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ROLL NUMBER

DESCRIPTION

10999

2007 HOUSE INDUSTRY, BUSINESS AND LABOR

HB 1099

2007 HOUSE STANDING COMMITTEE MINUTES

Bill/Resolution No. HB 1099

House Industry, Business and Labor Committee

☐ Check here for Conference Committee

Hearing Date: January 15, 2007

Recorder Job Number: 1120

Committee Clerk Signature

Stephanie Thomas

Minutes:

Chair Keiser opened the hearing on HB 1099.

Mike Hillman, Academic & Student Affairs: See written testimony #1.

Rep. Johnson: You said you took language from the Attorney General opinion.

Mike: The interim committee on economic develop, as working with the Attorney General and work with the legislative council in drafting a bill that was actually on the agenda late this summer for the committee. Our office worked close with the Attorney General's office to identify any potential concerns, and address them.

Rep. Nottestad: As companies have dealt with our universities pertaining to Centers of Excellence programs, have they expressed concern about the lack of protection that ND has in these hearings?

Mike: Yes, it's an issue that we have to explain. Attorneys from companies in California look at ND laws, and they're concerned. Things are not clearly defined. We have to explain to them the Attorney General's opinions in order to get them comfortable with it.

Rep. Boe: Would the names of the companies contracting with the universities or Centers of Excellence be kept confidential also?

Mike: The names of the companies that we work with are open to public information.

Rep. Nottestad: There's always the concern about companies being made public as cities deal with different companies, the competition is great. Is it kept confidential until it's bought in, or is it released immediately so that the other universities can compete against it?

Pat Zerwith, State Board of Education University System: Those documents that maybe confidential are governed by different statutes. Those statutes would not permit university system entities to keep the name of a company confidential.

Rep. Nottestad: What if there was city economic development money in the mix?

Mike: In those negotiations relating to economic development projects, if there's another statute that provides that those documents are confidential, and a university is a partner in that project and has received confidential documents from the city, then the university would be obligated to comply with that statute, and keep those documents confidential.

Rep. Keiser: On page 4, line 2; I'm having a problem with the word exempt at the end of that line. I read it one way and it means it's not confidential, then I read it another way and it's confidential. Can we use those words instead of saying exempt from something?

Pat: That term exempt is defined in another section in chapter 44-04. The records that are governed by this chapter are divided into different categories. One is information that is confidential, cannot be released or disclosed. Exempt means that the record is exempt from the open records requirement and the head of the agency or government official in possession of the document has the discretion to disclose or not disclose that information.

Dale Zetica, Director at Tech Transfer At NDSU: Support of HB 1099. As we negotiate licensing agreements with private entities, it's important during that process to keep that information confidential.

Rep. Kasper: Under this statute, or any other confidentiality statute in ND law, are you able comfortably to the identity of companies that we negotiate with confidential and private as long

as you need to, or do you have some area there where you might have to disclose a name that you really wouldn't like to expose during this negotiation process?

Dale: It may be difficult to keep the name confidential, although I think the issue of if it's not previously disclosed, especially in licensing negotiations; we would like to be able to keep that confidential until an agreement is in place.

Rep. Kasper: Under the current law is it easy enough to keep things quiet, or would there be some place in statute to give you a little more leeway in keeping these companies names confidential while you go through the process you just described?

Dale: I'm not sure I can answer the statute. On the university side as we enter into research agreements, the name of the company can be released. Part of what we were trying to get in the statute was to keep the negotiations confidential as well.

Pat: It's not easy under current law, and it would not be easy under the amended law to keep the name of a company confidential.

Rep. Nottestad: Has there been a problem with any projects being lost to other institutions, because of the lack of confidentiality?

Pat: I'm not aware of losing any projects. I am aware of quite a number of cases in which I've been involved, and then get a general council or high level legal officer involved for the sell of the company, because the lack of clarity in the statute. I have to supply copies of AG opinions and explain our position, and that has caused delays.

Dale: What we've experienced is there definitely is a sensitivity for companies being concerned about what their competitors might find out about what's going on. I'm not sure we've lost any; however, we may not know if companies have decided not to work with us if they were to look at the statute and there was uncertainty about this.

Rep. Kasper: Are you aware of any states that these companies site where they say something along the lines that if ND law were like other states law, we really have no problem with talking to you very easily, because we know it's going to be confidential?

Dale: On some negotiations, some have expressed a desire to use, let's say California law, because their trip trade secret languages were better from a companies perspective.

Rep. Keiser: Is this the best in the country right now on confidentiality for our state?

Dale: I think what we were trying to do was stay consistent with recommendations from the consulting company.

Mike: The approach that we took is what do we have to put in place? We worked with the Attorney General's Office, representatives, and the media in order to balance everybody's expectations here. I think it is very clean and direct.

Rep. Kasper: I don't think we're even close to making ND the best based upon what I've heard.

Mike: It really revolves around one of the key discussions that we've had. ND's heritage in an open records open meeting state, we wanted to honor that. Right now we work with the public institutes. If the research foundations were not a public institute, that would be the only way to address this.

Rep. Keiser: It doesn't even have the emergency clause on it, should it?

Mike: We think that we've done our homework. In fact, the reason the Interim Economic Development Committee did endorse the bill, the comment was made that there wasn't time for the broader discussion with everybody involved, we took the approach not to rush, but to be very specific getting in place what we needed.

Dale: I think it needs to be put in place as soon as possible, because we have ongoing discussions.

Pat: The reason I did not include an emergency clause is because the bill that is before you is not quite word for word copied from a graph that was presented to the interim EDC committee. It was drafted by the Attorney General's Office, and it was based, or closely tracked Attorney General opinions issued interpreting the current law. So, if an issue would come up between now and August 1, we would point to those AG opinions, and say that's our position. After August 1, then we have that in statute.

Shane Goettle: Department of Commerce: The question pertaining to the location the cities or company might make. In our open records laws we rely that the Department of Commerce, on the resumption that pertains to businesses trying to make expansion decisions in ND, doesn't have to reveal those companies. It's an exempt record until such time as the company chooses to reveal that.

Karlene Fine, Industrial Commission: I don't want to oppose a bill that is about clarification, because this is a very important topic. When you change definition, it may make a difference somewhere else. We may need to add another provision so we don't impact the research section.

Hearing Closed

2007 HOUSE STANDING COMMITTEE MINUTES

Bill/Resolution No. HB 1099

House Industry, Business and Labor Committee

☐ Check here for Conference Committee

Hearing Date: January 22, 2007

Recorder Job Number: 1496

Committee Clerk Signature

Stephanie N. Thomas

Minutes:

Chair Keiser opened the hearing on HB 1099. This bill was on laying the confidentiality of trade secrets for proprietary commercial and financial information. It gives a clear definition of commercial information, and financial information for proprietary information that removes the ambiguity and uncertainty that existed prior to defining these extreme areas.

Rep. Nottestad: I move a do pass.

Rep. Ruby: Second.

Rep. Dosch: There was some talk about adding the emergency clause onto here.

Rep. Nottestad: I withdraw my motion.

Rep. Ruby: Withdraw second.

Rep. Keiser: The chair would entertain a motion to so move for the emergency clause.

Rep. Nottestad: I move the motion.

Rep. Ruby: Second.

Voice vote was taken, motion adopted.

Rep. Nottestad: I move a do pass, as amended.

Rep. Thorpe: Second.

Roll call vote was taken. 11 Yeas, 0 Nays, 3 Absent, Carrier: Rep. Nottestad

2007 HOUSE STANDING COMMITTEE MINUTES

Bill/Resolution No. HB 1099

House Industry, Business and Labor Committee

☐ Check here for Conference Committee

Hearing Date: 01-23-2007

Recorder Job Number: 1651

Committee Clerk Signature

Lisa M Thomas

Minutes:

Chairman Keiser opened the hearing on HB 1099. HB 1099 relates to confidentiality of trade secret, proprietary, commercial and financial information.

Rep. Ruby moved to reconsider the committee's previous action. Rep. Johnson seconded. Voice vote: motion carried.

Rep. Keiser: The first component information including technical and financial or marketing records that are received by a public entity that are owned or controlled by the submitting person and are intended to be and are treated by the submitting person is private and the disclosure of the information would cause harm to the submitting person's business operations. They want that inserted. The other technical issue on page four, this section does not limit the release or use of records obtained in an investigation by the ND Attorney General or other law enforcement and on page four, line seven, the addition of for partner with a public entity to conduct research or to license an innovation. These amendments strengthen our confidentiality for the university and research sector.

Rep. Ruby moved to adopt the amendments. Rep. Nottestad seconded.

Voice vote: motion carried.

Rep. Nottestad moved a DO PASS AS AMENDED. Rep. Dietrich seconded.

Page 2

House Industry, Business and Labor Committee

Bill/Resolution No. HB 1099

Hearing Date: 01-23-2007

Roll Call Vote: 13 yes. 0 no. 1 absent.

Carrier: Rep. Nottestad

January 22, 2007

**House Amendments to HB 1099 (78153.0101) - Industry, Business and Labor
Committee 01/22/2007**

Page 1, line 2, after "information" insert "; and to declare an emergency"

**House Amendments to HB 1099 (78153.0101) - Industry, Business and Labor
Committee 01/22/2007**

Page 4, after line 21, insert:

"SECTION 2. EMERGENCY. This Act is declared to be an emergency
measure."

Renumber accordingly

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1099
Revised January 23, 2007

Page 2, after line 9, after "(5)" insert "Information including technical, financial, or marketing records that are received by a public entity that are owned or controlled by the submitting person and are intended to be and are treated by the submitting person as private and the disclosure of the information would cause harm to the submitting person's business operations.

(6)"

Page 2, line 9, overstrike "or" and after "2" insert "or 6"

Page 2, line 20, after "copyright" insert an underscored comma

Page 4, line 1, after "4." insert "This section does not limit the release or use of records obtained in an investigation by the North Dakota Attorney General or other law enforcement.

5"

Page 4, line 7, overstrike "or" and after "state" insert ", or partner with a public entity to conduct research or to license a discovery or innovation."

Page 4, line 15, remove the overstrike over "5"

Page 4, line 16, remove "4"

Add the Emergency Clause.

Renumber accordingly

These proposed amendments have been prepared by the Attorney General's Office and revised by the North Dakota University System.

January 23, 2007

**House Amendments to HB 1099 (78153.0102) - Industry, Business and Labor
Committee 01/25/2007**

Page 1, line 2, after "information" insert "; and to declare an emergency"

**House Amendments to HB 1099 (78153.0102) - Industry, Business and Labor
Committee 01/25/2007**

Page 2, line 1, remove "into"

Page 2, line 8, after "1" insert an underscored comma

Page 2, line 9, remove "or" and after "2" insert ", or 6"

Page 2, line 10, after "(5)" insert "Technical, financial, or marketing records that are received by a public entity, which are owned or controlled by the submitting person, are intended to be and are treated by the submitting person as private, and the disclosure of which would cause harm to the submitting person's business.

(6)"

Page 2, line 12, replace "(6)" with "(7)"

Page 2, line 20, replace "(7)" with "(8)" and after "copyright" insert an underscored comma

**House Amendments to HB 1099 (78153.0102) - Industry, Business and Labor
Committee 01/25/2007**

Page 4, line 1, after "4." insert "This section does not limit the release or use of records obtained in an investigation by the attorney general or other law enforcement official.

5."

Page 4, line 7, overstrike "or" and after "state" insert ", or partner with a public entity to conduct research or to license a discovery or innovation"

Page 4, line 15, remove the overstrike over "6.", remove "5.", and remove the overstrike over "6"

Page 4, line 16, remove "4"

Page 4, after line 21, insert:

"SECTION 2. EMERGENCY. This Act is declared to be an emergency measure."

Renumber accordingly

Date: 1-22-07
Roll Call Vote #: _____

2007 HOUSE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. HB 1099

House Industry Business & Labor Committee

☐ Check here for Conference Committee

Legislative Council Amendment Number _____

Action Taken DO PASS, AS Amended

Motion Made By Rep. Nottestad Seconded By Rep. Thorpe

Representatives	Yes	No	Representatives	Yes	No
Chairman Keiser	X		Rep. Amerman		
Vice Chairman Johnson	X		Rep. Boe		
Rep. Clark	X		Rep. Gruchalla	X	
Rep. Dietrich	X		Rep. Thorpe		
Rep. Dosch	X		Rep. Zaiser		
Rep. Kasper	X				
Rep. Nottestad	X				
Rep. Ruby	X				
Rep. Vigesaa	X				

Total Yes 11 No 0

Absent 3

Floor Assignment Rep. Nottestad

If the vote is on an amendment, briefly indicate intent:

Date: 1-23-07
Roll Call Vote #: _____

2007 HOUSE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. HB 1099

House Industry Business & Labor Committee

☐ Check here for Conference Committee

Legislative Council Amendment Number _____

Action Taken DO PASS, AS Amended

Motion Made By Dietrich Nottestad Seconded By Dietrich

Representatives	Yes	No	Representatives	Yes	No
Chairman Keiser	X		Rep. Amerman	X	
Vice Chairman Johnson	X		Rep. Boe	X	
Rep. Clark	X		Rep. Gruchalla	X	
Rep. Dietrich	X		Rep. Thorpe	X	
Rep. Dosch	X		Rep. Zaiser	A	
Rep. Kasper	X				
Rep. Nottestad	X				
Rep. Ruby	X				
Rep. Vigesaa	X				

Total Yes 13 No 0

Absent 1

Floor Assignment Nottestad

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

HB 1099: Industry, Business and Labor Committee (Rep. Kelser, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (11 YEAS, 0 NAYS, 3 ABSENT AND NOT VOTING). HB 1099 was placed on the Sixth order on the calendar.

Page 1, line 2, after "information" insert "; and to declare an emergency"

Page 2, line 1, remove "into"

Page 2, line 8, after "1" insert an underscored comma

Page 2, line 9, remove "or" and after "2" insert ", or 6"

Page 2, line 10, after "(5)" insert "Technical, financial, or marketing records that are received by a public entity, which are owned or controlled by the submitting person, are intended to be and are treated by the submitting person as private, and the disclosure of which would cause harm to the submitting person's business.

(6)"

Page 2, line 12, replace "(6)" with "(7)"

Page 2, line 20, replace "(7)" with "(8)" and after "copyright" insert an underscored comma

Page 4, line 1, after "4." insert "This section does not limit the release or use of records obtained in an investigation by the attorney general or other law enforcement official.

5."

Page 4, line 7, overstrike "or" and after "state" insert ", or partner with a public entity to conduct research or to license a discovery or innovation"

Page 4, line 15, remove the overstrike over "6-", remove "5.", and remove the overstrike over "5"

Page 4, line 16, remove "4"

Page 4, after line 21, insert:

"SECTION 2. EMERGENCY. This Act is declared to be an emergency measure."

