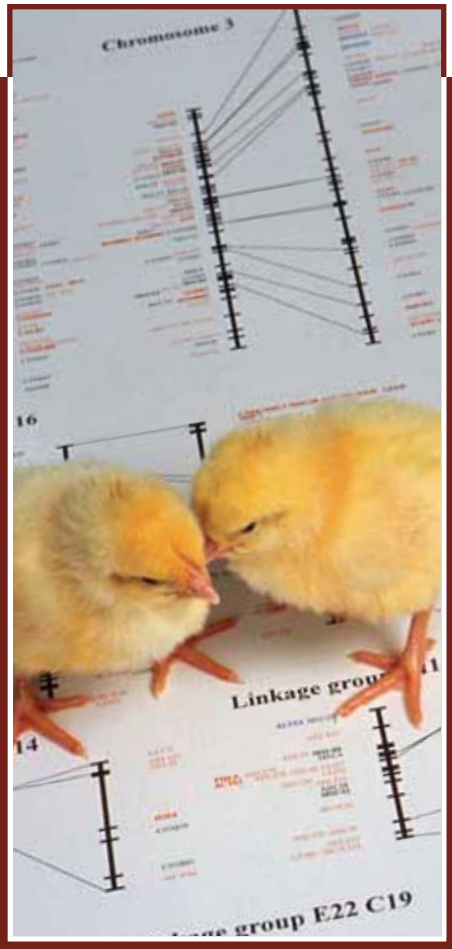

PUBLIC RESEARCH, PRIVATE GAIN

CORPORATE INFLUENCE OVER UNIVERSITY AGRICULTURAL RESEARCH

food&water watch

About Food & Water Watch

Food & Water Watch works to ensure the food, water and fish we consume is safe, accessible and sustainable. So we can all enjoy and trust in what we eat and drink, we help people take charge of where their food comes from, keep clean, affordable, public tap water flowing freely to our homes, protect the environmental quality of oceans, force government to do its job protecting citizens, and educate about the importance of keeping shared resources under public control.

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Executive Summary

Since their creation in 1862, land-grant universities have revolutionized American agriculture. These public institutions delivered better seeds, new plant varieties and advanced tools to farmers who deployed scientific breakthroughs to increase agricultural productivity. They pioneered vitally important research on environmental stewardship, such as soil conservation. Land-grant universities partnered with farmers in research efforts, advancing rural livelihoods and improving the safety and abundance of food for consumers.

These innovations were spurred almost entirely with public investments from state and federal governments. Starting in the 1980s, however, federal policies including the Bayh-Dole Act of 1982 began encouraging land-grant schools to partner with the private sector on agricultural research. A key goal was to develop agricultural products such as seeds, which were sold to farmers under an increasingly aggressive patent regime.[1]

By 2010, private donations provided nearly a quarter of the funding for agricultural research at land-grant universities. This funding steers land-grant research toward the goals of industry. It also discourages independent research that might be critical of the industrial model of agriculture and diverts public research capacity away from important issues such as rural economies, environmental quality and the public health implications of agriculture.

Private-sector funding not only corrupts the public research mission of land-grant universities, but also distorts the science that is supposed to help farmers improve their practices and livelihoods. Industry-funded academic research routinely produces favorable results for industry sponsors. Because policymakers and regulators frequently voice their need for good science in decision-making, industry-funded academic research influences the rules that govern their business operations.

Congress should restore the public agricultural research mission at land-grant schools. The Farm Bill can reinvigorate investment in agricultural research and fund research projects that promote the public interest. Reprioritizing research at land-grant universities may not remedy all of the problems in the food system, but it could play a vital role in developing the science and solutions needed to create a viable alternative to our industrialized, consolidated food system.

Introduction

Public investment in agricultural research through land-grant universities and the U.S. Department of Agriculture (USDA) has provided significant benefits to U.S. farmers, consumers and food companies. This research has produced new seeds, plant varieties, farming practices, conservation methods and food processing techniques – all of which were broadly shared with the public.

The federal government created land-grant universities in 1862 by deeding tracts of land to every state to pursue agricultural research to improve American agriculture, "elevating it to that higher level where it may fearlessly invoke comparison with the most advanced standards of the world."[2] Public investments in agricultural research propelled decades of agricultural improvements. Yields and production increased dramatically, and every public dollar invested in agricultural research returned an average of $10 in benefits.[3] Public research brought about the domestication of the blueberry, early varieties of high-yield hybrid corn and widely used tools to combat soil erosion.[4] Well into the 20th century, seed-breeding programs at land-grant universities were responsible for developing almost all new seed and plant varieties.[5]

The land-grant university system includes some of the largest state universities – including the University of California system, Pennsylvania State University and Texas Agricultural & Mechanical University. With 109 locations and a presence in every state and territory, the land-grant university system has both the capacity and the mission to respond to the research needs of all sectors of agriculture.[6] The USDA distributes the scientific breakthroughs from these land-grant universities through its extension system, in which county extension agents share research with farmers and communicate farmers' research needs with the universities.

But over recent decades, the public mission of land-grant universities has been compromised. As public funding has stalled, land-grant universities have turned to agribusiness to fill the void, dramatically shifting the direction of public agricultural research. Land-grant universities today depend on industry to underwrite research grants, endow faculty chairs, sponsor departments and finance the construction

