



# AR/261 : Monocrotophos SL - Specification

Action Research Project : Revision of Standard

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## Introduction

India being a country of farmers and farming, its significant part of GDP comes from agriculture sector. But, being a third world country our farming community has faced challenges in terms of production, productivity, profitability, technological innovation and market instability. After the Green Revolution, with the objective of bulk production the farming community shifted towards the use of chemical based pesticides such as insecticide, weedicide, fungicides etc. These steps seemed historic and revolutionary at that point of time, when our per capita food availability was one of the lowest at that point of time and we wanted bulk production of agricultural products. But, pesticides have detrimental effects on the soil as well as on the human who are in contact with it. We have numerous cases of farmer`s death from pesticide poisoning. Slowly the regulatory bodies started to notice this issue. Pesticides have always been necessary evil for the agriculture sector. But, as the time progresses it's important for us to reevaluate its usability, its alternatives and its significance. In recent decades, one such pesticide has attracted much criticism, research, international and national studies along with newspaper headlines; Monocrotophos SL.

Monocrotophos is a broad spectrum organophosphorus insecticide with systemic, residual, and contact activity against a wide range of sucking and chewing insects and mites. It is mainly used in production of cotton, soybeans, and rice. But it has been used extensively in a variety of other crops, such as wheat, potatoes, groundnuts, maize, sugar cane, tobacco, and vegetables etc. From a toxicity stand point, it is highly toxic orally and moderately toxic dermally upon exposure to mammals. In indian context it has been used extensively in different crops ranging from grains to vegetables. Despite its toxic harmfulness, due to its low cost and wide range of effectiveness, it has been still in practice widely though it is of the age of DDT, which has been banned long ago.

Monocrotophos SL is normally manufactured and sold at 36 % (m/m) of monocrotophos. The standard IS 8074 : 1990 prescribes the requirements of monocrotophos which includes physical specifications, chemical specifications along methods for sampling and testing of Monocrotophos SL. The standard was published in 1976 and revised twice in the years 1983 and 1990. The standard also considers the Insecticide Act, 1968, which specifically focuses on the marking declaration.

The Action Research Project : ARP/261 is on the standard IS 8074 : 1990, Monocrotophos SL : Specifications. The clear objective of the Action research project is to put a fresh perspective and a relook at the standard considering the recent developments in product innovation, process innovation, stakeholder relevance, regulatory significance etc. In short, the ARP aims at considering the revision of IS 8074 : 1990 in order to explore the possibility of revision, amendment, withdrawal of the standard.

## Review of the Literature

The review of literature has focused on understanding different dimensions of the IS 8074 : 1990, taking assistance of reference standards, International code of conducts, National regulatory Orders, Research papers, International studies on impact evaluation, Case studies, Print media articles and books authored by renowned researchers.

- ❖ The standards referred and taken support while creating IS 8074 : 1990, have been analysed to understand whether the revision they undergone will induce any change in IS 8074 : 1990.

(Table no. 1)

Standard	Revision	Major changes	Action proposed
IS 1070 : 1977 Water for general laboratory use ( <i>second revision</i> )	3 <sup>rd</sup> revision in 1992	Limits for three grades of water depending on their end use have been specified and the characteristics have also been suitably modified.	(Page 2, Clause 7.3, 2 <sup>nd</sup> line) – Replace the phrase ‘ (See IS 1070 : 1977)’ by ‘(See IS 1070 : 1992). Incorporate the same change in Annex A (Clause 2).
IS 1448 (part 20) : 1982 Determination of flash point by Abel apparatus	3 <sup>rd</sup> revision in 2019	Alignment with the latest version of ISO 13736 : 2013.	(Page 1, Clause 3.2.3, 2 <sup>nd</sup> line) – Replace the phrase ‘IS 1448 (part 20) : 1982’ by ‘IS 1448 (part 20) : 2019’.
IS 6940 : 1982 Methods of test for pesticides and their formulation	1 <sup>st</sup> revision	Clause 13.5.4 has been substituted by Electrometric Procedure for Determination of Acidity or Alkalinity.	NIL
IS 8025 : 1990 Monocrotophos. technical	2 <sup>nd</sup> revision on May 1990	NIL	NIL
IS 8190 (part 2) : 1988 Requirement for packing of pesticides : Part 2 Liquid pesticides	NIL	NIL	NIL

IS 10627 : 1983	NIL	NIL	NIL
Methods for sampling of pesticidal formulations.			

