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Farming the Corn Genome

Better corn to feed the world.

Story by Dale Smith

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During the past 90 years, yields of corn — the nation's most important crop — have increased eightfold, with half the gain coming from painstaking genetics work: Breeders cross two plants with desirable traits and perform extensive field testing to discover whether the new hybrid is an improvement. That time-honored system works great, says Edward Buckler, PhD '97, who leads a maize genetics lab at Cornell University. But the cycle takes five years.

Luckily, Buckler says, new genetics technology could make the process two to three times faster in the next few years and up to 15 times faster in about 20 years.

Already, Buckler and his collaborators can grow a hybrid until it produces seed in about four months and read the seeds' genes to see if they are on the right track. At this point, the genetics data aren't quite

as good as the five-year process, he says, but they're close and improving all the time. "For example, we can tell within a couple of days when the plant will flower," Buckler says.

New corn hybrids will likely contain more vitamins and minerals, resist drought better, and produce more grain using the same amount of water and fertilizer. Corn might even become a perennial crop, to preserve the energy plants spend growing roots and leaves.

The progress is coming not only faster but also cheaper, Buckler says. "Thirteen years ago it cost \$1 billion to sequence the human genome. Now, we can do the same thing for the maize genome, which is about the same size, for \$2,000."

Buckler was recognized in spring 2013 as one of four distinguished alumni from the University of Missouri College of Arts and Science.

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