Agricultural Extension: Shrinking Support for Sharing Knowledge with Farmers

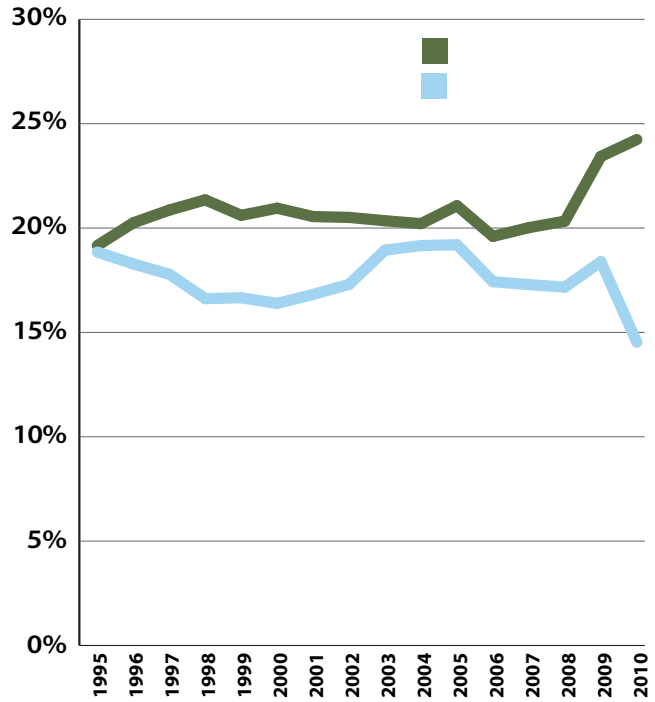
Diminishing USDA support has also undercut agricultural extension services affiliated with land-grant universities that deliver research findings to farmers through outreach, trainings and educational materials.[7] Real USDA funding of extension services decreased by around 12 percent between 2001 and 2010 (in inflation-adjusted 2010 dollars), diminishing the ability of extension to provide farmers with independent, research-based advice about best agricultural practices.[8] An extension officer at a 2011 agricultural forum described the impartial role of extension to tell farmers "that this corn is better than this corn" without "any interest other than putting the right product in front of the hands of the American farmer."[9] Lacking this independent voice, farmers are now turning to agribusiness for advice on the best products and practices.[10]

of new buildings. By the early 1990s, industry funding surpassed USDA funding of agricultural research at land-grant universities.[11] In 2009, corporations, trade associations and foundations invested $822 million in agricultural research at land-grant schools, compared to only $645 million from the USDA (in inflation-adjusted 2010 dollars).[12]

Although corporate donations provide needed funding for land-grant schools, they can also create potential, perceived or actual conflicts of interest for land-grant research programs.

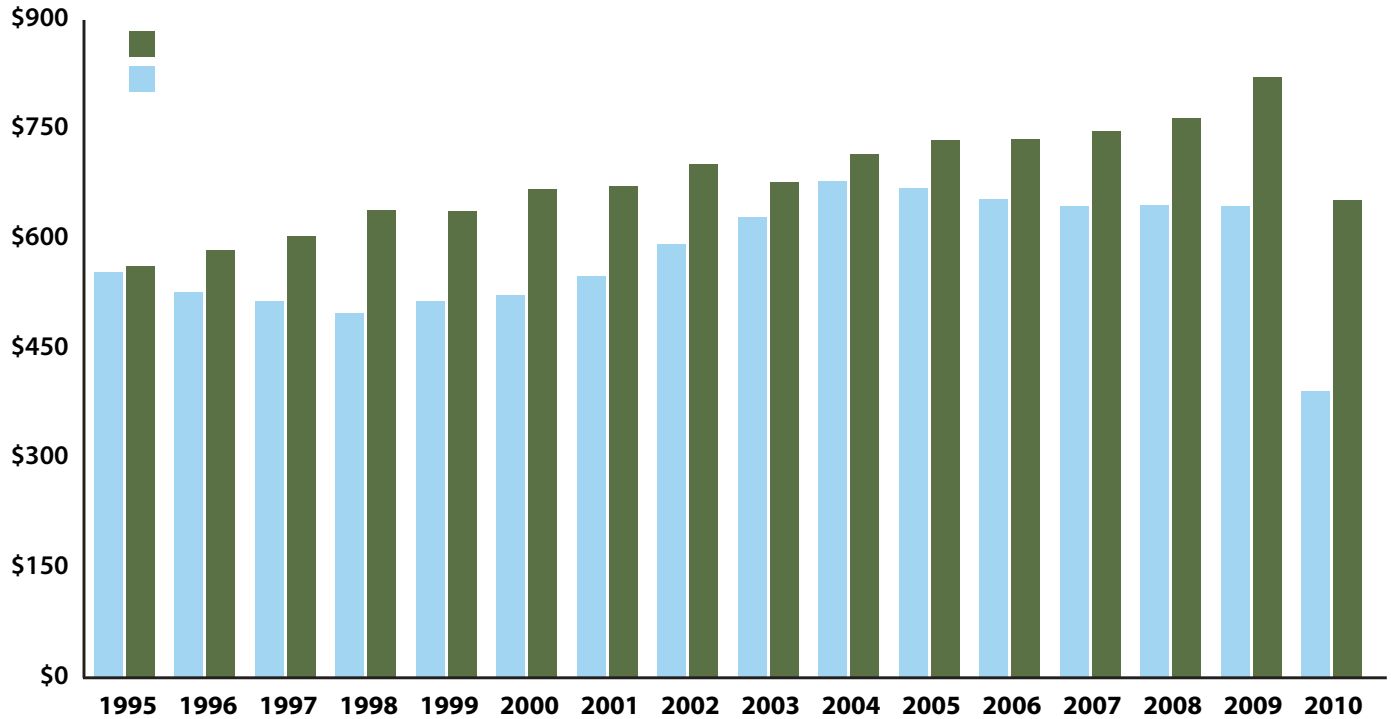
Some research programs nakedly advance the aims of donors, like the University of California department of nutrition's research into the benefits of eating chocolate, funded by the candy manufacturer Mars.[13] Similarly, industry-funded research is more likely to deliver favorable research results for donors than independent research. Despite this demonstrated bias, the financial relationships between researchers and their industry sponsors are not always revealed in published scientific papers.

Share of Total Land Grant Agricultural Research Funding



Other government money — from states and non-USDA federal sources like the National Institutes of Health — comprises the remaining research funding. (See Endnote 29.)

Funding of Land Grant Agricultural Research



Examples of Corporate Representatives on University Boards

Corporate Representatives	Department and School	Academic Role
Monsanto, Chiquita, Dole, United Fresh	Center for Produce Safety, University of California at Davis	Advisory Board[14]
Dole, Sysco, Earthbound Farms	Center for Produce Safety, University of California at Davis	Technical Committee[15]
Taylor Farms, Produce Marketing Association	Center for Produce Safety, University of California at Davis	Executive Committee[16]
Tyson, Walmart	Sam W. Walton Business College, University of Arkansas	Advisory Board[17]
Novartis (now Syngenta)	University of California	Research Board (1998–2003)[18]
Cargill, ConAgra, General Mills, Unilever, McDonald's, Coca-Cola	Center for Food Safety, University of Georgia	Board of Advisors[19]
Monsanto, Pioneer Hi-Bred	Plant Sciences Institute, Iowa State University	Board of Advisors[20]
Iowa Farm Bureau, Summit Group	Iowa State University	University Board of Regents[21]
Dole Food	University of California	University of California Regents[22]
Kraft Foods	Cornell University	Cornell University Board of Trustees[23]

Industry-sponsored research effectively converts land-grant universities into corporate contractors, diverting their research capacity away from projects that serve the public good. Agribusinesses use sponsored land-grant research – with its imprimatur of academic objectivity – to convince regulators of the safety or efficacy of new crops or food products.

