

**PARAQUAT DICHLORIDE RETAILING IN INDIA :
A CASE STUDY FROM WEST BENGAL
A SEQUEL TO 'CONDITIONS OF PARAQUAT USE IN INDIA' 2015**





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Cover Photo : **Paraquat bought in plastic carry bag**

About PAN India

Pesticide Action Network (PAN) India is a public interest non-profit organisation working to make India a world leader in agro-ecology. This organisation is being developed as a regional centre and works in collaboration with Pesticide Action Network (PAN) International community to eliminate the human and environmental hazards caused by pesticides. The organisation focuses on bringing changes to the way chemical pesticides are used, harming life and the environment. It aims to help farmers reduce dependence on toxic chemicals and to increase the use of sustainable alternatives to chemical pest control, based on scientific knowledge. Primarily, PAN India focuses on generating and sharing knowledge related to chemical pesticides such as farm level actual practice, health and environmental effects, as well as on alternatives to hazardous chemicals. PAN India is committed to support efforts of farming communities to promote ecological agriculture, conserving traditional knowledge and agro biodiversity towards ensuring sustainable food production systems and toxic free living. PAN India supports sustainable options in all human endeavours and living, based on participatory research and sound science, achieving social and environmental justice to replace toxic substances in our society.

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FOREWORD

Agro-chemicals are increasingly becoming a normal feature of production, so much so that people feel that this is the only way food can be produced, and farmers feel constrained to avoid them. Using is become so ingrained, almost to the point of addiction. Yet most methods and practices of sale and usage of pesticides are not sufficiently regulated or monitored.

Among the many agro-chemicals in use today, paraquat stands out for its uniqueness in toxicity and chemical characteristics. Dependency on such a toxic chemical has been spawned by formal agricultural science, which has failed to warn farmers about the dangers involved. Farmers who are addicted to using it, with no alternative solution offered by the agricultural extension system, have ignored precautions and have adopted practices that suit their payment capacities. Buying this toxic pesticide in small quantities and carrying it in small plastic sachets, on a par with food or tea, farmers' pesticide usage practices have gone beyond any rationale. Monitoring pesticide sales and usage should be the extended responsibility of agricultural bureaucracy, agricultural scientists, agricultural extension personnel and

pesticide companies, given the concerns and current global situation wherein Sustainable Development Goals have become an agenda for growth.

Regulation of pesticides is an under-studied subject in India. Pesticide regulation has to be continuous, constant and innovative. It has to be based on the experiences of farmers, and the impacts caused by such toxic chemicals. Reviews of regulatory decisions, with regard to pesticides, have to be transparent and consultative.

PAN India is committed to document, research and create advocacy around agro-chemicals, and link these field efforts to global attempts at making this planet safer for all forms of life. This report, a sequel to the previous report, based on field research, is part of these efforts. We hope to bring more and more information that has relevance for policy change and building agro-ecology based food production.

Dr. D. Narasimha Reddy
C. Jayakumar
Board of Directors, PAN India

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Dileep Kumar A D

EXECUTIVE SUMMARY

Paraquat dichloride is a hazardous non-selective herbicide and is known to cause severe health hazards and deaths among farmers, workers and communities around the globe. Paraquat dichloride is registered for use in India, and 24% SL is the only formulation approved for use. A 2015 report, *Conditions of Paraquat Use in India*, revealed the appalling situation regarding paraquat's sale and use in India: many of the uses of paraquat are in violation of the laws in India and as well as the International Code of Conduct on Pesticides Management. This report brought out an important fact that retail sale of paraquat is happening with unacceptable practices, as illustrated by the situation in the State of West Bengal. Following the publication of the report, it was decided to further explore and document the prevailing paraquat retail practices in West Bengal. Study for the current report was conducted during February–March, 2016.

This study found a total of 10 different brands of paraquat dichloride that were sold among three retailers. All three retailers claimed that they have licenses to sell, stock, or exhibit for sale pesticides. But these claims could be verified for only one retailer. Though this retailer was selling seven brands, only three of the brands were authorised by their

respective manufacturers, and four brands (Gramo and Kattar of Canary Agrochemicals, Gramoxone of Syngenta and Milquat of Insecticides India) were without authorisation from the manufacturers.

Regarding packaging labels, none of the 10 brands contained information in the local language – Bengali – though they contained instructions in English, Hindi and other Indian languages, which the farmers in West Bengal do not understand. Crop recommendations were not mentioned on the labels of two brands. Two companies had recommended the use of paraquat beyond the uses approved by CIB&RC. Though labels of all the brands carried precautionary warnings, they did not give a clear picture about the use of personal protective equipment (PPE).

