



## Monsanto U: Agribusiness's Takeover of Public Schools

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I've startled a bug scientist. "Yeah, now I'm nervous," said Mike Hoffmann, a Cornell University entomologist and crop specialist who spends his days with cucumber beetles and small wasps. But he's also in charge of keeping the research funding flowing at Cornell's College of Agriculture and Life Sciences. What have I done to alarm him? I've drawn his attention to the newly released FY 2009 Presidential Budget.

Like more than a hundred public institutions of higher learning, Cornell is what's known as a "land grant." Dotting the United States from Ithaca, N.Y., to Pullman, Wash., such schools were established by a Civil War-era act of Congress to provide universities centered around, "the agriculture and mechanic arts." Congress handed each U.S. state a chunk of federal land to be sold for start-up monies, and for the last 150 years, it has funded ground-breaking research on all things agriculture, from dirt to crops to cattle.

The land-grant system has been, in short, a high-yield investment. The scientific research that has come out of land-grant labs and fields have aided millions of farmers and fed millions of Americans. And the land-grant reach doesn't stop at ocean's edge. Oklahoma State, the Sooner State's land grant, says that the public funding of land-grant research "has benefited every man, woman and child in the United States and much of the world."

That was until America's land-grant system met George W. Bush. Tucked into the appendix of his latest national budget is a nearly one-third cut in the public funding for agriculture research at the land grants. The size of the cut is surprising, but not its existence -- it's part of a multiyear drive by the Bush administration to completely eliminate regular public research funding. In a press briefing last week, a USDA deputy secretary illuminated the Bush administration's rationale for the transition to competitive grant making: "That's how you get the most bang for the buck."

Wallace Huffman, an Iowa State agro-economist, is deeply unimpressed with Bush's "bang" approach to land-grant research. "There's a sense in the president's office that you invest in research like you invest in building cars," Huffman told me last week. Land-grant school officials are similarly skeptical. In a survey, Kansas State argued that the loss of regular funding would upend education. Minnesota complained that cuts would undermine ongoing research projects. North Dakota simply asked, "What is the future of ag research?"

Good question. A reasonable answer? The future of agricultural research at America's land-grant institutions belongs to biotech conglomerates like Monsanto.

And it seems likely that it's a future of chemical-dependent, genetically modified, bio-engineered agriculture.

In stark contrast to how the federal government and many states are wallowing in red ink, the St. Louis-based Monsanto boasted more than \$7 billion in annual sales in 2007 -- simply the latest in four years of record-smashing profits. And so when our president says that the time has come for public land-grant institutions to get cracking at "leveraging nonfederal resources," you can be sure that Monsanto's ears perk.

But, it doesn't take a presidential invitation to get Monsanto to sink its roots in the land-grant system. Those roots are already planted. Iowa State's campus boasts a Monsanto Auditorium and the school offers students Monsanto-funded graduate fellowships on seed policy with a special focus on "the protection of intellectual property rights." Kansas State has spun off Wildcat Genetics, a side company whose purpose is the selling of soybean seeds genetically engineered to survive the application of Roundup® -- the result of a decades long relationship with Monsanto, the pesticide's maker.

But don't get the wrong idea about Monsanto's land-grant activities. By that, I mean, don't think the company is the *only* multinational biotech conglomerate firmly rooted in American land-grant soil.

Head on down to Texas A&M. There you'll find the a chair for the "Dow Chemical Professor of Biological and Agricultural Engineering." Similar chairs exist at West Virginia State and Louisiana State. The agricultural college of the University of California at Davis is funded in part by DuPont and Calgene.

The University of California at Berkeley's Plant and Microbiology Department entered into a \$25 million/five-year quasi-exclusive research agreement with the Swiss-based Novartis, which then became Syngenta, which now funds the land-grant research group on soybean fungi. In 2005, Purdue, Indiana's land-grant school, developed an application of the so-called Terminator gene pioneered by Delta Pine and Land Co.; school officials and researchers later took to the hustings when the public resisted the idea of self-sterilizing plants.

But the agricultural industry's relationship with the land-grant system is not an entirely new development. In 1973, former Texas agricultural commissioner and activist Jim Hightower lamented the situation in his landmark report, *Hard Tomatoes, Hard Times: The Failure of America's Land Grant College Complex*.