Growing dependence on corporate funding discourages academics from pursuing research that might challenge the business practices of their funders or that irks money-hungry administrators who grant tenure to professors. A 2005 University of Wisconsin survey of land-grant agricultural scientists found that the amount of grant and contract money that professors generate has a significant influence over their tenure and salaries.[24] This chilling effect discourages academic research on environmental, public health and food safety risks related to industrial agriculture – and explains the sparse research on alternatives to the dominant agriculture model. Conflict-of-interest policies at public universities and academic journals have failed to address the biasing effect of industry money on science.

Agricultural research priorities can be refocused through the Farm Bill, which reauthorizes farm policy every five years, including providing much of USDA's research funding to land-grant universities. The next Farm Bill's Research Title should replenish USDA's research coffers and direct funding toward research that promotes the public good, not private interests.

This report details the trends in agricultural research and the corrosive impact of industry funding on public research. Food & Water Watch analyzed USDA databases and reports, grant records from land-grant universities, academic journal articles, court filings, corporate press releases, media coverage and other public documents. (For a more detailed methodology, see page 16.)

From Public to Private: Funding Agricultural Research at Land-grant Universities

U.S. agricultural research is performed mainly by three entities: the federal government, largely through the USDA; academia, almost entirely through land-grant universities; and the private sector.

Since the 1970s, private-sector spending on agricultural research has skyrocketed, outstripping total public-sector spending. Between 1970 and 2006, the latest years for which data are available, total private agricultural research expenditures (both in-house research and donations to land-grants) nearly tripled from $2.6 billion to $7.4 billion, in inflation-adjusted 2010 dollars.[25] Over the same period, total public funding – going to land-grant universities and the USDA – grew less quickly, rising from $2.9 billion to $5.7 billion.[26]

Land-grant university funding has mirrored the total expenditures on agricultural research. Federal funding of land-grant schools has stagnated, while industry

donations have grown steadily. Over the past 15 years, industry funding of land-grant schools significantly outpaced federal funding. In 1995, private sector and USDA research funding of land-grant universities stood at about $560 million each (in inflation-adjusted 2010 dollars).[27] But by 2009, private sector funding had soared to $822 million, compared to $645 million from USDA.[28] The economic recession curbed research funding significantly, but USDA funding for land-grant schools fell twice as fast as private funding between 2009 and 2010 – dropping 39.3 percent and 20.5 percent, respectively.

State funding for land-grant schools declined as well, leaving the institutions more dependent on corporate money to fund university research.[29]

Branding the Campus

Agribusiness and food companies exert influence at the highest echelons of the university hierarchy. In addition to directly funding research at land-grant universities, many companies make other generous donations that curry favor with administrators, including laboratory sponsorship, building construction, student fellowships and faculty endowments.

Building a Legacy of Corporate Influence

Corporate donations for buildings give businesses a literal presence on campus. Monsanto's million-dollar pledge to Iowa State University ensured naming rights to the Monsanto Student Services Wing in the main agriculture building.[40] The University of Missouri houses a Monsanto Auditorium.[41] Monsanto gave $200,000 to the University of Illinois's college of agriculture to fund the Monsanto Multi-Media Executive Studio, where industry seminars are held.[42] Kroger and ConAgra each have research laboratories named after them at Purdue University's school of food sciences, which advertises other naming opportunities on its Web site.[43] Campus buildings reinforce the company's brand identity, promote goodwill among faculty and students and are a powerful recruiting tool.

The Corporate Meddling Department

Many land-grant university agricultural research programs and departments rely on corporate donations for a sizable portion of their budgets. In addition, agribusiness sponsors fill seats on academic research boards and direct agendas. The University of Georgia's Center for Food Safety offers seats on its board of advisors for $20,000 to industry sponsors, where they can help direct the center's research efforts.[44] Current advisory board members include Cargill, ConAgra, General Mills, Unilever, McDonald's and Coca-Cola.[45] Purdue University's Food Science Department openly courts industry by allowing donors to influence curricula and direct research

Examples of Schools, Buildings and Departments Funded by Corporations

Corporate Donor	Land-grant University	Amount	Name of Building/School
Cargill	University of Minnesota	$10 million	Cargill Plant Genomics Building[30]
Five Rivers Ranch	Colorado State University	$2.5 million	Feed facility for research on environmental benefits of feedlots[31]
Walmart	University of Arkansas	$50 million	Sam Walton Business School[32]
Monsanto	Iowa State University	$1 million	Monsanto Student Services Wing[33]
Monsanto	University of Missouri	Unknown	Monsanto Auditorium and Monsanto Place[34]
Monsanto	University of Illinois	$200,000	Monsanto Multi-Media Executive Studio[35]
Kroger and ConAgra	Purdue University	Unknown	Kroger Sensory Evaluation Laboratory and ConAgra Foods, Inc. Laboratory[36]
Tyson (includes foundation, corporation and family member donations)	University of Arkansas	Unknown	John W. Tyson Building[37]
Tyson (includes foundation, corporation and family member donations)	University of Arkansas	$2.5 million	Jean Tyson Child Development Center[38]
Walmart (and Walton Family)	University of Arkansas	Unknown	Bud Walton Basketball Arena[39]

programs.[46] Iowa State University's $30 million plant sciences institute board includes representatives of Monsanto and Pioneer Hi-Bred.[47] Some departments are especially reliant on corporate donations:

- Purdue University's food science department received 37.9 percent of its research grants, $1.5 million, from private-sector donors between 2010 and 2011, including Nestlé, BASF and PepsiCo.[48]
- Texas A&M's soil and crop science department received 55.5 percent of its research grant dollars from private-sector donors between 2006 and 2010, a total of $12.5 million from groups like Cotton Incorporated, Monsanto and Chevron Technology Ventures.[49]
- University of Illinois's crop science department took 44 percent of its grant funding from the private sector, including Monsanto, Syngenta and SmithBucklin & Associates, between 2006 and 2010, amounting to $18.7 million.[50]
- Iowa State University's agronomy department took $19.5 million in research grants from private-sector donors between 2006 and 2010,

Examples of Academic Departments Funded by Private Sector (in surveyed states)[52]

