

No surprise to find rogue genetically altered crop

By Michael Wines, New York Times

One week after the revelation that an Oregon farmer had found genetically engineered wheat growing in his fields, scientists remain mystified over how the strain – apparently the remains of a test crop shut down a dozen years ago – got there.

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But few are surprised. Even with extensive precautions, gene-altered plants turn up in unwanted places regularly enough that farmers have come to consider a few of them weeds, and even a threat to their livelihood.

And while none of them yet poses any known public health hazard, experts say the boom in so-called transgenic crops should prompt even more careful evaluation of future varieties with an eye to the prospect that they, too, could eventually appear elsewhere.

In the case of the wheat found in Oregon, most experts say, all those prospects are remote. The experimental wheat was created and tested by the Monsanto Company to be resistant to its best-selling Roundup herbicide, and similarly Roundup-resistant varieties of corn, soybeans and other crops are widely grown with no known health effects.

In a telephone news briefing on Wednesday, Monsanto officials called the appearance of the altered wheat “a random isolated occurrence” and said there was no evidence that the wheat had moved beyond the single farm or that its seeds were in the seed stocks that the farmer used to plant his fields.

Nor is the Monsanto wheat likely to spread elsewhere, most experts say. The plants found in Oregon, which the company said covered less than 1 percent of the farmer's 125 acres, are the only ones found anywhere since Monsanto abandoned plans to sell modified seeds in 2004.

As with most transgenic plants, the wheat could have transferred its engineered trait to ordinary wheat via its pollen, which contains the single gene for herbicide resistance. That gene is dominant, meaning plants fertilized by the Monsanto wheat's pollen would likely pass the Roundup-tolerant trait to future generations.

But while plants like corn fertilize each other, spreading their pollen far and wide by winds, butterflies or bees, wheat plants generally fertilize only themselves. Moreover, wheat pollen rapidly loses its potency once it leaves the plant.

"A transgene that comes up in corn could be a much different situation," Kendall Lamkey, the chairman of Iowa State University's agronomy department, said in an interview. "Corn pollen can travel, under the right conditions, a great distance," he said. But with wheat, he said, "The gene's unlikely to be moving to other varieties in any significant way."

When a gene does move to other varieties, however, the potential for mischief can be considerable.

Consider the benchmark example: in 1998, Aventis Agrosience Inc., a Swiss company now known as Syngenta, won federal approval to sell a strain of corn called StarLink altered to produce a pesticide that kills insect larvae. After scientists found a moderate possibility that the strain could trigger allergic reactions in some people, the government registered the corn for use only in animal feed and biofuels, and imposed safeguards to keep it out of the food processing chain.

At its peak, StarLink corn was grown on less than half of a

percent of all the corn acreage in the United States. Yet by September 2000, it was discovered in corn taco shells, triggering a huge recall, tests on more than four billion bushels of corn and the cancellation of StarLink's federal registration.

Such dire consequences are rare, but not unheard of. A group representing more than a thousand organic farmers in Saskatchewan complained in 2002 that gene transfers from canola that had been genetically engineered to tolerate herbicides had contaminated their fields. That made it impossible to certify their canola as wholly natural, costing the farmers \$10 million, the group stated.

Nature is hardly the only culprit in genetic transfers. Farmers can accidentally mix bags of natural and modified seed. Combines that harvest a gene-altered crop can pick up its seeds, then drop them while harvesting a field of natural plants.

Both farmers and manufacturers alike employ measures like putting buffer zones around fields, to limit the risk that genetic material will cross from altered crops to natural ones. But many experts say that the myriad ways that seed and genes can be spread make that possibility substantial.

The real question, they say, is how much that matters.

Absent any proven health threat, the most common fear is economic – that organic farmers will lose crops, or that food exports to countries that ban imports of gene-altered products will suffer. The Oregon incident instantly raised fears that the United States' \$8 billion annual wheat trade would be hard hit, although the strain of winter wheat at issue makes up only a fraction of those exports.

But a 2010 report on genetically engineered crops by the National Research Council noted that genes can pass not only from an altered plant to its natural brother, but to less

close relatives in the wild. "Such hybridization is common in plants generally and is a key process for the evolution of new plant species," the report stated.

Concerns about transfers to the wild already had stalled approvals of genetically altered crops like sunflowers and rice. During tests in Oregon of a pesticide-tolerant bentgrass in 2003, "introgression of the transgene into weedy populations was detected at a considerable distance from the test sites," the report stated.

That is also a potential problem with genetically modified wheat, said the chairman of the group that prepared the report, David E. Ervin, an environmental management professor at Portland State University in Oregon.

"There has always been a worry with wheat, being in the grass family," he said. He added that if there were a transfer of the gene into grasses, "There's going to be difficulty in controlling those grasses, and you might have to resort to stronger herbicide treatments, some of which have more environmental consequences."

That underscores the need for caution in approving new varieties of altered plants, he said, adding: "All bets are off when you start introducing new kinds of crops. That we haven't had any serious events to this point doesn't mean we won't have significant risk of them occurring in the future."