



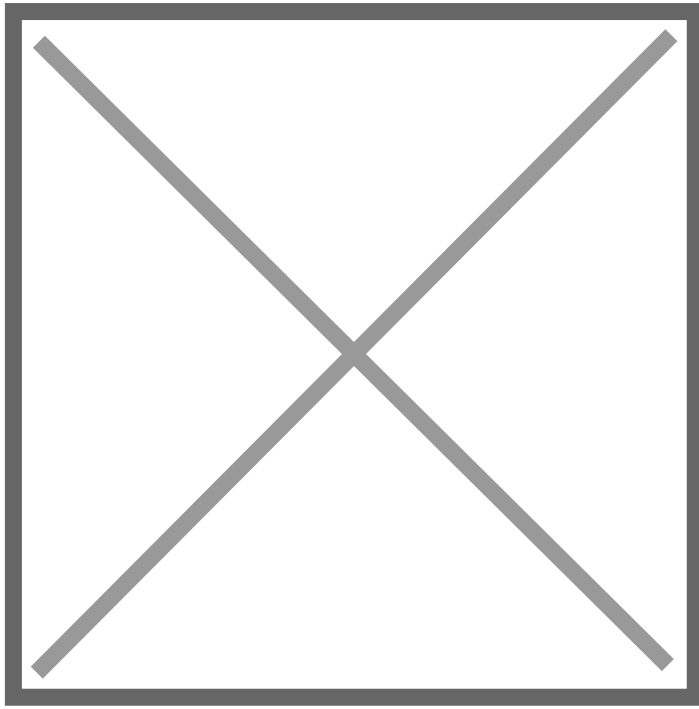
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"Scientists have an obligation to explain science"

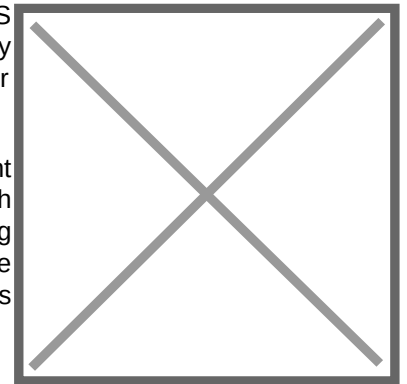
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"Scientists have an obligation to explain science"

Continuing our series of "Biotech Gurus", in this issue we focus on Dr Channapatna S Prakash, the founder of the highly successful and popular agricultural biotechnology website—Agbioworld. He moderates daily Internet discussion group and newsletter "AgBioView" which is read by more than 4,000 experts in 55 countries.

Dr Prakash is a professor in plant molecular genetics and the director of center for plant biotechnology research at Tuskegee University, Alabama, USA. He oversees the research on food crops of importance to developing countries and is actively involved in enhancing the societal awareness of food biotechnology issues around the world. In an exclusive interview, Dr Prakash shares his views about the future of crop biotechnology, its promises and the problems. Excerpts:



What was the objective behind starting a website on agricultural biotechnology?

I started "AgBioView" in the year 2000 to provide a forum for discussion on issues facing agricultural biotechnology among scientists across the world. Because the products of our research, GM crops, were being increasingly seen as controversial and their public acceptance was being threatened by scare campaigns by the activist NGOs. I felt that scientists must speak up. To empower scientists, it is essential that we understand the root of such apprehension and also recognize that the public and policy makers must be provided with a reasoned, science-based information (in a manner that they understand) by the scientific community. The orchestrated opposition to biotechnology is by a minority of individuals or groups who are very vocal and effective but they must be countered for so much is at stake here. While scientists are not usually trained to indulge in such activism, increasingly it has become essential that we learn to communicate effectively among various stakeholders. AgBioView is sent out daily to more than 5000 readers across the world including hundreds in India. Our readership now not only includes scientists but also the media, students, scholars, environmental organizations and policy makers. It contains important news from across the globe on issues related to agricultural biotechnology and also useful commentaries, research developments, information on scientific meetings, scholarships, book reviews and even occasional humorous pieces. Articles posted on AgBioView are often reprinted in many newspapers, magazines and web forums. I am heartened when many people routinely tell me how useful they find AgBioView.

The EU commissioners have granted a license for the import of Syngenta's GM maize. Will this have major bearings on the future of GM crops in Europe?

