
Cultural Shift: Innovation is a Process

PETER SCHUERMAN

Texas A&M AgriLife Research

College Station, Texas

Peter.Schuerman@ag.tamu.edu

Presentations at this conference demonstrate that the commercialization of genetically engineered traits in specialty crops is a complicated process. Furthermore, university researchers are more accustomed to thinking about innovation as an event rather than as a process. Within Texas A&M AgriLife Research we are taking on the challenge of how to look at innovation as a process and how to steward innovation beyond simply publishing, to create opportunities for our industry partners. In so doing, we are addressing a fundamental problem: the weakness of the pipeline.

UNIVERSITY CULTURE

We are not trying to change the university, but rather to change the boundaries of what it can do, because university culture is vital and important for society. For us, innovation is about exporting something—our product. Every transaction with the world is about innovation. Resources come in; innovations go out. Although research is not a simple matter, conceptually it's simple. Conducting research is complex. When research results are generated, they are interpreted and captured in a form that can be communicated as a channel to the marketplace. Principal investigators are a type of entrepreneur in that they convert resources from their stakeholders, federal and state agencies for the most part, and turn them into products: publications, which create professional success. It's a well understood process.

CORPORATE CULTURE

For corporations, innovation is about a product or a service. Regarding plant-biotechnology traits, the method of production is far more complex than just research. Even when a new trait has been evaluated and deregulated—having gone through the regulatory approvals process—it still has to have a channel to the marketplace which involves having freedom to operate, involving patenting, and thorough understanding of the marketplace. It's a dynamic process.

THE CONTRAST

Contrasting the two, one has a fairly quick turnaround whereas the other is like a slog through mud. The challenge for universities is to figure out how to be part of this whole process. Dennis Gonsalves¹ talked about his work in terms of a public-sector anomaly. I give him a great deal of credit for having the fortitude to take on that task. A lot of researchers, not just those developing in plant biotech traits, are unwilling to face the challenges involved in commercialization. Publishing papers is a much more immediate fix. There's nothing wrong with publishing, but if we are to work in plant biotechnology, we should be ready to take on the challenge of being good stewards to the point of translating valuable opportunities to industry partners.

UNIVERSITIES: THINKING DIFFERENTLY

You cannot bring damaged goods to the game with industry. If a research result has been published, the ability to obtain patents is damaged, affecting the investment opportunity. The high cost of investment to obtain deregulation has been discussed by other speakers. Scott Thenell² mentioned that the expense may be reduced by an order of magnitude; nevertheless, a lot of money would still be involved.

Criticisms leveled by the public and NGOs against genetically engineered crops include:

- Big chemical companies are marketing these for profit.
- They are not in the best interests of consumers.

Big chemical companies *are* involved in these projects, because commercialization requires commitment and significant investment over a long period of time. On the other hand, if we can stand behind the traits that we're developing, there's an opportunity to build university/industry trust.

Why should universities be involved in this beyond publishing research papers? In 1980 the world changed as a result of the Bayh-Dole Act (BDA), which permits a university/small business/non-profit institution to use federal research funding to pursue ownership of an invention; prior to the BDA, federal funding obligated inventors to assign inventions to the government. Universities responded by forming offices for intellectual property

¹Pages 37–46.

²Pages 183–194.

management and technology transfer, which resulted in the formation of Association of University Technology Managers (AUTM), the first incarnation of which was the Society of University Patent Administrators (SUPA). At the time, they believed the important thing was to file patents, and this thinking set the stage. As a result, we now see universities carrying huge portfolios of unlicensed IP because patenting is the priority.

This is still a new process for universities, but it is endorsed by Texas A&M, which has the following mission statement:

*To provide education, conduct research, **commercialize technology**, offer training, and deliver services for the people of Texas and beyond through its universities, state agencies and health science center.*

The mission statement clarifies the importance of commercialization of technology, which is a consideration toward tenure in the Texas A&M University system.

WORKING ASSUMPTIONS

We have the legacy of viewing innovation as a researcher-initiated and -driven event. Now the “eureka” moment is viewed as justification for commercialization. Often, the first thing that the researcher does, to ensure compliance with federal laws, is to go to the website and start filling out a form to disclose the invention. The next order of business is to file a patent and license it to someone and obtain a “commercialization” notch in the belt. This eventuality may not happen very often, but it’s a common framework, a baseline expectation; it is what the BDA says should happen.