Renumber accordingly

2007 SENATE JUDICIARY

HB 1099

2007 SENATE STANDING COMMITTEE MINUTES

Bill/Resolution No. HB 1099

Senate Judiciary Committee

☐ Check here for Conference Committee

Hearing Date: February 28, 2007

Recorder Job Number: 4120

Committee Clerk Signature

Morie L. Solberg

Minutes: Relating to confidentiality of trade secret proprietary, commercial and financial information.

Senator David Nething, Chairman called the Judiciary committee to order. All Senators were present. The hearing opened with the following hearing:

Testimony in Favor of the Bill:

Pat Seaworth, General Counsel ND University System. Introduced the bill and gave his testimony #Att. #1

Sen. Nething requested (meter 3:20) he review the bill for the committee.

Sen. Fiebiger asked (meter 8:51) page 2, Section 2, the new language referring to "private business" sounds to broad? **Mr. Seaworth** referred to page 1, line 9 and 10 proceeds to the information with its limitations.

Sen. Nelson questioned (meter 10:32) on line 11 after the "unless the contexts otherwise requires", Would this alter the above statement? Yes, he spoke to research being done for a company but the information the company provided for the research is "confidential" already, they want it to stay confidential/proprietary and that is addressed in the contract.

Sen. Fiebiger asked for (meter 12:17) the definition to "technical know how" and he deferred the question.

Dale Zetocha, NDSU & NDSU Res. Foundation (meter 13:00) Gave Testimony Att. #2

Sen. Fiebiger questioned the statement pertaining to the "opportunity to work", has section 44-04 18.4 cause you to lose opportunities? He **Mr. Zetocha** responded that currently it is a very sensitive environment. It would be talk amongst the industry and we would not be aware of lost opportunities. Things are even as sensitive as they asking who is on our board.

Sen. Fiebiger asked for (meter 20:01) the definition to "technical know how" and responded the technical information important in addition to what is published in a patent to make you more able to advance or a better incite into the topic.

Testimony Against the bill:

Barb Price, Organizer for Dakota Resource Council – Att. #3 (meter 24:30) Also submitted additional information Appendix A-F

Sen. Fiebiger wanted clarification (meter 32:19) of her concerns. She spoke to the liability may come back to the "state" via the college and not to the organization (i.e. Monsanto). She also referred to information never being published about a product after a "recall". She submitted additional testimony: **Todd Leake**, Grand Forks Farmer – Att. #4.

Sen. Olafson asked Ms. Price what the bases of there opposition is? Her concern was the loss of the over sees market, ND being used as "guinea pigs", and the loss of seed varieties. Sen. Olafson questioned her definition of "sound science" (meter 36:40). Ms. Price responded, science that happens in ND that is well researched and in a reputable institution and can be reproduced in any part of the world.

Sen. Feibiger stated that page 4, section 4, should help with her concerns; investigative ability of the attorney general's office. She replied that this process is long and involved. Our requests have been stuck in a draw or a file and this I have been told by the Attorney Generals office.

Testimony Neutral to the bill:

None

Senator David Nething, Chairman closed the hearing.

2007 SENATE STANDING COMMITTEE MINUTES

Bill/Resolution No. HB 1099

Senate Judiciary Committee

☐ Check here for Conference Committee

Hearing Date: March 12, 2007

Recorder Job Number: 4885

Committee Clerk Signature *Maria L. Solberg*

Minutes: Relating to confidentiality of trade secret proprietary, commercial and financial information.

Senator David Nething, Chairman called the Judiciary committee to order. All Senators were present. The hearing opened with the following committee work:

The committee discussed the Dakota Resources objections and the contract they submitted as an example of there objection was 10 years old. Sen. Lyson and Sen. Fiebiger reviewed the hearing. The committee sensed that the issues they brought up would have no effect with the

Sen. Lyson made the motion to Do Pass HB 1099 and **Sen. Olafson** seconded the motion.

All members were in favor and the motion passes.

Carrier: **Sen. Olafson**

Senator David Nething, Chairman closed the hearing.

Roll Call Vote # 10 of 1

BILL/RESOLUTION NO. 1099

☐ Check here for Conference Committee

Action Taken Do Pass

Motion Made By Sen. Lyson Seconded By Sen. Olatson

[illegible]

Total Yes 6 No 0

Absent 

Floor Assignment Sen. Olafson

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE (410)
March 12, 2007 2:13 p.m.

Module No: SR-46-5018
Carrier: Olafson
Insert LC: . Title: .

REPORT OF STANDING COMMITTEE

HB 1099, as engrossed: Judiciary Committee (Sen. Nething, Chairman) recommends DO PASS (6 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). Engrossed HB 1099 was placed on the Fourteenth order on the calendar.

2007 TESTIMONY

HB 1099

#1

Testimony before House Industry, Business and Labor Committee – HB 1099

By Dr. Michel Hillman,
Vice Chancellor for Academic and Student Affairs
North Dakota University System

January 15, 2007

Chairman Keiser and members of the House Industry, Business and Labor Committee:

My name is Mike Hillman, Vice Chancellor for Academic and Student Affairs, North Dakota University System and I am here today supporting HB 1099 on behalf of the North Dakota University System.

HB 1099 was introduced at the request of the State Board of Higher Education. The bill amends section 44-04-18.4 of the North Dakota Century Code, relating to confidentiality of trade secret, proprietary, commercial and financial information. The bill is intended to implement one of the key recommendations in a recent study completed for the Department of Commerce and NDUS. This study by RTI International on Intellectual Property and Technology Commercialization in North Dakota was mandated and funded by the 2005 Legislative Assembly. The RTI report recommended amendments to section 44-04-18.4 to adopt clear definitions of confidential information under North Dakota's open records law. As RTI pointed out, current law defining confidential information does not define "commercial" or "financial" information and current definitions of "trade secret" and "proprietary" information are less than ideal and in need of updating.

Not having a definite and clear definition of these terms in state law creates unnecessary confusion and can cause North Dakota institutions to be at a competitive disadvantage with public institutions in other states and private institutions in competition for research funding. Companies looking for higher education partners for research and development projects need clarity and guarantees that the higher education partner will not release or disclose the company's confidential proprietary information and intellectual property except as that company permits or when it would otherwise become public.

As state entities, NDUS institutions are subject to state statutes defining what information is and is not confidential. A lack of a clear definition of confidential information causes concern and uncertainty on the part of company officials involved in negotiations with state officials. Since "commercial" and "financial" information now used in section 44-04-18.4 are not defined in the statute and language in definitions of "proprietary" and "trade secrets" is less than ideal or inconsistent, the attorney general has in a series of opinions provided guidance on interpreting this section.

However, opinions of the attorney general are not binding and courts may disagree with the opinions. For private companies interested in contracting with North Dakota entities, an opinion of the attorney general does not provide the same degree of certainty as is provided by carefully crafted legislation. Often, negotiating parties may not even be aware of the Attorney General Opinions, particularly those negotiating for our commercial partners.

HB 1099 is intended to remove uncertainty and ambiguity in application of NDCC section 44-04-18.4. The new (or revised) definitions closely track attorney general opinions interpreting this section and similar statutes in other states.

It's important to remember that all the definitions in subsection 2 are subject to subsection 1's limiting language that the information be privileged and not previously publicly disclosed. Additionally, most of the subsections clarifying "proprietary" information are taken from the current law and rearranged, with the exception of (2) and (4) relating to licensing and commercialization, and adding "technical know-how" under (7) and d for the trade secret definition.

Mr. Chairman and committee members, on behalf of the North Dakota University System, I urge your support of HB1099.



January 15, 2007

Chairman Keiser, Members of the House Industry, Business, and Labor Committee,

For the record, my name is Dan Wogsland, Executive Director of the North Dakota Grain Growers Association. I appear before you today in support of HB 1099.

The New Economy Initiative from the North Dakota Chamber of Commerce states the following "Successful economic developments rests on the creation of strong public/private partnerships that promote a dynamic business climate." In entering into public/private partnerships, confidentiality is critical for businesses in protecting developmental concepts, ideas, products and processes. Additionally, it is critical to protect negotiations and communications related to research and intellectual property agreements. It is also critical for non-profits affiliated with universities to keep confidential information confidential. Given these factors, there is a real need for the passage of HB 1099.

Current state statute exempts records and information pertaining to a prospective location of a business, including identity and location of the business when no previous public disclosure is made by the business or industry of intent of the business or industry to locate, relocate, or expand within the state. Licensing and certain research-related activities should be afforded the same or similar status. Related agreements, records, negotiations and communications pertaining to licensing or certain research agreements should be exempt.

Current statute hinders related university non-profits such as research foundations, centers of excellence, and technology parks working with businesses on inventions, products and research that foster economic development.

Solutions to the current problem include fine-tuning what type of information is excluded under Section 44-04-18.4; excluding the definition of propriety information; and expanding the definition of trade secret. Updating state statutes to address confidential information dealing with licensing, sensitive research-related activities, agreements, intellectual property, including related communications and negotiations, is needed to help foster and ensure a dynamic public/private business climate.

Citizens and organizations that provide funding for research have the right to know how such money is spent, and oversight and protections already exist in that regard. If we want to maximize the research capabilities of institutions in the state to work with

NDGGA provides a voice for wheat and barley producers on domestic policy issues – such as crop insurance, disaster assistance and the Farm Bill – while serving as a source for agronomic and crop marketing education for its members.

companies to spur economic development, then barriers must be removed and tools provided to accomplish it. Refining the confidentiality rules that can hinder business development would assist in reducing barriers to companies that are interested in working with the state's research institutions.

A key goal put forth in the New Economy Initiative, a project of the North Dakota Chamber of Commerce, is to "develop effective partnerships between government and the private sector to improve the state's business climate."

There are signs of progress, as outlined in the new Economy Initiative Progress Report, which can be found online the N.D. Chamber of Commerce web site, www.ndchamber.com (See link "New Economy Initiative")

One of these signs is The Red River Valley Research Corridor, an initiative championed by U.S. Sen. Byron Dorgan, which builds on the strengths and potential of North Dakota's two major research universities and involves other institutions across the state, public and private, in engaging in high-level funded research and commercialization of science and technology.

In the 2005 legislative session, \$15 million was allocated to promote partnerships between the Commerce Department and the University System to develop and enhance centers of research excellence. It was a progressive move, given the advancement of both NDSU and UND to Division I status.

The mission of the Beef Systems Center of Excellence at NDSU (www.ag.ndsu.edu/research/BeefSystemsCE.htm) is to provide "plate to gate" programs, linking consumer research to beef product development in the area of beef and beef products. A key goal is to create a model for development of a coordinated beef processing industry which could be implemented in other parts of the state, region, or country.

A specific purpose of the NDSU Oilseed Development Center of Excellence (www.ag.ndsu.edu/research/OilseedDevCE.htm) is to encourage private sector investment in research and technology that can increase farm incomes, and facilitate development of oilseed agriculture in North Dakota.

The 55-acre NDSU Research & Technology Park (www.ndsuresearchpark.com) represents a major initiative where university researchers and private industry can combine their talents to develop new technologies, methods and systems.

The Energy & Environmental Research Center (EERC) at UND (www.undeerc.org/centersofexcellence) has ten Centers of Excellence that are at the forefront of developing advanced energy and environmental technologies systems. "Partnerships are the Currency of Life," says the EERC, with the majority of EERC contracts from nonfederal entities, with business partners that range in size from large multinational corporations to regional utilities to small local businesses.

Given all of these circumstances, it is essential that the North Dakota Legislature address the confidentiality issue; HB 1099 is a big step in the right direction. The North Dakota Grain Growers Association requests your favorable consideration of HB 1099.

HHH 71 /
2.28-07

Senate Judiciary Committee

Testimony on HB 1099

Pat Seaworth, General Counsel

North Dakota University System

February 28, 2007

Chairman Nething and members of the Senate Judiciary Committee:

HB 1099 was introduced at the request of the State Board of Higher Education. The bill amends section 44-04-18.4 of the North Dakota Century Code, relating to confidentiality of trade secret, proprietary, commercial and financial information. The bill implements one of the key recommendations in a recent study completed for the Department of Commerce and NDUS. This study by RTI International on Intellectual Property and Technology Commercialization in North Dakota was mandated and funded by the 2005 Legislative Assembly. The RTI report recommended amending section 44-04-18.4 to adopt clear definitions of confidential information under North Dakota's open records law. As RTI pointed out, current law defining confidential information does not define "commercial" or "financial" information and current definitions of "trade secret" and "proprietary" information are less than ideal.

Not having clear definitions of these terms in state law creates unnecessary confusion and can cause North Dakota institutions to be at a competitive disadvantage in competition for research funding. Companies looking for higher education partners for research and development projects need clarity and guarantees that the higher education partner will not release or disclose the company's confidential proprietary information and intellectual property except as that company permits or when it would otherwise become public according to law.

A lack of a clear definition of confidential information causes concern and uncertainty on the part of company officials involved in negotiations with state officials. Although the attorney general has issued opinions interpreting section 44-04-18.4, opinions of the attorney general are not binding and courts may disagree. For private companies interested in investing in North Dakota, an opinion of the attorney general does not provide the same degree of certainty as is provided by carefully crafted legislation. Often, these companies are not aware of the attorney general opinions.

HB 1099 is intended to remove uncertainty and ambiguity in application of NDCC section 44-04-18.4. The new (or revised) definitions closely track attorney general opinions interpreting this section and similar statutes in other states.

It is important to remember that the definitions in subsection 2 of section 44-04-18.4 (beginning on page 1 at line 11 of Engrossed HB 1099) are subject to subsection 1's limiting language that the information be privileged and not previously publicly disclosed (lines 9 and 10). Additionally, most of the lengthy definition of "proprietary information" (beginning at the bottom of page 1, line 22 and continuing on pages 2 and 3) is taken from the current law and rearranged. New language in this definition is found in c.(2), c.(4), c.(5), which was added in a House amendment, and in c.(8) and d., where the words "technical know-how" were added.

Mr. Chairman and committee members, the North Dakota University System requests your support of and favorable action on HB1099.

10:30 AM #2 2-28-07
FT-Lincoln Room

Confidentiality Important to N.D. Economic Development

“Successful economic development rests on the creation of strong public/private partnerships that promote a dynamic business climate.”

New Economy Initiative, North Dakota Chamber of Commerce

A key goal put forth in the New Economy Initiative, a project of the North Dakota Chamber of Commerce, is to “develop effective partnerships between government and the private sector to improve the state’s business climate”.

There are signs of progress, as outlined in the New Economy Initiative progress Report, which can be found online at the N.D. Chamber of Commerce web site, www.ndchamber.com (See link “New Economy Initiative”).

One of these signs is the Red River Valley Research Corridor, an initiative championed by U.S. Sen. Byron Dorgan, which builds on the strengths and potential of North Dakota’s two major research universities and involves other institutions across the state, public and private, in engaging in high-level funded research and commercialization of science and technology.

In the 2005 legislative session, \$20 million was allocated to the Centers of Excellence in Economic Development Program. The Centers of Excellence are based on creating university and industry interaction or partnerships. This is a very progressive move.