I think that this is a step in the right direction. It is a kind of break on the impact of five years of so-called de facto moratorium.

So it is a breath of fresh air for those of us who have been calling for Europe to open up. After all, Europe is the home of this technology and the cradle for the whole of science and technology revolution. And it is not a technophobic continent by any means. Even in the field of biotechnology, it is home to literally thousands of biotech companies both small and big.

Europe was dragging its feet in the area of agricultural and food biotechnology and its approval of the insect resistant, Bt11, GM maize variety (developed by the Swiss firm Syngenta) is a step in the right direction. But I still believe that much needs to be done before Europe can open its front to biotechnology without much fear and feel comfortable about it. The European public, the policy makers and the food industry are the three major stakeholders that are holding back in the area of biotechnology in Europe.

Both the UK and EU have given a tentative go ahead to biotechnology but with strict labeling and segregation rules. Is this like moving one step forward and two backwards?

Well, I think in a symbolic manner even though EU has approved Bt 11, at the moment, Europe by itself is not moving ahead in biotechnology. In England also, though they have approved the GM maize developed by Bayer Crop sciences, but because of the stiff conditions imposed, the company is not marketing it purely for business reasons. This is one of the reasons why I say that Europe has a long way to go. However, at least this is one step forward. But it is so encumbered in traceability segregation and labeling that it is a very hard sell. We are wishing that Europe would open up fully. And I am sure that Europeans will understand that it is in the country's interest and recognize that many countries like North America, developing nations like China, India, South Africa are moving ahead with this technology and none of them seem to be having any problems. All their worry related to the use of technology in food is either very hypothetical or very insignificant in terms of food safety or its environmental effects.

Now the world has started recognizing the very positive effects of this technology. Last year alone, in the US, we saw a drop of 21 million Kg of pesticides, active ingredients, so much so that BASF closed one of its pesticide plants because they incurred losses of \$175 million last quarter. The rate of pesticide application/sale coming down was directly attributed to the use of GM crops. Today Europe has the highest per capita pesticide consumption in the world. Two countries, Europe and Japan, consume much more pesticides than the US.

In Europe people have this image of nice family farms, small farmers and they somehow think that by using better varieties, using biotechnology is somehow going to corrupt the kind of image they have, which is silly, really! It is not going to change one bit, like it has not changed anything for the Bt cotton farmers growing cotton. It is only going to make things better. I am sure that in the next 5-10 years Europe is gradually going to see light but it shouldn't take so long too. As earlier Europe was the seat of action for many of the big biotech companies like ICI, Syngenta, Ciba, PGS and so many others, who had invested so much into this technology and suddenly they started closing shop and moving their R&D units to the US. It is really sad in terms of how this technology could have blossomed into so much more if not for the European intransigence.

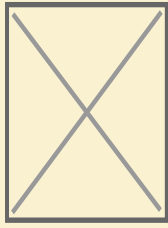
Monsanto has abandoned its plans to sell GM Wheat in the US. Is this a big setback for the agri biotech sector?

I think that more than the US, it is the export of wheat to Europe and Japan that led to this decision. Although, probably only about 10 percent of the wheat produced in the US is exported, but still it was significant enough to have led to this decision. This shows that the perception of the technology in the food sector is not as positive as in the seed sector. Much of the push for biotechnology in the seed sector came from the farmers because they are the direct beneficiaries of the current day technology—herbicide tolerant, pest resistant, insect resistant crops, etc. The food industry does not see much benefit for itself, at least that is the perception, and this perception is bound to the consumer concerns. When ironically the consumer is not having any concerns, at least not in the US.

And even in Japan and Europe it is just the politics of marketing and supermarkets having more clout. It is unfortunate because wheat is one of the largest growing crop in the world and if commercialized this would have had an impact on how the technology could have translated into many more crops. I think that it is a bit of a setback.

Labeling of GM products is a contentious issue. Do you think it should be allowed?

It is a difficult question as the US does not have any labeling of GM products and yet does not have any problem. Labeling is a very tricky issue and is being enforced not for any health reason but for marketing and it is not going to help the technology much at this moment. Today there is so much of negative perception attached to labeling at least in Europe because of traceability and other issues.



