

---

# *Sludge, States Rights and Success*

**KEN EVANS**

*President Arizona Farm Bureau  
Phoenix, Ariz.*

As I will describe later, we have sophisticated technology to handle agricultural applications with sludge. With this technology you would expect government regulators to be supporting our efforts. Not so. Our biggest enemy and clearly our most serious obstacle, whether in wildlife preservation or quality beneficial bioremediation, is the very government reportedly there to protect us. The Federal government's weakening of regulatory processes at the state level has created a time bomb — an environmental disaster just waiting to happen or be reported. I do not want to be a continuing part of an industry “in retreat” from prudent regulation. My only forum for available protest is to retreat from that management practice until prudence returns.

What a wondrous time we live in. At no time have the twin spears of technology and communications had such impact and influence on people's lives. Over the years, I have traveled a great deal and have seen much of what the world has to offer. On my travels, one observation stands out above the rest. From New York to Tokyo, from Cartagena to Boise, from Tel Aviv to Ciudad Obregon, from Mexico City to Kansas City — no matter how small the cardboard hut or how exquisite the mansion, no matter how beautiful the home or how small the apartment, most all have televisions. Whether in the streets of Mexico City or the ghettos of Los Angeles, the most affluent neighborhood in Scottsdale or the middle class suburbs of Atlanta, being able to see the news and the latest fashions instantly has produced a silent but powerful revolution in thinking throughout the world. Under all of the extremes of social and economic class differences, designer sneakers and jeans are there . . . and there in abundance. Kids may not have enough to eat but they know what's “in” and

they wear it. They see political and economic and social conditions elsewhere and they want the best of what they see. This worldwide communication explosion has brought images of Robin Leach's "Lifestyles of the Rich and Famous" into people's homes, dreams into their eyes, hope into their hearts, and an insatiable hunger to their belly. The bringing of news and current affairs and entertainment into the homes and lives of earth's inhabitants will one day be recognized as the most significant political, social, and educational event in recorded history. Televisions were the powerful fans that produced the winds of change around the globe. But television will be to the telecommunication, tele-information and tele-management tools of the 21st century what slide rules were to computers.

I will now describe the advanced technology used for sludge application at my farm.

In the early morning dawn, as the spine-tingling scream of the 903 diesel engine grew close, it became apparent to the college visitors that the machine was using all of its power to pull the seven tine, deep chisel plow. But it wasn't the display of raw power that caught their attention. Nor was it the precision driving that had kept the tractor on target within six inches across a half mile field — 2,600 feet. Neither was it the high-tech instrumentation that had regulated the application rate to within 0.03 percent of the target rate of 48,450 gallons per acre. It wasn't the cab's air conditioned, stereo tape deck, CD ROM dust-free environment or its computer instrumentation. What impressed the visitors to this 12,000-acre southwestern family farm was their discovery, as the tractor turned, that there was no driver. The 300 horsepower sludge injection tractor was controlled remotely by a portable computer sitting on the seat of my Chevy pickup.

The use of biosolids, as better quality sludge is now called, has been a scientifically based management tool on our ranch for the past 18 years now, but that will likely come to an end as a result of government abandonment of reasonable standards for the industry. When was the last time you heard a farmer say he wanted more government regulation? More on that later. Over the years, we have carefully applied and tracked over 3,000,000 metric tons of municipal biosolids. We have actually raised the elevation of our 22 square mile ranch over three inches.

What in the world do biosolids have to do with biotechnology? Well, as Peter Day, Director of the AgBiotech Center at Rutgers University, told this group in 1994, one of the most underdeveloped opportunities for agricultural biotechnology is in the area of bioremediation. For those who have visited our farm, however, this is not the typical sludge dump-and-run operation you see all across America. In addition to the high-tech application equipment, which my family has pioneered, we have also developed high-tech, biotechnology methodologies to monitor and track nutrients, pathogens, and heavy metals. As an example, we have pioneered the use of DNA/PCR gene probe testing to

provide us with analyses of Escherichia coli pathogen levels in the biosolids prior to application. To give you a scoping perspective, we have run more than 22,000 pathogen tests this year. Additionally, we use a Strontium 90 CPN Neutron Probe to give us instant measures of heavy metal concentrations in the biosolids so we can track those as well. In the last six months we have diverted nearly 1,200 truckloads of biosolids to a landfill because it did not meet our quality standards. Additionally, our reporting is done electronically using an instantaneous and accurate reporting protocol.

Today, I have been asked to focus on regulatory and social changes affecting Agricultural Biotechnology in the Environmental and Energy Sector. Specifically, where we are, where we're going and how we're going to get there. The biotechnology sector is about where the budding computer industry was in 1976. We are facing enormous changes in the agricultural sector over the next few decades. Let's discuss a few of the changes that will most affect us.

