

The culture of innovation in the plant science industry
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Ladies and gentlemen, dear guests,

I am excited to be with you today for this conference – and to see that such a diverse and committed group of people has come together to exchange thoughts on a crucial, yet debated topic: the role of innovation and intellectual property in farming and thus the food chain. Speaking on behalf of CropLife International today, I would like to talk with you about “The culture of innovation in the plant science industry.”

I believe that our industry is about two simple things: helping farmers produce healthy crops and getting affordable, high-quality, nutritious food on the table. We contribute to these things with innovation, innovation in modern technologies, innovation that creates sustainable farming.

Still, as you all know, the benefits of our industry’s innovation are not always self-explanatory. In Europe, for example, there seems to be a fear that agrochemicals are harmful to our health and the environment. A recent survey showed that while most people say plant science has improved the quality of life, the majority also thinks it would be better if we could do without it.

People concerned with farmers in the world’s poorest regions have mostly different concerns. They say we are not doing enough to get our innovative products and technologies to developing countries.

Why? Industry is profit driven, so it is interested in functioning markets. Biotechnology is a good example. Here the technology is in the seed, and the seed is often owned by the companies.

This is tough criticism. But being an optimist, I was quick to hone in on the common ground. Many NGOs, institutions and ordinary people agree with the plant science industry on a major point: Modern, innovative agriculture is critical to getting high-quality, affordable food on the table – in the industrialized economies as well as in emerging and developing markets.

Looking forward, farming is likely to make a growing contribution to securing our energy supply. Several countries already produce ethanol and biodiesel from crops such as maize, sugar cane and soybeans. And many governments are working to support the introduction of renewable fuels.

I also find nothing wrong with the claim that our industry is profit driven. While the plant science industry takes its social responsibility seriously, its activities are geared toward business success. Our market system may not be perfect, but it is the best one we've been able to produce. The job now is to make it even more workable.

So it also goes without saying that our industry's research efforts are in equal measure guided by the desire to do business. That's common sense. Products are made for markets. Or the other way around: Where there's a market, there's a product. But I don't believe that our industry's business agenda prevents it from making a contribution to sustainable agriculture. I believe I can speak for all of CropLife's members when I say I am convinced that the opposite is true. Our business agenda has made and will keep making agriculture more sustainable.

However, we also know we're not perfect. During the Green Revolution, people were in pursuit of ever-greater yield increases. This tunnel vision helped people in poor regions improve their nutritional standards. In the pursuit of this goal, some people tended to ignore the ecosystem.

We have learned a lot from since then. Agrochemicals are put through a set of stringent environmental and toxicological tests, and plant science companies work hard to make sure that their products and technologies are used judiciously. We can't do this alone. We rely on the cooperation of farmers, distributors and retailers.

Creating an environment of listening, learning and trust will help us achieve our goal of making agriculture even more sustainable using all of the tools available to us: products, technologies, services and our knowledge.

In what follows, I would like to show how our industry's innovation has and will continue to help both developed and developing countries do this. I will also argue that a market approach, including patent and data protection, is the best solution for all stakeholders.

Farming innovation started long before talking heads divided the world into developing and developed countries, and long before there was a plant science industry. A glance at world population growth is a reflection of innovation in farming and medicine.

For centuries, farmers have sought to increase their yields by fertilizing their fields. In fact, man has gone to astonishing lengths to improve crop yields. Have you ever heard of Guano? That's bird excrement of cormorants and pelicans. Few people know how many European sailors died trying to bring Guano from the South Seas around Cape Horn to help European farmers fertilize their fields. Another favorite import was Saltpeter from South America's Atacama Desert. The invention of synthetic fertilizers by using nitrogen from the air has revolutionized farming.

Since then, a lot of innovation has helped farmers to improve the quantity and quality of their yields.

Never before in history have so many people enjoyed access to such high-quality, varied and reasonably priced food. Back in 1960, for example, Germans forked over 29 percent of their disposable income to buy food. That may seem like a lot from today's perspective. But it was a big improvement from the 50% people had to spend in 1920. Today, people in Germany spend less than 12 percent of their incomes to feed themselves and their families. The same trend can be seen in the rest of Europe, in the U.S. and most other parts of the world. This is a lifestyle that many people would not want to give up.

What many people do not realize is the enormous role that chemistry has played and continues to play in securing this abundance. Advances in molecular biology and advanced environmental science have helped make products with less toxicity and an improved environmental profile. In recent years, the plant science industry has also brought new technologies into the equation: Computer science helps farmers monitor their crops, green biotechnology has added a new dimension to traditional breeding methods.

The need for high-quality, nutritious food and feed will continue to increase as the population grows. Some estimates put the population at over 9 billion by 2050. At the same time, potential arable land is decreasing and people are eating more calories a day all over the world.

That means that we will have to intensify agricultural production in a sustainable manner there where more food is needed. This is especially true in some parts of Asia and Africa, where the variety of food available is often insufficient to meet basic nutritional requirements. The plant science industry's products, services and technologies are uniquely positioned to help meet these challenges in a socially responsible and ecologically sound manner.

