

## What are the commercial and regulatory challenges facing CRISPR gene-edited crops?

When you use [CRISPR](#) gene editing on crop plants, you can do “some pretty cool things,” says Timothy Kelliher, PhD, head of crop trait and technology discovery at Syngenta Seeds. You can change the structure of chromosomes, add large amounts of genetic material, move genes around, turn genes on and off, and fine-tune gene expression. And yet, Kelliher admits, inefficiency in bringing these cool things to commercial agricultural products is “still a problem.”

So, why is CRISPR gene editing facing commercial challenges? There are several answers.

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In most cases... the optimal alleles for all of the genes involved in a complex trait are unknown. So, even though there are CRISPR tools like Cas12 that allow multiplexing in one construct with multiple guides to different genomic targets, it is a biological challenge to know how to edit each gene involved in a trait and to figure out what effect the different edits have on a trait when they are all put together.

What’s more, since there is a great deal of genetic diversity, gene redundancy, and structural variation among the chromosomes in plants, there are, Kelliher says, many examples where a gene or an edit works as desired in one crop line but has a different effect in another crop line.

**[This is an excerpt. Read the original post here](#)**