

# Safety Of Genetically Modified Food Scrutinized

BY ROSIE MESTEL  
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LOS ANGELES — To the naked eye, the white puffs of cotton growing on shrubs, the yellow flowers on canola plants and the towering tassels on cornstalks look just like those on any other plants. But inside their cells, where their DNA contains instructions for how these crops should grow, there are a few genes that were put there not by Mother Nature but by scientists in a lab.

Some of the genes are from a soil bacterium called *Bacillus thuringiensis* that makes proteins lethal to flies, moths and other insects. Others are from the soil bacterium *Agrobacterium* that programs plants to make a key enzyme that isn't vulnerable to a popular weed killer. These modifications allow farmers to grow crops with easier weed control and fewer pest-killing chemicals.

To an increasingly vocal group of consumers, this genetic tinkering is a major source of anxiety. They worry that eating engineered foods could be bad for their health or cause unanticipated environmental problems. At the very least, they insist, they deserve the right to know whether the foods they might buy contain genetically modified ingredients.

In California, this unease has culminated in Proposition 37. If approved on Nov. 6, the initiative would require many grocery store items containing genetically modified ingredients to carry labels.

But among scientists, there is widespread agreement that such crops aren't dangerous. The plants, they say, are as safe as those generated for centuries by conventional breeding and, in the 20th century, by irradiating plant material, exposing it to chemical mutagens or fusing cells together to produce plants with higher grain yields, resistance to frost and other desirable properties. Now they want to insert other genes into plants to make them more nutritious, resistant to drought or able to capture nitrogen from the air so they require less fertilizer, among other useful traits.

"There's no mystery here," said UCLA plant geneticist Bob Goldberg. "When you put a gene into a plant ... it behaves exactly like any other gene."

Genetically engineered crops have been extensively studied. Hundreds of papers in academic journals have scrutinized data on the health and environmental impacts of the plants. So have several in-depth analyses by independent panels convened by the National Academy of Sciences.

The reports have broadly concluded that genetically modified plants are not only safe but also in many respects friendlier to the environment than nonengineered crops grown via conventional farming methods.

For instance, a review this year of 24 long-term or multigenerational studies found that genetically modified corn, soy, potato, rice and wheat had no ill effects on the rats, cows, mice, quails, chickens, pigs and sheep that ate them. Growth, development, blood, tissue structure, urine chemistry and organ and body weights were normal, according to the report in Food and Chemical Toxicology.

About 90 percent of the corn, soy and cotton now grown in the U.S. is genetically modified, and that has led to less use of pesticides, more targeted insect control, a shift to fewer toxic chemicals and less soil erosion compared with conventional farms, according to a 250-page analysis from the National Academies in 2010.

"There were hundreds and hundreds of peer-reviewed articles we combed through," said environmental economist David Ervin of Portland State University, who chaired the panel.

Though genetically modified crops are widespread, the alterations are quite limited.

The most common one makes crop plants tolerate the herbicide Roundup, allowing them to thrive while weeds die. Roundup kills weeds by disabling an enzyme called EPSPS that plants need to make amino acids. But crops are vulnerable too. So scientists at Monsanto Co. developed seeds

with a resistant version of the EPSPS gene from *Agrobacterium*, splicing it into soy, alfalfa, corn, cotton, canola and sugar beets. The resulting crops have built-in protection to the herbicide; hence the brand name Roundup Ready.

It was such an easy way to control weeds that farmers flocked to it, said weed scientist Mike Owen of Iowa State University in Ames: "The siren song of simplicity and convenience was incredibly powerful."

Scientists used another strategy to make crops that can resist insect pests, such as the European corn borer and cotton bollworm.

For this job, the key genes are from *Bacillus thuringiensis*, known as Bt, which makes proteins that are toxic to insects but harmless to fish, birds, people and other

vertebrates because they lack a receptor to which the proteins bind.

For decades, Bt proteins have been sprayed on organic crops to control insects. In the genetically modified version of the strategy, genes for Bt proteins are spliced into the plant's DNA so that it makes the protein itself.

Adoption of these crops has led to several documented benefits. American farmers cut back on their use of traditional insecticides that kill a broader array of bugs — including helpful ones — between 1996 and 2008, the National Academies review found.

China's broad adoption of Bt cotton led to a rise in numbers of beneficial ladybugs, lacewings and spiders and fewer aphids and other pests, according to an April study in

the journal Nature.

