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Biotech companies keen on setting up R&D factories

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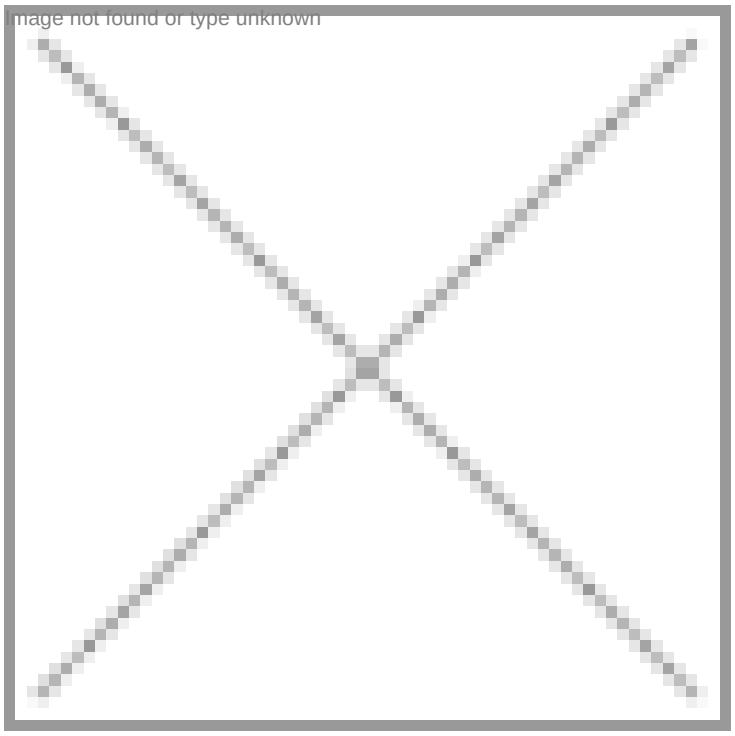

Biotech companies keen on setting up R&D factories

With so many Indian and multinational companies establishing their R&D centers here, it is clear that India is poised to become the R&D hub of the global life sciences industry.

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DuPont India
Investment: Rs 100 crore
Area: 15 acres
Location: Hyderabad

R&D in Indian industry has witnessed a paradigm shift in the last decade. Today, the strategic focus of most of the Indian biopharma, pharma and agribiotech companies has shifted to research driven business.

Indian companies are now willing to take the risk of investing big money in research and development. The last few years have seen a lot of companies like Avesthagen, Dr. Reddy's, Biocon, Dabur, Panacea Biotec, and Bharat Biotech making substantial investments in establishing, upgrading and expanding their R&D infrastructure in an effort to ascend the research value chain and sustain global challenges, competitiveness, and avail the opportunities. And in a short span of about five or six years, some of these companies have significant R&D milestones to their credit. For example Bharat Biotech has invested almost Rs 30-35 crore this year on R&D. For the malaria vaccine and rotavirus program, the company is about to invest Rs 25 crore. Biocon made an investment of Rs 150 crore on BioMAb EGFR, the anticancer monoclonal antibody. Thus, all these companies came out with new research models that changed the position of their companies.

Focusing on R&D and innovation has now allowed the Indian life sciences companies to move further up the value chain, and thereby increase their profitability.

Indeed, the cost of doing R&D in India is a big advantage, along with other factors like scientific talent, patent protection, and a large patient pool.

MNCs expand their R&D presence

MNCs are looking at India in a big way and are making huge investments to set up R&D centers in the country. The nation has attracted numerous multinationals like GSK, AstraZeneca, Monsanto, AMRI, Pfizer, Novartis, and DuPont to establish their research and development centers here, bringing the number of foreign-funded R&D centers to more than 100.

With the new emerging trend of internationalization of R&D, MNCs are targeting developing countries in Asia for setting up their dedicated R&D centers. The skilled manpower and the reasonably developed infrastructure have been drawing a number of MNCs to the shores of India for setting up their dedicated R&D centers.

