



भारतीय कृषि एवं खाद्य परिषद्
INDIAN COUNCIL OF FOOD AND AGRICULTURE

NATIONAL ROUND TABLE OF CEOs ON INDIAN PLANT PROTECTION



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HOTEL TAJ PALACE, NEW DELHI



INDIAN PLANT PROTECTION MARKET OVERVIEW

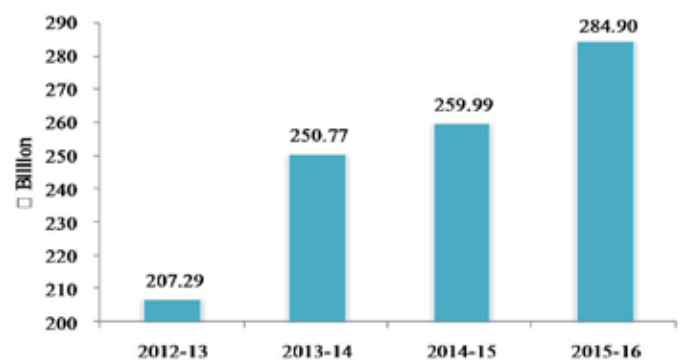


India is world's second largest nation with a population of 1.3 billion, which is approximately 18% of the Global population. Rising population has led to increasing food demand. To meet the food & nutrition needs of a growing population requires a sustainable approach that puts thrust on increasing productivity against the background of lower yields & decreasing farm sizes. It requires a push from all stakeholders – the farmer, the government and the agrochemical industry collectively so that the changing needs of the nation are met. Approximately 25% of the global crop output is lost due to attacks by pests, weeds and diseases which doesn't predict well for farming given the critical challenges ahead and thus agrochemicals have an increasing role to play.

INDIAN PLANT PROTECTION MARKET BY VALUE

India is the fourth largest global producer of agrochemicals after the U.S., Japan and China. This segment generated a value of ₹279.27 billion in 2015-16, increasing at a CAGR of 8.28%.

Indian Plant Protection Market by Value;2012-16

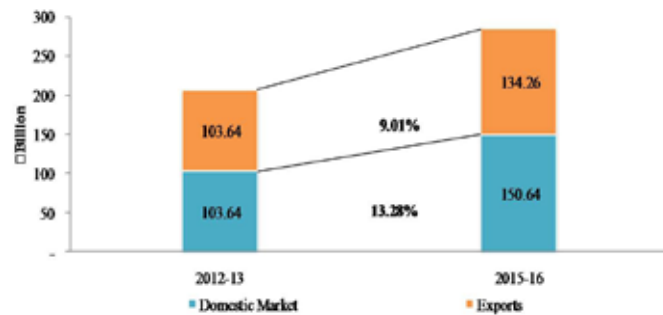


Source: FICCI, Tata Strategic Management Consultants and ICFA

2015-16 has been a challenging year for crop protection chemicals market in India. As per Economic survey of India, agriculture sector has grown by 1.1% in 2015-16. The country faced weak monsoons with rainfall falling 12% short of expectations. A number of states were affected by drought like conditions especially during the Kharif season. 2015-16 has been a stagnant year for Indian crop protection industry.



Indian Plant Protection Market by Consumption Pattern; 2012-16



Source: FICCI, Tata Strategic Management Consultants

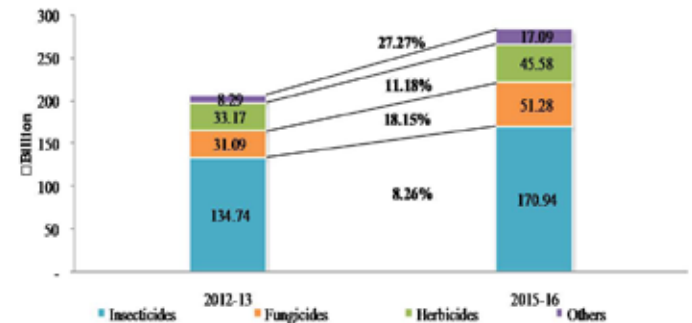
Approximately 50% of the demand comes from domestic consumers while the rest goes towards exports. The domestic demand is expected to grow at 6.5% per annum and exports are estimated to grow at 9% per annum during the same period.

