

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Cornhusker Economics

Agricultural Economics Department

---

April 2002

## The Role of Public Institutions in Biotechnology Research

Jeffrey S. Royer

*University of Nebraska-Lincoln*

Follow this and additional works at: [https://digitalcommons.unl.edu/agecon\\_cornhusker](https://digitalcommons.unl.edu/agecon_cornhusker)



Part of the [Agricultural and Resource Economics Commons](#)

---

Royer, Jeffrey S., "The Role of Public Institutions in Biotechnology Research" (2002). *Cornhusker Economics*. 63.

[https://digitalcommons.unl.edu/agecon\\_cornhusker/63](https://digitalcommons.unl.edu/agecon_cornhusker/63)

This Article is brought to you for free and open access by the Agricultural Economics Department at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Cornhusker Economics by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

# Cornhusker Economics

Cooperative Extension

Institute of Agriculture & Natural Resources  
Department of Agricultural Economics  
University of Nebraska – Lincoln

## The Role of Public Institutions in Biotechnology Research

Market Report	Yr Ago	4 Wks Ago	4/19/02
<b><u>Livestock and Products,</u></b>			
<b><u>Average Prices for Week Ending</u></b>			
Slaughter Steers, Ch. 204, 1100-1300 lb Omaha, cwt	\$76.98	\$71.40	\$67.07
Feeder Steers, Med. Frame, 600-650 lb Dodge City, KS, cwt	106.07	88.24	81.32
Feeder Steers, Med. Frame 600-650 lb, Nebraska Auction Wght. Avg	102.94	96.44	92.25
Carcass Price, Ch. 1-3, 550-700 lb Cent. US, Equiv. Index Value, cwt	116.73	110.24	106.07
Hogs, US 1-2, 220-230 lb Sioux Falls, SD, cwt	50.00	35.75	33.75
Feeder Pigs, US 1-2, 40-45 lb Sioux Falls, SD, hd	*	38.50	40.28
Vacuum Packed Pork Loins, Wholesale, 13-19 lb, 1/4" Trim, Cent. US, cwt	120.30	99.20	91.70
Slaughter Lambs, Ch. & Pr., 115-125 lb Sioux Falls, SD, cwt	75.00	*	*
Carcass Lambs, Ch. & Pr., 1-4, 55-65 lb FOB Midwest, cwt	171.00	142.75	144.77
<b><u>Crops,</u></b>			
<b><u>Cash Truck Prices for Date Shown</u></b>			
Wheat, No. 1, H.W. Omaha, bu	3.22	3.03	3.05
Corn, No. 2, Yellow Omaha, bu	1.82	1.86	1.83
Soybeans, No. 1, Yellow Omaha, bu	4.15	4.43	4.54
Grain Sorghum, No. 2, Yellow Kansas City, cwt	3.40	3.52	3.34
Oats, No. 2, Heavy Minneapolis, MN, bu	1.40	2.38	1.75
<b><u>Hay,</u></b>			
<b><u>First Day of Week Pile Prices</u></b>			
Alfalfa, Sm. Square, RFV 150 or better Platte Valley, ton	115.00	110.00	117.50
Alfalfa, Lg. Round, Good Northeast Nebraska, ton	85.00	65.00	45.00
Prairie, Sm. Square, Good Northeast Nebraska, ton	105.00	92.50	80.00
* No market.			

In early 1998, the news media reported that researchers from the U.S. Department of Agriculture (USDA) and the Delta and Pine Land Company of Scott, Mississippi, had devised a method for developing plants whose seeds could be made incapable of germinating. Such a technology would be of little interest to the commercial seed corn industry because widespread use of hybrid seed corns means farmers must rely on retailers to sell them new seed every year. Farmers who saved seeds from a harvest of hybrid corn to plant the following year would produce a widely varying crop of inferior quality. Therefore, seed corn companies are able to maintain control over their products and have an incentive to develop new and better varieties of hybrid seed.

Until recently, soybean seed companies have faced a much different situation. Soybean farmers regularly saved some soybeans from harvest, cleaned them, and used them as seed the following year. Seed companies were unable to capture the value of plant breeding programs. Consequently, the companies were primarily in the business of providing services to soybean producers - saving them the effort of cleaning, storing and testing seed.

All that changed when Monsanto Corporation, the biotechnology giant, prepared to market its Roundup Ready soybeans. Monsanto patented the Roundup Ready gene and began licensing it directly to farmers, charging them a "technology fee" for use of the gene. To purchase Roundup Ready soybeans, farmers must sign a legal contract that forbids them from replanting the soybeans and specifies substantial penalties for violations. Monsanto frequently has threatened farm-



ers with legal action to enforce these “technology agreements,” and it provides farmers a toll-free telephone number they can call to report suspected violations by neighbors.

A technology that would render the seed of genetically modified plants useless for replanting would enable Monsanto to consolidate its commercial control over genetically modified seeds. It also would allow the company to abandon its unpopular technology agreements and expand its control to international markets in countries beyond the reach of its legal department.

At first, development of such a technology by USDA and an unfamiliar cotton seed company in Mississippi did not attract much attention. However, soon after news of the technology became public, Monsanto announced plans to acquire the Delta and Pine Land Company. The “Terminator gene,” as the new technology was quickly dubbed, would soon be in the hands of multinational Monsanto, and suddenly the technology became controversial.

The Terminator technology is actually based on a series of genes that act as “genetic switches.” Until the genes were switched on, genetically modified soybean seeds would develop in the usual fashion. However, before the seeds were sold to farmers, they would be soaked in the antibiotic tetracycline, which would trigger the series of switches. Once these genetic switches were activated, the plants from the seeds would develop normally and produce their own seeds, but those seeds would be unable to germinate.

Critics of the Terminator technology charged it would give Monsanto too much control over the world’s food supply while threatening biodiversity and subjecting farmers to “bioserfdom.” Developers of the new technology argued it would create more choices for farmers by providing companies an incentive to improve crop genetics in the same manner hybridization of corn promoted the development of better corn varieties.

Ultimately, the controversy surrounding the Terminator technology convinced Monsanto officials to forswear any commercial applications. Nonetheless, USDA’s participation in the technology’s creation calls into question the appropriate role of publicly funded institutions, such as USDA and the land-grant universities, in the development of commercial prod-

ucts based on biotechnology.

Historically, public institutions have played an important part in making new technology accessible to farmers and small agricultural businesses that would otherwise be unable to compete with larger companies capable of funding their own research and development programs. For example, until the 1960s, many small seed companies depended on the plant breeding programs at state universities, which would develop and distribute new corn hybrids free of charge. More recently, in contrast, Monsanto’s success in dominating biotechnology is due in part to spending millions of dollars to hire some of the best molecular biologists at American and European universities in order to gain exclusive access to research necessary for obtaining patents and building a strong “proprietary position.”

As the facilities and equipment needed to conduct advanced scientific research become more expensive and public universities struggle to replace shrinking federal and state funding with income from private sources, the universities’ traditional role of providing public access to new technology will become increasingly challenged.

Jeffrey S. Royer, (402) 472-3401  
Professor of Agricultural Economics

---

*Note:* Background information for this article was drawn from Daniel Charles, *Lords of the Harvest: Biotech, Big Money, and the Future of Food* (Cambridge, Mass.: Perseus Publishing, 2001).