North Dakota’s research institutions are expected to and are playing a significant role in economic development.

As more and more businesses work with research institutions in North Dakota, they would prefer that their company’s financial, market, technical, or other sensitive business information not be shared or have the possibility of being shared with their competitors. Many of these businesses want legal assurance that such businesses’ information shared during the course of research and licensing does not end up in their competitors’ hands.

Research includes assisting private companies in solving product and process issues in their businesses or developing new products. Companies do not want such sensitive information to be available to competitors. Businesses are very concerned about a university’s ability to keep company information confidential, as well as communication and negotiations related to research and intellectual property agreements.

Non-profits affiliated with universities also have the need to keep a businesses' confidential information confidential, as well as negotiations, communication, and license agreements.

Current state statute exempts records and information pertaining to a prospective location of a business, including identity and location of the business when no previous public disclosure is made by the business or industry of intent of the business or industry to locate, relocate, or expand within the state.

Licensing and certain research-related activities should be afforded the same or similar status. Related agreements, records, negotiations, and communications pertaining to licensing or certain research agreements should be exempt.

Current status hinders related university non-profits such as research foundations and technology parks working with businesses on inventions, products, and research that foster economic development that could bring companies (or enhance existing companies) and jobs to the state.

RTI International conducted a study at the request of the ND Department of Commerce and the State Board of Higher Education to study intellectual property and technology commercialization in North Dakota. This study was provided to an interim legislative committee.

RTI recommended solutions to the current problem including fine-tuning what type of information is excluded under section 44-04-18.4; expanding the definition of proprietary information; and expanding the definition of trade secret.

"The vague statutory language raises the uncertainty that information that is both competition-sensitive and critical to companies will be publicly released and creates a risk for companies seeking to enter into research and commercialization arrangements with the North Dakota state universities. As a consequence, companies may decide to do business with universities in other states where this risk does not arise."

RTI indicated that they had "... spoken with a number of companies from around the country who currently work with other universities. They assert that they reveal extremely sensitive and company proprietary information during their discussion with technology transfer offices at universities and the threat of public disclosure would have a chilling effect on their willingness to initiate discussions."

RTI recommended modifying/updating state statutes to address confidential information dealing with licensing, sensitive research-related activities, agreements, intellectual property, including related communications and negotiations.

This is needed to help foster and ensure a dynamic public/private business climate.

Citizens and organizations that provide funding for research have the right to know how such money is spent and oversight and protections already exist in that regard.

If we want to maximize the research capabilities of institutions in the state of North Dakota to work with companies to spur economic development, then barriers must be removed and tools provided to accomplish it. Refining the confidentiality rules that can hinder business development would assist in reducing barriers to companies that want to work with the state's research institutions.

#B1099
1st attempt in Oct to bring it forward
Later NDSU & UND worked with the State
Board of Higher Ed to provide input into
the amendment

The 1st hearing was on January 15th
Some concern expressed by NDAG
regarding fraudulent bus practices
One or more legislators expressed concern
about being able to keep a company's
name confidential during early
stages of inquiry & negotiation

The NDAG ~~was~~ provided some
recommended changes regarding the
exemption for fraud investigations &
keeping the name confidential
UND & NDSU provided minor edits
to this language to the State Board
of Higher Ed.



"Watchdogs of the Prairie"
Organizing North Dakotans Since 1974

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AH #3
2-28-07

**Testimony on HB 1099
Senate Judiciary Committee
February 28, 2007**

Chairman Nething and committee members my name is Barb Price and I am an organizer for Dakota Resource Council. DRC is an independent membership-based grassroots organization that has been working with North Dakotans since 1978.

HB 1099 is overreaching and thereby allows administrators at publicly supported research institutions to use the exemptions this bill creates for shading management decisions and priorities while proclaiming to be shielding trade secrets and proprietary information. Any unintended ramifications resulting from passage of HB 1099 could surface first at NDSU and the NDSU Research Foundation.

We single out NDSU and the NDSU Research Foundation due to our concerns about the priorities of NDSU administrators with respect to agricultural biotechnology and transgenic crops. Social science researchers using a decade's worth of data from the U.S. Department of Agriculture itself now conclude that "university research on transgenic crops has increasingly mirrored the research profile of for-profit firms." (Appendix, Item A)

There is a term for that trend, "academic capitalism," a development thoroughly addressed in a paper titled "University Administrators, Agricultural Biotechnology, and Academic Capitalism: Defining the Public Good to Promote University-Industry Relationships." Among the report's conclusions is this: "... our findings suggest that

UIRs [University-Industry Relationships] are becoming entrenched and that this raises concerns about the integrity of public-interest research.”

(Appendix, Item B)

In fact, an apparent change in priorities at NDSU is already under way, and evidence can be found through a study of its public relations efforts. Consider a news release, dated April 14, 2005, coming from the NDSU Agriculture Communication Department announcing the establishment of the NDSU AgBiotechnology Center of Excellence. Quoted in this news release, along with several NDSU employees and others, is Al Skogen, a North Dakota farmer and a proponent of transgenic crops such as Roundup Ready wheat. Mr. Skogen's comments in this news release focus on the benefits to growers and small biotechnology firms “that have an idea, but have limited resources to proceed.”

(Appendix, Item C)

However, in July 2006 the NDSU Agriculture Communication Department issued a news release that implies a contradiction in objectives when compared to Mr. Skogen's comments in the 2005 news release. The lead paragraph of the July 2006 document reads as follows:

North Dakota State University and Monsanto have announced collaboration between the NDSU AgBiotechnology: Oilseed Development Center of Excellence and the St. Louis-based agricultural company. In this public-private partnership, scientists from both organizations will focus on cooperative research, technology development and educational activities that are expected to benefit North Dakota's agricultural sector, its producers and consumers. The initial focus of the collaboration will be oilseed improvement.

(Appendix, Item D)

Clearly, Monsanto is not a small biotechnology company. Rather, Monsanto stands tall among the world's biotech giants. Is Monsanto's financial muscle twisting NDSU's priorities? We believe such a case can be made. Again, NDSU's public

relations activities offer examples. Consider the following snippets from e-mail conversations between an NDSU communications professional, the originator of these messages, and a Monsanto public affairs manager:

- “I was ready to release when the story hit the news that the N.D. Attorney General said the NDSU Research Foundation’s records must be opened so the Dakota Resource Council can learn about NDSU’s cooperation with Monsanto ... The University Relations news director and I decided we better hold off on the collaboration news release until this news faded away. Hope you agree. Let’s wait a couple of weeks and see where we stand. Thanks for understanding. I hate how long this has drug out, but I’m sure glad we hadn’t sent the story right before this one came out.”

(Appendix, Item E)

- “Since the Oilseed Center of Excellence news conference was a few weeks ago, time for another shot of publicity. Let’s finally send out the news release about the Monsanto collaboration with NDSU.”

(Appendix, Item F)

As these comments prove, there is considerable energy being expended at NDSU to appease Monsanto. But how does this “publicity” benefit NDSU’s core constituents—namely, North Dakota’s agricultural sector, its producers and consumers?

Furthermore, if NDSU and Monsanto are only *initially* collaborating on oilseed improvement, one can justifiably wonder what subsequent focuses might result from this public-private partnership, or others. Meanwhile, Mr. Skogen’s views concerning the commercialization of transgenic wheat are enlightening. These views recently appeared in a news article in *Capital Press Agriculture Weekly*, published in Salem, OR. The following portion of the story contains Mr. Skogen’s perspective:

Based on the current time line for release of a fusarium head blight-resistant

variety, there appears to be years to sort out the GMO opposition, but Al Skogen, a grower from North Dakota, doesn't believe growers have the luxury of waiting.

"Somewhere along the line we are going to have to make more aggressive moves," he said, including telling buyers that growers are unilaterally making the choice to move forward. "I think the wheat industry is going to have to step up the pace."

He said he believes the answer is not to withhold GMO wheat, but rather to give customers what they want.

Speaking of Japan, where several importers indicated they would cease sourcing U.S. wheat if the Roundup Ready trait were commercialized, he said: "The only question they really should ask is can we deliver what they want? Beyond that, they don't have the right to tell us what to plant."

(Appendix, Item G)

Mr. Skogen's desire for "aggressive moves" concerning the commercialization of transgenic wheat and his association with the NDSU AgBiotechnology Center of Excellence beg several questions: In the future, who will be making decisions regarding the commercialization of transgenic wheat at NDSU? Based upon what set of criteria? Which documents pertaining to this process will be available to the public and which will be sealed by the provisions of HB 1099? Who is accountable to the public?

Academic capitalism threatens the integrity of public-interest research. Now, more than ever, the administrators of our public research institutions need to be held accountable—especially with respect to biotech research involving corporate partners. Stewardship of vital, irreplaceable public assets such as germ plasm, issues related to legal liability resulting from genetic contamination, the potential for damaging domestic and international markets for U.S. hard red spring wheat and durum, and the

erosion of consumer choice in the marketplace stand as reasons for this essential oversight. Please recommend a "do not pass" on HB 1099 and keep North Dakota's open records laws working like sunshine to maintain transparency regarding the people's business and the management of their property.

S|S|S

ABSTRACT Private sector firms have dominated the research, development, and commercialization processes for transgenic crops. This has led to a narrow focus on a few commercially important crops and engineered traits, while minor crops and traits remain largely ignored. Analysts have decried this situation and called for more public-centered research regimes, such as research on minor crops and traits. Universities are often identified as places where research on the more minor crops and traits should occur. The burgeoning literature on the changing structure of the university toward an institution more aligned with private for-profit sector interests and orientations calls these arguments into question. Using time series data from 1993–2002 obtained from the US Department of Agriculture's Animal and Plant Health Inspection Service, we find that over time, university research on transgenic crops has increasingly mirrored the research profile of for-profit firms.

Keywords academic capitalism, Animal and Plant Health Inspection Service, minor crops, traits, transgenic

Considering the Role of the University in Conducting Research on Agri-biotechnologies

Rick Welsh and Leland Glenna

Agribusinesses and many agricultural scientists and policymakers assert that the Gene Revolution, which was initiated with the commercialization of the first transgenic crop technologies in 1995, may generate more agricultural benefits than the Green Revolution of the 1960s and 1970s. However, although most parties agree that transgenic crop technology is a powerful new agricultural tool, the United Nations Food and Agriculture Organization (FAO) contends that important factors that distinguish the Gene Revolution from the Green Revolution may generate food insecurity along with any benefits (Food and Agriculture Organization, 2004).

For instance, the research and new crop varieties associated with the Green Revolution were generated by the public sector and distributed as public goods. In contrast, the research and products of the Gene Revolution are being advanced primarily by the private sector, protected as intellectual property owned by large transnational agribusinesses, and distributed through commercial markets. Although the intellectual property protection that accompanies transgenic crops has inspired the private sector to invest in agricultural research, those investments have overwhelmingly been targeted at plants and traits that are of interest to the

largest farms with the most widely planted crops (Food and Agriculture Organization, 2004). The two dominant commercialized traits, herbicide tolerance and toxicity to insects, were developed because of the need to realize a return on substantial research and development (R&D) investments for agri-biotechnology firms as they sought to switch from a chemical pesticide approach to a life science regime (Ervin et al., 2001). And these traits fit easily within the firms' established and, therefore, familiar approaches to pest management (Welsh et al., 2002). The FAO points out that concern that staple food crops (such as bananas, sweet potatoes, and lentils) will be neglected is supported by the evidence from field trials of transgenic crops in industrialized nations (Food and Agriculture Organization, 2004: 35).

A growing number of analysts and observers argue that the criticisms of the FAO and other organizations with regard to current and planned agri-biotechnologies originate in the social and economic context in which these technologies were developed (for example, Hubbell & Welsh, 1998). To remedy this situation they argue that the public sector must take on a greater burden of transgenic crop development, or public regulatory institutions must develop tax or other financial incentives for firms to alter their current trajectory. To that end, Doering (2004) wants research efforts for the next wave of agri-biotechnologies to emphasize traits designed to enhance safety and environmental benefits. Hubbell & Welsh (1998) argue that activist groups have been able to coerce universities to perform research on sustainable agriculture interventions and could potentially do so for agri-biotechnology research. Paarlberg (2000) asserts that private sector firms would be expected to focus on a relatively few profitable crops when commercializing engineered traits, while it is the responsibility of the university and other more publicly oriented institutions to focus on less commercially relevant or subsistence crops – that is, minor or 'orphan' crops.

These arguments assume that the university is largely separate from the private sector in agriculture, and that it operates under a different logic and set of assumptions that buffer it from the commercial interests and demands inherent to private sector firms. However, the growing body of literature on the links between university and industry research, and the university's shift toward private sector approaches for raising revenue, call these assumptions into question. That is, a large and increasing number of authors argue that the mission of universities to address public concerns has been altered. Driven by the need to replace decreasing public investment, universities are orienting themselves toward activities normally associated with the private sector. For example, Kleinman (2003) finds that public university laboratories and scientists are influenced directly and indirectly through shifts in the legislative and intellectual property environment in which they operate. And Krinsky (2003) observes that technology development and transfer create a situation in which revenue is more central to university research than in previous decades. Therefore, Krinsky argues, university research is conducted more in the 'private interest' than

entrepreneurial university that is emerging today (Etzkowitz, 2001: 25). For example, political and economic commentators defined that university's insulation from political and economic forces as an obstacle to economic growth in the 1970s and 80s. President Reagan's science advisor George Keyworth's assertion epitomizes the perspective underlying the drive to change the institutional context for public science research: 'most academic and federal scientists still operate in virtual isolation from the expertise of industry and from the experience and guidance of the marketplace' (quoted in Krinsky, 2003: 30). More recently, Kunhardt (2004) argues that patenting and licensing activities should be part of the tenure-granting process at research universities. This would make 'academic entrepreneurship' part of the academic mainstream. He claims that such reform is necessary to maintain the USA's competitive advantage in the global economy.

Contrary to enthusiasts for the entrepreneurial university, analysts who are concerned about the increasing and changing links between universities and industry assume that both play unique roles in society, and question whether those roles might be compromised when the individuals from the two organizations increase their interaction. In this vein, Krinsky (2003) argues that universities have historically entailed four missions or personalities: knowledge as virtue, knowledge as power or productivity, the defense model, and the public-interest model. Krinsky sees and regrets that the second personality subsumes the final personality as scientific research is increasingly driven by what the market discerns as important and not what society discerns as important. Furthermore, public interest is being re-defined, so that the public is viewed as being best served by market forces and the university's job is to develop science and technology to generate revenues and ultimately profits for private sector firms. The idea that public interest science tackles problems 'that elude a market solution' (Krinsky, 2003: 181) has become passé.