INDIAN PLANT PROTECTION MARKET BY SEGMENTS

The Indian plant protection market can be categorized into insecticides, herbicides, fungicides and others, which includes bio-pesticides.

The market is dominated by insecticides, which form almost 60% of domestic plant protection chemicals market. The major applications are found in rice and cotton crops. Fungicides and herbicides are the largest growing segments

Indian Plant Protection Market by Consumption Pattern; 2012-16



Source: FICCI, Tata Strategic Management Consultants

accounting for 18% and 16% respectively of total crop protection chemicals market respectively.

As the weeds grow in damp and warm weather and die in cold seasons, the sale of herbicides is seasonal. Rice and wheat crops are the major application areas for herbicides. Increasing labor costs and labor shortage are key growth drivers for herbicides.

The fungicides find application in fruits, vegetables and rice. The key growth drivers for fungicides include a shift in agriculture from cash crops to fruits and vegetables and government support for exports of fruits and vegetables.

Bio-pesticides include all biological materials organisms, which can be used to control pests. Currently bio-pesticides

Major Plant Protection Chemical Products

MOLECULE	TYPE	APPLICATION	CROPS
Acephate	Insecticide	Control of severe infestations of sucking & chewing insects	Chillies, Vegetables, fruits & cereals, tobacco
Chlorphrifos	Insecticide	Control of fruit borers, stem borers & leaf eating caterpillars	Cotton, pulses, oilseeds, rice, etc.
Dinotefuran	Insecticide	Control of Brown plat hoppers in rice	Rice
Fipronil	Insecticide	Control of rice stem borer, diamond moth	Cole Crops, Sugarcane, Chilli
Flonicamid	Insecticide	Control, of all aphid species	Apples, peaches, wheat, potato, vegetables
Imidacloprid	Insecticide	Control of sucking pests-aphids, jassids, whitefly, brown planthopper	Cotton, rice & vegetable crops
Glyphosate	Herbicide	Control of weeds and grasses	Variety of crops
Quizalofop	Herbicide	Control of narrow leaf weeds	Broad leaf crops
Hexaconazole	Fungicide	Control of powdery mildews, rusts & leaf spots	Cereals, Oil Seeds, horticultural & plantation crops
Tricyclazole	Fungicide	Control of leaf blast, node blast & neck blast	Rice

Source: Tata Strategic Management Consultants and Company Reports

constitute only 3% of the Indian plant protection market; however there are significant growth opportunities for this product segment due to increasing concerns of safety and toxicity of pesticides, stringent regulations and government support.

MARKET DRIVERS & OPPORTUNITIES

Generic Products

Large proportion of the agrochemical market is expected to go off-patent by 2020. This provides significant export opportunities for Indian companies which have expertise in generic segment. Top 6 importing nations constitute only 44% of India's agrochemical exports. This also indicates export potential for Indian companies. In order to build a strong export base, companies could set up marketing offices in association with domestic players in export geographies. Companies could also look for strategic alliances with local companies to expand their marketing and distribution reach. Merger and acquisition opportunities could also be explored to increase their global presence.

Low Pesticides Consumption

The per hectare consumption of pesticides in India is amongst the lowest in the world and currently stands at 0.6 kg/ha against 5-7 kg/ha in the UK and almost 20 times with approximately 13 kg/ha in China. In order to increase yield and ensure food security for its enormous population agrochemicals penetration in India is bound to go up.

Growth in Herbicides and Fungicides

Labor shortage, rising labor costs and technological interventions has led to growth in the use of herbicides. The herbicide consumption in India stands at ₹45.58 billion in 2015-16 and is expected to grow at a CAGR of 15% over the next five years. On the other hand the fungicide industry in India has grown due to the growth in Indian horticulture industry, which has grown at a CAGR of 7.5% over the last five years.

