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In focus



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Seed Production and Developing GM Crops in Hawaii, Part 2



In our last bulletin, we reviewed how genetically modified (GM) crops are regulated in the United States during their development and how this is relevant to Hawaii. We also introduced and explained field trials as the final stage of development for all commercial crops, including crops bred using conventional methods, mutagenesis or genetic engineering. Here, we'll examine the role that Hawaii plays in GM and conventional crop development. To do so, we'll rely on the Information Systems for Biotechnology (ISB) database, available online at <http://www.isb.vt.edu/>, and the U.S. Department of Agriculture's National Agricultural Statistics Service.

Funded by USDA and administered by Virginia Tech, the ISB database provides an easy way to search past, current, and pending field trials of regulated GM crop varieties. This comprehensive resource extends back to 1985, when USDA's Animal and Plant Health Inspection Service issued the first permit for the release of a genetically engineered organism.

For each field trial, the ISB database lists the institution responsible for testing the GM crop (typically a corporation or university), the number of acres on which the field trial is to take place, the location(s) (state) where the test will occur, the crop to be tested, the new variety's specific traits, and the dates for which a permit or notification is valid. Data items reported as confidential business information are represented by the acronym CBI.



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As of January 2015, the ISB database lists more than 19,000 completed, active, or pending permits and notifications for field trials of GM crops in the USA. Of these, about 3,500 field trials were, are, or will be located in Hawaii. A single field trial can involve plantings at multiple sites. For example, the 178 GM crop field trials conducted in Hawaii in 2013 took place at 1,124 individual test sites.



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Hawaii's GM Field Trials

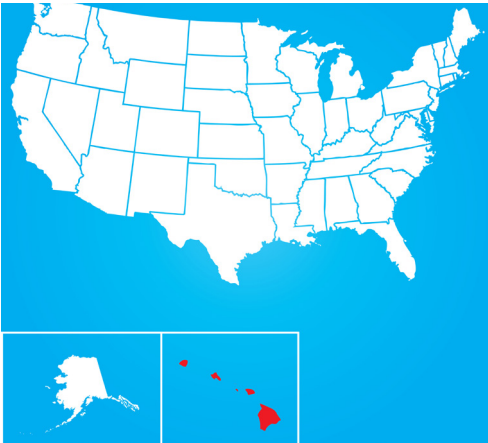
The overwhelming majority of Hawaii's GM field trials test corn (maize) varieties. Parent seed is also produced in the islands, for the same reasons that trial plots are grown here. Drawn by the advantage of multiple growing seasons per year, seed corn producers first came to Hawaii in the 1960s. In the 1990s, the seed industry was well-positioned to expand as acreage in sugarcane and pineapple declined. Since 2006, the seed corn industry has been Hawaii's largest (by dollar value) crop.

Hawaii's parent seed producers operate on Kauai, Maui, Molokai, and Oahu. More than 12 million pounds of seed valued at \$213 million were harvested from 7,000 acres during the 2012/2013 seasons. This seed includes regulated GM crops in the testing and improvement stages, deregulated GM crops that are used by farmers on the mainland and internationally for planting, and conventional non-GM crops.



One of Many

If you add up the ISB database acreage values for GM crop varieties being tested in Hawaii, the resulting sum is ten times larger than the acreage currently owned or leased by seed companies. This is because a single field trial can involve multiple locations (different States) with Hawaii being one of many.



Year Round Production



Not every acre allowed by permit is necessarily planted in any particular state. After Hawaii, the second most frequently used location for GM field trials is Puerto Rico, another tropical environment where the mild climate supports year-round corn production.

More Corn Field Trials

Nationwide, since 1987 there have been more than 8,000 field trials for GM corn varieties; by comparison, there have been fewer than 2,400 GM soybean field trials. In fact, more U.S. field trials have been held for GM corn than for the next nine GM crops combined.



Conducting part of their field testing in Hawaii and Puerto Rico allows corn breeders to bring a new variety to market much faster than if all the field testing was done on the mainland US, where winters limit corn to a single growing season each year. However, Hawaii and Puerto Rico are not alone in hosting field tests for GM crops. The ISB database reports that hundreds of field trials are carried out each year in Midwestern corn belt states to ensure that new GM varieties will perform as expected for farmers who plant the seed in their fields in those locations.