented to see which strains prospered under the toughest conditions. He selected plants that produced good husks that could protect the grain from bugs and rain; plants that produced long, thin ears, so the grain could dry thoroughly on the cob before killing frosts arrived.

About 10 years into the process, he peeled back the leaves from a couple of

Christensen not only harvests by hand, he must winnow the chaff by hand as well.



ears and found solid black kernels, and that dream he'd had as a teenager came rushing back. The corn had come from Arizona, where a Navajo woman had told him that black corn was for healing. So he began incorporating that corn into his own breeds.

And gradually, he started selling a little seed, first through catalogs to people wanting ornamental corn, then to people who wanted to eat it. (Put some on a plate beside some modern sweet corn and "most people will go for the sugar," Christensen says. His corn, though it has a pleasant, nutty flavor, is best dried and stored, so it can be used in soups or ground into flour.)

The desire for a hearty corn variety eventually put him in touch with Frank Kutka, who was living in northern Minnesota at the time and, despite being a professional plant breeder, couldn't bring a corn crop to maturity in that climate.

He got some seeds from Christensen and soon had mature corn.

That was in 1994 and Kutka was impressed. He started studying harder.

"In some degree, that was the impetus in my getting my

A cornucopia of colors adorn Christensen's Painted Mountain Corn.

Ph.D. in plant biology," said Kutka, who now lives in western North Dakota.

Christensen had left the Flathead by then, moving in 1976 to Big Timber where "the corn kind of took over." Today, he has 10 established strains and 100 ongoing experiments on a dozen farms across Montana, places where people put aside a patch of land where he can manipulate genetics and pollinate thousands of plants by hand. For payment, he cherry-picks the best ears and sets them aside for seed, then studies them over the winter, harvesting individual kernels.

His signature variety is the one he calls Painted Mountain Corn. It now grows in locations from Siberia to South Africa because Christensen has pushed the genetics, finding or creating strains that can live at higher latitudes and altitudes. He's excited about the possibility of a strain with natural resistance to devastating corn borer infestations. He's passionate about the improved nutrition his corn provides.

Most modern corn, he says, "is raised for calories" and in this country most of it is pushed through livestock or burned



in a motor as ethanol. Christensen's corn provides much more protein, vital amino acids such as lysine and extraordinary levels of antioxidants like anthocyanins, often touted as a remedy or preventative for all sorts of ailments.

"Part of my life purpose is to save things that are being lost, things that can help people," he says.

Plus it's comparatively easy to raise and grows fast even in climates where cold spring weather devastates modern corn seedlings. Nearly a decade ago, he traveled to isolationist North Korea,



Arranging a rainbow of ears. Below, each ear is fed by hand into a shelling machine.

bringing 3,000 pounds of seed corn to a place where starvation remains a threat, a region with steep hillsides, rocky soils and a climate similar to Montana's. Farmers there had been producing 1,000 pounds of grain per hectare. With Christensen's corn, they boosted that to 2,600 pounds per hectare, a big jump in a hungry land.

Other crops are growing in Siberia, Ukraine, the Argentine Andes and New Zealand.

"With my corn, a handful of seed can grow for generation after generation," he says.

Sending seeds across international boundaries can get pretty complicated, but Christensen has stayed on the job for 40 years.

"He's willing to share with about anybody in the world," Kutka said. "It's almost like he's his very own USDA."

Despite all that, the corn remains little known, a garden novelty for a few people.

Some think it could get a lot bigger.



SEEDING THE FUTURE

KUTKA SAID HE WASN'T SURPRISED at Christensen's success in North Korea, where farmers cover hillside after hillside with the hardy corn.

But most places in the world lack the willingness or capacity to harvest Indian corn. That's because all the reaping must be done by hand. Christensen's varieties don't have stems strong enough to lift the plant high enough for a modern combine to harvest it. And in America, hand harvesting corn is not a job that appeals to many people.

"We're so spoiled now," Kutka said.

In places like North Korea, with its periodic famines, the specter of starvation provides a powerful motivator. Those who don't have any other choice will still harvest by hand, Kutka noted.

He's interested in crossing some of Christensen's corn varieties with modern strains to see if stronger stalks can be introduced to the gene pool without losing the nutritional elements of the grain as well as its colors. Introducing machine harvesting to the ancient corn could open all sorts of possibilities for dryland farmers.

If large and steady supplies could be assured, big markets for things like tortillas and chips could open up, he said, and those buyers pay premium prices.

"More folks would like to grow corn if there is one that works," he said. "It just needs to be a little taller."

The heirloom corn could also prove valuable to farmers growing it for livestock forage because it doesn't need irrigation, it prospers in tough conditions and cattle can be turned loose to do the harvesting themselves.

"I suspect a lot of farmers would grow corn for feed," Kutka said, though there haven't been any formal studies of how Indian

corn puts weight on cattle.

"What I know for sure is they liked it," Kutka said. "Cattle ate it right into the ground."

At least one man is making a stab at putting Christensen's corn on American tables.

Ole Norgaard, a respected innovator in Montana's organic farming industry, grows a few acres of Montana Morada Maize, a black corn variety that Christensen developed and one with especially high levels of those valuable anthocyanins, which face a growing demand in the nutraceutical field, where people look at food as medicine.

Norgaard has begun marketing cornbread mix and pancake mix made with a blend of purple corn and organic wheat flour. (They're quite tasty.) His company, North Frontier Foods, is headquartered at his farm near Lewistown. But he has to harvest by hand as well. It's no fun.

"After you've harvested an acre of corn by hand, you don't want to do that too many times," Norgaard said.

Christensen developed his strains with the goal of feeding the world's poorest people, folks who would never dream of owning a mechanical harvester, so breeding plants with stronger stems hasn't been his first priority.

"Dave knew that people needed something," Kutka said. "He



Cornbread made from Montana Morada Maize, a strain of corn that Christensen developed.

wasn't sure what or where, or how to get a hold of them, but he did the work anyway."

To make the corn commercially viable in the United States, a strain must be developed that can stand up to the rigors of a combine. Norgaard said he has some ideas on the mechanical side, while Kutka is working on the breeding side.

"Things are headed in the right direction," Norgaard said. "And we're standing on Dave's shoulders." ■