MARKET CHALLENGES

Non-Genuine Products

There is a significant share of non-genuine pesticides, which include counterfeit, spurious, adulterated or sub-standard products. According to industry estimates the non-genuine pesticides could account for more than 40% of the pesticides sold in India in 2014-15. These products are inferior formulations which are unable to kill the pests



or kill them efficiently. They also result in by-products which may significantly harm the soil and environment.

Apart from crop loss and damage to soil fertility, use of non-genuine products leads to loss of revenue to farmers, agrochemical companies and government. Some of the key reasons for use of non-genuine products are lack of awareness amongst the farmers, difficulty in differentiating between genuine and non-genuine products, supply chain inefficiencies, law enforcement challenges and influencing power of distributors/retailers.

Low Focus on R&D by Domestic Manufacturers

R&D for novel molecule discovery requires huge capital and manpower investments. Indian Companies spend only 1-2% of their revenues in Research and Development as against the global MNCs which invest about 8-10% of their revenues. This makes Indian manufacturers uncompetitive globally in specialty molecules.

Lack of Education and Awareness among Farmers

It is important to educate the farmers about the appropriate kind of pesticide, its dosage and quantity and application frequency. However it is not easy to reach the farmers owing to differences in regional languages and dialects and a general inertia towards adoption of newer products on account of possible risks of crop failure.

The main point of contact between the farmers and the manufacturers are the retailers who don't have adequate technical expertise and are thus unable to impart proper



Indian Plant Protection Market Key Players

Company	Insecticides	Herbicides	Fungicides	Others
BASF India	√	-	√	Seed Treatment
Bayer Crop Science Ltd.	√	√	√	Seed Treatment, Plant Growth Regulators
Dhanuka Agritech Ltd.	√	√	√	PGRs, Surfactants
Dow AgroSciences India Pvt. Ltd.	√	√	√	Plant Growth Regulators
DuPont	√	√	√	Growth Enhancer
Excel Crop Care Ltd.	√	√	√	Seed Treatment, Home & Garden
Gharda Chemicals Ltd.	√	√	√	Plant Growth Regulators
Mrghmani Organics Ltd.	√	√	√	Pesticide Intermediaries
Monsanto India Ltd.	-	√	-	Maize Seeds
Nagarjuna Agrichem Ltd.	√	√	√	Fertilizers, Micro Nutrients, Liquid Fertilizers
PI Industries Ltd.	√	√	√	Speciality Products
Rallis India	√	√	√	Rodenticides, Seed Treatment
Syngenta India	√	√	√	Seed Treatment
United Phosphorus Ltd.	√	√	√	Fumigants, Rodenticides

Source: Tata Strategic Management Consultants and Company Reports

product understanding to the farmers. It is also very difficult for the farmers to convey their needs effectively to the manufacturers.

Need for Efficient Distribution Systems

The large number of end users and the predominantly generic nature of the market make it essential to have a strong and efficient distribution network for the plant protection market. However, the industry has been plagued by problems arising out of supply chain inefficiencies and inadequate infrastructure which result in postharvest losses estimated at ₹450 billion every year. Lack of efficient distribution system also makes it difficult for agrochemical companies to reach out to the farmers and promote their products and educate them about their benefits.

MARKET COMPETITIVE LANDSCAPE

The Indian plant protection industry is dominated by generic products with more than 80% of molecules being non-patented. This results in very low entry barriers for the industry. Hence, strong distribution network, appropriate pricing, brand recall and dealer margins are some of the critical factors for companies to succeed. Plant protection chemicals are manufactured as technical grades and converted into formulations for agricultural use.

The Indian Agrochemical value chain comprises of

technical grade manufacturers, formulators producing the end products, distributors and end use customers. According to the Pesticide Monitoring Unit, GOI, there are about 125 technical grade manufacturers, including about 10 multinationals, more than 800 formulators and over 145,000 distributors in India. More than 60 technical grade pesticides are being manufactured indigenously.

