Industry exhales as USDA okays glyphosate-resistant alfalfa

US farmers can again plant genetically engineered alfalfa following a decision in January by the US Department of Agriculture (USDA). The ruling, which follows a tumultuous debate and four-year US court-imposed ban, comes as a relief to the agricultural biotech industry. The agency was proposing to place geographic restrictions on planting in response to organic growers' requests. This alternative was only narrowly averted and could have set sweeping regulatory precedents.

"There was probably a collective sigh of relief that the agency stuck with the precedent that it has been relying on since it started reviewing and approving biotech traits," says Jeff Rowe, vice president of biotech affairs and regulatory at Pioneer in Des Moines, Iowa.

Jason Lugo/istockphoto

Planting glyphosate-resistant alfalfa has resumed following the USDA's January decision.

But the events that led up to the USDA's decision have left leaders in industry rattled. They are concerned that the agency will begin making non–science-based concessions to the organic community at the expense of biotech crop developers and growers. Some expect litigation delays and longer regulatory timelines for crop approvals.

Alfalfa is a high-protein forage crop for livestock. On one side of the debate are those seeking to sell and grow the biotech variety, genetically engineered to tolerate the herbicide glyphosate through expression of the *Agrobacterium tumefaciens* transgene 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) and brought to market in 2005 by St. Louis–based Monsanto and Nampa, Idaho–based Forage Genetics International. On the other, are those who market organic alfalfa.

Leaders of the organic lobby fear that Monsanto's alfalfa containing the EPSPS transgene will outcross or admix with their organic varieties. One of several reasons why consumers buy organic products is specifically to avoid transgenes in their food; thus, the presence (or 'contamination,' as it is commonly branded) of transgenic material in organic food is viewed as a threat to both the domestic and export markets of organic producers. "This is striking at the heart of the organic community," says Doug Gurian-Sherman, a senior scientist at the Union of Concerned Scientists in Cambridge, Massachusetts. "The biggest single use for alfalfa is dairy, and organic milk is a premium product." Although there is no validated mechanism in the literature clarifying how transgenic *EPSPS* sequences in alfalfa would make their way into cow's milk, the issue is that organic products claim to avoid GM products in any shape or form; thus, transgenic alfalfa presents a problem to organic dairy farmers.

In 2006, a group of organic alfalfa growers and nonprofit organizations, such as the Center for Food Safety in Washington, DC, sued the USDA for approving the GM alfalfa, arguing that the agency had not fully considered its environmental and economic impacts. A US federal court agreed and in 2007 ordered the agency to conduct a more thorough environmental analysis. In the meantime, crop planting and sales were halted.

USDA worked on the court-ordered environmental impact statement (EIS), for nearly four years. After receiving about 244,000 public comments and holding four public meetings, the agency produced a final EIS on December 16, 2010. The 2,300-page review acknowledged the potential for genes from EPSPS transgenic alfalfa to find their way into nontransgenic varieties but noted that the probability was "low" and depended on several conditions. USDA maintained its conclusion that EPSPS transgenic alfalfa is safe for food and feed purposes and poses no plant pest risk.

On the basis of the EIS, the agency at first proposed one of two actions: either to approve the GM alfalfa fully or approve the crop in part, with restrictions on where it could be planted. For instance, to segregate the transgenic alfalfa from organic alfalfa, farmers would have to set up an exclusion zone of at least 5 miles.

The agency said upon filing the EIS in the Federal Register December 23 it would decide after 30 days which of the two actions it would follow. "This final EIS is a first step toward look-

IN brief

DuPont swallows Danisco

Early in January, agricultural biotech giant DuPont of Wilmington, Delaware, agreed to purchase Danish enzyme maker Danisco, based in Copenhagen, for $5.8 billion. The deal has not been finalized, but speculation about the potential consequences of this buyout is rippling through the Danish biotech sector. "We've sold one of our national treasures," says Claus Felby, a professor of wood and biomass technology at the University of Copenhagen. Biotech researchers like Birger Moller, professor of plant biochemistry at the University of Copenhagen, fear that if DuPont decides to move Danisco's manufacturing to the US, this may put an end to an era of fruitful collaboration between industry and basic research in the country. Equally, DuPont's interest in Danisco could send a message about the value of Danish biotech. "It indicates we're sitting on a gold mine here," says Moller. In another recent transaction, Danish enzyme manufacturer Novozymes bought Darmstadt, Germany–based Merck's bioagricultural science unit for $275 million. Merck's divested Crop Bioscience, which makes inoculants for plant health, is a strong strategic fit for the Danish biotech located in Bagsvaerd. The companies expect to close the deal by May, pending regulatory approval. *Nidhi Subbaraman*

Alzheimer's genetic map

Research groups across France, the UK and US are pooling their resources to create the biggest genetic information bank on Alzheimer's disease. Researchers participating in the International Genomics of Alzheimer's Project (IGAP) will compare the genomic data of 20,000 individuals with 30,000 controls. Members of the project include the European Alzheimer's Disease Initiative, led by the Institute Pasteur de Lille and Lille University, the Genetic and Environmental Risk in Alzheimer's Disease group from Cardiff, UK, the Heart and Aging Research in Genomic Epidemiology, Boston University and the Alzheimer's Disease Genetics Consortium at the University of Pennsylvania School of Medicine, Philadelphia. "This is the first time, internationally, we've all gotten together," says Gerard Schellenberg, director of the Philadelphia-based team and professor of pathology and laboratory medicine, University of Pennsylvania Medical School. Each institute will carry out its own association analysis, and those statistics pooled into a meta analysis, says Schellenberg. With almost 50,000 individuals, and drawing on results from the 1000 Genome Project, the IGAP aims to deepen understanding of the molecular basis of rare variants of the disease, Schellenberg says, and identify genetic risk factors for the disease. IGAP's meeting and analysis costs are currently supported by the Alzheimer's Association of Chicago, and Foundation Plan Alzheimer, of Paris. *Nidhi Subbaraman*