But the world of agriculture is today a far, far different place than when Hightower wrote.

For one thing, in the early 1970s Monsanto was still a decade away from genetically modifying its very first plant cell. For another, back then the federal government was still committed to providing steady research funding.

And, importantly, it was neither possible nor profitable for our nation's bastions of higher learning to be players in the global agribusiness. But intervening tectonic shifts in American public policy help us to understand why a public institution like Purdue would fight so darn hard to defend a biotech advance like the Terminator

gene: in a manner of speaking, they *own* the thing.

Jump ahead to 1980, when the U.S. Supreme Court under Warren Burger decided that, as long as they'd been tweaked from their natural state, living organisms from seeds to microbes or Terminator genes could be patented just as if they were a new cotton gin or tractor blade. And in that same year, Congress gave universities a kick towards the marketplace by encouraging institutions to file patent claims on the discoveries and inventions of their faculty researchers -- no matter if their work was funded in whole or in part by taxpayer dollars.

The summed effect was that, suddenly, a public institution like Purdue had a great deal of motivation for working with Delta Pine and Land Co. to see if they might make a buck off their biotech invention in the marketplace. What's more, the policy shift made it so individual lab geeks themselves stood to profit, eligible for a large slice of whatever windfall their discovery generated.

As the biotech industry has since exploded, the impact on the land-grant system is perhaps not unexpected. "Researchers want to be at both the cutting edge of science *and* the cutting edge of the marketplace," says Andrew Neighbour, until recently the director of UCLA's office on the business applications of faculty research. (The entire University of California system functions as that state's "land-grant institution.") And so the advent of patentable and profitable plants (and animals, for that matter) has meant a shift in research focus away new knowledge and towards the creation of marketable products.

The land-grant institutions find themselves in a pickle. "On the one hand," says Paul Gepts, professor of agronomy and plant genetics at UC Davis, schools pushed into the free market have developed the habit of patenting research and found a taste for private business deals. But on the other hand, "they have a public role where the information they produce should be available to all."

As things stand, "public universities," says Dr. Gepts, "are a contradiction."

This embrace of patents and profits means that land-grant agricultural research centers today are not playgrounds of academic collaboration they once were. "Things have changed enormously," says William Folk, a plant geneticist at the University of Missouri. "When I started in the '70s," he recalls fondly, "meetings were filled with people criticizing each other and sharing ideas." But today, he says "if you have an idea that has any potential commercial value, you're reluctant to share."

Not surprisingly, school administrators argue that a negative reading of the cozy relationship between agricultural researchers and biotech corporations like Monsanto and Syngenta is hogwash. When asked, Neal Van Alfen, dean of the UC Davis College of Agriculture and Environmental Science, acknowledges that about 20 percent of the \$165 million annual research budget is contributed by industry. But Dean Alfen is quick to add, "It forms just one part of who we work with." Research conducted in conjunction with industry interests, he insists, is simply one chunk of "an awfully large amount of work."

But numbers and percentages don't tell the whole story, because of the way that industry engages in the land-grant system. In short, they skim. Here's how it works:

(a) federal and state governments hand over taxpayer money to build and sustain the basic infrastructure, without which research can't hope to take place, then (b) the biotech industry injects some smaller amount of much-needed cash into the system, and then (c) agribusinesses skim off and patent the most promising (and potentially profitable) discoveries that rise to the top.

Still, administrators argue, scientific professionalism keeps industry in check -- a researcher who fudges his or her findings to curry industry favor is in for a short career. But that line of reasoning misses the real concern. What's alarming isn't that global agribusiness conglomerates like Monsanto, Dow Chemical and DuPont are getting the answers they want from our land-grant entomologists, agronomists and plant geneticists.

It's that at public institutions, private interests are the ones asking the questions.

What must be kept in mind is that land-grant researchers are generally expected to bring to the table their own research funding, and the situation can already be fairly dire. When UC Davis' Paul Gepts comments on how his institution's support is limited to a base salary, I attempt a lame joke: "They give you a desk too, right?" Yes, he responds, but a phone is another matter.