In India top ten companies control almost 75-80% of the market share. The market share of large players depends primarily on product portfolio and introduction of new molecules.

CONCLUSION

The crop protection industry is expected to grow at a significant CAGR during 2015-2020 as a facilitator of the Indian agricultural sector. The opportunities for the Indian plant protection industry will come from exports, higher production of generic products, product portfolio expansion, and growth in herbicides and fungicides. In coming years, the need for safe and effective use of crop protection chemicals will increase to brace with larger climatic variations and emergence of new invasive insects, weeds and diseases. Hence, it is important for companies to invest in science and practices which promote safe and judicious use of crop chemicals.



DELIBERATIONS



India loses agricultural produce worth over ₹1 Lakh Crore annually. Crop protection products hold key to save crop losses and thus contributing to the national food security and doubling farmers' income. Given its importance, ICFA hosted a National Round Table of Plant Protection at Hotel Taj Palace in New Delhi on February 17, 2017. The main purpose was to provide a common platform to private players, government officials and heads of research and academic institutions in the sector to have loud thinking over the issues and concerns as well as the steps the steps required to overcome them, with major focus on ensuring that only genuine and quality products go to the market and are available to the farmers or producers.

The conference was chaired by Dr. A. K. Sinha, Plant Protection Advisor to the Government of India in the

presence of Mr. Salil Singhal, MD, Pesticides India, Mr. R.G. Agarwal, Chairman, Dhanuka, Mr. Raju Kapoor, Director, Dow AgroSciences India, Dr. Nutan Kaushik, Area Convenor, TERI and many other eminent personalities from the plant protection sector. In all twenty five senior executive members of Government associations, scientists along with policy makers and corporate heads were present and participated in the deliberations.

Dr. M. J. Khan, Chairman, ICFA, opened the session welcoming all the dignitaries and underlining importance of crop production in agriculture and focus that the government is giving to this sector. He flagged some of the key issues of plant protection sector like spurious or substandard products, import and export of molecules, regulatory and related issues.



Dr. A. K. Sinha, Plant Protection Advisor, Government of India, highlighted the critical challenge for country, as 60-70 per cent of farmers fall under the marginal category (i.e. <1 ha land) and were inadequately addressed due to many reasons. He mentioned that majority of farmers were unaware of plant protection measures, stakeholders working in the sector and various activities being performed by them and to overcome this constraints and to take benefits down to farmers, participatory approach was required, which would bring to light their needs, requirements and capacities. He discussed the losses caused by different pests i.e. weeds (33%), diseases (26%), insects (20%), rodents (2%-5%) and stored grain pest (6%). He further briefed the house about various activities being undertaken by Government of India to ensure and to promote plant health through its various organizations like Bio-pesticide and pesticide registration committee, Directorate of PP and Quarantine, quarantine stations, state machinery (insecticides inspectors) to implement Quality control act, central insecticides lab with its regional labs and eight institutes for bio-pesticides analysis.

He suggested a two point strategy to combat pests in agriculture; 1) promoting judicious use of pesticides and integrating cultural, agronomical, mechanical and biological methods to manage pests rather than trying to control them, and 2) making sure that new pests do not enter our agri-ecosystem by adopting proper quarantine methods. He urged our strategies should be farmer centric through participatory planning and strengthening linkages of extension and research with farmers as well as establishing forward and backward market linkages to benefit farmers.

Mr. Raju Kapoor, Leader-Corporate Affairs, Dow AgroSciences India, stressed the importance of agrochemicals for plant protection considering the fact that they come into play after all other major investments have been made. He quoted that crop produce worth ₹140 thousand Crores is lost every year; hence collaborative efforts are required to reduce the losses and increase production and returns to farmers. It was brought to light that in India average pesticide usage stood at 600gm/acre which was one of the lowest in the world. Speaking of importance of

safety of food chain and need to produce safe food he mentioned that with application of safe new molecules (pesticides) faster availability of molecules (pesticides) to farmers need to be ensured.