THE REALITY

On the other hand, this doesn’t fit well for biotech traits, because nowhere in this process have patenting and partnering strategies been developed. Universities do not typically engage in freedom-to-operate analyses, which is something that companies often have to deal with. Certainly, university researchers don’t think about freedom to operate when they are putting together gene constructs. We may receive an invention disclosure on a new trait composed of pieces and parts from six other collaborators, provided under individual material transfer agreements (MTAs) that preclude commercialization; complex conversations may be needed if the invention is to see the light of day. We have a distressed asset at that point, which is, unfortunately, not uncommon across universities.

A problem here is that universities are places for researchers who have decided that—for whatever reason—they don’t want to work in industry. Traditionally, professors have run self-directed programs of research within the support structure that the university provides. But, this is changing. Now we expect researchers to not only be experts in their fields, but also to be educated in commercialization and partnering with industry, which is unfair. My hat is off to productive scientists who have had the fortitude to negotiate the process of gaining regulatory approval.

Many times, I have been approached by scientists with new, useful transgenic plants that they now wish to patent and on which they initially published data a couple of years before. In contrast, the people in the university patent office are less interested in

immediate usefulness than in whether the invention is novel and non-obvious, in which case they would have patented the invention two years before. Different ways of thinking are involved due to how researchers are schooled.

On the subject of schooling, it is a false premise that researchers simply need more education on intellectual property. The concept of a talent agent is relevant: artists, authors and athletes all have agents. In contrast, researchers don't have agents; they are on their own. Historically, scientists haven't needed agents, whereas they now have to face the challenges of getting transgenics deregulated and marketing related technologies. Strategies are needed to ensure that assets are not damaged inadvertently through actions that may seem very reasonable from a research perspective. They should not be expected to be skilled in all subjects.

CULTURE SHIFTING

Managing innovation is not just about filing an invention disclosure, getting a patent and licensing it. One of the things that people often don't appreciate is that, at a very early stage, a new innovation is not separable from the innovator. Therefore, if a researcher is not interested in innovation, there should be no negative consequence. The university should still allow the advancement of knowledge through publication. Professors should not be dictated to, should not feel forced to do something they are not comfortable with.

On the other hand, that comfort zone should not be overemphasized. Scientists should be encouraged to look for opportunities to transfer their research vision into results that may change the world. An important element of that change is leadership. Those in leadership positions should not be saying, "Commercialization is not that important. Working with industry is not that important." Within the Texas A&M University system, high-level leadership espouses the philosophy that commercialization is important.

Although it is clear that researchers need assistance, sometimes they are unaware of that need. Also, deeds speak louder than words; it is important for us not to just philosophize, but actually show results. In 2006, what was then the Texas Agricultural Experiment Station—now Texas A&M AgriLife Research—hired Bill McCutchen, who not only had industry experience but also had a track record as an innovator and as a researcher (Figure 1). He was exactly what Texas A&M AgriLife needed to be able to effect the culture change.

Shortly after joining AgriLife, Bill hired Bob Avant (Figure 2) to head up the bioenergy effort, which is a pilot program to explore the concept of working with industry in different ways. It has been enormously successful, and has matured such that we now have a corporate relations program. Bob has assembled a team who now work with industry as project managers and who act as intermediaries between our industry partners and our scientists who focus on research, and so we have project managers who mediate deliverables and assist in communication, because sometimes some translation is necessary.

In 2007, I joined as the Director of Innovation Management and transformed the Office of Technology Commercialization as a liaison with Texas A&M AgriLife Research (Figure 3). I came from UC Berkeley where I'd had the opportunity to form the Industry Alliances Office, which tripled industry support for Berkeley in the first year. The simplest

Bill McCutchen, Executive Associate Director for Texas A&M AgriLife Research

- Strategic leader for trait and chemistry R&D for the DuPont Ag & Nutrition Platform
- Accrued over 55 granted patents and over 200 pending or published patent applications as a bench scientist, technical leader and coordinator of R&D initiatives
- Recipient of DuPont's and Pioneer's most prestigious agricultural R&D team award, The 2007 Henry A. Wallace Agricultural Revolution Impact Award
- Recipient of DuPont's Global Innovation and Team Accomplishment Awards and Pioneer's Inventors of the Year Award

Figure 1. Leadership in innovation–Bill McCutchen.

Bob Avant, Director of Corporate Relations & Bioenergy Program

- Former Executive Director of a State agency responsible for funding food and fibers research
- Registered Professional Engineer (Agricultural Engineering)
- 38 years of experience in agricultural and engineering systems management
- Directs major corporate sponsored research programs with a team of project managers

Figure 2. Strategic hire–Bob Avant.

way to describe what innovation management is at a university is to say that it's the same as business development anywhere else. We have created three integrated teams:

- Innovation Management
 - They help researchers recognize opportunities and advance those opportunities through strategic planning.