Land-grant University	Academic Years	Private Grants	Share of Dept. Grants	Agribusiness Donors Include...
University of Illinois Crop Sciences	2006–10	$18.7 million	44 percent	Monsanto, Syngenta, SmithBucklin & Associates
University of Illinois Food Sciences and Human Nutrition	2006–10	$7.7 million	46 percent	Pfizer, PepsiCo, Nestlé Nutrition
University of Illinois Animal Sciences	2006–10	$6.2 million	33 percent	Elanco, Pfizer, National Pork Board
University of Missouri Plant Sciences	2007–10	$16.4 million	42 percent	Phillip Morris, Monsanto, Dow Agroscience, SmithBucklin & Associates
University of Missouri Veterinary Medicine	2004–10	$6.1 million	63 percent	Iams, Pfizer, American Veterinary Medical Association
Purdue Agronomy	2010–11	$2.5 million	31 percent	Dow, Deere & Company
Purdue University Food Science	2010–11	$1.5 million	38 percent	Hinsdale Farms, Nestlé, BASF
University of Florida Large Animal Sciences Clinic	2006–10	$2.7 million	56 percent	Pfizer, Intervet
University of Florida Small Animal Sciences Clinic	2006–10	$5.5 million	70 percent	Alcon Research, Mars, Vistakon
University of California Viticulture and Oenology	2006–10	$5.0 million	49 percent	Nomacorc, American Vineyard Foundation
University of California Plant Sciences	2006–10	$33.6 million	28 percent	Chevron Technology Ventures, Arcadia Bioscience
University of California Nutrition	2006–10	$5.0 million	49 percent	Mars, Novo Nordisk
Iowa State University Agronomy	2006–10	$19.5 million	48 percent	Dow, Monsanto, Iowa Soybean Association
Iowa State University Agricultural & Biosystems Engineering	2006–10	$9.5 million	44 percent	Deere & Company, Iowa Cattlemen's Association, National Pork Board
Iowa State University Entomology	2006–10	$3.7 million	52 percent	Syngenta, Bayer
Iowa State University Plant Pathology	2006–10	$10.7 million	38 percent	United Soybean Board, Dow, Iowa Soybean Association
Texas A&M Institute of Plant Genomics	2006–10	$1.8 million	46 percent	Cotton Inc., Chevron Technology
Texas A&M Animal Science	2006–10	5.1 million	32 percent	National Cattlemen's Beef Association, National Pork Board, Donald Danforth Plant Science Center
Texas A&M Soil and Crop Sciences	2006–10	$13.0 million	56 percent	Monsanto, Cotton Inc., Pioneer Hi-Bred

representing close to half of its grant funding. Donors included the Iowa Soybean Association, Dow and Monsanto.[51]

Chairs & Professors

Many companies will pay handsomely to endow faculty chairs. Monsanto's name is attached to a professorship at the University of Florida[53]; the university requires a $600,000 donation to endow a professorship.[54] In 2011, Monsanto gave $500,000 to Iowa State University to fund a soybean breeding faculty chair.[55] Pioneer Hi-Bred funds five endowed Iowa State positions, including the distinguished Chair in Maize Breeding.[56] Monsanto gave $2.5 million to Texas A&M to endow a chair for plant breeding.[57] Kraft Foods gave $1 million to the University of Illinois's school of nutrition for a Kraft-named endowed professor, graduate fellowships and undergraduate scholarships.[58]

Many professors are highly dependent on industry for research funding. Nearly half of land-grant agricultural scientists surveyed in 2005 acknowledged to have received research funding from a private company.[59] Texas A&M Animal Science Professor Jeffrey Savell took 100 percent of his research grants from industry groups between 2006 and 2010, more than $1 million from groups like National Cattlemen's Beef Association and Swift and Company.[60] Texas A&M Soil and Crop Sciences Professor David Baltensperger took more than $3 million in research grants – almost all of his grant funding – from Monsanto and Chevron between 2006 and 2010.[61]

University of California Plant Pathology Professor Robert Gilbertson took 89 percent of his nearly $2 million in research grants from private sector sources between 2006 and 2010, including the Chippewa Valley Bean Company and Seminis Vegetable Seeds.[62] University of California nutrition professor Carl Keen took $3.9 in private grants between 2006 and 2010, almost all of it from Mars.[63]

In addition to taking industry research grants, some professors supplement their academic salaries with corporate consulting fees. A 2005 survey found that nearly a third of land-grant agricultural scientists reported consulting for private industry.[65] More than 20 University of California, Davis professors have acted as paid consultants for biotech companies, some earning up to $2,000 per month.[66]

And Now a Word from Our Sponsors

Farmers, consumers, policymakers and federal regulators depend on land-grant universities as a source of credible, independent research. But land-

Snapshot of Selected Professors at Iowa State University[64]

Years	Professor	Department	Private Grants	Percentage of Total Funding	Examples of Corporate Donors
2006–10	Kan Wang	Agronomy	$1.8 million	90.7 percent	Pioneer Hi-Bred, Dow
2006–10	Silvia Cianzio	Agronomy	$2.6 million	83.9 percent	Iowa Soybean Association, United Soybean Board
2006–10	Stuart Birrell	Agricultural & Biosystems Engineering	$2.1 million	93.0 percent	Deere & Company, Archer Daniels Midland
2006–10	Gregory Tylka	Plant Pathology	$1.5 million	97.6 percent	Iowa Soybean Association, Monsanto
2006–10	Antonio Mallarino	Agronomy	$1.4 million	92.2 percent	Monsanto, Fluid Fertilizer Foundation, Iowa Soybean Association
2006–10	Alison Robertson	Plant Pathology	$1.2 million	85.3 percent	Syngenta, BASF, Iowa Soybean Association
2006–10	Max Rothschild	Animal Sciences	$1.3 million	76.5 percent	National Pork Board, Pfizer, Monsanto Fund
2006–10	Leonor Leandro	Plant Pathology	$1.2 million	99.6 percent	Monsanto, DuPont, Iowa Soybean Association
2006–10	Palle Pedersen	Agronomy	$1.0 million	94.5 percent	Valent, Monsanto, BASF, Bayer

grant universities' dependence on industry money has corrupted the independence of public science, as academics align their research projects with the ambitions of the private sector. Industry funding also diverts academic resources and attention away from projects that benefit the public, including research that challenges corporate control of food systems.