In the future, we are likely to see more arable land used for renewable fuel crops such as sugar cane, corn and canola. In Brazil, for example, ethanol is already an affordable alternative to gasoline. In Germany, people can choose between diesel and biodiesel. Harnessing the sun's energy through plants is a nice idea. Bioethanol and biodiesel are just the beginning of its realization.

Governments looking to secure access to affordable, environmentally safe fuels as one component of their energy strategies are supporting the introduction of renewable fuels. U.S. President George Bush, for example, has given the promotion of biodiesel and ethanol a prominent position in his proposed energy bill. Just a few weeks ago, the French government announced new measures to promote biofuel production facilities. By 2010, biofuel is supposed to account for almost 6 percent of the fuel being pumped into French cars, helping the French implement the EU's renewable fuel directive. To help us meet these goals, scientists are breeding new plant varieties that grow faster and are less demanding.

This competition for arable land is something we need to keep in mind when thinking about sustainable agriculture. Just to give you an idea of what I'm talking about: It takes five kilograms of maize to make 1.5 liters of bioethanol. In your car, this does the same job as 1 liter of gasoline. Those same 5 kilograms of maize would feed one person for 11 days.

A glance at the FAO fact book shows that yields have increased dramatically since the early 1960s both in developed and developing countries. Maize crops in developed countries, for example, have achieved an average yield increase of more than 160% compared with almost 130% in developing countries. Rice yields are up by almost 95% in the developed world, and around 27% in developing regions. These improvements stem from the use of new technologies ranging from improved cultivation and water management techniques to agrochemical inputs and superior plant varieties, including agricultural biotechnology.

Still, there's a lot to be done. Reducing losses to crop production from pests, diseases and weeds is, and will remain, a crucial element in maintaining and increasing productivity. Globally, an average of 35% of crop yields are lost to pre-harvest pests and 10%-20% to post-harvest pests. That makes around one-half of all current agricultural production. Losses in Africa, Asia and Latin America are the highest.

“How can agricultural production rise to meet demand in a framework of equitable, environmentally, socially, and economically sustainable development?” For me, this question is at the heart of the matter. Many consumer and environmental groups in more developed regions equate plant science with bad chemicals, and in Europe with dangerous biotechnology to boot.

What many people don't realize is that our products have to pass regulatory hurdles that are comparable to those in the pharmaceutical industry. That's one reason I don't get defensive when people point out that chemicals are a major part of our business. I also keep pointing out that we do more than make chemicals. With our technologies and services, we are able to give farmers a whole set of tools to produce healthy crops.

For example, using the newest discoveries in the field of molecular biology, we create compounds with better efficacy at lower toxicity and an improved environmental profile. That's why we are focusing our research activities on creating more effective and safer products rather than simply reducing the amount used. This research has led to products with better biological performance. Lastly, plant science innovation also helps protect our ecosystems *proactively*, for example by conserving water and helping farming communities preserve their forested areas.

In many parts of the world, we take food and feed for granted. But that hasn't always been the case. A single disease has the power to wipe out whole crops and with them a key foodstuff. The fight against Asian Soybean Rust is a good recent example of how our industry's innovative products have been helping farmers all over the world.

This fungus first showed up in Taiwan in 1902. In some years, it destroyed as much as 91% of the country's soy crop. Soybean Rust has made its way to all corners of the earth over the past 100 years. Last year, it hitched a ride from Brazil to Florida with Hurricane Ivan and may now be making its way across the continental United States. As the chart shows, Soybean Rust has the power

to wipe out a country's entire soy crop. Our industry's innovation has allowed us to react immediately and protect the world's soy crops in cooperation with farmers.

In addition, our industry has led the way when it comes to integrating new technologies into farming processes. One example is the GPS diagnostic system. Using modern computer technology and satellite navigation, we have developed tools that help farmers monitor soil conditions, water supply, pests and disease early on and apply our products only there when and where they are really needed. This helps farmers reduce their costs by saving water and applying fewer chemicals to their fields. This is just one aspect of our integrated approach to farming - called Integrated Pest Management.

High salt levels make about one-third of the world's irrigated land unsuitable for growing crops. Currently, more arable land is lost through salinity than is gained through clearing forests. Most trees and crop plants are highly sensitive to salty conditions.

Green biotechnology will make it possible to engineer crop plants that tolerate high levels of salt in the soil. Salt-tolerant crops will be particularly important for developing countries. Increasing yields from marginal soils by growing genetically modified crops is one step toward helping farmers produce sufficient food, feed and fiber.

Rice cultivation is another example of how we help farmers save water. Rice paddies have traditionally been flooded with water to control weeds. New rice varieties combined with herbicides allow rice farmers to forgo flooding their fields preemergence.

To make the kinds of improvements I've outlined takes a lot of innovative research. The plant science industry currently invests around 10% of its sales in research and development.