Decanting and selling paraquat dichloride in refill bottles, as well as in plastic carry bags, were noted among all the retailers. All the 10 brands were decanted and sold either in empty pesticide bottles or refill bottles or plastic carry-bags. Required safety precautions are not followed while decanting. The International Code of Conduct on Pesticide Management states, in article 10.4, that:

Governments should take necessary regulatory measures to prohibit repackaging or decanting of any pesticide into food, beverage, animal feed or other inappropriate containers and rigidly enforce punitive measures that effectively deter such practices.

The India Insecticide Rules 1971, in its Rule 16 on prohibition of sale or distribution unless packed and labelled, states that *no person shall stock or exhibit for sale or distribute [or cause to be transported] any insecticide unless it is packed and labelled in accordance with the provisions of these rules*"; and the Rule 17 on packaging of insecticides, states that *"every package containing the insecticides shall be of a type approved by the Registration Committee"*.

Therefore, it is very clear that decanting of paraquat is an illegal, unapproved activity, and use of plastic carry bags and refill bottles are inappropriate and dangerous.

It was also noted that PPE was not sold by the retail points. Additionally, there was no facility to collect back empty containers, nor a proper system to dispose them.

Retail sale of paraquat and related practices noted in West Bengal are in violation of

Indian Insecticides Act and Rules as well as International Code of Conduct on Pesticides Management. A gross failure of the current regulatory system is observed from the study area. Central Insecticides Board and Registration Committee, the Central and State Agriculture Department, manufacturers and retailers are all responsible for lax enforcement of framed rules.

POLICY RECOMMENDATIONS

1. Under the circumstances, the Indian government should immediately ban production, import, sale and use of paraquat as it cannot be used safely under prevailing conditions of distribution, sale and use.
2. All companies should immediately cease sales of paraquat and take back remaining stock and containers from the market.
3. The Indian Government should rigidly enforce compliance with its rules and the International Code of Conduct.
4. The Department of Agriculture and Farmers Welfare should urgently take measures to popularise non-chemical methods of weed management, based on agro-ecology, and organise trainings of farmers in this regard.

1. INTRODUCTION

Paraquat dichloride is a herbicide (weedicide) with the CAS (Chemical Abstracts Service) number 1910-42-5. Paraquat belongs to bipyridylium chemical class and is one of the most widely used herbicides in the world. It is used on large and small farms, plantations and estates and in non-agricultural weed control. It is a quick acting, non-selective herbicide, which destroys green plant tissue on contact and by translocation within the plant. It is used to control broad-leaved weeds and grasses, in a wide range of agricultural applications and for general weed control; it is less effective on deep-rooted plants. Paraquat is increasingly used to destroy weeds as part of land preparation for planting crops in combination with no-till agricultural practices.

World Health Organization (WHO) categorizes paraquat as class II, moderately hazardous pesticide. However, it has been identified as among the most problematic pesticide in wide use in the world today. Pesticide Action Network (PAN) International has categorized it as a Highly Hazardous Pesticide (HHP). Paraquat also qualified as a PAN North America bad actor as well as a PAN International dirty dozen pesticide. Toxicological Data Network (ToxNet) and Integrated Risk Information

System (IRIS) of the United States Environmental Protection Agency (US EPA) have classified it as a probable human carcinogenic - Class C chemical. Paraquat is also reported to be linked to reproductive effects and Parkinson's disease. (FAO 2003; WHO 2009; Watts 2011; Isenring 2017; PAN Pesticide Database).

Paraquat is known to cause severe health hazards and deaths among farmers, workers and communities around the globe. No antidote for paraquat poisoning exists although it is recommended that the highly absorbent Fuller's Earth is administered. Paraquat is highly toxic to animals and has serious and irreversible delayed effects. Absorbed paraquat is distributed through the bloodstream to practically all areas of the body. Lungs selectively accumulate paraquat, and therefore contain higher concentrations than other tissues. Paraquat causes pulmonary oedema and other lung damage, leading to fibrosis. Liver damage occurs and renal failure may follow as kidneys remove absorbed paraquat, and this together with the lung damage often leads to death.

Paraquat dichloride 24%SL is the only formulation registered and approved for use in India by the Central Insecticide Board and Registration Committee (CIB&RC). CIB&RC has categorised paraquat dichloride as highly toxic. Paraquat dichloride is one of

the 20 most commonly used and recommended herbicides in the country.