The "Funder Effect"

Donors can and do influence the outcomes of research to meet their business needs. More than 15 percent of university scientists acknowledge having "changed the design, methodology or results of a study in response to pressure from a funding source."[67]

Individual examples of pro-industry research abound. A study supported by the National Soft Drink Association found that soda consumption by school children was not linked to obesity; an Egg Nutrition Center-sponsored study found that frequent egg consumption did not increase blood cholesterol levels.[68] Candy manufacturer Mars donated more than $15 million to the University of California's Nutrition Department to study things like the nutritional benefits of cocoa.[69] Mars used this research to tout the benefits of eating chocolate.[70]

Industry-funded studies are much more likely to arrive at pro-industry conclusions. A peer-reviewed analysis of dozens of nutrition articles on commonly consumed beverages found that industry-funded studies were four to eight times more likely to reach favorable conclusions to the sponsors' interests.[71] Another study found that around half of authors of peer-reviewed journal articles about the safety of genetically engineered (GE) foods had an identifiable affiliation with industry.[72] All of these produced favorable results to industry sponsors, while very few acknowledged having received industry funding.[73]

Many scientific journals do not require authors to disclose their source of research funding, despite the well-documented bias that industry funding can introduce.[74] The conflict-of-interest disclosures that do exist vary and can be either weak, unenforced or both.[75]

Corporate Funding Curtails Public Interest Research

Corporations have successfully discouraged many academics from critically examining their products and practices. In a 2005 survey, land-grant agricultural scientists reported that private-sector funding arrangements restrict open communication among university scientists and create publication delays.[76]

Seed companies have been particularly effective at quashing unfavorable research by exercising their patent rights. Seed licensing agreements can specifically bar research on seeds without the approval of the corporate patent holder.[77] Scientists cannot independently evaluate patented seeds, leaving crucial aspects of GE crops, like yields and food safety, largely unstudied.[78]

When an Ohio State University professor produced research that questioned the biological safety of biotech sunflowers, Dow AgroSciences and Pioneer Hi-Bred blocked her research privileges to their seeds, barring her from conducting additional research.[79] Similarly, when other Pioneer Hi-Bred-funded professors found a new GE corn variety to be deadly to beneficial beetles, the company barred the scientists from publishing their findings.[80] Pioneer Hi-Bred subsequently hired new scientists who produced the necessary results to secure regulatory approval.[81]

Scientists that persist in pursuing critical inquiries into biotech seeds can face reprisals. One university

investigator anonymously told the prestigious journal *Nature* that a Dow AgroScience employee threatened that the company could sue him if he published certain data that cast the company in a bad light.[82] A University of California professor, after reporting that transgenic material from GE crops cross-pollinated native corn varieties in Mexico, faced threats and attacks from scientists, government officials and a public relations firm with ties to industry.[83]

The rising importance of patents and licenses in research can stifle academic freedom and open scientific discourse. University of California, Berkeley scientists funded by Novartis were reluctant to discuss their research and collaborate with others because of Novartis's licensing rights under the grant.[84] One Berkeley scientist noted "the little research that has been undertaken to explore unexpected and possibly harmful aspects of biotech deployment has been construed as intended to undermine Novartis-funded activities."[85]

Public Research for Corporate Commercialization

Corporate donors benefit from land-grant universities by poaching scientific discoveries used to develop new products. Land-grant researchers also act as contractors for food and agribusiness companies to perform product and market testing. The landmark 1980 Bayh-Dole Act pushed universities to take a more entrepreneurial role, generating revenue through producing patents that the private sector could commercialize.[86] This legislation paved the way for growing industry influence over land-grant research agendas, as schools shifted their research agendas to meet the needs of private-sector partners.

Public universities provided breakthrough research in agricultural biotechnology that fueled the development of Monsanto's signature products, recombinant Bovine Growth Hormone (rBGH) and RoundUp Ready crops.[87] Cornell University scientists invented the first genetic engineering process, but sold it to DuPont in 1990 – essentially privatizing a very valuable asset.[88] The biotech industry's use of university research to develop highly profitable products – often of dubious benefits to farmers and consumers – is at odds with the mission of land-grant universities.

These university-industry partnerships were expected to generate income for cash-strapped schools through licensing and patent earnings. In practice, corporate sponsors have captured most of the gains. Although most land-grant universities have "technology transfer" offices aimed at capitalizing on university inventions, few of these offices generate much money that can be funneled back into research programs.[89]

The University of California, Berkeley-Novartis collaboration exemplifies the conflicts and disappointments of university-industry partnerships. In 1998, the department of plant and microbial biology entered a $25 million funding agreement with Novartis, then the world's largest agribusiness company (the company's agricultural division is now owned by biotech giant Syngenta).[90]

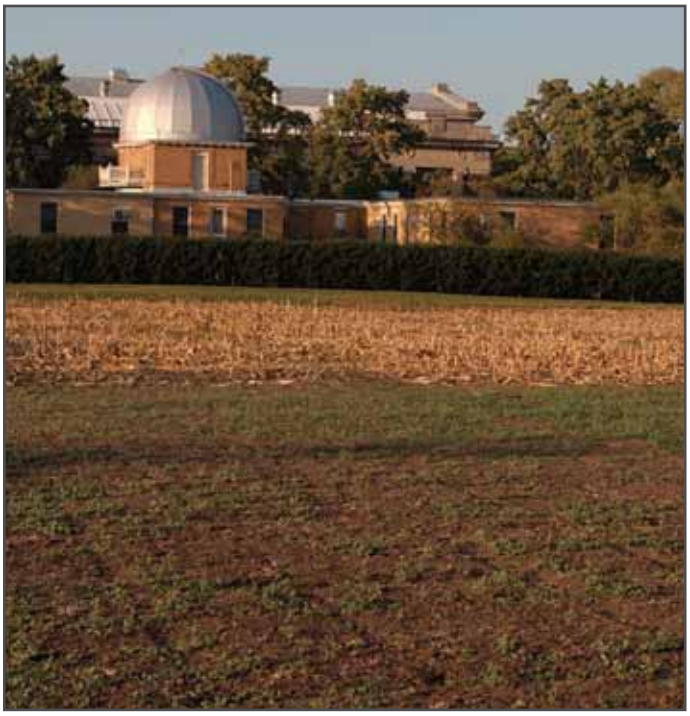
Novartis received two of the five seats on the department's research committee, allowing it to influence the department's research agenda.[91] The company maintained the right to delay publication of research results and was also awarded licensing options to 30 percent of any innovations the department developed, even those that it didn't fund.[92] The $25 million yielded little. An external review found that the highly controversial partnership produced "few or no benefits" for either Novartis or the University of California in terms of generating patents, commercial products or income.[93]

Land-grant universities also contract themselves out as *de facto* corporate laboratories, conducting pre-commercial tests and biotech crop field trials.[94] Industry hires land-grant scientists to conduct taste tests to predict consumer response to new foods.[95] In 2010, more than half of the 206 grants at Purdue University's Food Science Department went toward "sensory evaluation research," including multiple contracts with Hinsdale Farms, one of the world's largest corndog producers.[96]

Public Research for Regulatory Approvals

While policymakers and regulators demand a scientific basis for policy changes and regulatory decisions over agriculture, agribusiness is financing the experiments and funding the scientists. The regulatory approval process requires companies to submit field and laboratory testing data for new food and agricultural products, such as biotech seeds.[97] Land-grant research, paid for by industry, lends credibility to corporate regulatory applications, greasing the wheels for approval of safety of controversial, new products.