Faculty researchers are so hungry for funding that, says Missouri's William Folk, "if companies want to entice researchers to work on their projects, all they have to do is wave a bit of money." "The availability of funds, he says, "makes an enormous difference in what we can do."

"We're opportunists," Folk says, with compassion, of himself and his fellow researchers, "we go after money where it might be."

When it comes to how industry-university relations shape academic research, UCLA's Andrew Neighbour is the person to talk to. While an administrator at Washington University in St. Louis, Neighbour managed the school's landmark multiyear and multimillion-dollar relationship with Monsanto. (Note: WashU is a private institution.) "There's no question that industry money comes with strings," Neighbour admits. "It limits what you can do, when you can do it, who it has to be approved by."

And so the issue at hand becomes one of the questions that are being asked at public land-grant schools. While Monsanto, DuPont, Syngenta, *et al.*, are paying the bills, are agricultural researchers going to pursue such lines of scientific inquiry as "How will this new corn variety impact the independent New York farmer?" Or, "Will this new tomato make eaters healthier?"

It seems far more likely that the questions that multinational biotech conglomerates are willing to pay to have answered run along the lines of "How can we keep growing our own bottom lines?"

I put it to Dr. Folk. "The companies are there to make money, no doubt," he responds.

What suffers for falling outside the scope of industry interest? Organic farming, for one. The Organic Farming Research Foundation was founded in the 1980s after,

Executive Director Bob Scowcroft tells me, farmers interested in weaning themselves from chemical dependence approached their local land-grant outreach agents for help for pest management. As Scowcroft tells it, their advice was invariably in the spirit of, "Well, sure, I can tell you what to spray."

OFRF began arming land-grant researchers with modest grants but found that academics interested in conducting organic-related research faced obstacles beyond funding.

"Coming out of the organic closet could be the beginning of the end of your career," says Scowcroft. Looking outside biotech agriculture is, he says, "like throwing 30 years of the Green Revolution in your boss's face." Today, says John Reganold, an OFRF grantee and apple researcher at Washington State University, academics interested in organic farming "just don't have the money to do what we need to do."

Also the subject of minimal industry attention: so-called orphan crops, like sorghum and cassava, which feed millions of people in the developing world but aren't considered patentable or profitable. UC Davis' Paul Gepts is working to breed a disease-resistant variety of the East African common bean, an important protein source for AIDS sufferers. He's turned to an English charitable group for funding, and all involved have agreed to resist patenting the plant -- once a useful variety is developed, the science will be left in the public domain.

While it's clear that funding cash is the carrot used by agribusiness to entice researchers into asking the questions industry is most interested in having answered, there is a stick involved: corporately held patents used to block them from asking others.

That's certainly been Paul Gepts's experience, when he thought he might tackle the question of gene transfer in Mexican maize varieties. The question, though, is a sensitive one for Monsanto, as one of the arguments against transgenic crops is the difficulty in containing their spread -- raising the specter of a threat to the world's biodiversity. As the maize he was interested in was patented by Monsanto, Gepts asked the company for some samples. Their response: no way.

When I asked Gepts for his take on Monsanto's motivation for the refusal, I hadn't yet finished the question when he answered: "Avoiding scrutiny," he said. Missouri's Folk seconds the contention that such private claims on science impede research, saying, "Our ability to do science is constrained by the patents held by agribusiness."

All this said, it's not fair to say that there hasn't been resistance against public land-grant schools mutating into institutions of private science. After Novartis had become involved in UC Berkeley's Department of Plant and Microbiology, the school ordered an internal review by the academic senate, which ultimately deemed the relationship "a mistake." Lawrence Busch, a Berkeley faculty member who headed the review said at its conclusion: "I think it is high time for serious discussions of what the devil we want our universities to be."

When Mike Hoffmann -- the Cornell entomologist I startled by sharing Bush's proposed budget cuts -- recovers from his shock, he offers his take on "what the devil" our universities should be. The principle that should guide Cornell, Berkeley,

Missouri and our other land-grant institutions is simple, he says: public funding for the public good. The mission of America's centers of agricultural learning is, he concludes, "to produce new knowledge for the public benefit. That's why we have the land-grant system, and I think it's pretty important."

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