1. Farmers of the future will produce more food and fiber, and more than just food and fiber.

Agricultural biotechnology will affect every single farmer and rancher. As the emphasis shifts from yield per acre to yield per unit of resource expended delivering products to the end-consumer, biotechnology will play an increasingly important role. Additionally, crops that will be engineered specifically to yield feedstocks for the pharmaceutical, energy, and industrial sector will dot 21st century farms. Growing fuel and cosmetics will become as important as growing feed and cotton.

2. Production of industrial and chemical feedstocks will be a major source of revenue, not a novelty.

As the percent of GDI spent on food and clothing continues to decline along with the demise of government subsidies, a new generation of farmers will emerge. The appropriate infrastructure must be embraced in order for this to occur globally.

3. Tomorrow's farmers will be as comfortable on the internet as yesterday's were on a tractor, and as comfortable using a computer as their dad was using a shovel.

The internet has evolved from an information gold mine to an information glut, to a management and marketing tool. This evolution, as discussed earlier, will touch every aspect of our lives. Smart computers, tied to worldwide information and data, will allow individual producers to make better decisions. We must develop an infrastructure that allows open and free movement of information between private business and government, between the regulated and the regulator. We must give up old crutches and embrace new concepts of community welfare, individual accountability, and shared responsibility for the public and environmental well-being of this space ship we call Earth.

4. Conservation will become an established philosophy religiously practiced — not a mandated farm practice.

The worldwide environmental movement and community sensitivity about environmental and wildlife protection, coupled with global access to what we do, or don't do, on our farms, will force farmers and ranchers to modify their farming philosophy to take into account public attitudes about the impact of farm practices on the environment.

5. A new alliance will emerge between land grant universities and commercial researchers and farmers, end-users, and true environmentalists that will carry us well into the next century.

The next decade will produce a blurring of the traditional structural lines in business and society. Responsibility for the administration of social goals will continue to evolve away from government and toward a shared public-private partnership. From education to medical care, from basic research to child care, from prisons to the airwaves, a blurring between private enterprise and government regulation will occur at an ever escalating pace. Even the lines between labor and management will become hard to distinguish. Banking, insurance, and marketing will blur until they cease to exist as discernible institutions and focus instead on function and vision. To succeed, we must identify, develop, and cultivate those new alliances that share our common vision. We must also tell our story. We must spend more of our resources educating the public and ourselves. The public's right-to-know and their access to huge amounts of information regarding every aspect of business and the environment will force us to be more open and forthright in business practices and government operation. We must address phobias, fears, and suspicion by the public and within our own industry. We must be willing to change.

6. Farmers who succeed will need to expand into providing for other societal needs such as recreation, wildlife management, environmental management, etc.

The most recent USDA report revealed that the 1.5 million small-and medium-size American farmers received nine-tenths of their disposable income from off-farm sources, with even the largest producers receiving more than half of their disposable income from off-farm sources, as well. As a further indication of this trend, three State Farm Bureau Presidents make more money on wildlife and recreation than on the cattle or crops on their ranches. American farmers in the 21st Century will have to learn to farm for the maximum benefit of the entire ecosystem we call Planet Earth versus mining the land or farming directed by government programs. Providing recycling for such waste products as biosolids and the beneficial reuse of our dwindling resources will become more widespread. Biotechnology will play a critical part in accomplishing this goal.

## 7. We must do a better job of telling our story.

We have accepted and embraced proven, as well as emerging, technology. The public does not understand what we are doing or why. In response to Caron Chess, yes there is a segment in society that has a higher latent trust factor than the “white-coated scientist.” They are the family farmers. There is a difference between having information versus having understanding. To prevent special interest groups of political activists and environmental extremists from misusing their access to massive amounts of data to create mass hysteria, we must empower the average citizen with access to and understanding of this ocean of information. We have heard much about the shortcomings of the nuclear industry or the chemical industry or the plastics industry. Perhaps the greatest weakness and most damning deficiency of modern society is our illiteracy when it comes to understanding risk. As a people, we expect the government to give us freedom from all risks, even those we can't define. While one-third of the world is hungry, we demand: convenience without cost, pleasure without pain, thrills without danger, recreation without work, service without sacrifice, freedom without price, glory without honor, products without waste, energy without pollution — any at all. We expect to have toys that do not break, cars that don't wreck, trains and planes that don't crash — ever! We want to gamble and win, but do not accept the risk of losing. We even want tans without sunshine and health with out prudence. We fantasize about nature being in balance and then bankrupt ourselves and squander our children's future trying to restore a balance to nature . . . a balance that never was nor ever, ever will be. To survive we must educate an entire generation about the concept and cost of risk avoidance. Risk cannot be eliminated. Risk can be reduced — at a cost. Cost benefit analysis must be a core part of education.

These changes are occurring, with all of their attendant challenges and opportunities. I, like you, have a hard time visualizing what the 21st Century farm community will look like. But this much I do know. Telecommunication assisted, real time, graphically enhanced technology will put substantial regulatory and public pressure on every aspect of business and education including the development and commercialization of biotechnology. In spite of that, biotechnology will play a significant role in the future of farming.