The seed industry funds universities to conduct pre-commercial evaluations, such as field-testing for biotech crops, banned in other countries out of concern about their safety.[98] Almost all the Monsanto grants to the University of Illinois crop science department funded projects like field-testing Monsanto products.[99]



The Morrow Plots, an experimental corn field at the University of Illinois at Champaign-Urbana.

One Cornell professor was a paid Monsanto consultant while also publishing journal articles promoting the benefits of rBGH for dairy farms.[100] His research was used in Monsanto's regulatory submissions to the U.S. Food and Drug Administration.[101] Despite FDA approval, rBGH has not been approved for commercial use in the European Union, Canada, Australia, Japan and New Zealand due to concerns about the drug's impact on animal health.[102]

Conversely, biotech companies prohibit independent research of their patented products, effectively limiting the public's ability to understand risks and preventing scientists from submitting critical comments to federal regulators, a crucial role that public researchers should play in regulatory and policy development.[103] One land-grant professor noted that these restrictions on independent research give companies "the potential to launder the data, the information that is submitted to EPA."[104]

The professor was one of 26 university scientists, most from land-grant universities, who submitted an anonymous letter to the U.S. Environmental Protection Agency in 2009 explaining how restrictive patent and licensing agreements prevent scientists from pursuing objective research necessary to provide impartial guidance to regulators.[105] Their letter read:

> *These agreements inhibit public scientists from pursuing their mandated role on behalf of the public good unless the research is approved by industry. As a result of restricted access, no truly independent research can be legally conducted on many critical questions regarding the technology, its performance, its management implications, [insecticide resistance management], and its interactions with insect biology.*[106]

The 26 scientists who wrote to the EPA in 2009 withheld their names for fear of being blacklisted and losing private-sector research funding.[10]

Regnat Populus: The People Rule in Arkansas[108]

Two of the biggest food companies in the world – Arkansas-based Tyson Foods and Walmart – have benefited from their generous donations to the University of Arkansas. The names Tyson and Walton are now emblazoned across the Arkansas campus following hundreds of millions of dollars in donations.

The campus's largest research facility is in the school of Poultry Science housed in the John W. Tyson Building.[109] The Tyson empire – through Tyson Foods, the non-profit Tyson Foundation and related foundations controlled by the Tyson family – has endowed six of the agricultural college's 15 chairs.[110] Between 2002 and 2010, Tyson donated more than $15 million to the university, including poultry sciences scholarships, an endowed food safety chair and a research center bearing the Tyson name.[111]

This philanthropic giving effectively generates positive public relations and favorable research from the university that supports Tyson's business practices. For example, in 2005, Tyson Foods faced allegations of inhumane poultry slaughtering practices that were caught on tape.[112] Tyson responded by conducting an animal welfare study, concluding that its existing slaughtering practices were humane.[113] Tyson then hired a professor who held one of its funded chairs at Arkansas (through a $1.5 million endowment) to confirm its findings.[114] In 2011, the university launched a new Center for Food Animal Well-Being, funded with $1 million each from Tyson Foods and the family of Walmart founder Sam Walton.[115] The center's director openly lauded "large-scale confinement rearing," a euphemism for factory farming, as a "good thing."[116]

Tyson's influence pales in comparison to Walmart and the Walton family. The Arkansas Razorbacks basketball team plays in the Bud Walton arena.[117] In 1998, the Walton family donated $50 million to Arkansas's business school, which was renamed the Sam W. Walton Business College; two Tyson and three Walmart executives sit on the advisory board.[118] In 2002, the Walmart empire gave $300 million to the university, then the largest donation to a public university ever.[119] The money was earmarked to endow research chairs, fund doctoral fellowships and finance research programs in fields including food sciences, biotechnology and the use of electronics in packaging.[120] By 2007, the University of Arkansas credited Walmart with donating more than $1 billion. This amount included contributions squeezed from the company's suppliers.[121]

This philanthropy provides Walmart with a major return on investment. As Walmart rolled out its controversial radio-frequency identification (RFID) supply chain management technology, the Sam Walton Business School provided research in support of the technology.[122] Walmart's RFID program mandated that suppliers pay the high cost of installing RFID chips into products or packaging.[123] Meanwhile, for the retailer, the RFID chips would reduce inventory costs and allow the company to monitor consumer purchases.[124] One study estimated that the average Walmart suppliers would spend $9 million the first year to comply with the RFID regime.[125] In contrast, Walmart would see a $287 million annual benefit through automating inventory and price checks.[126]

After a 2007 *Wall Street Journal* article reported on the controversy surrounding Walmart's aggressive RFID campaign, Walmart promoted an "independent" study touting RFID's benefits.[127] This unnamed study

appears to come from the University of Arkansas RFID Center, founded with Walmart money and housed in a building owned by a Walmart vendor.[128] In 2010, the *Wall Street Journal* exposed consumer privacy concerns associated with Walmart's RFID chipping of clothing items; in the article, a Walmart-funded Arkansas professor defended the use of RFID.[129]

South Dakota: Privatizing the Land-Grant University

At the South Dakota State University (SDSU), corporate influence extends all the way to the top. SDSU president David Chicoine joined Monsanto's board of directors in 2009 and received $390,000 from Monsanto the first year, more than his academic salary.[130]

Simultaneously acting as a director of the world's largest seed company and the leader of South Dakota's largest public research institute raised obvious conflict-of-interest concerns.[131] One state senator proposed legislation barring Chicoine's corporate appointment, observing that Monsanto was "trying to buy influence at the university by buying influence with the president" and that "makes it look like we're in the hip pocket of Monsanto."[132]