From education point of view, India is well designed to accommodate any kind of research and development initiative. India has now become the obvious choice for setting up the competence centers, going by the size and opportunity in the country. The big names of the global biotech industry already have development centers in India, and are planning to further expand their existing facilities and infrastructure. A lot of them are carrying out a significant proportion of their R&D work in India, which contributes to their overall growth and success. Some of these companies have their largest development centers outside the US in India.

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Rasi Seeds
Investment: Rs 10 crore
Area: 40,000 sq. ft.
Location: Attur, Tamil Nadu

DuPont India, a subsidiary of E I du Pont de Nemours and Company recently opened the first biotech research facility at the DuPont Knowledge Center (DKC) in Hyderabad. The Biotech Research Center (BRC) began its operations with more than 80 scientists working on a variety of global research programs on plant and industrial biotechnology. The India center is the first integrated agriculture and industrial biotechnology research center for DuPont outside the US. The other research facilities at the DKC will come up in phases over the next couple of months, and the complete DuPont Knowledge Center is expected to be formally inaugurated sometime before this year-end.

The BRC at DKC will focus on bringing new crop genetics to the market faster and on application of industrial biotechnology to produce biofuels and biomaterials for global markets. Plant biotech scientists at the DKC will work on developing biotech traits and technologies that will be incorporated into multiple crops for markets the world over. The trait discovery work conducted on site will help create advanced seed products to meet the growing global demand for increased food production, improved animal feed products and expanding energy needs. Research teams will work to deliver new technologies and products for the DuPont Agriculture & Nutrition platform and the DuPont Applied BioSciences business for India and global markets. Both research teams will work together to develop products from renewable resources for food, feed, materials and energy.

Starting with more than 80 crop geneticists and industrial biotech scientists today, DuPont expects the number at the BRC to double by the year end. An estimated total of 600 scientists and engineers across all disciplines will work out of DKC once it is fully functional.

Emphasizing the significance of the DuPont Knowledge Center, Balvinder Kalsi, president and CEO, DuPont India, said, "The DuPont Knowledge Center will provide substantially increased competitiveness to build the future of DuPont and contribute to DuPont India's growth. I expect DuPont Knowledge Center to be a global Center of Excellence for DuPont. This will enable us to increase our 'speed to market' with products that come out of our R&D and innovations pipeline, not only for India but also for other growth regions". By adding biotechnology to DuPont strengths in chemistry and material science, our scientists at DKC will work to develop biocatalysts that will utilize renewable feedstocks to deliver sustainable innovations to global markets, he added.

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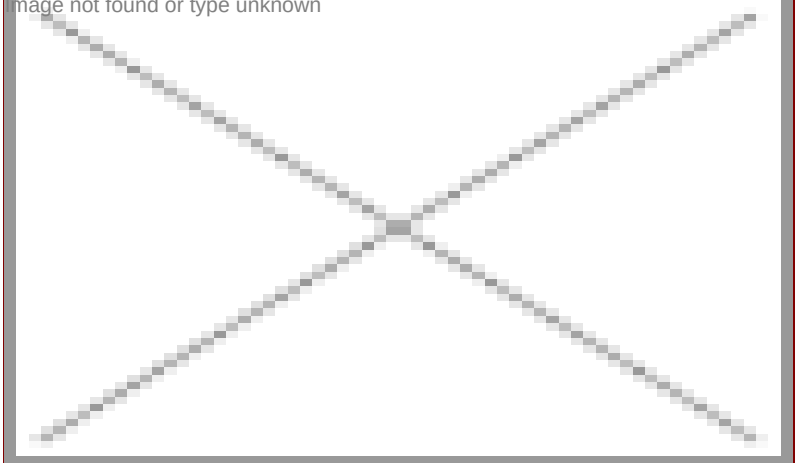

Krishidhan Seeds
Investment: Rs 5 crore
Area: 3000 sq.mt expansion
Location: Jalna

The DKC in India is very important to the global R&D and innovation strategy of DuPont. This center reinforces the importance of India, and the city of Hyderabad, as the emerging center of knowledge excellence, particularly in the new scientific disciplines of biotechnology, bioengineering, bioinformatics, nanotechnology and other emerging sciences. The DKC at Hyderabad will undertake basic research and product application development across all five of the business growth platforms for global and local markets, as well as offer other knowledge services to DuPont businesses.

