fund these courtroom battles. It is tempting to see Vermont's move as the first success in a larger US movement that aims to limit the spread of genetically modified foods.

The Center for Food Safety, a consumer activist group in Washington DC, says that there are 35 similar food-labelling bills in the works across 16 states. That is not to say that all will follow in Vermont's footsteps. In 2012 and 2013, voters in California and Washington state defeated similar ballot measures. Vermont — the only state to boast a self-described socialist as a senator — is something of an outlier on the US political spectrum. But the interest in laws on labelling is a striking trend in a country that is the world's leading producer of genetically engineered crops.

There is plenty of precedent for such laws: more than 60 countries require genetically engineered foods to be labelled. Many of those countries grow few, if any, genetically engineered crops. The US labelling movement poses a number of logistical challenges. Navigating a patchwork nation in which labelling requirements vary from state to state is one obvious problem for the food industry. The sheer pervasiveness of genetically engineered crops in all manner of foods is another.

In 2013, such crops populated about half of US farmland. That included more than 400,000 hectares of sugar beets modified to withstand the herbicide glyphosate. By 2010, some 95% of the US sugar-beet crop was genetically engineered, and more than half of the processed sugar made in the country derives from sugar beets. Although neither the genetically engineered DNA nor protein remains in the finished product, laws proposed in some states would require that foods containing this sugar be labelled as 'genetically modified'.

And so it would go for most genetically engineered crops, which make their way onto the dinner table largely by way of processed foods. Herbicide-tolerant corn (maize) appears as the sweetener high-fructose corn syrup, and engineered soya beans are used to make the common food additive soy lecithin. Corn oil made from engineered corn is chemically no different from that made with conventionally bred corn. Yet some proposed laws would require a frozen pizza drizzled with corn oil made from genetically engineered corn to be labelled as 'genetically modified'.

The definition of that term is set to become even fuzzier as new technologies widen the array of genetic modifications available to crop breeders. Some are experimenting with 'cisgenics' — the science of modifying a crop by expressing genes plucked from related species. Methods that alter gene expression using RNA molecules are also in vogue. And advances in genetic engineering have yielded ways to precisely edit the genome, inserting genes at specific locations. These methods allow just a few letters of the DNA sequence to be changed.

"Determining the provenance of some engineered crops may be impossible."

It is a far cry from the days when genes that conferred insect resistance or herbicide tolerance were taken from a bacterium and shot near-randomly into crop genomes. Yet while regulators are deep in discussions about how to handle the new varieties of genetically engineered foods, popular conceptions of such foods seem largely unchanged. Vermont's labelling law and many of the other proposals make no distinction: products of a crop engineered using recombinant DNA techniques to make heritable changes to the genome are to be labelled, regardless of whether that change was one that could have been produced through conventional methods such as breeding with relatives or exposing seeds to mutagens. It is also not clear whether the labelling laws could be enforced: determining the provenance of some of these engineered crops may be impossible, because the products will be indistinguishable from those made using conventional crops.

The issue of genetically engineered foods is a muddled one, and the debate surrounding them is heated. Some oppose the technology because they oppose industrialized agriculture; others worry that engineered crops could pose environmental hazards. And many consumers believe, despite evidence to the contrary, that the foods pose more health risks than those grown through conventional breeding and mutagenesis.

Researchers may understandably be hesitant to plunge into these turbulent waters. But the popular discourse around genetically engineered crops is in dire need of a scientific update. Without it, public discussion and political legislation will continue to drift away from reality. ■

Out with a bang

The discovery of a Wolf–Rayet supernova rebuts the idea that the biggest stars go quietly.

A long time ago, a faraway star threw up its insides and ended its days in a colossal explosion. The first light to hold the record of this supernova reached Earth about this time last year. Just a few hours later, quick-thinking astronomers were able to point a telescope at the hole in the sky where the star had been. The resulting images help to resolve a key question in stellar physics. And they might raise more questions about the fate of Earth.

Supernovae are one of the most stunning events in the night sky; the explosions are so well known for their violence that the term has even entered common parlance. Yet supernovae are rare, and so, therefore, are direct observations of the circumstances immediately before and after them.

As astronomers describe on page 471 of this issue, being able to focus on the immediate aftermath of a supernova has shed new light on why some stars go bang with such force. In this case, the emissions spectra sent out by the dying star show that it was a Wolf–Rayet star, massive bodies that shed their mass rapidly in strong stellar winds.

The finding is significant because, although astronomers assumed that Wolf–Rayet stars would go supernova, there was no direct evidence that they did. In fact, in the absence of observations of such supernovae, a rival theory was gaining ground: that they might end their lives not in a bang but with a whimper. As John Eldridge explains in an accompanying News & Views article on page 431: "Until this event, there was growing evidence that such stars were likely to have dim or unobservable deaths."

Wolf–Rayet stars are more than 20 times more massive than our Sun and are very breezy places: their fierce stellar winds can reach more than 1,000 kilometres per second. They are also rare, so if the name rings a bell then it could be because you have heard of a particular specimen: WR 104, a binary star about 2,450 parsecs (8,000 light years) from Earth that shot to fame in 2008 when astronomers warned that we could be in the firing line if it exploded. If you are concerned by this (and you probably needn't be), then the finding that Wolf-Rayet stars do go supernova will do little to ease your anxiety.

A mere supernova would not threaten us at that distance, but some very massive stars explode as two powerful beams of lethal radiation known as γ-ray bursts. Depending on which way WR 104 is pointing — and the jury remains out on that — one of those bursts could head our way.

There are plenty of ifs and buts there — evidence suggests, for instance, that WR 104 has the wrong environment for γ-ray bursts — but, technically, the odds of such an event just shortened, very slightly. All Wolf–Rayet stars will go bang, the paper proposes, WR 104 included. The question is when — it could be next week, or thousands of years hence. Or it may already have happened. ■

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