Weeks before Chicoine joined Monsanto, the company sponsored a $1 million plant breeding fellowship program at SDSU.[133] Chicoine's appointment at Monsanto also coincided with a new SDSU effort to enforce university seed patents by suing farmers for sharing and selling saved seed. A millennia-old practice, saving seed allows farmers to reproduce their strongest plants from previous years and avoid the cost of purchasing seed. Historically, land-grant schools have developed public seeds that farmers freely propagated, saved and shared.[134] Recently, however, SDSU joined the Monsanto subsidiary WestBred in a public-private program called the Farmers Yield Initiative, which sues farmers for seed patent infringements – using private investigators and toll-free, anonymous hotlines to uncover possible illegal use of seeds, such as selling saved seeds.[135] These aggressive practices come straight out of playbook of Monsanto, which has filed dozens of

patent infringement lawsuits against farmers.[136]

In 2009, SDSU filed suit against South Dakota farmers for the first time, alleging illegal use of SDSU-controlled seeds.[137] One accused farmer called the lawsuit a "rotten scam" in which SDSU purportedly entrapped him to violate university patents by running a fake "seed wanted" ad in a newspaper.[138] He and four other farmers settled the 2009 cases for more than $100,000.[139] In 2011, SDSU settled another lawsuit against a farmer for $75,000.[140] Farmers not only paid damages but also consented to allow SDSU inspect their farms, facilities, business records and telephone records for up to five years.[141] SDSU is not alone in suing farmers over seed patents. Texas A&M, Kansas State University and Colorado State University have pursued similar lawsuits against farmers.[142]

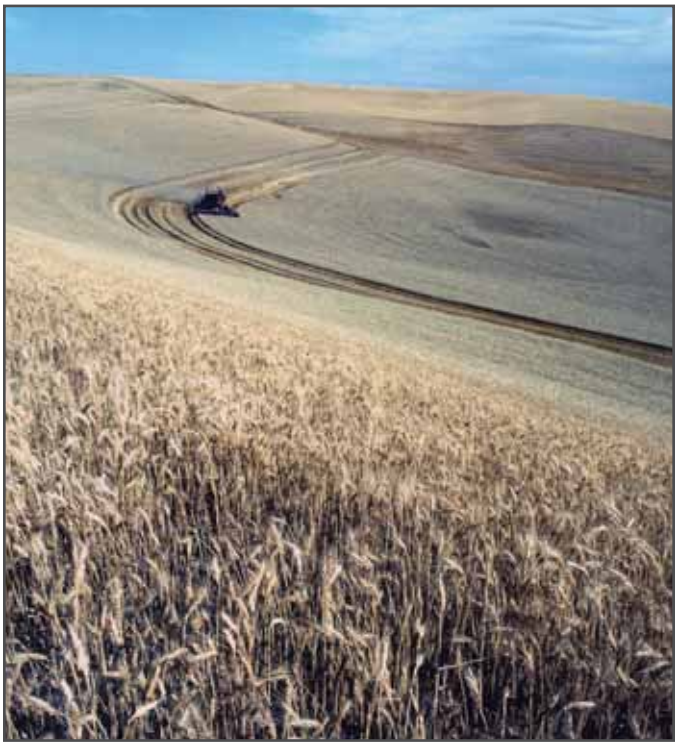
What makes the university lawsuits against farmers more offensive is the fact that SDSU wheat seeds were developed with farmer and taxpayer dollars.[143] South Dakota farmers pay 1.5 cents to the South Dakota Wheat Commission for every bushel of wheat they produce (known as a check-off program).[144] About 40 percent of this check-off money, totaling more than $870,000 in 2009, funds SDSU wheat research.[145] These check-off dollars funded the development of many SDSU wheat varieties, including the Briggs and Traverse varieties involved in the SDSU farmer lawsuits.[146] The USDA, using taxpayer money, has awarded SDSU at least 50 wheat research grants, averaging $108,000 each, some of which also

contributed to the development and registration of the Briggs and Traverse varieties.[147]

Government Research Dollars

The USDA spends around $2 billion a year on agricultural research, funding its own scientists and those at land-grant universities.[148] Unfortunately, the USDA's research agenda mirrors corporate-funded research, directing dollars toward industrial agriculture. The National Academy of Sciences found that USDA research prioritizes commodity crops, industrialized livestock production, technologies geared toward large-scale operations and capital-intensive practices.[149] For example, the Farm Bill dedicates little funding to more sustainable farming programs like the Organic Agriculture Research and Education Initiative and Specialty Crop Research Initiative (covering fruits and vegetables), which each represent just 2 percent of the USDA's research budget.[150]

The bias toward industrial agriculture is unfortunate given the USDA's unique position to address public research needs that the private sector will ignore, such as those related to health and the environment. As the National Resource Council notes, "no other public agency has the resources, infrastructure, or mandate to support research focusing on the interface between agriculture and the environment. And this is where private-sector research is highly unlikely to fill the void."[151]



The USDA prioritizes research dollars for commodity crops like corn and soybeans, which are the building blocks of processed foods and the key ingredients in factory-farmed livestock feed. Although the agency boasts that fruits and vegetables comprise almost half of the total value of crop production, the USDA spends relatively little on fruit and vegetable research.[152] In 2010, the USDA funded $204 million in research into all varieties of fruits and vegetables, less than the $212 million that was spent researching just four commodity crops: corn, soybeans, wheat and cotton.[153]

The USDA also generously funds research into crops that produce oils and sugars that are used to manufacture processed foods. In 2010, the department spent $18.1 million researching sugar crops (including sugar cane and sugar beets) and $79.4 million on oilseed crops (including soybeans, canola and palm oil).[154] The USDA's prioritization of sugar and fat research is disconcerting given the current diet-related epidemics of diabetes and obesity. The USDA dedicates more research to sugars than to nutrition education and healthy lifestyles combined ($15.5 million and $1.3 million, respectively).[155]

Much of the research funding for commodity crops implicitly or explicitly goes toward genetically engineered (GE) crops because the vast majority of the corn, cotton and soybeans grown in the United States is GE.[156] This funding can act as corporate welfare because, for example, Monsanto and DuPont alone control 70 percent of the corn and 59 percent of the soybean seed market.[157]

At the same time, the USDA has largely failed to investigate potential environmental and food safety risks of GE crops. Between 1994 and 2002, the USDA funded more than 3,000 plant biotechnology studies: none investigated possible unintended toxins and only two examined potential allergens in GE food.[158] USDA's pro-biotech research bias was highlighted with the 2009 appointment of Roger Beachy, a major biotech advocate with strong ties to Monsanto, to

lead USDA's main agricultural research program (a position he vacated in 2011).[159] Other federal research agencies, like the National Academy of Sciences, have conducted very little food safety research on GE foods – and actually demonstrate a bias toward reporting the benefits of biotechnology, according to one peer-reviewed study.[160] This leaves the public in the dark about the potential threats of GE crops, even as other countries limit or prohibit GE cultivation and marketing.