- ❖ Monocrotophos is included in the interim PIC procedure as a pesticide. It is listed on the basis of the final regulatory actions to ban all uses of monocrotophos reported by Australia and Hungary. Initially, only formulations of monocrotophos exceeding 600 g a.i./l were included in the interim PIC procedure as severely hazardous pesticide formulations, based on the recommendation of the fifth meeting of the FAO/UNEP Joint Expert Group (October 1992). The action was taken because of their acute hazard classification and concern as to their impact on human health under conditions of use in developing countries.

*(Rotterdam Convention - Operation of the Prior Informed Consent (PIC) procedure for banned or severely restricted chemicals in international trade, Decision Guidance Document, Monocrotophos, February 2005)*

- ❖ Hazard Classification of Monocrotophos by different regulatory bodies.

WHO	Technical product: 1b (highly hazardous), classification based on oral toxicity (WHO, 1999)
E.C.	Classification of the active substance (E.C. 1998) is: Mutagenic category 3 ; R 40: possible risks of irreversible effects; T+; R 26/28: very toxic by inhalation and if swallowed; T; R 24: toxic in contact with skin; N; R 50-53: dangerous to the environment, very toxic to aquatic organisms, may cause long term effects in the aquatic environment.
USEPA	Category 1 (highly toxic) (USEPA, 1985)
IARC	Not classified

*(Rotterdam Convention - Operation of the Prior Informed Consent (PIC) procedure for banned or severely restricted chemicals in international trade, Decision Guidance Document, Monocrotophos, February 2005)*

- ❖ Monocrotophos affect the nervous system by inhibiting acetylcholinesterase, an enzyme essential for normal nerve impulse transmission. The toxicological profile of monocrotophos is typical of organophosphorus compounds, with cholinergic signs (including tremors, convulsions, salivation and trismus) being similar in experimental mammals and humans.

*(Rotterdam Convention - Operation of the Prior Informed Consent (PIC) procedure for banned or severely restricted chemicals in international trade, Decision Guidance Document, Monocrotophos, February 2005)*

- ❖ To prevent future problems with HHPs, the registration system for pesticides may need to be revised. This may involve:
  - Defining protection goals and unacceptable risks in the pesticide legislation.
  - Strengthening of registration procedures and in particular the assessment of risk.
  - Adding registration considerations based on the HHP criteria. This could, for example, include not registering products that fall under GHS Category I, or adding restrictions or conditions of approval that ensure products whose handling and application require the use of PPE that is uncomfortable, expensive or not readily available, are not accessible to small scale users and farm workers in hot climates.
  - Requiring the periodical review of registered pesticides and initiating a registration review where monitoring, field surveillance, new scientific information, or new information from comparable countries indicates high risks, e.g. because of relatively high numbers of adverse incidents.
  - Pro-actively favouring registration of products that pose less risk where such alternatives are viable and available. In this respect, particular attention should be given to encouraging the use of biological control.

*(International Code of Conduct on Pesticide Management, Guidelines on Highly Hazardous Pesticides, WHO/HTM/NTD/WHOPES/2016.03)*

- ❖ An acceptable daily intake (ADI) of 0.0006 mg/kg bw was allocated in 1993 and confirmed in 1995. This ADI was established on the basis of a 28-day human volunteer study with an NOAEL for erythrocyte acetylcholinesterase of 0.006 mg/kg bw/d and using a 10-fold safety factor. An acute reference dose (ARfD) of 0.002 mg/kg bw was established by JMPR in 1995.

(FAO/WHO, JMPR (1995))

- ❖ Monocrotophos is out of patent and therefore has become an easily affordable pesticide. Its low cost and many possible applications have kept up demand in India despite growing evidence of its negative impact on human health.

Monocrotophos is not compatible with integrated pest management programmes. There are a number of systemic organophosphorus insecticides that are less harmful than monocrotophos that have long been recommended in various crops to manage the target pests.

Almost all polyphagous pests across the world have been reported to have developed resistance to monocrotophos. In the 1980s, *Tetranychus cinnabarinus* (Acari: Tetranychidae) developed resistance to monocrotophos and other organophosphorus pesticides.