Talking of research and development of pesticides in India, he underlined that till now not even a single safe molecule has been developed indigenously. Therefore, R&D in crop protection sector needs to be strengthened. The need to promote safe and judicious use of pesticides through extension agencies and make the farmers aware of what, how and when to use and in what quantity was emphasized. Referring to a report by Dr. KK Sharma regarding perception about crop protection industry, he underlined that in India less than 2 per cent tested samples exceed MRL limit which is far less than US and Europe. He emphasized on need to harmonize quality system in the country and harmonizing the acts and their implementation by states. As majority of farmers (around 80 per cent) refer to dealers for advice regarding pesticide usage, at last he revealed their company will soon be starting an online cloud based system for dealers' training.

Mr. R.G. Agarwal, Chairman, Dhanuka, criticized the thought of failed extension system in the country particularly in regard to plant protection and therefore, urged the private firms to step into the field of extension. He drew the attention of house towards dealer training programme started by them with MANAGE, Hyderabad and also subsidized by them. He also put to notice that similar programme was initiated at subsidized rate in three universities of Gujarat, which was now running as full course and with no subsidy. He desired some concrete suggestions to go to universities from this platform to take up such programmes, which can also be used to issue dealer license. He affirmed with the already talked of severe losses due to various pests.

He opined the need to shift focus from Integrated Pest Management (IPM) to Integrated Crop Management (ICM) i.e. from sowing to harvesting. He also voiced that government should evaluate the outcomes against investment made by it in agriculture and its extension system, as he quoted the example of soil health card which were issued to farmers but were not utilized to provide practical suggestions to farmers, thus



diluting implementation. He also raised the issue of substandard and spurious pesticides in the market. Bio pesticides available in market contain cocktail of pesticide molecules and majority of samples tested were of reputed firms against hundreds of licensed issued. According to report by FICCI, 25- 30 per cent of pesticides available in market are spurious. He thus advocated the need to strengthen the mechanism to ensure that only genuine and quality products are available in the market.

Dr. A. K. Sinha, made a remark that State Governments being the actual implementation agencies were responsible and he clarified that samples can be taken from anywhere in supply chain and not only from retailers. He also mentioned that a strong mechanism is required to check vested interest of involved functionaries. To overcome the disparity in samples drawn, state could be asked to maintain a database of issued licenses with number of samples drawn from respective licensee.

Mr. Salil Singhal, MD, Pesticides India, spoke of a critical need for collating the data base of registrations made till date with categories and monitoring the process of registration. He opined that a stringent mechanism was required to regulate the registration process to make sure that an adequate information and discussion should be given to the products. Registration Committee should identify its vision and mission as well as should evaluate its current registration processes and system to ensure that these are really robust and process based with well-defined

and detailed Standard Operating Procedures to evaluate data. He stressed on use of information technology in regulatory management. Pointing to the fact that maximum complains in agriculture pertain to spurious pesticides thus, quality management by enforcing and adopting good management practices in pesticides manufacturing particularly in the formulation industry (GMP & GLP) was necessary. He also mentioned the flaws in registration system as same molecule was registered in different names with different dosage etc. There should also be a mechanism to check illegal dealings in the market.

He underlined an urgent need to manage innovations in agrichemical industry as documentation of innovation as well as recognition and benefits to innovator were necessary for further R&D whereas returns to spurious sellers will restrict the growth of this sector. SPS issues and MRL for import of pesticides must be catered. He further called it a high time that government comes up with a well defined National Pesticide Policy.

Mr. Ankur Agarwal, MD, Crystal Crop Protection, underlined in general the need to focus on how yield improvement could be achieved and what are the ways to resolve bureaucratic and implementation challenges. He urged to decide on implementation strategy and devise a clear path for technological reforms. He affirmed with already discussed points of monitoring the issue of registration certificates. Besides talking about reforms required in registration and its implementation, he mentioned about creating awareness among customs authorities regarding



certificate requirement for imports and exports.