DuPont today has major plant biotech research centers in Delaware, Iowa and California along with 90 plant genetics research centers around the globe. Globally, DuPont has more than 50 R&D facilities, 20 in the United States and 30 in 11 other nations. The company invests an average of $1.3 billion annually on global research and development in a diverse range of technologies for many markets including agriculture, automotive, construction, electronics, chemicals and industrial materials. Today, DuPont has more than 5,000 scientists and engineers around the world.

Today, DuPont India, with more than 900 employees and growing at more than 25% every year, markets a wide range of products in various market segments. The company has six production facilities in India in three locations for DuPont Crop Protection, DuPont Engineering Polymers, DuPont Refinish, and Pioneer hybrid seeds.

R&D activities in agribiotech is still very nascent in India today and dominated by public institutions such as Indian Council for Agricultural Research (ICAR) and the Universities as opposed to private companies in the developed world. It is very recently that the Indian agribiotech companies started focusing on innovation, and are making huge investments to set up R&D centers in the country.

The Bt cotton leader Rasi Seeds has recently created a new state-of-the-art biotechnology laboratories and crop breeding facilities at Attur, near Salem in Tamil Nadu which has been set up with an investment of about Rs 10 crore. The new R&D facilities have laboratories for biotech research, crops research, germ plasm conservation, insect bioassay laboratory, library and documentation, and other facilities that cover an area of 40,000 sq. ft. The company has created excellent and modern facilities for undertaking crop biotech research with dedicated and proficient scientific staffs. The biotech labs are equipped with all the modern equipment such as PCR machines, refrigerated centrifuges, DNA gel documentation system, various DNA electrophoresis systems including nucleotide sequencing facility, freeze-dryer and various other equipment. A new transgenic greenhouse following the biosafety guidelines of the Department of Biotechnology (DBT) has also been created. In addition, the R&D center is well equipped with infrastructural facilities that include research farm of 140 acres, 5,500 sq. mt. transgenic greenhouse, seed quality control laboratory, and a state-of-the-art seed processing facilities. The center also has a plant molecular biology laboratory for carrying out crop biotechnology activities, a tissue culture facility to undertake genetic transformation of desirable genes in crops is fully functional.

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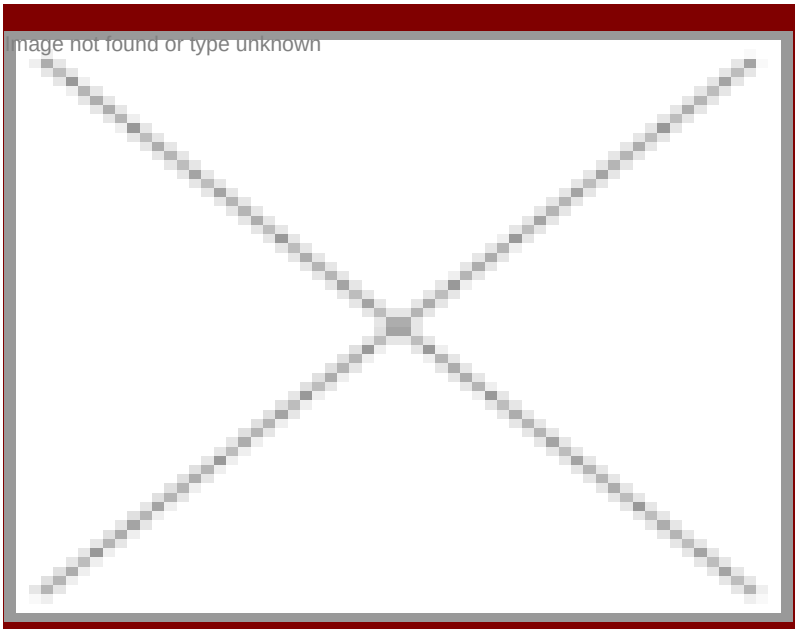