In India, the use of monocrotophos on vegetables has been banned since 2006 due to reports of high levels of residues in food items. A review of the hospital-based studies on pesticides poisoning in India shows that monocrotophos poisoning has been reported from all parts of India and that it has higher case fatality rates than other pesticides.

Other countries have banned monocrotophos on the grounds of its risks to public health and negative environmental impacts. Monocrotophos use is not permitted in the United States of America, and the European Union. Other countries in Asia no longer permit its use: Australia, Cambodia, China, Indonesia, Lao PDR, Philippines, Sri Lanka, Thailand, Vietnam.

*(Health implications from monocrotophos use: a review of the evidence in India, World Health Organization, Regional Office for South-East Asia, 24 July 2013)*

- ❖ The results of the present study suggest that algal metabolism of organophosphate insecticides like monocrotophos is highly likely in soil environments only when such chemicals are encountered by the microalgae at nontoxic levels.

*(M. Megharaj, K. Venkateswarlu, and A. S. Rao (1987) Metabolism of Monocrotophos and Quinalphos by Algae Isolated from Soil. Bull. Environ. Contam. Toxicol. (1987) 39:251-256)*

- ❖ MCP (Monocrotophos) and lead might have affected the development of cerebrum and cerebellum via thyroid disruption leading to developmental neurotoxicity.

*(Kumar BK, Reddy AG, Krishna AV, Quadri SSYH, Kumar PS (2016) Developmental neurotoxicity of monocrotophos and lead is linked to thyroid disruption, Veterinary World 9(2): 133-141.)*

- ❖ As per the Insecticide Banning Order, 2020 prohibition should be implemented on Certain Insecticides as per the following,-
  1. No person shall import, manufacture, sale, transport, distribute and use insecticides as specified in the Schedule to this Order from the date of publication of this Order.
  2. The Registration Committee shall call back the certificate of registration granted for the insecticides as specified in the said Schedule.
  3. If any person who holds the certificate of registration fails to return the certificate to the Registration Committee, referred to in clause (2) , within a period of three months, action shall be taken under the provisions contained in the said Act.
  4. The certificate of registration for the insecticides as specified at Schedule granted under section 9 of the said Act shall be deemed to be cancelled from the date of publication of this order.
  5. Every State Government shall take all such steps under the provisions of the said Act and the rules framed thereunder, as it considers necessary for the execution of this order in the state.

- ❖ Monocrotophos is banned in 112 countries, Not approved in EU vide Legisl. 2002/2076/EC; Details of country (As per PAN data) EU, UK, Brazil, China, Indonesia, Myanmar, Pakistan, Thailand etc. Alternatives are available for use. It is toxic to honey bees and aquatic organisms. Therefore, import, manufacture, sale, transport, distribution and its use shall be prohibited in agriculture.

*(MINISTRY OF AGRICULTURE AND FARMERS WELFARE (Department of Agriculture, Co-operation and Farmers Welfare) NOTIFICATION New Delhi, the 14th May, 2020, [F. No. 13035/15/2019-PP-I])*

## Methods and Materials

As the action research project deals with the pesticide, it involves multiple stakeholder perspectives. Also, bringing conclusions and recommendations driven by factual data sets and subjective analogies is very important for the successful implementation of the research project.

### Focus points of the research methodology

- ❖ Finding relevant information in order to create a base of information to lead the research in the desired direction.
- ❖ Perceptual mapping of stakeholders to understand the outlook of each stakeholder regarding the product and standard associated with it.
- ❖ Data backing with real life information (Print and Digital media) in order to revalidate the existing set of information.
- ❖ Triangulation of data points among all stakeholders to analyse the findings of primary and secondary research.
- ❖ To bring out a concrete conclusion stage in order to provide relevant recommendations.

### Secondary Research

As the name suggests secondary research is about finding information from existing literature related to the product and IS 8074 : 1990. The secondary research revolved around finding information from reference standards, International code of conducts, National regulatory Orders, Research papers, International studies on impact evaluation, Case studies, Print media articles and books authored by renowned researchers. It has been explained in detail in the literature review section of the project.