Dr. P.P.S. Pangli, Chairman, UFEI, cited the importance of availability of authentic and quality seeds for healthy crops and safe produce, for which NSC through its network of regional seed banks can play an important role. He stated that various plant protection measures and GAP should be communicated to farmers by mass media like programmes on DD Kisan channel. He also mentioned about the International seed vault at Netherlands to preserve the seed of traditional varieties by freezing them for 1000 years, a facility which the government should be actively availing.

Mr. Ankur intervened to point out that the talks by specialist on television surprisingly still mention DDT, BHC and other old pesticides and the Package of practices (PoPs) offered by SAUs were not updated. Mr. Singhal invited suggestions for improvement of 80 IPM packages which were being framed. Dr. Sinha made it clear that if outdated or banned chemicals were promoted or were advised, that amounts to an illegality.

Many participants intervened one by one targeting strong exception on the issue by universities recommending specific brands of pesticides against numerous registered ones primarily of their own reasons of generating revenue by testing the pesticides in their local conditions but in the process end up creating unethical market practices.

Mr. Sanjay Chhabra, VP, DCM Shriram, clarified that although Central Insecticide Board and Registration Committee (CIB&RC) require phytosanitary certificate data to approve any product but SAUs operating under ICAR system need to test them in their local conditions before recommending it in their PoPs, which he himself and house considered it as a disregard to the competencies of CIB&RC. It was also felt as to why the universities may not test a new pesticide launched in the market on its own for its recommendation or otherwise rather than firm taking it to university for testing and paying charges for the same. The participants felt that this distortion needs to be addressed.

Dr. Nutan Kaushik, Area Convenor, The Energy and Resources Institute (TERI), suggested that a copy





should be forwarded to all the SAUs whenever a new molecule is registered with CIB. To this, it was mentioned that all the details are regularly update on website of the organization.

DGM Marketing, IndoGulf Crop Science, suggested using only technical or generic name instead of any brand names in package of practices of SAUs.

Dr. MJ Khan intervened giving suggestion that considering the overwhelming feeling of the house on this issue; ICFA shall take this matter up with DDG (Crops) and DDG (Education) for seeking appropriate redressal of the matter.

Mr. Vipin Saini, Pesticide Regulatory Affairs-India, highlighted the need to introduce and integrate the new technologies in agrochemical industry like nano-technology for pesticides and biotechnology for seed treatment or other technologies which might be available in the world and were unaware to the Indian farmers. But this adoption would require appropriate knowledge and mechanism. He further pointed out the dearth of qualified functionaries like regulatory chemical specialist, radiologist and experts other than scientist to improve the pace of development of this sector.

It was also suggested by house that universities should have specific courses for regulators to overcome the shortage of qualified regulatory functionaries.

Mr. N.S. Randhawa, ED, ICFA, referred to the reality of India supporting more than 17.50% of world's population with less than 2.4% land and 4% water resources and the fact that by 2022 India is likely to surpass China in terms of world's most populous country. As such ensuring sustainable food and nutritional security shall remain a continuing challenge for the Indian Agriculture. In this context, the focus on productivity, production quality and the essential technologies associated with that including the agrochemicals just cannot be diluted.

There was however utmost need that only genuine and quality products are available to the farmer and the farmer is fully satisfied on their safe and proper usage



along with best agronomical practices to ensure not only his own health and safety, safety of environment but also to produce safe food for the consumers. This would call for a harmonious balance between the regulatory regime, industry, distribution, extension systems, research systems and the farmers which was precisely the aim behind the present brainstorming.

In his concluding remarks, Dr. MJ Khan mentioned about the unavailability of facts of registration till date with CIB&RC would definitely be taken up by the concerned authorities and Dr. Sinha affirmed to it. Further Dr. MJ Khan ensured that issue of testing of pesticides with SAUs would be taken up by with DDG (Education) in ICAR and he made a call for development of the industry and benefits to farmer by working together from the platform of WG on Crop Protection.