Dr CS Prakash has been instrumental in catalyzing the scientific community in many countries to be more proactive in the biotechnology debate. His website has become an important portal disseminating information and promoting discussion on this subject among the stakeholders. The website has received endorsements from over 3,500 scientists from across the world including 24 Nobel Laureates.

Dr. Prakash has actively worked to promote biotechnology research and policy in developing countries of Asia and Africa through training of students and scholars, research collaboration and lectures. His contribution to agricultural biotechnology outreach was recognized by the magazine *Progressive Farmer* who awarded him the 'Man of the Year' award 'in service to Alabama Agriculture'. He was recently named as one of a dozen 'pioneers, visionaries and innovators behind the progress and promise of plant biotechnology' by the Council for Biotechnology Information.

Dr. Prakash received a bachelor's degree in agriculture and a masters in genetics from the University of Agricultural Sciences, Bangalore, India. He obtained his Ph D in forestry/genetics from the Australian National University, Canberra. His research interests include studies on transgenic plants, gene expression, tissue culture and plant genomics. Dr Prakash's group at Tuskegee University has led the development of transgenic sweet potato plants, identification of DNA markers in peanut and the development of a genetic map of cultivated peanut.

Currently, he serves as the principal investigator of a USAID funded project to promote biotechnology awareness in Africa. He has more than 50 scientific publications in refereed journals and has presented more than 100 papers.

Dr. Prakash serves on the scientific advisory board of American Council on Science and Health (NY), BioScience Policy Institute (New Zealand), and Policy Network (UK). He also serves on the editorial board of AgBiotechNet and AgBioForum, the Journal of New Seeds, Indian Journal of Biotechnology, Food Biotechnology, and the Journal of Plant Biochemistry and Biotechnology.

Dr. Prakash often serves as a speaker on behalf of the US State Department and has traveled to many nations across the globe for delivering public lectures, interacting with the media and meeting with policymakers, scientists, activists and trade experts.

I believe that labeling is very important. The laws of labeling should be made keeping the interest of the consumers in mind. And traditionally labels all around the world are meant for two major things. One for providing information on content and second to provide any health related information and warning. So writing about an ingredient sourced from a GM crop has nothing to do with either. For instance, if you buy a bag of potato chips you do not know what variety of potato has been used, what pesticide was used and where it was grown because it is immaterial. It has no relation either to the nutritional aspects of the food that one is consuming or to the health and allergies concerns. By putting on the label that it is a GM food, you are actually stigmatizing the product just because it is biotech. When there is absolutely no scientific proof anywhere in the world that because of being biotech/genetically modified it somehow has an extra element of risk. There is none! While those who have a vested interest in opposing the product like the organic food industry or the anti biotech activists will have an advantage in maligning the product.

What you provide on the label should be factual and verifiable. When you talk of labeling sugar, oil, etc as GM or non-GM, then it may so happen that you use a GM crop with all its health benefits and still label it as non-GM and it will be very difficult to trace that. This is the reason why FDA has resisted labeling. The only compromise that they made was to certify organic food where they cannot use any GM variety. Thus, following all the traceability rules is very difficult for developing countries. It is draconian in terms of what has been put together. To give an example, if you are eating a chocolate bar and you want to know in what form the cocoa or sugar were used I think it is stretching the things a bit too far.

How do you foresee the future of crop biotech nology in the African continent?

I think Africa is going to move slowly though public perception is not a big problem there. It is a country like India where perception is not a major issue except for a few intellectuals here and there. The biggest problem in the African continent is that apart from South Africa and some parts of the Arab world like Egypt, there is hardly any technology research being done.

Africa is where agricultural biotechnology's greatest promise lies. In Africa biotechnology has the potential of increasing the agricultural productivity, developing crops that are tailored for harsh environmental conditions, marginal soils, etc. But this cannot be done in many of the African countries simply because of lack of research infrastructure, lack of policy supporting, forget biotechnology, just simple agricultural research. And so there is no point in having computers when people are illiterate. So what is required there is something more basic. Just like how the green revolution was brought into countries like India with the help of an international consortium of institutions, a similar model will work for Africa at the moment.