### Primary Research

The primary research is all about finding first hand information by interacting with stakeholders directly or indirectly related to the product and the standard. Hence, in this



research project multiple research tools have been used to collect data. 'Structured and semi structured interview methodology' have been adopted to collect data from stakeholders, who have technical knowledge regarding the product and the standard. The 'FGD (Focus group Discussion) Methodology' has been used in order to collect information from the stakeholders who are broadly at the consumption/application end of the product or the stakeholders who are supporting the consumers of this product. While conducting the FGD (Focus group Discussion), to understand the stakeholder perspective, ZMET (Zaltman Metaphor Elicitation Technique) has been used to understand view of each stakeholders towards the product and standard.

### Structured Interview

The tool used for this methodology is Questionnaire, which is comprised of a set of question related to Monocrotophos SI 36%, IS 8074 : 1990, current technological innovation in the product and process related to Monocrotophos, relevance of the product and standard, technical comment on the IS 8074 : 1990 clause wise etc. The questionnaire has been indexed as Appendix 1.

The Questionnaire has been E-Mailed to various Pesticide Manufacturer Associations; Pesticide Manufacturers and Formulators Association of India (PMFAI), Mumbai, Pesticide Manufacturers and Formulators Association of India (PMFAI), Mumbai, Crop Care Federation of India, (CCFI), New Delhi, Crop Life India. Also, the questionnaire has been E-Mailed out to all the licensees of IS 8074 : 1990.

### Semi-Structured Interview

The semi-structured interview is different from structured interview in terms of flexibility of discussions. In semi-structured interview methodology, the tool used is a set of basic questions, which worked as direction for discussions. Due to COVID related restrictions, the medium used for this methodology was telephonic interviews. The questions broadly focused on the technical specifications, requirements, testing methodologies, recent innovations etc.

The telephonic interviews have been done with Laboratories dealing with BIS recognised IS 8074 : 1990; IDMA Laboratory and ITL Laboratory. Also, the same has been done with Phd Graduates from Indian Agriculture Research Institute, New Delhi to understand the harmful effects of monocrotophos as a pesticide on the environment and the short term & long term impacts of its toxicity.

### FGD (Focus Group Discussion)

The FGD (Focus Group Discussions) is based on the fact that more quantitative and qualitative information can be derived from an extensive discussion, where the participants of a Focus group discuss among themselves. The same FGD has been conducted with different stakeholders to understand deeper insights related to the product and IS 8074 : 1990. The stakeholders who participated in these FGDs are basically farmers, FPOs, NGO personnel who are dealing with developmental projects related to agriculture, Agriculture

Researchers on environmental Science and PhD graduates. Due to flexibility of the discussion, one among the focus group has been nominated as moderator to prevent the discussion from going out of the line.

### ZMET Analysis (Zaltman Metaphor Elicitation Technique)

ZMET Analysis is a powerful market research tool used to decode the deeper customer insights about the customers tacit or hidden thoughts and feelings as well as those, which are readily expressed. With ZMET, researchers use the visual or non-visual objective of tools gathered and/or generated by consumers to elicit and probe the metaphors that represent consumers' thoughts and feelings about a certain topic. Due to flexibility of discussions, the participants are able to express themselves in a better way.

Here, in the case of the Action research project, the ZMET analysis here has been used for different stakeholders. The stakeholders have undergone FGDs for 15-20 min. Preceding to the day of discussions, the participants have been given a brief idea about the objective of the discussion, which enabled them to bring out the detailed perspective or an advanced stage of thinking related to Monocrotophos and IS 8074 : 1990 and various facets related to this.

After the FGDs, the stakeholder`s thoughts and feelings have been summarised into a key feature called 'Construct'. This construct represents the mental terrain of stakeholder`s mindset.

The constructs have been aligned on a sheet called the Consensus Map, which shows the relations among the constructs. From the Consensus map, the commonalities has been found among the constructs and the key word which defines the linked constructs are known as Deep Metaphor. These Deep Metaphors has been used to draw parallel with secondary research finding and validate them with the stakeholder perception.