In one famous case, genetic engineering saved a crop headed for extinction. Papaya plantations in Hawaii were under attack from the papaya ringspot virus; a new genetically altered papaya is resistant.

None of this means that modified crops are perfect. Problem weeds like water-hemp and Palmer pigweed are developing resistance to Roundup around the U.S., undercutting the usefulness of Roundup Ready crops.

That doesn't surprise Owen, who saw the same thing happen with older herbicides for conventional crops. The reason was the same: overuse of one chemical. The solution, he said, is not to ditch engineered crops but to incorporate them with a variety of herbicides, cover crops, crop rotation and till-

ing of the soil.

He said he gets irked by talk of monster "superweeds" spawned by genetically modified crops: "It was the decision of how the genetic engineering was going to be used that created the problem."

To discourage the evolution of pests that are resistant to Bt proteins, the Environmental Protection Agency requires farmers to plant a buffer zone of conventional crops near ones engineered for resistance. Farmers have been lax about this, undermining the technology's usefulness, said Gregory Jaffe, director of the biotechnology project for the Center for Science in the Public Interest in Washington.

Indeed, reports of Bt-resistant pests are cropping up, just as occurred with traditional insecticides, said ento-

mologist Yves Carriere of the University of Arizona in Tucson. To stave off the trend, companies are creating crops with multiple Bt genes, since it's harder for insects to develop resistance to all of them at once.

Engineered crops can — and do — cross with conventional crops, creating occasional embarrassments for the plant biotech industry and headaches for organic farmers who want their products free of genetically modified ingredients. In Europe, rules state that products can be labeled alteration-free if they contain up to 0.9 percent genetically modified content. There is no such cutoff in the U.S., Carriere said.

Stacy Malkan, a spokeswoman for California's Yes on 37 campaign, said she and others were not convinced

by the safety data on genetically modified crops because, among other reasons, many of the studies were done by industry scientists and didn't assess effects of eating such crops for a long enough period of time.

It's also a matter of basic consumer rights, she added. "When we're the ones buying the food, we should get to know what we want to know about it," she said.

As the wife of an organic farmer, Pamela Ronald is heartened that consumers are interested in food safety and sustainability. But as a University of California, Davis, plant geneticist, she said the labels required by Proposition 37 wouldn't tell people what they want to know.

"It has no meaning, whether it's (genetically modified) or not," she said.

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### INSTRUCTIONS TO THE VOTERS

#### VOTING RIGHTS

Any voter who can't mark a ballot because the voter has a physical disability or can't read, may ask any person they choose to help them vote.

Any voter may ask for instruction in the proper procedure for voting.

Any voter at the polling place prior to 7:00 p.m. is allowed to cast a ballot.

If your voting rights have been violated, you may call the person in charge of the election at 605-260-4400 Ext. 0, the Secretary of State at 888-703-5328, or your state's attorney.

Any person who is convicted of a felony on or after

July 1, 2012, loses the right to vote. However, any such person may register to vote following the completion of their felony sentence.

Any person who is convicted of a felony on or before June 30, 2012, and who receives a sentence of imprisonment to the adult penitentiary system, including a suspended execution of sentence, loses the right to vote. Any such person so sentenced may register to vote following completion of their sentence. Further information is available at www.sdsos.gov.

#### ELECTION CRIMES

Anyone who makes a false statement when they vote, tries to vote knowing they are not a qualified

voter, or tries to vote more than once has committed an election crime.

#### YANKTON COUNTY VOTING CENTERS

YANKTON CITY HALL –  
416 WALNUT STREET, YANKTON

YANKTON MIDDLE SCHOOL –  
2000 MULBERRY STREET, YANKTON

JODEANS STEAKHOUSE & LOUNGE –  
2809 BROADWAY AVENUE, YANKTON  
GAYVILLE COMMUNITY CENTER –  
404 WASHINGTON STREET, GAYVILLE