In other words they have a need for crops like cassava that is virus resistant, banana that is fungus resistant and perhaps corn that is herbicide resistant and disease resistant cowpeas. These are the major African crops, and improving them is very simple. For example disease resistant cowpeas, it is an off the shelf technology, you just take the Bt gene which is there in cotton and put it in cowpea, it will be protected. Even the seeds are given free and the farmer does not have to make any extra effort. It is not a destructive technology and does not call for a lot of investment also. These things could be put into place by international institutions, donor agencies and western labs working in consort with the local African agricultural scientists. Some efforts are being made in this direction by the CGIAR system, National Centre of Tropical Agriculture, some of the other centers working in Africa including ICRISAT, donor agencies like the Bill Gates foundation, which has recently pledged \$25 million for this effort. These are some of the medium term applications of biotechnology that will come in Africa.

What are the major problems hindering the growth of agricultural biotechnology in the world today?

The crux of the problem hindering the growth of agricultural biotechnology around the world can be divided into three major issues.

Trade - Till the time the South African countries perceive that bringing in biotechnology will jeopardize their trade, they will not go for it and that is what happened in Zambia, which literally shot itself in the foot by refusing food grains last year and Angola did the same this year. They were purely driven by fears of their trade being threatened. To give an example, Namibia is a small country and is one of the biggest importers of corn. It cut off all its corn trade with South Africa because the latter grows GM corn and Namibia is the largest exporter of beef to Europe. Now though Europeans are the biggest consumers of GM food for the life stock and would not have had a problem but due to the perception of some food companies that source beef from Namibia, it could have taken this step. So countries that have nothing to do directly with biotechnology but due to the fears of trade avoid adopting it. Another example is Thailand, which has done excellent research in rice biotechnology since the last 15 years but does not want to opt for biotech crops, as it is the largest exporter of rice to the world including Europe. China is a good example. It has approved Bt cotton long time ago but has yet not approved Bt corn, although GM corn has been on field trials since more than the past eight years. It has not approved the commercialization of Bt corn as it exports corn to Korea and Japan. It is sad that trade more than any other concern is the guiding factor in growing/commercializing GM crops.

Biosafety regulations - The current regulations are very burdensome, costly and mostly unscientific. The regulation or too much of it is another important factor hindering the growth of agribiotechnology. Even the US grows only 3-4 GM crops. Monsanto, that has spent \$1 billion a year for the past 10 years which is probably more than what we have spent on agricultural biotechnology research related to developing countries in all the past 20 years and yet what products do we see? Hardly a handful on cotton, soybean, canola! And all these are just insect tolerant or Bt. They have many other products like virus resistant potato, sweet corn, etc but none of them have been brought in the market because the cost of regulation is very high. And this not a case specific to the Monsanto's products but is common in the entire food industry.

Today amongst the whole range of biotech products/food there is no whole food other than papaya, all other biotech products are processed foods. To illustrate the cost of regulation, lets take a product that is of direct relevance to the consumer especially from a health point of view. Assume that there is a groundnut oil that is better in quality with low saturated fats, almost as good as olive oil. Today, we do have the technology to do it, but the point is if you spend \$5 million to develop that groundnut, it takes another \$20 million to prove that it is safe. Although it may be just turning off one gene and not much conceptually to worry about. But yet the burdensome regulations that just don't regulate it in the country in which you are growing, you also have to worry about the regulations in the country, which is importing it. You have to satisfy all of them! So why bother? And that is why most of the companies have put some very promising technologies on the shelf.

Development of GM crops is an expensive process and scientifically very sophisticated but its commercial release is almost prohibitive because of the burdensome regulation and bureaucratic red tape. The extra cost of justifying the product safety is invariably passed on to the consumer. So just like the pharma industry is in search of blockbuster drugs to cover the cost of developing a new drug. Similarly the agri industry wants to go for a blockbuster, no one wants to bother for cassava, cowpea, etc, they want to go for something big. This is really sad because many of the crops, which are of direct benefit to the consumers include healthier fat, better starch more vitamins, better appearance flavor and color all of which are technically possible and yet are not going to happen.

Food Industry - There is a certain kind of monopoly when it comes to food in the western world. Like for potato, Mac Donald is a big buyer. And though we had a GM potato, which was nearly similar in all respects to the normal potato and is practically pesticide free, but it cannot be introduced because of the company monopoly, which dictates terms.

N Suresh & Rolly Dureha