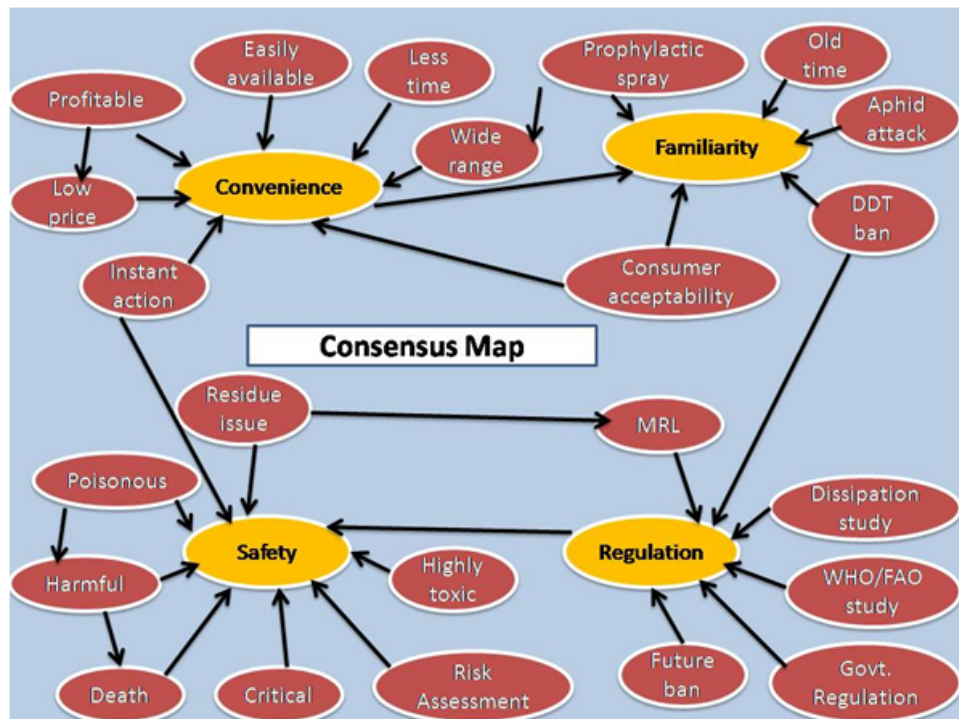
## Results and Analysis

The data points collected through the primary data collection, secondary data collection and ZMET analysis are factual and qualitative. Due to lack of quantitative data points, no data analysis tools have been used. The qualitative analysis is argument based and response based.

### Stakeholder perspective analysis

From the ZMET analysis, key constructs have been identified from the Focus group discussions. The words in the red circle identify as constructs. The constructs have been arranged keeping the inter-relations between them. For example, the constructs such as profitable are related to low price as both are cause and effect. In a similar way, all the key constructs have been mapped. Then, based on the commonality, the deep metaphor has been identified. For example, constructs such as profitable, low price, instact action, easily

available, less time, wide range establishes the factor of convenience for the users. Hence, here the deep metaphor is 'Convenience'. In similar ways, from all the constructs, four key deep metaphors have been identified; convenience, familiarity, safety and regulation. It concludes that the stakeholders are familiar with monocrotophos and they feel the factor of convenience during its application. But, on the other hand they are concerned and accept the safety concern related to it due to its high toxicity. Also, they believe that regulatory reforms are necessary to handle this issue. The consensus map also highlights the possibility of banning monocrotophos.



For a simplified view, the key constructs have been arranged into a word cloud. In the world cloud, the size of the word signifies the frequency of the word that came up in the FGDs and vice versa. From the word cloud, words such as critical, low price, regulation, toxic, ban, residue, FAO appeared more frequently.

## Analysis of primary research

Farmers, FPOs, NGOs

From the primary research involving the above stakeholders were less of a technical specification based but more of a qualitative understanding of market relevance of monocrotophos. Their familiarity with the product standard IS 8074 was nil.

Monocrotophos came into application as a replacement of DDT after its ban. Though due to toxicity issues and awareness of NGOs, the progressive farmers and modern day farmer cooperatives (FPOs) have stopped its application. The marketing push strategies of the large manufacturers is causing the higher availability and visibility of Monocrotophos in the market, which leads to its application.