However, research universities presently find themselves governed by different legal, legislative, and economic policies and practices than they were three decades ago. The 1980 US Supreme Court decision *Diamond v. Chakrabarty* (447 U.S. 303) enabled the patenting of living organisms, which opened the way for universities to profit from biological research discoveries and gave corporations a heightened interest in collaborating with universities in biological research. The Bayh-Dole Act of 1980 marked the first in a series of laws that sought to encourage the transfer of university research discoveries to the private sector, in order to speed development of commercial products which would stimulate economic growth in the private sector. Likewise, scientific networks and intellectual property issues are much more heavily influenced by private sector interests, as universities and their scientists have become integrated into the 'knowledge economy' and the 'life sciences industry'. What has followed is a narrowing of the definition of how science might generate public benefits and a diversion of public investment into scientific research that favors private over public benefits.

Private and Public Science and Transgenic Crops

The growth in transgenic crop plantings is the most rapid technology revolution in recent US agriculture history. Starting from zero in 1995, farmers intended to plant approximately 82% of soybean acres, 76% of cotton acres, and 46% of corn acres with biotech varieties in 2004, the vast majority of which are transgenic (US Department of Agriculture, 2004). Barring a serious environmental or human health problem linked to the crops, these plantings likely will grow and spread across ecosystems throughout the USA over the next decade. Universities have played a crucial role in developing the enabling technologies to fuel the explosive growth in this area (Charles, 2001). Although these data suggest a wide and varied adoption, a closer look reveals that the commercialization of transgenic crops is limited to two dominant traits engineered into a handful of major agronomic crops. James (2005) finds that 95% of the 90 million hectares planted to transgenic crops worldwide are planted to three engineered crops: soybean (60%), corn (24%), and cotton (11%) (see Table 1). In addition, practically all the transgenic crop acreage consists of two engineered traits: herbicide tolerance and insect resistance (see Table 2).

However, James (2005) also finds that 98% of transgenic crop acreage is located within seven nations, with the USA accounting for 55% of total transgenic acreage. In fact, the populations of many nations, most notably European Union (EU) nations, have resisted the commercialization of these technologies. This resistance has developed for a number of reasons, but in general the belief that the current set of commercialized traits may not be safe for the environment and place corporate interests over the

TABLE 1
Global area of transgenic crops by crop: 2005

Crop	Millions of hectares	%
Soybean	54.4	60
Corn	21.2	24
Cotton	9.8	11

Source: adapted from James, 2005.

TABLE 2
Global area of transgenic crops by trait: 2005

Trait	Millions of hectares	%
Herbicide tolerance	63.7	71
Insect resistance	16.2	18
Insect resistance and Herbicide tolerance (stacked)	10.1	11

Source: adapted from James, 2005.

public interest (Wesseler, 2005). Consequently, the EU has followed a more precautionary approach than the USA in regard to commercialization of transgenic crops (Ervin & Welsh, 2005), with resulting trade frictions between the USA and EU. As the transgenic proportion of the total acreage of important agronomic crops such as corn and soybean increases, the politics of trade in these crops become more intense.

Arguments about structural changes taking place in the university combined with the overall growth in the USA and international markets for particular types of transgenic crops and traits, and the public resistance to these crops and traits, raise the question of whether universities have followed private sector firms and mimicked their strategy of focusing research and development efforts on a few major agronomic crops and engineered traits. Or have the universities, despite significant structural change and evolving expectations, focused their efforts on less dominant traits and crops that might serve smaller markets of less interest to the major private sector firms? This latter role, it can be argued, would serve the more public function that universities, with their non-profit status, have traditionally been expected to fulfill. In fact, the National Research Council's Committee on the Future of Land Grant Colleges of Agriculture (1996) agrees. It finds that:

Public goods are a specific class of goods, of a 'common property' nature, that is, they benefit societal groups but do not provide the means of economic returns to private individuals or firms ... Public support is also justified for research and development that may eventually have commercial application in achieving national (or state) interests, but is too costly, uncertain, or otherwise an unlikely focus for private sector investment. For instance, integrative or adaptive research supporting producers or consumers of commodities representing small markets for agricultural input suppliers (many fruit, vegetable and specialty crops) may not be conducted despite anticipated benefits without public support.

The literature on agricultural biotechnology innovations and investments by private sector firms supports the assumption that universities may have to intervene to lead biotechnology research in the minor crop sectors. For instance, Bradford & Alston (2004: 84–85) argue that:

Unlike the commodity agronomic crops, horticultural markets are highly segmented by factors such as location, season and consumer preferences. The horticultural market is composed of many niche markets, and any single product may be successful in just a few of those niches ... Introducing a trait into a horticultural species likely requires its introduction into multiple varieties to achieve market success.

With the vast diversity in horticultural species relative to the commodity agronomic crops such as soybean and corn, it may require rather particular and different genetic transformations for each species. Therefore there is a built-in disincentive for for-profit firms to exploit the minor crop sectors in this area (Bradford & Alston, 2004). We extend the discussion of public support in agriculture to research on minor traits within transgenic approaches to agriculture. Given the growing importance and potentially

in general and UIRs in agricultural biotechnology in particular, we asked the following research questions:

To what extent have universities mimicked the for-profit sector in agricultural biotechnology by focusing their transgenic research on a relatively few proven genotypes (traits)?

To what extent have universities mimicked the for-profit sector in agricultural biotechnology by focusing their transgenic research on the relatively few major (commercially dominant) agronomic crops?

To address these research questions, we labeled herbicide tolerance (HT), insect resistance (IR), and product quality (PQ) as major traits. Product quality is a category that includes the alteration of particular crop qualities to make it more valuable to food manufacturing firms. An example is to engineer corn to contain higher levels of lysine, which is useful to livestock producers. PQ was included because it is often touted as the next wave of transgenic crops and because in the APHIS data set PQ trait crops were almost as numerous as HT and IR crops. Minor traits consisted of nematode resistance, fungus resistance, bacteria resistance, virus resistance, agronomic properties (for example, yield), and 'other'. We did not include marker gene as a major or minor trait, since it is not directly related to crop production or use. Rather, marker genes are inserted into plants, along with the gene for the new trait of interest such as herbicide tolerance. The marker gene is used to identify the cells that have the new trait of interest (Miki & McHugh, 2004).

In addition, we labeled soybean, corn, wheat, alfalfa, and cotton as major crops. These crops were selected because they are planted on extremely large acreages and dominate the national agricultural landscape. Minor crops were too numerous to list, but generally included field crops, vegetables, and fruits that are planted on smaller acreages than the major crops. Crops important to particular states but not planted on very large acreages across states and regions were included as minor crops, such as apple, grape, tomato, tobacco. We removed entries from the database for forestry crops, crops that serve as research models such as arabidopsis, and crops used for turf and ornamentals. Our intent was to measure transgenic field research for crops produced for animal feed, food, and fiber.

Analysis and Results

The initial step in the analysis entailed using the Crosstabs procedure in SPSS to obtain results for the following combinations of variables: for-profit firms X major trait, universities X major trait, for-profit firms X major crop, and universities X major crop. For each combination we were primarily interested in the percentage of the research profile of an organization type (for-profit or university) that was accounted for by major traits and major crops. The results, presented in Table 3, indicate that in general the research profiles of universities, as measured by notices filed with APHIS, are less dominated by the major transgenic traits and the major agronomic crops than for-profit firms. For example, 78.8% of the notices

filed by for-profit firms entailed major traits while only 57.6% of the notices filed by universities included at least one HT, IR, or PQ trait. The pattern continues when considering major crops. Approximately 71% of notices filed with APHIS by for-profit firms entailed research on major agronomic crops, while about 32.6% of notices filed by universities entailed research on such crops.

However, an analysis of changes over time provides additional information. For the time periods 1993–95, 1996–98, and 1999–2002 the research profile of the for-profit firms remained fairly consistent. For universities the trend is such that, in the third time period, universities look increasingly like for-profit firms. This is especially true for research on major traits as almost 73% of notices filed by universities entailed at least one major trait. This is up from about 35% for 1996–98 and 37% from 1993 through 1995. Research on major crops also increased for universities (38.6% in 1999–2002 up from 31% from 1996–98) but lagged behind for-profit firms and university research on major traits. A closer look at the APHIS data helps explain this finding.

Land grant universities have historically dominated agriculture research in the USA. This tradition is reflected in the APHIS data. As part of their historical and institutional roles, land grants have focused a significant portion of their research efforts on crops important to the state in which they are located. And this tradition seems to have acted as a kind of brake on economic pressures to only focus on a few major crops with the most commercial potential. For instance, Cornell University's notices have a substantial number of apple and grape entries. For Michigan State, potato entries are more numerous, as are tobacco entries for North Carolina State. The trend continues in other regions where University of Florida focuses on tomato and tobacco, and University of Idaho on potato, pea, and wheat.

Still, the results in Table 3 suggest a change in the nature of university research; therefore, we conducted a more rigorous time series analysis to test for trend effects. We constructed an index we labeled 'the commercial index'. To do this we placed the binary variables for major crop, minor crop, major trait and minor trait into the following equation:

TABLE 3
Results from cross-tabulations

	For-profit firms (%)		Universities (%)	
	Major traits	Major crops	Major traits	Major crops
1993–2002	78.8	71.0	57.6	32.6
1993–95	87.9	76.1	36.7	5.8
1996–98	82.6	69.6	34.6	30.8
1999–2002	72.1	69.7	72.6	38.6

$$\text{commercial index} = (\text{major crop} + \text{major trait}) \\ - (\text{minor crop} + \text{minor trait})$$

The index at the individual firm, university, foundation or government

agency level for each filing has possible values of 2, 1, 0, -1 and -2, since major and minor traits are both engineered into major and minor crops and it is possible to 'stack' traits into a single crop.¹ Higher values for the index indicate greater emphasis in research effort on more commercially relevant crops and traits, and lower values indicate a greater emphasis on crops and traits with smaller markets. We then calculated the mean value of this index for the three main categories of organization types (firm, university, other) for each year. The mean index values by year for all universities and all private firms are displayed in Figure 1. Figure 1 indicates that, although private sector firms consistently score higher on the commercial index, universities seem to increasingly parallel private sector research trends. In the more recent years the university score turns positive and steadily increases in value.

Beyond the visual examination of the trends, we also conducted a time series statistical analysis. We performed an ordinary least squares regression where we regressed the mean commercial index value by year on dummy variables for private firm and university. The dummy variable for the 'other' category was omitted and acted as a basis for comparison. The requested Durbin-Watson statistic indicated that the data exhibited autocorrelation. Therefore, we performed the time series regression analysis again, this time using the autoregression procedure in SPSS (Cochran-Orcutt first-order autoregression model). The results presented in Table 4 indicate that universities and private firms are positively and significantly associated with the commercial index. The adjusted r^2 is approximately 0.62, indicating that the two-variable model explains more than 60% of the variation in the commercial index. The autoregression results (Table 4) combined with the data presented in Figure 1 suggest that universities and private sector firms have increasingly similar research trajectories with regard to transgenic crop technology and as measured by APHIS registrations.

TABLE 4
Autoregression results: commercial index as dependent variable

Independent variables	Beta coefficients	P value
University	0.85	.000
For-profit firms	1.13	.000

Adjusted $R^2 = 0.62$.

Discussion and Conclusions

When considering the role and responsibility of scientists in research universities, it is instructive to consider the legal standing of the university. Nonprofit organizations are given a specific legal status within market

1. If a filing indicates stacked major traits or stacked minor traits within a crop, the value used to calculate the index remains 1 for each type of trait, no matter how many are stacked within a crop.

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**UNIVERSITY ADMINISTRATORS,
AGRICULTURAL BIOTECHNOLOGY,
AND ACADEMIC CAPITALISM:
Defining the Public Good to Promote
University-Industry Relationships**

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The theory of academic capitalism explains how federal, state, and university policies and people have expanded university-industry relationships (UIRs) and the commercialization of knowledge. These changes represent a profound shift in the way university research is expected to contribute to the public good. Because university administrators are responsible for creating organizational policies and infrastructures that are consistent with their organizational mission and with federal and state laws, it is critical to analyze how university administrators assess UIRs in relation to public-interest scientific research. Our in-depth interviews at six prominent land-grant universities with 59 key administrators having oversight responsibilities for agricultural biotechnology research programs and UIRs reveal how administrators justify their role in promoting UIRs. They tend to interpret their university's mission to contribute to the public good in a way that is conducive to encouraging UIRs and to commercializing research discoveries. Their rationale emerges within a context of having to justify their budgets to state governments.

Following World War II, Vannevar Bush worked with industry leaders and scientific experts to convince the U.S. Congress that it was in the nation's interest to spend public funds on research and development (R&D) while giving scientists the authority to determine which research agendas should be funded through peer review (Kleinman 1995;

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research (Slaughter and Leslie 1997; Kleinman and Vallas 2001; Lacy 2001; Bok 2003; Krinsky 2003; NRC 2003:114–15).

We are less interested in evaluating the new social contract than we are in understanding how it is being translated into organizational change in research universities. "Academic capitalism" is the theory that Slaughter and Rhoades (2004) develop to describe the social, political, and economic forces, such as the end of the Cold War and the rise of the economic-competitiveness coalition in the Congress, behind the emphasis on commercializing academic research. These efforts were driven by at least two major goals: subsidizing the private sector, by making it easier to privatize publicly funded research, and generating a revenue stream for universities in exchange for the transfer of research discoveries to the private sector.

What makes the academic capitalism theory useful for this article is its critique of the notion that federal intellectual property policies, private research funding, and other pressures external to the public research organization alone are responsible for the commercialization trend. Slaughter and Rhoades (2004:1) contend that groups of actors within the university—faculty, students, administrators, and academic professionals—are actively participating in the creation of "new circuits of knowledge that link higher education institutions to the new economy." We believe that this theory of academic capitalism might better explain the commercialization of academic research if it were to incorporate a description of how the structural position of university actors, especially university administrators, influences the ways that university actors participate in and make sense of UIRs.

Many studies have examined how and why university scientists participate in UIRs. A typical study uses interviews with university scientists to describe how those scientists interpret, negotiate, and compromise as they face quandaries over how to publish and patent discoveries, maintain open communication with colleagues while protecting industry information, and maintain their broad public commitments while facilitating commercialization (Slaughter, Archard, and Campbell 2004). With the exception of a few studies on university presidents and university technology-transfer managers, however, university administrators have been ignored (Slaughter and Rhoades 2004). One of those exceptions is Slaughter's (1990) study of the emergence of what she calls a new "institutional class"—comprised of university presidents and industry chief executive officers (CEOs). Her study revealed that the members of this new class define the "common good" as policies that give them unlimited authority and resources to fund research, to promote entrepreneurialism among university faculty, and to facilitate the transfer of publicly funded university research to the private sector to promote economic growth (Slaughter 1990). However, the diverse administrators who oversee UIRs have yet to be studied.

