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Sunrise Genetics Debuts Complete Cannabis Genome Map

The comprehensive genetic tool will assist in further breeding advancements of the plant.

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Eric Sandy

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Earlier this month, at the Plant and Animal Genome Conference in San Diego, the team at Sunrise Genetics debuted their newly completed cannabis genome map. As the company describes itself, Sunrise partners with "cannabis cultivators and breeders to apply evolving genomic knowledge to target improvement of desired traits, accelerate breeding, and unlock the opportunities of cannabis." Their new map is a milestone for the genetics side of the rapidly expanding cannabis industry, where research constraints have restricted scientific developments for decades.

Now, though, thanks to Sunrises' coordinated resources—including stabilized plant populations of the plant biologist George Weiblen's laboratory at the University of Minnesota—fellow geneticists will be able to access a comprehensive picture of cannabis' 10 pairs of chromosomes. Weiblen's lab is the only DEA-approved cannabis genetics facility in the U.S.

"The complete genome allows for the localization and combination of genes in a precise way to generate specific chemical profiles, for example, in custom cannabis strains," Sunrise Genetics President Matt Gibbs tells *Cannabis Business Times*.

Broadly speaking, the Sunrise map comes after years of research. At Weiblen's lab in Minnesota, more than a decade of study allowed his team to stabilize marijuana and hemp populations. This gave Sunrise incredible access to cross-bred cannabis plants with clear and divergent genetic backgrounds.

"If you have two plant populations that are inbred, because they're highly genetically stable, making a cross allows you to see the differences among the plants more clearly, thus producing more consistent results," Gibbs says. With only limited legal access to cannabis plants in U.S. research facilities, this plant population was critical for Sunrise's work.

The strength inherent in a map like this is its ease of use. End-use consumers may see an immediate impact as strains can now be precisely identified and labelled (like a barcode), providing transparency for cannabis consumers, Sunrise's genomic map also gives a helpful boost to geneticists and enterprising cultivators in what Gibbs calls "marker-assisted selection." Essentially, identifying important genes and gene combinations for maximum productivity in bringing out the plant's desired traits.

In a Bloomberg story, where the Sunrise news was first announced, the team extolled the importance of this: the ability to visualize the capabilities of the cannabis plant and act on that knowledge.

"For those that are cultivating or seeking to breed—or just learn how to improve the plant for whatever the desire trait is—this is now a map that allows for you to do that with a high degree of accuracy," Gibbs says. "Also, what this does is it pulls together a bunch of disparate data sets that are out there with private companies and academia. With this map, they're going to be able to really make better sense of that data, because it's going to be ordered in a fashion that we can all agree can be replicated. ... When we understand what genes are controlling what traits, then I think you're going to see a change in the quality of the starting product, and this increasing depth of knowledge will reveal the potential as to what products a certain strain can produce."

As the cannabis industry matures, licensed producers will learn more about the nuances of cannabis strains. Localizing genes that affect pain or anxiety, for instance, will become increasingly important as consumers become familiar with the capabilities of the product.

The foundational information in the Sunrise map will allow for more rigorous study of those genetic impacts. Gibbs compared the genome to a road map, which grows more detailed as urban planners add informative landmarks over time. In this case, geneticists' work will flourish; over time, end users will see tangible benefits of this scientific study.

"What someone could do is create accurate heredity maps with this genome map, and you can start to understand geographic origins, and predict end products," Gibbs says, pointing to an illustration provided by his colleague to Bloomberg (and derived from data compiled by the Open Cannabis Project). "You can do the same thing for terpenes and cannabinoids, create or recreate what you like by combining specific genes in a single strain background. The genetic map is already in use by researchers to identify the genes, but we need to make sure that those genes are what is actually expressed in the plant for us to be confident in giving people an *à la carte* look at their plant and the important components of its genome."

Top photo courtesy of Adobe Stock

`Cannabis Cultivar Selection`   `Cloning Cannabis Plants`
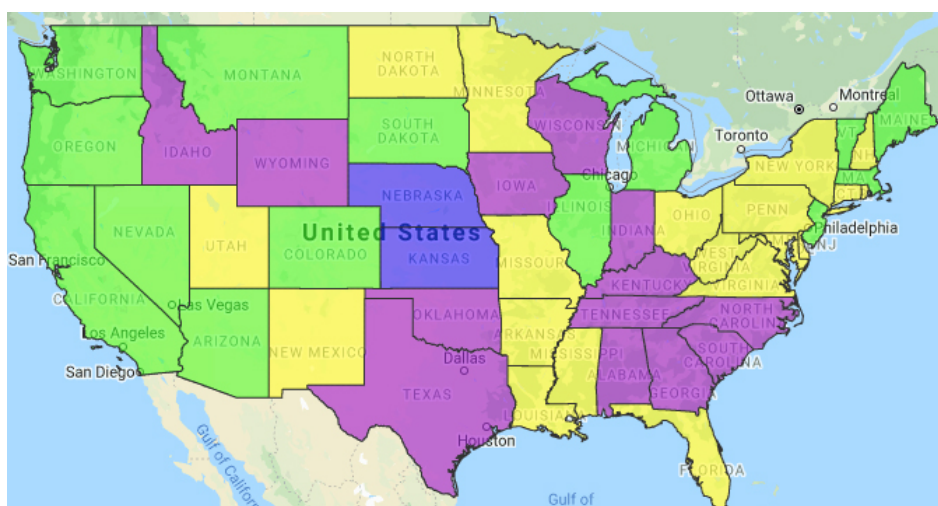
LEGISLATIVE MAP

Cannabis Business Times' interactive legislative map is another tool to help cultivators quickly navigate state cannabis laws and find news relevant to their markets. view more

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