Peter Schuerman, Director of Innovation Management

- **Founded UC Berkeley's Industry Alliances Office**
- **Transformed the Office of Technology Commercialization's operations in licensing and IP management and its relationship with AgriLife**
- **New role as Director of Innovation Management**
- **Works with Corporate Relations, individual researchers, industry partners and entrepreneurs to develop strategy and make deals**

Figure 3. Strategic hire—Peter Schuerman.

- **Corporate Relations**
 - They foster strategic partnering so that, instead of thinking about the relationship between industry and academia as just a way of outsourcing some research tasks, they create audacious collaborative projects to make exciting things happen.
- **Technology Commercialization**
 - Protecting intellectual property and assisting licensing, understanding that they need to focus; every time we say “yes” to something that isn’t any good, we are saying no to something that is. By setting priorities, they are masters at creating win-win arrangements with our industry partners.

VALUE GENERATION

From 2003 to 2007, things were pretty flat, but the creation of resources and infrastructure within Texas A&M AgriLife has met with success since then (Figure 4). The bar graph shows engagement from outside. The line graph shows engagement from inside.

There is opportunity for continued improvement; we’re still innovating in how we manage innovation, but we think that we are on the right track with an infrastructure that supports researchers. The first questions we have for them are:

- “What is it you’re trying to do?”
- “What is your vision?”
- “How are you trying to change the world?”

And we are asking our industry partners:

- What is it that’s keeping you up at night?
- What are you trying to achieve?

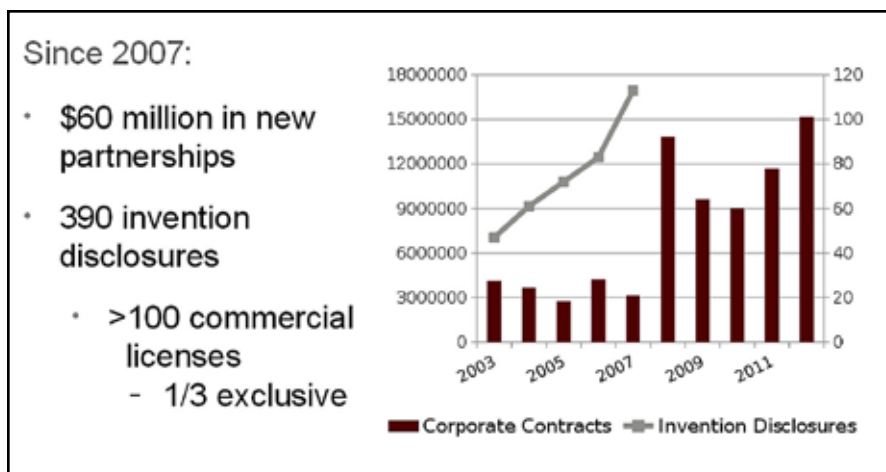


Figure 4. Generating real value.

The university is vast with much going on; it is impossible to keep track of it all. It's like Google; we invite industry: "Give us some search terms. Tell us what it is you're looking for." Then we search within the university and put things together in a way that would be an impossible task for an individual researcher to take on. We broker these relationships. We identify opportunities, and then we make sure that our partners are being taken care of and we make sure that our researchers have the opportunity to participate in audacious, ambitious projects from which amazing things develop.

Texas AgriLife Research, having assembled the personnel and resources to steward traits from discovery to commercialization, is now the number-one Texas A&M System member for disclosures, licenses and royalties.



PETER SCHUERMAN is the director of Innovation Management for Texas A&M AgriLife Research, where he works with researchers and industry to develop and execute commercialization strategies. Prior to joining AgriLife, Dr. Schureman served as the director for licensing and intellectual property for the Texas A&M University System's Office of Technology Commercialization, where he implemented novel operational procedures to achieve an unprecedented level of administrative and faculty support while significantly increasing licensing revenues and invention disclosure rates. During this time, working with AgriLife, he and his team helped the agency to develop significant industry relationships that continue to enhance its research mission.

He also served as the founder and associate director of UC Berkeley's Industry Alliances Office, a program that achieved nearly a three-fold increase in revenue from industry-sponsored research agreements in the first year of operation and specialized in closing deals in ninety days or less. He has also been a member of the commercialization programs at Rice University and the University of Florida. Schuerman has a BS in botany from Colorado State University and a PhD in genetics from UC Davis and is a USDA postdoctoral fellow.