Given the central role university administrators play in developing and implementing policies and incentives governing scientific research and UIRs, it is critical to analyze how they view their institution's scientists' motivations for research, their perceptions of UIRs, and the context that enables and reinforces their articulation of how commercializing academic research contributes to the public good. To accomplish these goals, we conducted and analyzed semistructured interviews with 59 administrators involved in

agricultural biotechnology programs at six land-grant universities (LGUs). After briefly describing the politics and ideologies, policies, and funding trends promoting the shift to commercializing academic research, we explain how university administrators interpret key government policies and interact with state governments as they make sense of the changes they initiate and manage in their universities.

ACADEMIC CAPITALISM IN SOCIOLOGICAL CONTEXT

Insights from three related but distinct sociological literatures provide the context for academic capitalism: science and technology studies, economic sociology, and organizational sociology. Kleinman (2003) describes science and technology studies conducted by such notable scholars as Latour and Woolgar (1986) and Lynch (1985), who demonstrate through ethnographic studies how science is negotiated in communities and contexts. However, Kleinman (2003) contends that their passing references to organizational and macro-level influences on scientific research fail to capture the importance of such things as the effects of the world of commerce on university research. In contrast, Kleinman (2003) emphasizes how political and economic trends influence practices in a plant scientist's laboratory. Our study focuses on the administrators who manage the ways that political and economic trends influence scientific practices.

Economic sociologists (as well as economic historians and political sociologists) describe political and economic trends that have influenced policies affecting university research. One significant trend has been called "neoliberalism" or "market fundamentalism" (Glenna 2002; Somers and Block 2005). Market fundamentalism refers to "the idea that society as a whole should be subordinated to a system of self-regulating markets" (Somers and Block 2005:261). It is manifested in political rhetoric that demeans the public sector as a drain on economic growth, even though evidence contradicts the claim (Lindert 2004; Somers and Block 2005).

Market fundamentalism became evident in criticisms of university research as early as the 1970s, when business leaders, economists, and politicians claimed that United States' economic problems should be addressed by integrating the public research university into the market economy. President Reagan's science adviser, George Keyworth, epitomizes this perspective: "Most academic and federal scientists still operate in virtual isolation from the expertise of industry and from the experience and guidance of the marketplace" (cited in Krinsky 2003:30). The claim was that the knowledge economy provided new opportunities for companies to add value to (i.e., to extract profit from) the production process, and that the private sector needed to harness research universities' technologies in order to maximize the economic-growth potential (Buttel et al. 1984; Kenney 1986; Kloppenburg 1988; Busch et al. 1991; Slaughter and Leslie 1997; Slaughter and Rhoades 2004).

University research plays a more integral role in the biotechnology sector than, for example, in the mechanical engineering, computing, or chemical sectors. Nelsen (1991) refers to universities as the "lifeblood of biotechnology." In addition, agricultural biotechnology was an especially early target for efforts to commercialize university research

because so much of the research for the emerging agricultural biotechnology sector was conducted in LGUs (Busch et al. 1991).¹ Furthermore, the push toward academic capitalism in agricultural biotechnology research is socially relevant because, with the exception of major and a few minor crops that attract private investments, there is little profit to be made from agricultural research. Therefore, research on a variety of important food crops may not be conducted at LGUs if the private sector sets the research agenda primarily in terms of proprietary products (FAO 2004; Welsh and Glenna 2006).

The rise in UIRs and proprietary research at LGUs is largely the outcome of the 1980 Bayh-Dole Act. Prior to 1980, only a few universities encouraged the pursuit of proprietary research through technology transfer offices and research incentives. Furthermore, few university scientists went through the time-consuming legal process of gaining the government's approval to patent publicly funded research discoveries. They often chose instead to release their discoveries to the public. A series of policies beginning with the Bayh-Dole Act, however, streamlined the patenting process for universities by giving them the right to patent their discoveries and by encouraging them to seek ways to pass the discoveries to the private sector (Slaughter and Rhoades 2004). Allowing universities to hold patents meant that private sector firms could invest in university research with the understanding that the research results would have patent protection. This enabled companies to leverage their investments, even when the research is conducted in a publicly funded university laboratory (McSherry 2001:6). Eisenberg (1996:1664) captures the rationale of the Bayh-Dole Act: "If the results of federally sponsored research were to be rescued from oblivion and successfully developed into commercial products, they would have to be patented and offered up for private appropriation" (see also Shane 2004). In addition, Berglund and Coburn (1995) have described comparable state government policies.

The Bayh-Dole Act's rationale reflects the market fundamentalism described by Somers and Block (2005) because it portrays public research as less than worthwhile unless privatized. Two equations illustrate the shift from the Vannevar Bush to the Bayh-Dole social contract. Under the Bush model, the public good is considered the sum of public and private goods:

$$\text{public goods} + \text{private goods} = \text{the public good}$$

In contrast, under the Bayh-Dole model, the assumption is that public goods from the university are generally unused and a waste of public money unless utilized by the private sector. Public goods must be converted into private goods to contribute to the public good:

$$\text{public goods} \rightarrow \text{private goods} > > \text{the public good}$$

Universities are still expected to conduct basic research and other types of research that may not have immediate commercial applications. However, that is simply the starting point. Universities now have an additional expectation of developing UIRs to explore commercial opportunities for their research. The assumption, therefore, is that the public-interest research will continue, even as it is privatized. This leads us to our main

research question: whether university administrators rely upon this academic-capitalism definition of the public good in their descriptions of UIRs.

To operationalize the question, we examine how efforts to develop a new social contract for national R&D are converted into organizational change at the level of the university. This requires insights from organizational sociology. Applying DiMaggio and Powell's (1991) hypotheses on causes of organizational change, Hackett (2001:107) offers an observation especially relevant for our study: "increased resource dependence and other transactions with government agencies will cause universities to adopt and enforce the rules and formal rationality of government bureaucracies." Although this observation is most likely accurate, the focus on impersonal, external forces that influence organizational change tells only a part of the story. After all, "sociological theory explains nothing if it ignores the individual as agent and subject" (Schwartz and Shuman 2005:183).

We seek to explain how the macro-level political discourse, which is communicated to the universities in the form of political ideology and targeted research funding, gets incorporated into policies and practices at the organizational level of the university. Weick's (1995) concept of "sensemaking" is a useful approach for exploring how agents participate in such organizational change, not only by interpreting the changes, but also by creating meaning to justify their participation (Weick 1995). Sensemaking enables us to examine how the market fundamentalism that is so fashionable in the federal and state political rhetoric becomes an important component in administrators' efforts to construct the policies and rationale for UIRs.

There is an assumption of intersubjectivity in this sensemaking approach to the extent that it implies that people socially construct meaning in a context of action and interaction. It is a way of understanding how "[p]eople create their environments as those environments create them" (Weick 1995:34). Adopting this emphasis on intersubjectivity, we seek to describe how university administrators make sense of the policies and relationships that are promoting the integration of their universities into the market economy. How does their context provide them with the vocabulary to interpret UIRs as well as the relationships that reinforce their interpretations?

By pulling together elements from science and technology studies, economic sociology, and organizational sociology, we sharpen our focus on the effects of market fundamentalism on the social role of university research. The university is a significant source of knowledge and technology, and leaders in the public and private sector have sought to convert them into a source for private economic growth. Actors within universities, especially university administrators, have facilitated the integration of universities into the economy through the establishment of a variety of policies and organizational restructuring. They have also sought to make sense of efforts to reconcile publicly funded university research with academic capitalism, and this is what we address.

Derek Bok's (2003:207) commentary on this subject, although judgmental, offers insights into the administrators' sensemaking process when he states that administrators are pushing UIRs and other commercial activities because "the profits to be made seem all too tangible, while the risks appear to be manageable and slight. . . . Like individuals experimenting with drugs, therefore, campus officials may believe that they can proceed

without serious risks." Moreover, he suggests that administrators may not realize how their subtle compromises to accommodate UIRs eventually add up to dramatic changes.

These insights from a former university president who once promoted UIRs is a good starting point for sensemaking because they suggest that part of the justification process is built upon the assumption that public-interest research will continue, even as commercialization is accommodated. At the same time, however, Bok's (2003) portrayal of administrators pursuing profits may not adequately capture how they manage traditionally disparate and incongruous interests and goals: preserving the university's public-interest research tradition while also promoting the market fundamentalism behind the federal policies designed to transform university research. He also does not explain to whom these administrators need to justify their efforts, the political pressure they face, or the pragmatic challenges they must address when managing a research organization.

Lacy's (2001) list of distinguishing characteristics of public and private research institutions (Table 1) helps to highlight the incongruity that administrators must manage. He states that the goal of industry research is to generate trade secrets, patents, and exclusive licensing for commercial gain. Research agendas are set through a hierarchical structure with an emphasis on secrecy, intellectual property, and proprietary products. In contrast, university scientists conduct research within a more individualistic organizational structure and are generally expected to advance knowledge and address broad social problems. Research priority setting and review processes are more transparent, and knowledge is made available to the public through professional journals and university and government publications.

Public research institutions, such as universities, that were once responsible for the left side of Lacy's (2001) list of characteristics are now expected to produce proprietary research that is directed at marketability and profit. This new responsibility creates a dilemma for the administrators, and we want to determine if administrators acknowledge it. By converting Lacy's (2001) categorization of public and private research characteristics into Likert scales, we are able to quantify university administrators' perceptions of their university's scientists and their perceptions of UIRs. If administrators claim that

TABLE 1. Characteristics of Public and Private Science Research Institutions

Public research	Private research
Societal responsibility	Proprietary responsibility
Advancement of knowledge and problem solving	Marketable products and profit
Open-ended goals	Specific objectives and tasks
Long term, deliberate	Short term, quick, urgent
Open communication	Secrecy
Egalitarian	Hierarchical
Nonmonetary	Monetary
Individual	Team
Basic and applied research	Applied and development research
Disciplinary	Multidisciplinary

their scientists are motivated by public-interest values while offering favorable assessments of the private-interest benefits of UIRs, we will conclude that administrators at least implicitly acknowledge the structural incongruity. The challenge that follows will be to determine how the administrators rationalize it. Do they use public or private science values when explaining how university research contributes to the public good? And to whom do they make this rationalization?

RESEARCH METHODS AND DATA

An appropriate method for examining how administrators make sense of academic capitalism is the in-depth qualitative interview because it enables us to capture their definitions of shifting roles and responsibilities for public institutions. We focused on administrators at prominent universities because they often have influence beyond their universities.² Discovering how administrators from prominent universities evaluate UIRs may offer better insights of trends in UIRs than a random sample from all universities.

Our critical-case purposeful sampling technique was two tiered—we selected universities to serve as case studies and then selected administrators within those universities (for a discussion on purposeful sampling, see Patton 1990:169). We selected five prominent LGUs from the major U.S. regions (Cornell University, North Carolina State University, Texas A&M University, University of California-Davis, and University of Wisconsin) and one smaller LGU (Oregon State University) for comparative purposes, all of which emphasize agricultural biotechnology research. Prominent universities were defined according to size of sponsored research budget, technological ratings, agricultural science citation ranking, and patenting and licensing activities (see Appendix for detailed description of our criteria for case study selection).

Secondary data was used to quantify the commercial activity at each case study site. Those data reveal that all six showed a steady growth in patenting (Figure 1). They also generated significant licensing revenue. The University of Wisconsin received nearly \$23 million in licensing revenue in FY 2000, Texas A&M \$5.9 million, Cornell University just over \$5 million, North Carolina State University approximately \$2.5 million, and Oregon State University just under \$1 million (AUTM 2002: 33–34). The University of California-Davis received \$9.6 million in 2000 (Chrismer 2001). These receipts put the University of Wisconsin and the University of California-Davis in the top 20 in licensing revenue nationally, Texas A&M at 26th, and Cornell University at 27th (AUTM 2002:95). In 2002, the University of Wisconsin's licensing revenue increased to over \$32 million, Texas A&M received \$6.4 million, North Carolina State rose to \$3.7 million, Cornell University declined to \$2.9 million (from \$12 million in 2001), and Oregon State held steady at just under \$1 million (Blumenstyk 2003). University of California-Davis took in \$16.4 million in 2002 (UC Davis Connect Newsletter 2003). This information is important because it indicates that, although the licensing revenue is small in comparison to overall research budgets, the universities in our case study have been implementing the Bayh-Dole Act and participating in the establishment of academic capitalism.

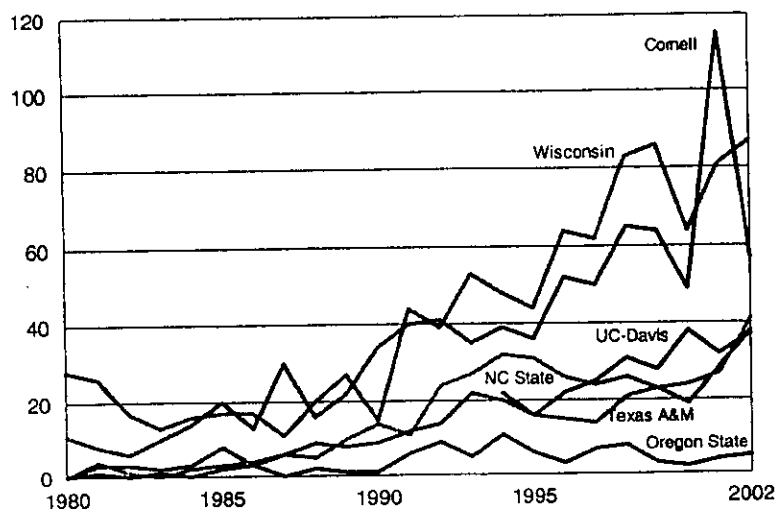


FIGURE 1. Patent Grants at Six Land-Grant Universities, 1980–2002.

Sources: U.S. Patent and Trade Office data, Chronicle of Higher Education, and University of California Office of Technology Transfer.

Administrators at each of the six LGUs were selected based on their responsibilities for overseeing some aspect of UIRs connected to agricultural biotechnology. We interviewed department chairs, deans and assistant deans, vice provosts and vice chancellors, and directors and managers involved in research and technology-transfer administration. A partial list of their varied responsibilities includes creating policies to promote and regulate UIRs, facilitating and managing technology transfers, overseeing patenting and licensing activities, and intervening to resolve legal violations and disputes between parties.

Near the end of each interview, we asked for recommendations of other administrators whom the interviewees considered to hold influential positions related to UIRs and agricultural biotechnology at their universities. This technique for finding key informants is often referred to as “typical case sampling” (Patton 1990:173). This technique gave us between 6 and 12 administrators at each campus ($N = 59$). Despite asking specifically for the names of administrators who were opposed to UIRs, we found none. Some were more critical and raised more concerns than others, but none expressed outright opposition to UIRs.

We informed respondents of the purpose of the survey by mail and contacted them by phone or e-mail to ask them to participate in interviews that would last between one and two hours. Only two administrators declined to be interviewed. They recommended that we interview one of their assistants instead. We assured interviewees that we would maintain confidentiality. To improve accuracy, we tape-recorded and transcribed the interviews.

