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'Next decade is going to be crucial for seed industry'

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Next decade is going to be crucial for seed industry

Last decade was the land mark decade for the seed industry. The biotechnological intervention in crop breeding has brought a new dimension. The launching of Bt cotton in India has changed the face of seed industry. With `4,000 crore cotton seed market, the seed industry's total value today is more than `13,000 crore, which is a growth of more than 100 percent. The double digit growth per year of the industry has placed India in the fifth position in the global seed scenario. The single cross hybrids in corn have increased productivity from 1.8 ton/ha to 2.4 ton /ha and production to 22 million ton. The molecular breeding tools played important role to bring these improvements. Rice hybrids of the private sector are expanding and increased productivity of the eastern India by more than one ton/ha. Vegetable seeds created another land mark by touching the value of `3,000 crore. The total vegetable production in the country has reached 150 million ton with a record increase during last decade. The last decade was the golden era for the seed industry, as it helped the country to achieve cotton production from 13 million bales to 36 million bales, corn production from 12 million ton to 22 million ton and vegetables from 105 million ton to 150 million ton. This phenomenal growth has encouraged seed companies to invest in R&D in a big way. Most of the companies have established their state-of-the-art biotech centres, large breeding stations, and international collaborations for technologies. Both multinational and Indian companies are working together to bring better hybrids/varieties for the Indian farmers. By using molecular and other cell biology techniques, the new hybrids with resistance to biotic factors are helping farmers to get higher yields with low inputs.

The next 10 years are going to be very crucial for the Indian agriculture, particularly the seed industry. The production of food grain in 2011-12 has touched an all time high and reached almost 260 million ton, with increased production of wheat and rice. This happened due to better quality of the seeds and good monsoon.

The three challenges for the Indian agriculture are declining land holdings, abiotic and biotic factors and climate changes. To overcome these challenges, we need new and diversified germplasm for breeding. The new Convention on Biological Diversity (CBD) regime and National Biodiversity Authority (NBA) in the country are restricting the free flow of germplasm. There is hardly any germplasm exchange happening between National Bureau of Plant Genetic Resources (NBPGR) and

private sector. This will certainly slow down the development of new hybrids required by the farmers under multiple stresses.

The biotechnological tools will play the key role in breaking the yield barriers in future. After the moratorium on Bt Brinjal, the uncertainty on these technologies slowed down the investments in new technologies. The three challenges in development and usage of technologies in agriculture are requirement of expensive infrastructure, most of the technologies are patented and protected and long gestation period for commercialization and also regulatory policies.

The multinational companies are making huge investments in these technologies and creating strong Intellectual Property (IP) around them. The regional companies, who are rich in germplasm and doing very good conventional breeding can't afford to invest heavily on these technologies and IPs. They have to depend either on public institutions or on the multinational companies for licensing these technologies. For achieving higher food production targets, higher seed replacement rate is required to ensure that the best quality seed goes to the productive soil. Both public and private sector have to come together and contribute for this mission. The degradation of soil due to continuous depletion of important nutrients, deepening of the water table, salinity, seasonal temperature fluctuations are the key abiotic factors which are going to challenge the agriculture scientists to develop new cultivars which can resist these stresses. On the other side, the insect pests, fungal, viral and bacterial diseases are becoming more virulent and causing biggest threat to our food production systems. The climate shifts and changes are allowing these organisms to adapt faster than the complex crop plants genetics. The breeders have to develop resistant cultivars to these diseases and that too in less time.

The only solution is to use new technologies to shorten the breeding cycles. Many of the resistant genes are not available in the crossable species and also difficult through conventional breeding. So, we have to adopt the gene introgression technique. The marker assisted breeding and selection and also cell biology tools can play important role in assuring important traits in hybrids. The other big issue is the policy ecosystem to regulate the agriculture in the country. With the changing requirement of the research, seed production and seed delivery system, the policies require continuous modifications. The present regulatory regime is more directed towards controlling the seed businesses rather than regulating it. The CBD laws, the germplasm exchange, technologies usage, differential policies of states are creating new challenges for the seed industry. From the very open environment, which was available to the seed industry a decade back, has now become a very close and tight system which may stifle the growth of seed industry. To encourage high investment in agriculture, we need transparent and predictive policies. There should be central agricultural policies and all state should follow the same to avoid duplicity of the efforts.

The government is keen to get the "National Food Security Act" bill passed through parliament. Though at present we have more than 75 million ton of wheat and rice reserve stock, due to poor condition of storage we discard sizable quantities from these stocks. Once this food is distributed through the food security act, we essentially need sustainable production of food. Biotechnological tools are going to play an important role in breaking the yield plateau in different crops.