Formal vote of Thanks was presented by Ms. Mamta Jain, Director - Corporate Affairs, ICFA and she expressed gratitude to Dr. A.K. Sinha for sparing his valuable time and chairing the RTC. She thanked all the participants for their earnest input and making the session worthwhile.



RECOMMENDATIONS

1. Promoting judicious use of pesticides and integrating cultural, agronomical, mechanical and biological methods through Integrated Pest Management (IPM) to manage pests rather than trying to control them is a pre-requisite for quality food production as well as for Integrated Resistance Management (IRM) and Integrated Crop Management (ICM). Government have been making utmost efforts through various schemes for the same, but it needs to be strengthened both in terms of scope and scale through joint efforts with crop protection industry. However, in order to sensitize farmers, awareness campaign for farmers needs to be initiated with demonstrations for practical exposure to farmers regarding various practices and methods of managing pest. Efforts of the industry have been laudable in this regard. More sustained farmers reach out programs with CSR funds need to be taken up. A public system led pest surveillance and early warning system should be set up on localised basis across geographies to support farmer's decision to protect his crops.
2. The system of molecules registration needs to be streamlined with an aim to restrict flooding of markets by 'Me-too products' on one hand and speedy registration of new molecules on the other hand. This system while saving the time on making newer molecules available to the farmers will also help in regulating the markets, making the job of quality enforcement easier and effective. The system of import regulations need to be revisited to make it more stringent for healthy system to work and farmers to get new molecules to meet their crop protection challenges more effectively
3. It takes nearly 15 years and US\$270 million to develop one new crop protection molecule. With global trends about developing environment friendly and green chemistry based molecules by the industry to offer safe molecules for managing pests as part of the IPM and eco-farming systems, Government of India needs to create a special R&D fund for indigenously developing newer molecules under public private partnership. Jointly funded R&D projects with the industry are required for India to take advantage of rapidly growing global market for green chemistry based safer products. However success rate of such initiatives in any other countries, if already tried need also to be critically assessed beforehand along with specific opinion of the industry.
4. It is evident that input retailers are more important information sources than public extension system. As such their knowledge enhancement cannot be ignored. Considering the same, Government has already notified mandatory minimum qualification for dealers' and their employees along with the timeline vide G.S.R. 106(E), dated 1st February, 2017. Also on its basis dealers' licenses will be renewed. Further, government in consultation with industry should immediately arrange for the training of dealers at universities country wide so as to enable them to provide appropriate information to farmers in PPP mode and till these trainings are executed, this time period should be extended. Further, states need to make funding provisions under RKVY or Extension Budget and collaborate with the industry, NGOs and universities for aggressively implementing DAESI training programs to cover all the dealers.
5. There is a dearth of qualified functionaries like regulatory toxicologists, chemical specialists, radiologists and experts other than scientists to improve the pace of development of registration, regulation and quality control functions in this sector. Lack of appropriately qualified quality human resource is one major hindrance in speedy registrations and effective quality enforcement. As such the government needs to address this gap by having specialised courses in select universities and institutions along with putting in place systematic training facilities for regulatory regime.
6. It is necessary to relook into the registration process of pesticides and is required to be completely revamped. Registration Committee should maintain