The interview guide included open-ended questions (e.g., “How do you define the public good?” and “What organizational policies or structures are most influential in

shaping UIRs?") and structured questionnaires that asked respondents to rate (on Likert scales of 1 to 7) the importance of scientists' criteria for research problem choice and to rate the advantages and disadvantages of UIRs. It is always a challenge when analyzing and presenting qualitative data to ensure that quotations represent emerging patterns and that interpretations of quotations accurately reflect the respondents' ideas (Patton 1990). Combining the answers to open-ended questions with the Likert-scale data enabled us to triangulate our interpretations of the administrators' statements with the administrators' own quantified assertions.

We present the results of our analysis in three stages. In the first two sections, we analyze how administrators assess their scientists' criteria for research problem choice and their evaluations of UIRs. In the third section, we examine how the administrators interpret federal policies and their university's relationships with state governments to rationalize their assessment of scientists as being publicly motivated while also offering very favorable evaluations of UIRs.

ANALYSIS AND RESULTS

1. University Administrators' Assessments of Their Scientists' Research Values

Early in the interviews, we asked administrators to assess the criteria they believed their university's scientists use when selecting research agendas. Descriptive statistics reveal that the criteria associated with public science received the highest mean scores (Table 2). "Enjoy doing the research," "scientific curiosity," and "professional publications" have mean scores above 6. "Research funding" sources also received high scores. The "public

TABLE 2. University Administrators' Assessment of the Importance of These Criteria in Their Scientists' Choice of Research Problem

Criteria for Problem Choice	Mean	Standard Deviation
Enjoy doing this kind of research	6.43	0.80
Scientific curiosity	6.14	1.05
Publication probability in professional journals	6.13	1.00
Availability of public (state and federal) funding	6.03	1.00
Potential contribution to scientific theory	5.88	1.20
Potential creation of new methods, useful materials and devices	5.40	1.20
Public good	5.34	1.37
Client needs as assessed by the scientist	5.09	1.30
Demands raised by clientele/extension	4.44	1.64
Availability of private (corporate) funding	4.38	1.46
Priorities of the research organization	4.29	1.72
Potential marketability of final product	4.15	1.52
The potential to patent and license the research findings	3.88	1.50
Industry consulting opportunities	3.84	1.41

Likert scale of 1–7 with 1 being "not important" and 7 being "very important."

N = 59; N = 50 after listwise deletions.

good," "useful results," and "client needs" land in the middle. And the scientific research criteria with commercial implications—"marketable products," "patenting and licensing results," and "industry consulting"—have the lowest mean scores.

These results suggest that administrators recognize their universities as places of public-interest research. They also suggest that the administrators do not believe that the rising prominence of UIRs over the past three decades have dampened their scientists' commitment to public-interest research.

2. University Administrators' Assessments of UIRs

On a separate form, we asked administrators to characterize the extent to which the qualities that are often associated with UIRs are common in their experiences. For presentation purposes, we divided those 18 characteristics that were intermingled on the form into 8 advantages and 10 disadvantages (Table 3). All of the variables that might be considered advantages of UIRs had mean scores above the neutral score of 4. "Provides new research funds" and "accelerates product development" received the highest scores. Other variables receiving very high scores include "contact with wider network of scientists," "access to new research tools," and "new support for postdocs/students." Only one

TABLE 3. Descriptive Statistics of University Administrator Views on Advantages and Disadvantages of UIRs

Advantages of UIRs Variables	Mean	Standard Deviation
Provides new research funds	5.93	0.96
Accelerates product development	5.94	0.97
Provides contact with a wider network of scientists	5.86	0.85
Increases access to new research tools	5.75	1.06
Provides new support for graduate students/postdocs	5.74	0.97
Increases access to new knowledge	5.58	1.36
Elevates university's prestige	5.02	1.46
Increases access to industry's intellectual property	4.81	1.48
Disadvantages of UIRs Variables	Mean	Standard Deviation
Increases potential for conflicts of interest	5.18	1.24
Deemphasizes nonproprietary agendas	4.09	1.51
Increases lawsuits over intellectual property	3.87	1.56
Inhibits materials transfer	3.86	1.61
Increases tensions between university colleagues	3.73	1.57
Restricts scientific communication among university researchers	3.71	1.61
Deemphasizes basic science research	3.61	1.45
Undermines the credibility of university scientists	3.26	1.60
Limits or restricts faculty members' ability to publish	2.86	1.61
Limits or restricts students' ability to publish	2.81	1.56

Likert scale of 1–7 with 1 being "not characteristic" and 7 being "highly characteristic."

N = 59; N = 50 after listwise deletions.

negative variable was portrayed as characteristic: "increases conflict of interests" with a score of 5.18. Another variable, "deemphasize nonproprietary agendas," was near a neutral score 4.09. All other possible negative aspects of UIRs were generally portrayed as not characteristic. We interpret these results to mean that administrators tend to perceive considerably more advantages than disadvantages, even though they do not completely dismiss disadvantages.

To avoid portraying the administrators as monolithic, we conducted a more detailed analysis of their assessments of UIRs to determine how common it was to give a score of 5–7 to a characteristic. Over 80 percent of administrators assigned high scores to the variables that have positive connotations (Table 4). However, many also recognized disadvantages. Nearly 75 percent of administrators indicated that potential conflicts of interests are characteristic or highly characteristic of UIRs. And over 51 percent of administrators gave a score between 5 and 7 for the variable on deemphasizing nonproprietary research. Close to half assigned a score of 5 or higher on variables reflecting other disadvantages: increased tensions between scientists, restrictions on scientific communication, and inhibiting material transfer. Over 40 percent recognize problems with lawsuits over intellectual property, and 26 percent claim that basic science is de-

TABLE 4. Frequencies of University Administrators Ranking Advantages and Disadvantages of UIRs as Characteristic to Highly Characteristic (Score of 5–7)

Variable	Percentage
Accelerates product development	94.8
Provides new research funds	93.0
Provides contact with a wider network of scientists	91.2
Increases access to new research tools	91.2
Increases access to new knowledge	86.0
Provides new support for graduate students/postdocs	76.0
Increases potential for conflicts of interest	73.7
Elevates university's prestige	72.7
Increases access to industry's intellectual property	67.2
Deemphasizes nonproprietary agendas	51.1
Increases tensions between university colleagues	46.4
Restricts scientific communication among university researchers	46.2
Inhibits materials transfer	45.1
Increases lawsuits over intellectual property	43.3
Deemphasizes basic science research	26.3
Undermines the credibility of university scientists	26.3
Limits or restricts faculty members' ability to publish	15.8
Limits or restricts students' ability to publish	14.0

Likert scale of 1–7 with 1 being "not characteristic" and 7 being "highly characteristic." A score of 5–7 is interpreted as characteristic to highly characteristic.
N = 59; N = 50 after listwise deletions.

emphasized and university credibility is undermined as a result of UIRs. However, despite the acknowledgment by a significant percentage of administrators that there are disadvantages, the general tendency was to present a considerably favorable assessment.

Answers to open-ended questions regarding UIRs reveal how administrators justify their favorable assessment even when acknowledging concerns. One administrator offered a succinct response that seemed to capture the positive sentiments:

Certainly there is the discovery of new knowledge. There's funding for the university. There's intellectual property that can be licensed to the companies, which benefit them. I think in some cases it actually helps our students because they get involved with companies, and they get positions with those companies.

When administrators acknowledged some disadvantages, they tended to portray them as manageable. One administrator described the need for "balance": "There are questions raised. Is this really for the public good or is it for the good of the industry? . . . Those are the real significant issues that you face when you balance: Should I do this or shouldn't I do this?"

Another administrator's statement is striking because, even after acknowledging problems, he asserts that he simply chooses to accentuate the positive:

So, I think that in some instances you run the risk of faculty becoming too jaded by the money that industry might throw at them, by the prestige they might get by working in the industry. From my perspective, I tend to think only in terms of how much more good comes from the relationships than the negative.

An evaluation of the negative consequences of UIRs is not necessary for someone who decides *a priori* that the advantages outweigh the disadvantages.

This tendency to emphasize the advantages and deemphasize the disadvantages is relevant because empirical studies of UIRs reveal that such positive assessments are not warranted. Kleinman (2001:232) points out that there is scant evidence to support the ideologies that are driving the transition to academic capitalism. There is evidence that the academic capitalism model fosters little economic growth or university revenue, even as it may inhibit scientific research (Powers 2006). Agricultural biotechnology research and the life sciences industry are generating some economic benefits for companies, universities, and the regions where they are located (Nelsen 1991; Candell and Jaffe 1999; Lee 2000). However, as Nelson (2001) reveals, it is a myth to think that patenting and licensing publicly funded research is necessary to promote effective technology transfer. And it is a myth to think that "universities can expect a lot of money to result from their patenting and licensing activity" (Nelson 2001:17; see also Bowie 1994; Thursby, Jensen, and Thursby 2001; Edwards, Murray, and Yu 2003:618). As for the universities in our study, they did all show steady increases in licensing revenue over the years. However, this licensing revenue is minor when compared to the growth in sponsored research. Therefore, the benefits to the universities from licensing revenue should not be overstated. Likewise, industry support for university research remains flat (less than 10 percent nationwide) in comparison to public investments (Lacy 2001). In the meantime, others point out that intellectual property transfer has "tied the hands of publicly funded efforts at crop improvement" (Knight 2003:568). This is because three-fourths of plant patents,

including many generated by publicly funded research, are held by the private sector (Conway 2003:16; Graff et al. 2003).

The administrators' evaluations of their scientists and UIRs reflect the dilemma they face as they interpret and apply the Bayh-Dole social contract at their universities. They must affirm the tradition of public-interest research while at the same time promoting proprietary and marketable research outcomes that are more typically promoted by the private sector. With little evidence that UIRs are generating many benefits and some evidence that UIRs are detrimental to the capacity of LGUs to conduct agricultural biotechnology research, it is reasonable to ask why administrators portray UIRs so favorably. Following the sensemaking approach, we analyzed administrators' responses to open-ended questions with an eye toward how and why they develop such favorable assessments. We discovered that they rely heavily on the market-fundamentalism rhetoric of the Bayh-Dole Act to describe how university research contributes to the public good. This rhetoric is useful to them in their interactions with state legislatures and governors who are responsible for allocating university salary and infrastructure funding.

3. Administrators' Definitions of the Public Good and How Their Relationships with State Governments Reinforce Those Definitions

We found that administrators offered broad and competing definitions of the public good. Two administrators defined public good in ways consistent with the Vannever Bush model of private and public goods. As one put it: "One way that works is the economic definition: producing things that the private sector has no incentive to produce." This administrator recognized a clear distinction between the motivations and goals of public and private science. Another administrator even went as far as to suggest that public researchers should pursue goals that might even contrast with private interests:

In the case of agriculture, I believe, there should be more farmers and they should be less dependent on having to purchase their inputs. And they should get technology that is environmentally sound, sustainable, and developing agriculture systems that would be in the public good, even if they cost more.

Other administrators, at least, implicitly acknowledged distinctions between the private and public sector when they commented on the university's role in providing the things that the private sector would not be primarily motivated to pursue. They listed such non-proprietary products as education, environmental protection, more nutritious food, better health care, and expanding minds. One even listed cultural enrichment and expanding the human understanding of morality and ethics.

Despite a few of these traditional definitions of the public good, the majority of the administrators—even some who mentioned the importance of other-than-marketable outcomes of scientific research—went on to emphasize the importance of university collaborations with the private sector. Although they characterized their scientists as motivated by public-interest, nonproprietary research goals, they articulated the pursuit of the public good as being inextricably bound to commercializing technology, creating products that people can buy, fostering economic growth, and generating a return on

investment for the university. As one administrator explained, "I would say that we're hoping to bring products that are going to benefit mankind but also turn dollars back to support additional basic research."

A typical approach to defining the public good was to start broad, but ultimately emphasize privatization:

It benefits the public. This also includes consulting. It includes unbiased opinion. It would also include teaching, of course. The goods are publications, patents, information that is transmitted to industries through consulting. Tech transfer is an important part. That's the way information gets to the public. . . . By definition, the best commercial interest means that the public is buying it, which means that the public is benefiting. A measure of public good is the moving of a commercial product.

The importance of this quotation lies in the administrator's acknowledgment that the research university is expected to do something that the private sector is not. But he also claims that the research university is best serving the public good when a research discovery is commercialized.

Another tendency was to draw upon the Bayh-Dole Act's rhetoric regarding the limited value of basic and nonproprietary research.

- The truth of the matter is that if things get created at the university and they never get pushed out into the industry sector and turned into a product, they really don't benefit the public good other than for the knowledge of their having existed.
- That's where of course the technology transfer role comes in because, if the technology isn't transferred, the public is never going to benefit from that. . . . What we're talking about is the transfer of a property right.
- The big issue here in our state is economic development now. . . . It used to be my philosophy . . . [that] . . . I was very opposed to what the university did, controlling the intellectual property [through patenting]. Then, I realized that if you continued the way that I was thinking nothing happens. No one utilizes it. You are not doing anything for anybody.

Like the Bayh-Dole Act, these administrators demean basic and nonproprietary research and promote commercialization as the way to make university research contribute to the public good.

It is important to point out that the administrators' use of the Bayh-Dole Act is reinforced through their relationships with their state governments. In fact, nearly every administrator at some point stated that their state governments expect them to promote economic growth, to establish UIRs, and to commercialize research. Many also indicated that they needed to conform to those state government interests in order to get access to much-needed and dwindling state funding. This series of quotations is illustrative:

- I think the public good that the university provides is . . . to create a capacity within the state for economic growth.
- Again, since we're a land-grant institution and a state institution, we have a fair bit of accountability to the people [of the state]. We do quite a lot of reporting to the state legislature. . . . So the way we define it is that we actually look pretty concretely at projects that have a positive impact, either economically or in improving the status of

particular groups or areas of the state. . . . So it's very specifically driven to exactly what impact it had statewide. There are also cases where we spun out a company, so we created 200 new jobs in the state. So the economic development aspect of it is not necessarily technology related but rather, what kinds of jobs did we create?

- Let me put it this way, if we didn't do it [generate intellectual property], we would receive less funding. It could have a negative impact [on our funding] if we weren't transferring our research over to private enterprise.

Conversely, if the university conducts research that affects the economy negatively, the state government may even withdraw funding. As one administrator put it:

They provide more research funding when they're satisfied. And they punish the university when it generates research that undermines economic growth. When [scientists at this university did research on a controversial environmental issue], the legislature cut funding and ran the dean through a bunch of hearings.

What these quotations reveal is that administrators are not merely trying to generate profits by commercializing research, as Bok (2003) suggests. Rather, they are striving to articulate the university's social responsibilities within an environment of federal funding and intellectual property laws while under pressure from state governments.