After pharmaceuticals, no other industry commits more to researching and developing new products, technologies and better processes. In practice, this means new products that have greater efficacy, and which can be used safely and effectively with minimal environmental impact.

Some critical voices point out that most of this research is being carried out by an increasingly small group of global players. But I believe that the critics have put the cart before the horse. The breakneck consolidation our industry has been going through has not *caused* a concentration of research among a few big players. It is the high cost of research and development that unleashed the process of consolidation to begin with.

The process of identifying a new active ingredient is only the start of the research and development process. Just look at agrochemicals: For every compound tested, only one in 140,000 actually makes it to the market. To begin with, hundreds of thousands of new compounds are screened and modified using state-of-the-art discovery research. After a new compound has proven its effectiveness for a certain indication, it has to prove that it is economically viable. Once this hurdle has been passed, each new active ingredient undergoes demanding tests to show that it is safe for the environment, for users and for consumers when applied appropriately.

To get that one active ingredient to the marketplace, a company spends an average of \$180-\$220 million and eight to 10 years. That's a lot of money and time. The stakes are high, and one wrong research decision may kill a smaller company. While universities and research institutes do important basic research, taxpayers are not willing to commit the amounts necessary to translate this research into marketable products.

This situation is similar in genomics research. Companies must make substantial investment to get a new trait to market, and the timeline is even longer than for a crop protection product.

In view of the magnitude of this investment, globally active plant science companies need to know that their investments will be safeguarded. As a globally operating industry, we believe that we need a matching global regulatory framework. Unfortunately, this isn't the case. Instead, regulations continue to vary from region to region and often even from country to country. They are also often based on political considerations rather than on reason and sound science.

From our perspective, a good regulatory framework that favors investment and innovation will support advancements in agriculture. We can only invest in countries that respect intellectual property and observe data protection standards. Once the registration process has started, data must remain protected for an exclusivity period of at least 10 years in addition to the time it takes for an active ingredient to be registered. And surely a comparable framework is needed in the biotech arena. Just as important, these regulations need to be enforced. We will stifle innovation if our framework fails to provide sufficient financial rewards to justify continued investment.

I have just argued that our industry's research has the capacity to help farmers in all regions. Our experience shows that our products and technologies can be adapted to the most diverse farming circumstances, from large industrial operations in the United States to Japanese-style micro farms.

But we also recognize that farmers in the world's poorest regions often have needs that we cannot always address. While we are present in those regions where our products meet with a ready market, we are also involved in some initiatives to get our technology to other regions. In this context, we often work with the international agricultural research centers of CGIAR.

In these efforts, our industry regularly partners with grass roots organizations as well as government and supranational bodies. We feel that such creative partnerships are the best way to get our technology and processes to farmers in developing countries. In addition, through CropLife, we conduct workshops all over the world on integrated pest management and the safe use of our industry's products.

Our plant science is just one piece of the puzzle. Innovation is needed on several fronts. Population pressures continue to prevent proper land and water management in many poor countries. Agricultural production is critical for any form of sustainable future. But focusing on the agricultural sector alone is certainly not the way to tackle the problems. Agriculture programs must be integrated into overall development objectives. They must also be linked to other resource issues. Here, the plant science industry has a limited yet vital role.

The creation of a viable regulatory framework is a first step toward private-sector investment in emerging markets. CropLife believes that a sustainable market is good for all stakeholders: industry, farmers and consumers. Access to cutting-edge plant science allows farmers in poor regions to compete on the global market. A process that itself may help the countries increase their competitiveness.

But how do they get access? That's the question. CropLife pursues an integrated approach: It seeks to secure its business prospects by working to ensure that intellectual property and data protection rights are implemented and enforced across the globe. Our industry cannot justify an investment without a certain level of protection.

Our work to make farming sustainable isn't a mere PR campaign. We believe that fostering sustainable farming is crucial to our business success.

New technologies often meet with a skeptical public. But when you think about it, it's amazing what science and technology have achieved. When I was in college, cell phones were a crazy idea, and plant biotechnology was science fiction. Today, our cell phones film our holidays and send the footage to our friends back home. In a few years, drought and salt-resistant plants maybe just as common.

We rely on science and observation to help us understand the impact of new technologies. That's a good thing. But of course, science doesn't ask questions. People do.

That's one reason we take the concerns of our stakeholders seriously. We also hope that by mediating between science and the public we can improve the basis for a solution-oriented approach, one that puts ideologies aside in order to work on a common goal.

This commitment is particularly important to me today as the incoming president of CropLife. In this talk, I've tried to outline how plant science industry innovation can continue to help farmers grow crops for food and – looking forward - for energy in a sustainable manner. To do this, our industry needs an enabling regulatory framework and sufficient patent and data protection.

Here, I would like to take the opportunity to extend my warmest thanks to Michael Pragnell for the work he has done these past two years. Under his leadership, CropLife has brought our industry forward by focusing on our long-term commitment to stewardship. During my presidency, I will do my best to press ahead with this work with a special focus on our commitment to open, transparent dialogue.