## Laboratories

As laboratories are the stakeholders with technical specification, the primary research tried to receive technical comments on each clause of the standard. Also, the focus was on the testing method also. The two labs IDMA laboratory and ITL Laboratory have been contacted, who confirmed the compliance of IS 8074 in their lab while dealing with monocrotophos. The concern they raised was common as they rarely received any sample of Monocrotophos in the last couple of years. There were no technical comments on the standard. But, one of them suggested the inclusion of clause for safety requirements or toxicology requirements based on/mentioning the followings:

- ❖ Evaluation of PHI of each active ingredient(pesticides) of product in 2-3 no. of Agricultural crops
- ❖ Dissipation studies of active ingredient in monocrotophos
- ❖ Active ingredient toxicity co-relations with maximum residue limits of FAO/WHO/CODEX to address risk assessment.

## Manufacturers

The primary research involving manufacturers has been through mode of structured interviews (Questionnaires). The small manufacturers had no response regarding the IS 8074 : 1990. But, the response from UPL Limited, which is a CCFI member company and is the principal manufacturer of Monocrotophos, was critical as it focuses on the method of testing of monocrotophos. The existing testing method for estimation of monocrotophos content is as per IS 8025 : 1990 and it follows the principle of colorimetry. But, the person from UPL Limited suggested to adopt the method of HPLC to estimate monocrotophos instead, with the following reasons:

- ❖ More accurate & precise method
- ❖ Easy for handling
- ❖ Eliminates methodical error (Personnel error)
- ❖ Deals with common instrument (HPLC method)
- ❖ Validated and accepted globally

*(CIPAC Method 1990, Monocrotophos panel of PAC-GB)*

## Pesticide Manufacturer Associations

The tool used for Pesticide Manufacturer Associations is structured interview through questionnaire. The response from PMFAI emphasizes on the fact of monocrotophos being highly toxic and short lived. As there has not been any new innovation in terms of product or process, hence new generation pesticides can be an alternative for monocrotophos.

Though there are no technical comments on the clauses of the standard, the suggestion was to include alternative packaging if available and approved by CIB and RC. The association believes the product and standard is still relevant as it is under review due to lack of data on its toxicity issue and label claim.

### Other observations

As per Directorate of Plant Protection, Quarantine and Storage (GOI) monocrotophos has been included in the list of pesticides, which are banned, refused registration, and restricted in use as of 31.10.2019. But, it is only limited to the application in case of vegetables.

Accumulation of monocrotophos in living tissues poses harmful threats to humans and adverse effects on non-target living systems present in the environment. It causes histopathological, acute, genotoxic, cardiotoxicity, hyperglycaemic and stressogenic effects to different living organisms.

112 countries have banned monocrotophos so far. Maharashtra government prohibited monocrotophos SL in 2017. Kerala has done the same in 2011.

## Summary and Conclusion

Monocrotophos SI 36% is a broad spectrum organophosphorus insecticide with systemic, residual, and contact activity against a wide range of sucking and chewing insects and mites. It is highly toxic for the environment and the person who comes in contact frequently. There have been deaths which have been directly linked to the monocrotophos application. But, due to its low price, high availability, higher familiarity and wide range of action on pests, it is still prevalent and used by farmers. The secondary research provided a strong base of technical as well as regulatory information, which helped in shaping the direction of the research.

There have not been any major changes in the cross reference standards, hence in this regard the IS 8074 : 1990 remains unchanged. The research papers on monocrotophos majorly focus on its environmental concerns due to its high toxicity and studies regarding this. The PIC documents have included monocrotophos into it and specifies the categorization of monocrotophos as per different international regulatory bodies, where all of them categorize monocrotophos as a pesticide of severe concern. The international study by WHO on impact of monocrotophos on health confirms its impact of toxicity. The news articles from all over India have criticised monocrotophos and the regulations related to it for its toxicity and havoc in the past. The FGDs with different stakeholders have clearly brought out the two sides of the monocrotophos; how they prefer it for its convenience but how they are worried about its safety. The semi-structured interviews with labs brought out the necessity of introduction of safety/toxicology requirement clause in the IS 8074 : 1990. The pesticide associations have emphasized on the toxicity issue, but suggested the modern age pesticide as alternatives due to lack of innovation in case of monocrotophos.

The suggestion from the manufacturing body came as an important one, as it suggested the alternative method of estimation of monocrotophos. They suggested the use of HPLC method for estimation rather than existing colorimetric method due to low error, higher functionality and global validation & acceptability. The ZMET analysis brought the stakeholder`s deeper insight through the deep metaphors; convenience, familiarity, safety and regulation. This analysis validates the whole research findings from primary and secondary research.