- a database of the registrations issued by it so far. Moreover, due to frequently changing guidelines, and lack of clarity pertaining to the registration process, combined with lack of qualified human resource, the registration of pesticides has become non transparent. It is recommended that a high powered committee comprising of top notch experts who have not been connected with the Registration Committee be appointed to revamp the entire registration process.
7. There is a need to review practice of SAUs retesting the pesticides for recommendations, as part of local package of practices for farmers, even after registration with CIB&RC. This process only adds to the costs and limits farmers' options to choose from a wide range of molecules. This matter needs to be taken up with DDG (Crops) and DDG (Education) of ICAR for seeking appropriate redress of the matter. Further, the state governments have to be sensitized to follow the recommendations of the registration committee, which are applicable all over the country.
 8. Quality enforcement of agrochemical products is one major issue facing the industry for a long time. It is observed that in many States a nexus exists among sampling inspectors, laboratories and spurious companies. There is need to make functioning of the system more effective, transparent and accountable, wherein quality manufacturers are encouraged and 'fly-by-night' players punished. This can be done by introducing system of joint testing of 3rd sample with the disputing party and by making laboratories accountable, if difference of results is found repeatedly. Also, Centre has around 150 notified inspectors; by giving proper training to these inspectors they can draw the samples of spurious pesticides and bio products laced with chemical pesticides. In addition the monitoring and punitive regime under the relevant act and regulations need also to be effectively implemented to act as a deterrent against illegal and unregulated operations.
 9. Producing safe food is also a function of how a molecule is used at the farm. Central and State Governments, Extension wings of SAUs and private industry are already rendering Farm Service through various programmes like farmers' training, field demonstrations, distribution of product literatures, slide shows, on spot solutions etc. This needs to be further strengthened. Also, adequate awareness/training of pesticide dealers be undertaken on safe and judicious use of pesticides very urgently, preferably in PPP mode. Moreover, an awareness campaign must be run for the general public to be aware of the advantages of protecting crops and the regulatory processes to change the perception about the use of pesticides, in particular the safe molecules.
 10. Generation of Residue and Persistence data for fixation of MRL values for pesticides on various crops costs a lot of money and are sometimes repetitive. Therefore, internationally, Crop Grouping system is used so that the required research work can be carried out on representative crops from various Crop Groups instead of generating data for each and every crop every time. This system which is already understood to be under review in India needs to be standardised and put in place at the earliest.
 11. Despite a lot of efforts from the Government as well as pesticide industry and constitution of an Expert Committee to streamline the procedure of export registrations, there is hardly any tangible improvement in this respect so far. This process needs to be expedited so that exports of plant protection products make rapid strides. Exports will not only earn foreign exchange for the country but will also contribute to the rapid and healthy growth of plant protection manufacturing activities in the country in larger interest of Indian agriculture.



LIST OF PARTICIPANTS

1. Dr. A.K. Sinha, Plant Protection Adviser, Government of India
2. Dr. Nidhi Dubey, Assistant Director, Department of Quarantine, Government of India
3. Mr. Rajendra Kumar, Manager, Crop Protection, Tata Chemicals
4. Dr. Nikhil Agarwal, Managing Director, Ichiban Crop Science Ltd
5. Mr. Maneesh Anand, CEO, Mithla Industries.
6. Mr. Sanjay Chhabra, VP, DCM Shriram
7. Mr. Vipin Saini, Pesticide Regulatory Affairs-India
8. Mr. Raju Kapoor, Leader- Corporate Affairs, Dow AgroSciences India
9. Mr. Vishwajeet ED, Centre for Good Governance
10. Dr. P.P.S. Pangli, Chairman, UFEI
11. Mr. Jitendra Mandrah, Food Chain Manager , Bayer CropScience
12. Mr. Bimal Shah, Director, Sulphur Mills
13. Mr. Sahib Singh Cheema, Business Development – Pesticide, Tata Chemicals
14. Mr. Sukhbir Singh Malik, AVP- Business Development and Marketing, Tata Chemicals
15. Mr. Sudhanshu, DGM Marketing, IndoGulf Crop Science.
16. Mr. Sanjay Jha, Director, SM Edagum Biotech
17. Mr. Reza Jivani, Managing Director, Vikas Crop Care
18. Mr. Prabhakar Gaur, Director, Gaur Frozen Agro Foods
19. Mr. Rajat Thakur, VP Plant Protection, DCM Shriram
20. Mr. S. Chander, Senior manager, Insecticides India Ltd.
21. Mr. P.C. Pabbi, Vice Chairman, Insecticides India Ltd.
22. Mr. Salil Singhal, CMD, Pesticides India
23. Mr. R.G. Agarwal, Chairman, Dhanuka
24. Mr. Ankur Agarwal, MD, Crystal Crop Protection
25. Dr. M.J. Khan, Chairman ICFA
26. Mr. N.S. Randhawa, ED ICFA
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