A common theme was that if administrators could convince the state governments that they had made economic contributions to the state, they would receive increased funding—or at least be spared from cuts:

- If we can demonstrate things to the legislature, we can get some funding increases.
- One of the missions that we have is to spend more time with the state legislature people and the federal government people.
- When our budget goes to the general assembly this spring, we are essentially on notice given the state's [budget problems] which almost every other state is having. When they look at which programs they are going to cut, one of the things that they're going to ask is "how does all of this benefit the citizens in this state?" One of the ways that we're going to try to answer that question is the economic benefit. It's a weird time.
- Certainly in the state here, our budgets are going to be very dependent on our ability to show the state legislatures that we've been doing work that they want us to do [which is to generate economic growth].
- They certainly want impact statements that can sell the system on economic development. We are encouraged to produce those and put them in the system.
- There apparently is not as great an appreciation for the role the university plays in the economic well-being of the state. That must mean that the people who are funding us don't appreciate us. . . . Either that or we appreciate ourselves too much . . .
- I think in this state, in particular, there have been decisions made in regard to funding that reflect the importance they view the university has towards economic growth. For example, in the most recent budget process, the governor really . . . I don't want to say spared the university because the university is subject to cuts like other agencies,

but there were those in the government who wanted to impose steeper cuts and the governor kind of interceded and one of the reasons is, I think, is that they view a healthy university as an important part of the economy.

One administrator explained that in some instances they even need to be more aggressive than their state politicians expect. He described how his efforts to pursue the latest technological opportunities and to be prepared to expand into new areas have "not always been popular. Even some of the legislators sometimes think that you're just getting bigger and all that sort of thing, and we shouldn't invest in that. But that's an engine for the economy. What you generate in creative science, sooner or later, is going to go out to the public. . . ."

Another important insight offered by some administrators was how the private sector influences state and federal research funding. One asserted that legislators and funding agencies "reward" universities when they contribute to the economic growth side.

You just don't see it written in black and white. . . . In the broader context, you are more likely to be competitive and get funding because if you look at NIH or NSF, they all have things in there for patents. . . . This is one of the requirements used for determination of the success of the grant. Then you get more [funding].

It was also described this way:

In fact, I think the best [most effective] constituency behind the universities is not the student constituency and their parents but it's been in fact the people with economic interests in this state that go to the legislature and go to the governor and encourage investment in the university. . . . So there's a grassroots effort that works with state government that can get felt in state government and then in turn brings investment back to the university, and there's a self interest in that.

What makes the previous quotations interesting is the cycle within which administrators find themselves. If they want to get more public funding for research, they make alliances with private-sector interest groups that will promote increasing research funding at the state and federal levels. That funding is then targeted to university research that will benefit the private sector. If publicly funded research yields patents and licenses, private-sector and government officials will agree that economic growth has been achieved, and they will call for more money for university research.

A final quotation encapsulates the administrators' context for evaluating their university's scientists' agricultural biotechnology research:

Another thing that helps is . . . for example, . . . the fact that the state recognizes biotechnology as an important component of their economic growth also helps identify biotechnology as a university priority area because it meshes well with the state vision for itself. . . . We always use leveraging as part of our case to the state. . . . For what they invest, this is the total dollars they get out of it, and so forth. So, it's part of our justification or *spiel* to the state.

Although the statement seems cynical at first glance, the reference to having to justify the budget to the state reflects the reality of the significance of the state in this administrator's sensemaking. He must adopt a particular type of rhetoric, or "*spiel*," to convince the state to fund university research. Administrators adopt the dominant political rhetoric in

order to justify their university's research to the state governments. And that dominant rhetoric is market fundamentalism.

CONCLUSION

The field of science and technology studies has made important contributions to understanding how science is produced, but it has tended to overlook how broader social, economic, and political contexts affect science (Kleinman 2003). The rise of the knowledge economy and the federal policy changes to integrate the public-research organizations, especially the research university, into that knowledge economy represents profound changes in the context of scientific research. Slaughter and Rhoades (2004) contend that elements of the public-goods model that was dominant after World War II persist, but the academic capitalism model is displacing it. This raises questions about the rationale behind this organizational change and the role of organizational actors in the change.

Somers and Block (2005) describe the rise of market fundamentalism in the United States as an ideology that denigrates the public sector. During the 1970s, market fundamentalism became the dominant political rhetoric for explaining and solving the economic problems facing the United States. It was applied to university research through the 1980 Bayh-Dole Act and subsequent policies. Although these external forces certainly have instigated the organizational change within the research universities, they explain only a part of the story. What remains to be explained is how actors within the university are participating in the transition (Slaughter and Rhoades 2004).

Using a sensemaking approach, we have sought to describe the vocabulary and social relationships that give university administrators the rationale and affirmation for their participation in the transformation of their universities during a period of market fundamentalism. As Croissant and Restivo (2001) argue, there has been an assumption that universities can be integrated into the market economy without losing their public-interest research focus. Furthermore, the administrators we interviewed tend to share this optimistic scenario. They portray scientists at their university as maintaining public-interest science criteria, even as they praise the private-sector benefits of UIRs. University administrators thereby rationalize disparate and incongruous interests and goals in order to justify their participation in the transition to academic capitalism.

Somers and Block (2005) claim that market fundamentalism is supported more by political rhetoric and ideology than by evidence of economic benefits. The same seems to be the case with academic capitalism. Administrators' structural positioning between the university and the state and federal governments makes it politically expedient for them to adopt a fashionable political rhetoric as they generate policies to promote and manage UIRs. Universities get more funding from the legislators if they support UIRs, which does lead to some material rewards. However, UIRs generate few direct material benefits for the university because the funding is primarily directed at subsidizing the private sector. And yet, despite the lack of evidence of significant material benefits to the universities, administrators offered anecdotal evidence to support their favorable evaluations of UIRs.

More importantly, within a political context that reinforces favorable evaluations, they tended to generate certainty in their evaluations, even though based on anecdotal evidence. Federal legislation and funding agencies provide the vocabulary and incentives for adopting market fundamentalism. And administrators' interactions with the state governments provide additional incentives. Through this process, university administrators serve as key mediators between state and federal economic policies and instigators of organizational and infrastructural change as their universities move toward academic capitalism.

Although we are unable to generalize from our purposive sample to all administrators at all United States universities, our findings suggest that UIRs are becoming entrenched and that this raises valid concerns about the integrity of public-interest research. Future research might seek to compare agricultural biotechnology to other sectors and to examine how variation in funding amounts and funding sources influence administrator evaluations of UIRs and university research programs.

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NOTES

¹LGUs account for a significant amount of public R&D in the United States. The 71 LGUs (including only the three campuses of the University of California System that receive land-grant funding) spent \$10,808,258,000 in 2001, compared to \$32,723,078,000 for the total of over 500 colleges and universities (calculated using NSF 2002 data).

²For example, when faced with intellectual property obstacles to conduct university research, administrators at 14 universities joined six foundations to implement the Public Intellectual Property Resource for Agriculture (PIPRA) policy, which is designed to give public research institutions the freedom to operate with minimal intellectual property constraints (Atkinson et al. 2003).

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APPENDIX

The University of California was selected in the western region because it is consistently in the top five in sponsored research expenditures and licensing revenue (Blumenstyk 2003), and was ranked number one in technological strength by MIT's *Magazine of Innovation* (Leo 2002). UC-Davis was chosen from the UC system because much of the system's agricultural research occurs there, and it was ranked first in science citations in agricultural science for 1993–1997 (the last year for comprehensive comparisons) and 16th nationally in total research expenditures in 2001 (NSF 2004).

The University of Wisconsin was chosen in the midwest because of its long history of technology development, entrepreneurship, and agricultural biotechnology research. In 2001, it spent over \$600 million in research, putting it at number two among research universities nationally (NSF 2004), and received the highest ranking of midwestern LGUs in technological strength (Leo 2002).

Cornell University was selected in the eastern region. It ranked second in science citations in agricultural science, spent \$440 million in sponsored research in 2001, ranking 14th in the nation (NSF 2004), and received the highest ranking of eastern LGUs in technological strength (Leo 2002).

North Carolina State University was chosen in the southeast. It spent nearly \$300 million in sponsored research in 2001, placing it 33rd in the nation (NSF 2004), and ranked second in technological strength in the region (Leo 2002). North Carolina State is also important because it is co-located with Duke University and the University of North Carolina in the Research Triangle Park, an important center of agricultural biotechnology research.

In the southwest, Texas A&M University spent over \$400 million on research in 2001, putting it in the top 20 in the nation (NSF 2004). It is ranked number one in technological strength in the southwest (Leo 2002).

We also selected a smaller LGU for comparative purposes. Oregon State University's sponsored research expenditures were \$150 million in 2001, which is 77th in the nation (NSF 2004), and it is ranked 70th in technological strength (Leo 2002). Oregon State has traditionally been in the top 10 among research universities in the United States in producing agricultural scientists (Busch and Lacy 1983). This makes Oregon State an important agricultural university, even if not prominent in terms of research expenditures or patenting and licensing activities in agricultural biotechnology. Since we found no difference in the way Oregon State administrators characterized UIRs, we simply included them in our broad sample.



NORTH DAKOTA STATE UNIVERSITY

SEARCH

NDSU Extension Service
ND Agricultural Experiment Station

NDSU Agriculture Communication

ARCHIVE

April 14, 2005

COLUMNS

AgBiotechnology Center of Excellence Established at NDSU

Recognizing the large potential from future developments in agricultural biotechnology, an AgBiotechnology Center of Excellence has been established at North Dakota State University.

"North Dakota has realized more than \$700 million in benefits from current crop biotechnology traits, but this is only a fifth of the benefit that has been realized by states that have aggressively pursued biotechnology," said Bill Wilson, NDSU Department of Agribusiness and Applied Economics professor.

Ken Grafton, director of the NDSU Agricultural Experiment Station, said the purpose of the center is to facilitate the sustainable, long-term development of agricultural biotechnology in North Dakota.

"It has the potential to increase producer net income," he said. "This is done through investments that bring about the commercialization of biotech crops."

Al Skogen, a grower and president of Growers for Wheat Biotechnology Inc., said that as well as being a benefit for growers, the center will benefit small biotechnology companies that have an idea, but have limited resources to proceed.

"These companies will have the opportunity to partner with NDSU and move forward," said Skogen, former president of the North Dakota Grain Growers Association. "It gives them a home in rural America, right here in the country."

Grafton acknowledged the governor's office and Legislature's support for the center and said they should be credited with forward thinking. Funded in part through the Center of Excellence in Genomics established during the 2003-05 legislative session, the center was identified as a catalyst in their rural economic development vision.

Rep. Tom Brusegaard said the center will "facilitate and encourage commercialization of agricultural biotechnology in North Dakota." Terry Wanzek, president of the NDGGA and a grower and former state senator, is excited about the development of the center. He says he would like to see North Dakota become a leader in biotechnology. "Already, it has helped growers to be more efficient and productive," he said. "I would like to see our growers have this advantage. I believe this is North Dakota's chance to be a leader, not only in the United States, but globally as well."

This sentiment was confirmed by state Rep. Michael Brandenburg.

BeefTalkPrairie FarePlains FolkHortiscope

Market Advisor:

CropLivestock

"Thank goodness for people like Al Skogen and Terry Wanzek," he said. "They took a stand back in the 2001 session to keep this technology in the state. This center is great for North Dakota."

Five activities are conducted at the center:

- Developing a biotechnology business plan - This includes industry analysis, identifying the relevant biotechnology trait developers that could be collaborators, targeting traits of value in North Dakota and evaluating technology transfer alternatives, commercial practices and regulatory/legislative initiatives to facilitate development and business plans for specific targeted traits.
- Trait research and development in North Dakota - New crop varieties are tested and evaluated to prove they will work under North Dakota production systems.
- Economic research - This includes research to expand commercialization and biotechnology development in North Dakota.
- Policy analysis implementation - The center provides expert research analysis to assist decision makers as they address policy issues.
- Outreach to explain the science and technology aspects of biotechnology from a nonbiased perspective - This includes outreach to producer groups, domestic and international buyers and the marketing and processing sector.

Funding for the center comes from NDSU, North Dakota legislature, trait providers, commodity groups and public-interest groups supporting biotechnology research and development.

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Source: Bill Wilson, (701) 231-7472, william.wilson@ndsu.edu
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North Dakota State University
NDSU Agriculture Communication
NDSU Extension Service
ND Agricultural Experiment Station



NORTH DAKOTA STATE UNIVERSITY

NDSU Extension Service
ND Agricultural Experiment Station

ARCHIVE

July 27, 2006

COLUMNS

North Dakota State University and Monsanto Announce Crop Research Collaboration

North Dakota State University and Monsanto have announced a collaboration between the NDSU AgBiotechnology: Oilseed Development Center of Excellence and the St. Louis-based agricultural company. In this public-private partnership, scientists from both organizations will focus on cooperative research, technology development and educational activities that are expected to benefit North Dakota's agricultural sector, its producers and consumers. The initial focus of the collaboration will be oilseed improvement.

NDSU Vice President for Research, Creative Activities and Technology Transfer Philip Boudjouk said, "NDSU has played an integral role in North Dakota's \$4 billion-per-year conventional agricultural economy. Partnerships such as this one facilitate the opportunity for additional cutting-edge innovations in agriculture into the 21st century."

NDSU Vice President for Agriculture and University Extension D.C. Coston said, "Results of these collaborations will expand the economic vitality of North Dakota. We are addressing a critical national priority while concurrently contributing to the prosperity of rural areas of our state."

NDSU's Ken Grafton said, "If North Dakota is to maintain its edge in crop production, NDSU must conduct research on important plant characteristics, understand how those characteristics respond to North Dakota's environment and deploy them in ways that create value for crop producers in both eastern and western North Dakota." Grafton serves as director of the North Dakota Agricultural Experiment Station; dean of the College of Agriculture, Food Systems, and Natural Resources; and director of the AgBiotechnology Center of Excellence.

Grafton noted that NDSU and its outlying Research Extension Centers, like most land-grant universities, can benefit from the expertise, experience and support of private-sector organizations such as Monsanto.

The NDSU-Monsanto collaboration will give faculty and students working with the new AgBiotechnology Center of Excellence an opportunity to observe and learn from Monsanto's state-of-the-art crop improvement, animal science and biotechnology programs.

Grafton said, "Knowledge gained in the collaboration should help the AgBiotechnology Center of Excellence identify viable opportunities for North Dakota growers to increase the productivity of their operations, add value to commodities they produce and expand opportunities in the emerging bioproducts industries in the state. Agriculture is North Dakota's No. 1 industry; we need to sustain and support it."

BeefTalkPrairie FarePlains FolkHortiscope

Market Advisor:

CropLivestock

"North Dakota has a diverse and dynamic agriculture, and Monsanto scientists are eager to work with their NDSU counterparts to identify new opportunities for North Dakota farmers," said Ernesto Fajardo, Monsanto's U.S. crop production lead. "Biotechnology has helped North Dakota farmers diversify their crop enterprises."

"It is our hope that this collaboration will culminate in new ideas and the commercialization of unique technologies that will give NDSU, and especially young North Dakotans, a greater role in tomorrow's exciting agriculture," said Monsanto Chief Technology Officer Robb Fraley.