The national insecticide Banning order, 2020 which includes 27 pesticides has monocrotophos listed in it, which is under review. This order brings the possibility of ban on the product and withdrawal of the standard, whose end result is yet to be recieved.

## Recommendations

The possibility of ban on monocrotophos can not be ruled out. Hence the IS 8074 : 1990 has to be withdrawn in the case of complete ban. But, due to lack of research data to prove its toxicity, monocrotophos might be banned on certain plants or not banned at all, in that case IS 8074 : 1990 will still be relevant and we need stricter guidelines and technical revisions in the standard.

Considering the toxicity issue of monocrotophos, Clause 3 of IS 8074 :1990 may include the compliance of the product with the specified toxicity limits as per WHO/FAO/FSSAI. Other clause related changes may be incorporated as per changes in cross reference standards in Table no.1.

Inclusion of HPLC method of estimating monocrotophos in clause 3.3.1 (testing method for estimation of monocrotophos) along with IS 8025 :1990. The HPLC method has to be incorporated in IS 8025 : 1990 and to be given due reference in IS 8074 : 1990.

Inclusion of PHI (Pre harvest interval) testing parameter to estimate the level of residual toxicity in Clause 3.3 of IS 8074 : 1990.

Hence, considering all these changes in the caluises of IS 8074 : 1990, the standard needs to be revised.

# Appendices

## Appendix 1

6/29/2021

Action Research Project on IS 8074 : 1990

### Action Research Project on IS 8074 : 1990

The research focuses on analyzing the relevance of the standard IS 8074 : 1990 from various perspectives.

Monochrotophos is a broad spectrum organo phosphorus insecticide, which is effective against a wide range of insects and mites. In recent decades, it faced significant criticism, news headlines, and global researches. As, it involves multiple stakeholders, hence the action research project aims at bringing out multiple perspectives.

\* Required

1. Email \*

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2. Your Name \*

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3. Name of your Organization \*

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4. Are you familiar with Monochrotophos SI 36%? \*

Mark only one oval.

Yes

No

5. Are you familiar with IS 8074:1990? \*

Mark only one oval.

Yes

No

<https://docs.google.com/forms/d/1RtItu9f3VKeDMVq3n5mv3FprZLq10gOKbUMw9aAIm8red1?ts=60c5fca2>

1/8

6. Is the Monochrotophos SI 36% still relevant? \*

Mark only one oval.

- Yes  
 No

7. Is IS 8074 : 1990 still relevant? \*

Mark only one oval.

- Yes  
 No

Product  
innovation

Justification should focus on modern technological interference in R&D and product innovation.

8. Any new innovation in product? \*

Mark only one oval.

- Yes  
 No

9. Justification \*

Innovation  
in process

Justification should focus on modern technological interference in process innovation in terms of product testing and application.



10. Any new innovation in process? \*

Mark only one oval.

- Yes  
 No

11. Justification \*

Product  
alternatives

Please mention the name/s of the product from both chemical and commercial outlook.

12. Is the product necessary now? \*

Mark only one oval.

- Yes  
 No

13. Replacement if any \*

Recommendation/s on required technical specification and related issues

14. Is there any technical comment on the standard? \*

Mark only one oval.

- Yes Skip to question 15  
 No

Regarding IS  
8074 : 1990  
and related  
standards

The recommendation should be based on probable and necessary additions or deletions of clauses of standard. It also should address the issues faced by stakeholders related to respective clauses.

15. Scope of standards clause \*

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16. Requirements clause \*

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17. Packing clause \*

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18. Marking clause \*

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19. Sampling clause \*

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20. Testing methods clause \*

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21. Quality of reagent clause \*

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Miscellaneous

22. Ongoing research related to the subject and scope of standard being reviewed.  
(Provide references) \*

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23. Impact of the research on IS 8074 : 1990 \*

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24. Research documents if any

Files submitted:

25. Ongoing regulatory reforms related to subject and scope of the standards.  
(Provide informations) \*

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26. Impact of the regulatory reform/s on this \*

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27. Regulatory reform documents if any

Files submitted:

Conclusion

28. IS 8074 : 1990 needs to undergo \*

Mark only one oval.

- Revision
- Amendment
- Withdrawl

29. Concluding remarks if any

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