Conclusion and Recommendations

Like almost every other aspect of the modern food system, the private sector now wields enormous influence over agricultural research. Over the past several decades, industry funding at land-grant universities has eclipsed USDA funding, challenging the public-interest mission of these institutions. And USDA funding appears to do more to further agribusiness interests than those of the public.

Sound agricultural policy requires impartial and unbiased scientific inquiry. Corporate funding taints the independence and objectivity of agricultural research, distorting scientific inquiry to deliver favorable results for corporate sponsors.

Industry funding unduly influences research agendas, prioritizing the dominant industrial food and agricultural production model. USDA-funded research reinforces this model by emphasizing research on commodity crops – including biotech crops – over fruits, vegetables and sustainable production techniques. This effectively subsidizes agribusiness by spending public money to advance the industrial agriculture model. Unfortunately, the conflicts of interest between public good and private profits or between independent research and for-hire science remain largely unchallenged by both academia and policymakers.

There is a critical role for government to play in supporting research that can spur a financially viable alternative to the industrialized model that dominates American agriculture. To reorient public agricultural research, Food & Water Watch recommends:

- **Congress should use the Farm Bill to prioritize and fund research to further the public interest**. The Farm Bill Research Title should direct funding to provide practical solutions to the day-to-day problems facing farmers and develop alternatives to industrialized production. Congress should emphasize lower-input and sustainable methods, diversified crop and livestock farming, and alternative production like pasture-fed livestock and organic farming. The federal government should shift public research away from projects that culminate in private patents, instead giving money toward developing non-GE seeds that are distributed to farmers without patents and licensing fees.
- **Congress should fund independent research into the health and environmental impacts of genetically engineered crops**. Congress should mandate that public institutions are permitted to research patented biotech seeds to analyze yields, assess food safety and investigate potential

environmental impacts by prohibiting companies from restricting research in their licensing agreements.

- **Land-grant universities must be more transparent about their funding sources, making grant records open to public scrutiny on university Web sites.** All sponsored research must specifically disclose the source of financial support for the authors, departments, chairs or universities. The public should not have to formally file records requests – or pay exorbitant sums – to view research grant records at public universities.
- **Agricultural research at land-grant universities should not be driven by the intellectual property regime created by the Bayh-Dole Act.** Congress should reconsider the Bayh-Dole Act's application to agricultural research at public universities and instead encourage schools to pursue public-interest research that can be shared freely with farmers.
- **Congress should restore funding for extension offices**, giving county-level agents the resources they need to communicate research results and research needs between farmers and university researchers.
- **Agricultural research journals should establish rigorous conflict-of-interest standards.** Scientific journals should prominently disclose the funding source for the academic work behind every published article, including any author and editor affiliations with the private sector – such as consulting fees, stock holdings, patent holdings, prior or potential future employment, and departmental or academic grants.

Methodology

To analyze trends in public research funding, Food & Water Watch used the United States Department of Agriculture (USDA) Current Research Information Service (CRIS) annual reports; despite the limitations in this dataset, it is the most comprehensive and widely used source of information on agricultural research funding.[161] Food and Water Watch's analysis of public funding focused on federal research dollars provided by the USDA. Although the CRIS reports detail the funding that other federal agencies contribute to agricultural research, there are major limitations in these funding data. These "other federal" agencies, like the National Institutes of Health and Department of Defense, comprised 19 percent of research money at land-grant universities in 2010. Food & Water Watch did not include this funding in this analysis because of significant limitations in this "other federal" funding, including hundreds of millions of dollars in erroneous reporting, confirmed by the University of Minnesota through personal correspondence.

The "other federal" funding sources for agricultural research is self-reported by the land-grant universities themselves, and the data appear inconsistent between institutions and between years. In addition, an unknown but likely significant portion of this "other federal" money goes toward non-agricultural research conducted by agricultural schools, such as companion animal (dogs and cats) research, medical research on primates, or human health and disease research that is not clearly agricultural research (such as autism or addiction research). Food & Water Watch focused on USDA's role in funding agricultural research at land-grant universities and did not examine the state funding for these state-based universities.

To analyze individual land-grant universities, Food & Water Watch used publicly available records as well as filing state-records requests, which yielded data of varying quality and quantity. Food & Water Watch examined grant records from the University of California, University of Illinois, Iowa State University, University of Missouri, Texas A&M, University of Florida and Purdue University.

Food & Water Watch adopted USDA's broad categorization of all non-public funding – from companies, trade groups, marketing orders, foundations and charities – as private-sector funding. A large majority of non-public funding comes from agribusiness interests. Food & Water Watch categorized non-public, private sector as industry funding based on a close examination of available data. To examine the extent to which non-public money going to universities comes from agribusiness interests and agricultural trade association – and not unaffiliated charities, like the American Heart Association – Food & Water Watch conducted an in-depth analysis of the non-public funding of the most comprehensive university grant records available (the University of California, University of Illinois and Iowa State University) over the most recent five-year period. This analysis found that the majority of private sector, non-public funding of agricultural research came from agribusinesses, agricultural trade associations, agricultural marketing orders and agribusiness-affiliated foundations between 2006 and 2010. These industry groups supplied nearly three-quarters (72 percent) of the non-public research funding to the University of California, University of Illinois and Iowa State University's five largest agricultural research departments (57 percent, 91 percent and 81 percent, respectively).

The industry funding at the University of California does not include a $16 million grant from the Bill & Melinda Gates Foundation, although this grant includes a private-sector partner, Nutriset, whose nutritional products are a major part of the grant. The company's patented nutritionally fortified foods, designed for the developing world, have been widely criticized by aid groups like Doctors Without Borders because the company's aggressive intellectual property protection has restricted the availability of similar nutritional supplements to malnourished people.[162] If this grant were categorized as an industry grant, the percentage of non-public funding from industry to the University of California would rise to 76 percent and the total to all three schools would rise to 81 percent.

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