Biovel (R&D and Production facility)
Investment: Rs 50 crore
Area: 1 lakh sq.ft
Location: Bangalore

The main research focus of the research center will be on the use of molecular biology tools such as Marker-Assisted Selection (MAS) in crop breeding, and development of transgenic crops. The emphasis will be on development of DNA markers for complex traits that include quantitative traits such as yield and quality in different crops, and pest and disease resistance in selected crops. Further, genetic engineering techniques will be used for developing resistance to virus diseases in crops such as cotton, okra, tomato and cassava and pest resistance in crops such as rice, brinjal, and okra. Dr V Subramanian, vice president-biotechnology, Rasi Seeds, shared, "The future thrust of our center would be on marker-assisted selection using DNA markers for several important traits in crops such as rice, wheat, cotton and vegetables. This will involve integration of crop breeding and biotechnology including bioinformatics." We also will intensify our transgenic research in different field crops and vegetables for agronomically important traits besides quality traits, he further added.

Krishidhan Seeds too has expanded its R&D operations and strengthened its research facility with additional 3,000 sq.mt building for biotechnology in Aurangabad, Maharashtra and recruited 44 scientists and breeders from public and private sector. The company made an investment of Rs 5 crore in infrastructure of Krishidhan Research Foundation, a 100 percent subsidiary company of Krishidhan, which is completely focused on research. It included improvement of farms, addition of about 100 acres of land, modernization of biotech lab to take up both applied and basic biotech research.

Krishidhan has also created a Gene bank within the company with modern infrastructure for storage and cataloging. Having tackled boll worm complex through Bt, the company has started a consortia mode research for development of resistance against sucking pest hetrosis and drought in cotton. The research team at Krishidhan has also taken the initiative to get insect resistance gene from one of the national institutes of ICAR and started developing IR in key vegetable crops. The program for IR brinjal is now at advanced stage. The company saw a revenue growth of 50 percent over the previous year, 62 percent of this growth came from biotech crops.

Biovel Life Sciences has also expanded its research facility and set up a new production facility in Bangalore. The company has a multi disciplinary research and development center with fully equipped modern infrastructure coupled with highly qualified and accomplished scientists who have made significant contributions in the field. The main focus of its R&D is development of vaccines, biopharmaceuticals and drug delivery. The company aims to add value to the products technically and capture the market through developing biosuperiors from biosimilars using the novel delivery technologies, conjugation technologies, etc. The company has two buildings dedicated for the R&D which are for conducting the molecular biology, protein purification, protein characterization, conjugation techniques, and cell culture work. Biovel is also setting up facilities for research work in drug delivery and monoclonal antibodies. "Our philosophy is to cooperate, collaborate and co-develop, and with that attitude Biovel has entered into the collaboration with several national and international companies for

technology transfers and co-development of products," shared Dr Durgaprasad Annavajulla, director- technical, Biovel Life Sciences. We believe that Biovel will carve out its place through the breakthrough research in the area of biotechnology. To achieve this we are recruiting very prominent scientists who have vast experience in their respective fields nationally and internationally, he added.

Biovel is currently working in the segments of cardiology, endocrinology, vaccinology, dermatology and oncology. Biovel has a long R&D pipeline which mainly includes-the dermal products; streptokinase and pegylated streptokinase for the treatment of myocardial infarction; recombinant human growth hormone-the company obtained the technology with global marketing rights for producing the human growth hormone (hGH) from the Dow Pharmaceuticals, US, which has patented Pfenex expression system. Biovel is working on scale up followed by testing the material in animals and humans and has the patent rights of Dow Pharma in producing the material from the Pfenex system.