Bill Wilson, NDSU Agribusiness and Applied Economics professor and an assistant director of the AgBiotechnology Center of Excellence, says many remarkable plant science innovations will be commercialized in the next decade. "North Dakota has accrued more than \$700 million in economic benefits from crop biotechnology, and NDSU wants to ensure that North Dakota producers have access to these technologies and that our state's consumers benefit from recent advances in genomics, plant breeding and biotechnology. It is great to have the support of Monsanto. They value independent, third-party research."

Phil McClean, NDSU Plant Sciences professor and an assistant director of the AgBiotechnology Center of Excellence, said, "Collaborations with Monsanto will provide access to leading-edge technologies that have the potential to positively impact North Dakota production agriculture for years to come. Their research pipeline contains both consumer and producer traits that will be of value to all North Dakota producers and their customers."

Learn more about the NDSU AgBiotechnology Center of Excellence at www.ag.ndsu.edu/research/AgBiotechCE.htm.

Monsanto Company is a leading global provider of technology-based solutions and agricultural products that improve farm productivity and food quality. For more information on Monsanto, see www.monsanto.com.

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From: Becky Koch <bkoch@ndsuent.nodak.edu>
To: andrew.burchett@monsanto.com
Subject: NDSU Collaboration News Release
Send reply to: bkoch@ndsuent.nodak.edu
Date sent: Fri, 13 Jan 2006 15:10:38 -0600

Hi, Andrew! I was ready to release when the story hit the news that the N.D. Attorney General said the NDSU Research Foundation's records must be opened so the Dakota Resource Council can learn about NDSU's cooperation with Monsanto. See

<http://www.in-forum.com/articles/index.cfm?id=114002§ion=News>

The University Relations news director and I decided we better hold off on the collaboration news release until this news faded away. Hope you agree. Let's wait a couple weeks and see where we stand. Thanks for understanding. I hate how long this has drug out, but I'm sure glad we hadn't sent the story right before this one came out. Becky

From: Becky Koch <bkoch@ndsuent.nodak.edu>
To: andrew.burchett@monsanto.com
Subject: NDSU/Monsanto Collaboration News Release
Send reply to: bkoch@ndsuent.nodak.edu
Date sent: Thu, 20 Jul 2006 12:08:16 -0500

Hello, Andrew! Long time, no e-mail. :-) Since the Oilseed Center of Excellence news conference was a few weeks ago, time for another shot of publicity. Let's finally send out the news release about the Monsanto collaboration with NDSU.

Attached is the latest version. Sorry it was changed again, but the only thing was adding a quote from Vice President Coston. Politics! Nothing is changed from the Monsanto side.

Since this has already gone through your legal staff, I'm guessing it doesn't need to again, but let me know. In fact, just let me know when you'd like us to release it, and it will go. If we could do it next Thursday, that's when we usually release news, so that would be great. However, any date is fine with us.

Thanks, Andrew! Becky

Attachments:
C:\Documents and Settings\bkoch\My
Documents\WPDOCS\NEWS\Monsanto_release2.doc

Att #4
2-28-07

Testimony HB 1099
Todd Leake, Emerado, ND
Feb. 28, 2007

Chairman Nething, Members of the Senate Judiciary Committee, My name is Todd Leake. I farm 2500 acres in Grand Forks County, mostly in wheat, soybeans, edible beans and sunflower. I rise in opposition to this bill, or at least part of it, as I would like to talk about certain language in HB 1099 that I am concerned with, regarding oversight and potential liability to the state. Sec 1, subsection 2c #1&2.

c. "Proprietary information" includes:

- (1) Information shared between a sponsor of research or a potential sponsor of research and a public entity conducting or negotiating an agreement for the research.
- (2) Information received from a private business that has entered into or is negotiating an agreement with a public entity to conduct research or manufacture or create a product for potential commercialization.

Certainly no one expects the blueprints of a patented machine, computer code or the genetic sequences of a new biotech gene event to be public information, and that they should remain confidential. But the above clauses I believe go too far in protecting contract negotiations between state agencies such as NDSU and contractors they may enter into agreements with. In particular, I am concerned about indemnification of contractors by state agencies in state contracts. If information about contracts for agreements for research are not to be public, then the scrutiny of the legislature and the public will be limited at best. Policy enforcement and interpretation on issues such as indemnification and the rights to and use of public property such as germplasm, will left to state agency legal departments, and the contractor's lawyers.

North Dakota State University has already engaged in indemnity clauses with Monsanto Corporation of St. Louis Mo. (see attachment), this contract was obtained by Dakota Resource Council through an open records request. Similar draft contracts on GM Roundup Ready® wheat would have held Monsanto harmless should the research activities required in the contract result in liability.

Monsanto had good reason to require indemnity in contracts with NDSU. Contamination of non genetically modified crops with patented, identifiable genetic trait material from open air test plots of genetically modified (GM) crops that the university would perform as a contractor for research for Monsanto, carry a huge potential liability burden. This was found out the hard way in August of 2006 by Bayercropscience Corporation. Apparently, a transgenic gene, Liberty Link 601 (LL601), cross pollinated from a test plot at the Louisiana State University Agcenter at Crowley LA. LL601 contaminated the foundation seed stocks for the Cheneire variety of long grain rice. This gene persisted and multiplied through the Chinere seed supply undetected until discovered by rice customers in the European Union (EU), where GM transgenic crop commodities are unmarketable. The EU and Japan effectively banned all US rice and the loss in value to US rice growers

could be up to ONE BILLION dollars. In addition to Bayercropscience being named as a defendant in the ensuing lawsuits, Louisiana State University has been named as a defendant in the Western District Court in Louisiana in the rice contamination cases. The point of this example is to illustrate the serious ramifications of allowing indemnification in contracts. If NDSU were to have a similar contamination event say, for example, in hard red spring wheat, and indemnified Monsanto Corporation, NDSU would carry the liability. Neither NDSU nor the State Risk Management Fund would be in a position to pay such a potential judgment, nor would the state like to appropriate to pay such a judgment. If HB1099 should become law in it's current form, and contract negotiations become confidential, who will have oversight to make sure such things as indemnification clauses don't find their way into state contracts.

Who will have oversight over state agencies that negotiate contracts behind the cloak of confidentiality that the above mentioned clauses will grant them. The fact that this bill is before you today is in part a reaction to the Attorney General's decision that the NDSU research foundation is, indeed, a public entity and therefore subject to open records requests. As the designated holder of NDSU's technology patents, HB1099 seeks to further close the door to proprietary information. HB1099 also hides from scrutiny the contract negotiation process. Who will have oversight of state agency contracting, if the contracting is hidden? If the contract is confidential, who will request the Attorney General to investigate? Making contract negotiations by state agencies confidential puts a lot of faith in state employees to look out for the best interests of North Dakota, and it puts a roadblock in the way legislators, enforcement officials, and the public from knowing what is being negotiated. I hope the Senate will at least amend HB1099 to delete Sec. 1 subsections 2c 1&2 and allow for oversight of state contract negotiations. At this time I request that the Senate Judiciary Committee recommend a DO NOT PASS.

Roundup Ready® Soybean License and Seed Services Agreement

This Agreement (the "Agreement") is made by and between Monsanto Company, and NDSU Research Foundation regarding the non-exclusive license of certain patent rights and proprietary technology of Monsanto Company for use in producing soybean plants with tolerance to glyphosate herbicide. Based on the mutual consideration between the parties recited below, the parties agree and covenant as set forth below.

Section 1-Background and Parties

1.01 Monsanto Company is a Company organized and existing under the laws of the State of Delaware with principal offices at 800 N. Lindbergh Boulevard, St. Louis, Missouri 63167.

1.02 LICENSEE is a non-profit corporation having seed business affiliates, organized and existing under the laws of North Dakota with principal offices at 103 Old Main, P.O. Box 5014, Fargo, North Dakota 58105-5014.

1.03 MONSANTO has certain rights relating to Biological Materials, including technical information and know-how relating to, among other things, transformed plants and seeds, useful for making soybean varieties exhibiting tolerance to glyphosate herbicide and has rights in and to patents and/or patent applications covering the Biological Material.

1.04 LICENSEE possesses knowledge or has legal access to, know-how, technical information, germplasm and expertise regarding the development, production and marketing of SOYBEAN varieties.

1.05 LICENSEE, a North Dakota non-profit corporation having seed business affiliates, wishes to acquire rights in relation to the above described MONSANTO technology in order to conduct further research in the licensed field and to produce and sell seed and licensed soybean varieties exhibiting such herbicide tolerance on a commercial basis to licensees of MONSANTO.

1.06 LICENSEE is interested in the commercialization of SOYBEAN varieties exhibiting such herbicide tolerance and LICENSEE seeks to obtain a limited license under MONSANTO's proprietary rights and MONSANTO desires to grant such license, all upon the terms and conditions provided herein. Such terms and conditions shall include either a ROYALTY and a GROWER AGREEMENT as provided below or a GROWER FEE and a GROWER AGREEMENT as provided below.

Section 2-Definitions

For purposes of this Agreement, the following words and phrases shall have the following meanings:

2.01 The term "AFFILIATE(S)" shall mean with respect to an entity, any other entity that, directly or indirectly, is wholly-owned by, are each wholly-owned by a common owner, or wholly-owns that entity

2.02 The term "BIOLOGICAL MATERIAL" shall mean any biological material or germplasm and data obtained, produced or made by or for MONSANTO relating to THE GENE and its expression in SOYBEANS disclosed to LICENSEE by MONSANTO pursuant to this Agreement.

2.03 The term "COMMERCIAL TOLERANCE" means tolerance under field conditions to 1.5 pounds/acre acid equivalent of GLYPHOSATE which includes a one hundred percent (100%) safety margin (i.e., twice the target use rate). The SOYBEANS containing THE GENE shall satisfy the criteria

COMMERCIAL SEED. The grant of the license pursuant to this Subsection 7.06(b) shall not include access to LICENSEE's proprietary SOYBEAN germplasm per se. MONSANTO acknowledges that North Dakota State University ("NDSU") and North Dakota Agricultural Experiment Station ("NDAES") employees have an obligation to assign intellectual property developed by such employees to the NDSU. LICENSEE reserves on behalf of NDSU and NDAES the right to continue to do research in this area. No rights to any of NDSU intellectual property pertaining to specific plant cultivars are granted to MONSANTO. Licenses resulting from exercises of any option shall be for the life of any such proprietary right.

(c) MONSANTO shall have the right to grant sublicenses under the licenses of this Subsection 7.06 to any and all THIRD PARTIES for production, use and sale of any transgenic soybean germplasm, developed or in-licensed by MONSANTO, without restriction other than the ROYALTY obligation to LICENSEE if any, if MONSANTO also offers LICENSEE a license to such transgenic germplasm under ROYALTY terms no less favorable than the subject THIRD PARTY.

(d) Provided that similar terms of this Section 7.06 have expired in any SOYBEAN agreement between MONSANTO and North Dakota State University that pertain to SOYBEAN line 40-3, this Section 7.06 is waived and is no longer in effect.

(e) The option(s) of Subsection 7.06 can be exercised by MONSANTO at any time, including after expiration or termination of this Agreement, by MONSANTO giving written notice of such exercise to LICENSEE.

(f) If despite good faith negotiations, MONSANTO and LICENSEE cannot reach agreement on the terms of such license, then determination of the license terms in dispute shall be submitted to arbitration pursuant to the provisions set forth in Exhibit H, if requested by either MONSANTO or LICENSEE.

Section 8-Warranties and Liabilities

8.01

Representations and Warranties:

MONSANTO represents and warrants that:

(a) it is the owner or Licensee of the MONSANTO PATENT RIGHTS and the LICENSED PATENT RIGHTS to the extent required for the grant of rights contained herein; and

(b) it has not previously granted, and will not grant to any THIRD PARTY during the term of this Agreement, any rights and licenses under the MONSANTO PATENT RIGHTS or the LICENSED PATENT RIGHTS that are in conflict with the rights granted to LICENSEE herein.

8.02

No Other Warranties: EXCEPT FOR THE EXPRESS WARRANTIES IN SUBSECTION 8.01, MONSANTO MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, REGARDING:

(a) MONSANTO PATENT RIGHTS, LICENSED PATENT RIGHTS, MONSANTO KNOW-HOW AND BIOLOGICAL MATERIAL (INCLUDING, WITHOUT LIMITATION, THE VALIDITY OR SCOPE OF THE MONSANTO PATENT RIGHTS OR LICENSED PATENT RIGHTS); OR

(b) THE LICENSED COMMERCIAL SEED OR BIOLOGICAL MATERIAL (INCLUDING, WITHOUT LIMITATION, PERFORMANCE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR THE NON-INFRINGEMENT OF THE LICENSED COMMERCIAL SEED OR BIOLOGICAL MATERIAL ON THIRD PARTY PROPERTY RIGHTS).

8.03

Indemnification:

(a) EXCEPT TO THE EXTENT CAUSED BY A BREACH BY MONSANTO OF ITS WARRANTIES UNDER SUBSECTION 8.01 ABOVE, LICENSEE SHALL DEFEND AND INDEMNIFY AGAINST, AND HOLD MONSANTO AND ITS EMPLOYEES, DIRECTORS, OFFICERS AND AGENTS HARMLESS FROM, ANY LOSS, COST, LIABILITY OR EXPENSE (INCLUDING COURT COSTS AND REASONABLE FEES OF ATTORNEYS AND OTHER PROFESSIONALS) INCURRED FROM ANY CLAIM ARISING OR ALLEGED TO ARISE OUT OF THE MANUFACTURE, USE, DISTRIBUTION OR SALE OF ANY LICENSED COMMERCIAL SEED BY LICENSEE; PROVIDED, HOWEVER, THAT (I) LICENSEE SHALL HAVE SOLE CONTROL OF SUCH DEFENSE, AND (II) MONSANTO SHALL PROVIDE NOTICE PROMPTLY TO LICENSEE OF ANY ACTUAL OR THREATENED CLAIM OF WHICH MONSANTO BECOMES AWARE.

(b) THE INDEMNIFICATION UNDER SUBSECTION 8.03(a) SHALL NOT APPLY TO ANY CLAIM AGAINST MONSANTO FOR INFRINGEMENT OF A PATENT OWNED BY A THIRD-PARTY PATENTEE, INsofar AS SUCH CLAIM ARISES OUT OF LICENSEE'S USE OF TRANSGENIC SOYBEAN

11.14 Counterparts: This Agreement may be executed in any number of counterparts with the same effect as if all parties had signed the same document. All such counterparts shall be deemed an original, shall be construed together and shall constitute one and the same instrument.

11.15 Appendices: The appended Appendices form an integral part of this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement.

MONSANTO COMPANY

By: Stephen Juehl

Title: Director, Soybean Licensing

Date: 11-19-01

NDSU Foundation Research

By: Dale Zetocha

Title: Executive Director

Date: 11/9/01