BROOMTREE RETREAT & CONFERENCE  
CENTER — 29827 446TH AVENUE, IRENE

LESTERVILLE FIRE HALL — LESTERVILLE

THE ROCK HOUSE —  
31120 QUARRY DRIVE, YANKTON

## OFFICIAL GENERAL ELECTION BALLOT

A	November 6, 2012	B	Yankton County, South Dakota	C
<b>INSTRUCTIONS TO THE VOTER:</b> To vote for a group of presidential electors <b>FILL IN</b> the oval (●) next to the names.  Use only a pencil or pen.  If you make a mistake, give the ballot back and get a new one.  <b>DO NOT</b> cast more votes than are allowed in each race.		<b>For Public Utilities Commissioner Six Year Term</b> You may vote for <u>one</u> or leave it blank.  <input type="radio"/> <b>Matt McGovern</b> Democratic Party  <input type="radio"/> <b>Kristie Fiegen</b> Republican Party  <input type="radio"/> <b>Russell Clarke</b> Libertarian Party		<b>Yankton County</b>
<b>For Presidential Electors</b> You may vote for <u>one</u> slate or leave it blank.  <input type="radio"/> <b>Obama &amp; Biden Electors</b> Democratic Party Jim Burg Marc S. Feinstein Ritchie Nordstrom  <input type="radio"/> <b>Goode &amp; Clymer Electors</b> Constitution Party Joy Howe Lori Stacey Dan Huwe  <input type="radio"/> <b>Romney &amp; Ryan Electors</b> Republican Party Dennis Daugaard Matt Michels Marty Jackley  <input type="radio"/> <b>Johnson &amp; Gray Electors</b> Libertarian Party Bob Newland Tony Ryan Samuel Saunders		<b>For Public Utilities Commissioner Four Year Term</b> You may vote for <u>one</u> or leave it blank.  <input type="radio"/> <b>Nick Nemec</b> Democratic Party  <input type="radio"/> <b>Chris Nelson</b> Republican Party		
		<b>For State Senator District 18</b> You may vote for <u>one</u> or leave it blank.  <input type="radio"/> <b>David L. Allen</b> Democratic Party  <input type="radio"/> <b>Jean M. Hunhoff</b> Republican Party		<b>NONPOLITICAL BALLOT</b>  <b>Supreme Court Justice Retention</b> Shall the Justice of the Supreme Court named on this ballot, whose term expires January 1, 2013, be retained in office?  <b>Justice Glen A. Severson</b> representing the Second Supreme Court District  <input type="radio"/> <b>YES</b>  <input type="radio"/> <b>NO</b>
		<b>For State Representatives District 18</b> You may vote for up to <u>two</u> or leave it blank.  <input type="radio"/> <b>Charlie Gross</b> Democratic Party  <input type="radio"/> <b>Bernie Hunhoff</b> Democratic Party  <input type="radio"/> <b>Mike Stevens</b> Republican Party  <input type="radio"/> <b>Thomas D. Stotz</b> Republican Party		
		<b>For County Coroner</b> You may vote for <u>one</u> or leave it blank.  <input type="radio"/> <b>Melisa Lynn Smith</b> Democratic Party  <input type="radio"/> <b>Arica K. Nickles</b> Republican Party		<b>INSTRUCTIONS TO THE VOTER:</b> To vote on a ballot question <b>FILL IN</b> the oval (●) next to "yes" or "no".  <b>DO NOT</b> cast more votes than are allowed in each race.  <b>Constitutional Amendments</b> The following amendments to the State Constitution are submitted to the voters by the Legislature. The amendments will not become effective unless approved by majority vote.  <b>Constitutional Amendment M</b> <b>Title:</b> An Amendment to the South Dakota Constitution regarding certain provisions relating to corporations. <b>Attorney General Explanation:</b> The Constitution currently contains certain restrictions on the Legislature's authority to enact laws regarding corporations. For example, corporate directors must be elected by cumulative voting, in which a shareholder may choose to cast all votes for a single candidate or spread the votes among two or more candidates. Corporate stock or bonds may only be issued for money, labor or property received by the corporation. Corporate stock or debt may not be increased without prior notice to and consent of current stockholders. Constitutional Amendment M removes these restrictions, and allows the Legislature to: (1) authorize alternative methods of voting in elections for corporate directors; (2) expand the types of contributions a corporation may receive for the issuance of stock or bonds; and (3) establish procedures governing the increase of corporate stock or debt.  <input type="radio"/> <b>Yes</b> A vote "Yes" will remove the constitutional restrictions.  <input type="radio"/> <b>No</b> A vote "No" will leave the Constitution as it is.
		<b>For County Commissioner At Large</b> You may vote for up to <u>two</u> or leave it blank.  <input type="radio"/> <b>Mark E. Johnson</b> Republican Party  <input type="radio"/> <b>James L. Van Osdel</b> Republican Party  <input type="radio"/> <b>Donna R. Freng</b> Independent		
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