Biovel has in house expertise in producing and purifying the polysaccharide vaccines. Hence, Biovel took up the project of producing quadravalent meningitis vaccine and as part of it, Biovel obtained all the strains A, C, W and Y and it is producing all the vaccines and characterizing them. Biovel has already produced and finished the clinical trials of vi-polysaccharide vaccine and is working on conjugation of the polysaccharide vaccine with carrier proteins like Tetanus Toxoid (TT). In addition to this, Biovel is working on the sustained delivery cough syrup formulation, which could lead to a patent and the company is taking up several other projects like erythropoietin, interferon, and pegylated GCSF, which are at the early stage of research.

Biovel is also developing a department which has the major focus on the delivery systems, either by inventing or by using the expired patents. Further, the company is entering in the areas of peptides and monoclonal antibodies in the coming years.

Looking ahead

More companies will be tempted to set up their R&D centers in India, and thus benefit from the advantages that India has to offer. There are already many examples of R&D centers doing quality work over here. The Indian government has also been instrumental in helping the domestic players and the MNCs to set up such centers in India, and is helping them with tax exemptions and other incentives. While other Asian countries are emerging as a major manufacturing hub for biotech products, India is heading towards becoming a global R&D hub for the life sciences industry. Many hope that this trend will continue, and that there will be a regular supply of skilled manpower.

While it's still relatively early in the movement of R&D to India but with a focused and a long-term R&D vision, policy framework and commitment coupled with the incentives which the Indian government is offering, can go a long way in branding India as the R&D hub of the of the biotech world.

Jahanara Parveen with inputs from Nayantara Som

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Dr M Ramasami, Managing Director, Rasi Seeds

Give us an estimate of Rasi Seeds' recent and future investment programs?

Rasi Seeds has invested around Rs 10 crore for the present R&D center and our future investments for biotechnology and crop research is expected to be around Rs 15 crore.

What is the idea behind setting up this biotechnology research center at Attur?

The center has the state-of-the-art biotechnology facilities established in rural area, and thus is one of the first of its kind. The center will undertake farmer-oriented biotech research and thus was established in an intensive agricultural area.

What are some of the major changes witnessed in the Indian bioagri R&D?

Agribiotech sector witnessed remarkable and successful adoption of insect-protected Bt cotton as the first biotech crop in India which is by far the largest adoption in the world on year to year basis. The transgenic technology was well adopted by the Indian seed industry, particularly for cotton that resulted in high yield of seed cotton to farmers, with increased income. Currently India enjoys the status of an exporter of cotton, from an importing country earlier. Thus considering the substantial benefits realized by farmers through biotech cotton, the adoption of biotechnology will be very useful for crop improvement of all the crops in the future.

What are the growth areas and opportunities for R&D in India?

The major areas would be development of transgenic food crops that reduces the losses in yield due to pests and diseases. The other area is complementation of biotech tools in crop breeding that will facilitate crop improvement, particularly for complex agronomic traits such as yield and quality of the crop. Further, diagnostics for the viral and fungal diseases is an important area by which suitable measures can be taken to protect the crop. Thus in order to infuse the biotechnology in agriculture, seed industry should be ushered for adoption and government should recognize the role of seed industry, as seed is the main carrier of technologies.

Public and private agribiotech sectors should work together to address the challenging problems to meet the demand of the farmers and consumers. It is expected that government shall consider investing more on agribiotech research.

Can you share some information on India's regulatory environment and its implications for R&D?

The regulatory system has evolved well based on the experience of transgenic cotton. However, in order to encourage the agricultural sector to develop new transgenic food crops to meet the high demand for food and to increase crop productivity, the regulatory system should facilitate such research activity, but with full biosafety considerations.

Can you outline how Rasi plans to leverage on the industry growth?

Since the agribiotech sector is cost-intensive and technology-oriented we would seek the collaboration of mentor institutions in the country as well overseas, to adopt the best and viable technologies in crop improvement that will be beneficial to the farmers and consumers.

Jahanara Parveen