Paraquat is used in more than 130 countries. It is banned or its use has been disallowed in at least 44 countries, including those of the European Union (EU), because of health risks. In addition, many international organisations such as Fair Trade International, Forest Stewardship Council, Rainforest Alliance, and agri-food corporate Dole have voluntarily banned paraquat.

PAN India, jointly with the Berne Declaration, IUF (International Union of Food and Allied Workers) and PAN Asia Pacific (PANAP) released a research report titled *Conditions of Paraquat Use in India* in April, 2015. This report was based on field studies conducted in 11 study sites across six Indian States (Andhra Pradesh, Arunachal Pradesh, Assam, Madhya Pradesh, Telangana, and West Bengal). Field data was collected through interviews with farmers, farm and plantation workers, pesticide applicators, agriculture extension officers, and pesticide retailers using questionnaires. Additionally, relevant secondary data was used, gathered from Government departments and their web sites.

This report revealed the appalling situation regarding paraquat's sale and use in India: many of the uses of paraquat are in violation of the laws in India. The report showed that farmers and workers in India lack proper information on the use of paraquat and the use of PPE, which in turn increases the risk of exposure and poisoning. The study revealed that paraquat use is happening in India in violation of the conditions of approval by the CIB&RC. In addition, manufacturers and retailers violate the Indian Insecticides Act. Besides the national legislation, the International Code of Conduct on Pesticide Management, and the International Labour Organization's (ILO) Chemicals Convention (1990) and ILO Safety and Health in Agriculture Convention (2001) are also being violated. Field data shows the failure of the current regulatory system and the need for an effective regulatory and monitoring system in India. The study recommended that the Indian government immediately stop the violations of the national legislation, and International Code, on pesticide sales and use, take necessary steps towards a progressive ban of paraquat in India, and promote and popularise non-chemical alternatives for paraquat and other herbicides.

2. OBJECTIVES AND METHODS

OBJECTIVES

A major objective of this study was to document practices of retail of paraquat dichloride in West Bengal, in the light of 2015 report *Conditions of Paraquat Use in India*. As a sequel, the current study focuses on license and authorisation details of retailers, information provided on labels, provision of personal protective equipments as well.

SIGNIFICANCE OF THE PRESENT STUDY

The first report, *Conditions of Paraquat Use in India*, brought to light an important fact, which has to be addressed seriously: the unacceptable practices of retailers who sell paraquat. It was noted that, in West Bengal, retailers were following the illegal and dangerous practice of decanting and selling paraquat dichloride in plastic carry bags and refill bottles. Further, this process of decanting and filling was performed with complete lack of care, without observing any safety precautions or wearing Personal Protective Equipments (PPE). Additionally, there were no labels on the bags. It was reported that the retailers in West Bengal (from whom the data was collected for the report *Conditions of Paraquat Use in India* sell paraquat formulations in plastic carry bags usually in small volumes, such as 100 ml or 200 ml, as

required by the farmers. Given these and other facts, it was decided to revisit the study area and the retailers from whom the data was obtained for *Conditions of Paraquat Use in India*, to reconfirm these realities and to gather further details. Additionally, the current study focuses on information provided on labels, provision of PPE, and license and authorisation details of retailers.

METHOD OF DATA COLLECTION

A field visit was conducted in the State of West Bengal (same study area and retailers from whom data was collected for *Conditions of Paraquat use in India*) to further investigate the practices followed by the retailers selling paraquat dichloride. It was conducted during February-March 2016 with the aim of gathering data.

The field visit was accompanied by a field guide (a known person from the locality), who also facilitated data collection by helping in translation between Bengali and English during the interviews. As part of the study, five pesticide sales points were visited. These included two distributors-cum-retailers and three retailers. All of them were from North 24 Paraganas District of West Bengal. As the retailers asked for anonymity, their details are not furnished in the report.

Demographic details of retailers

All of the retailers (3) were male and have been in the field of pesticide retail for more than 10 years. One retailer had been in this business for 25 years, while the other two had 12 years and 15 years experience respectively. One retailer was a graduate and the others had studied up to 12th and 5th standard. All the retailers had licences to sell pesticides (insecticides, fungicides, herbicides and plant growth regulators).

Limitations

One important limitation/constraint for the present study was that it was not at all easy to gather data from distributors and retailers. Usually it is normal to share details, especially on licensing and related matters, to known persons. Though the researcher was accompanied by a known person from the locality, the distributors were not cooperative

and did not give information as required for the study, while the retailers in the villages did give time for interviews and shared some information. However, among the three retailers only one gave access to, and permitted the researcher to take notes on, the documents related to licence and authorisation (it was possible only because of the presence of the field guide who is a close friend of the retailer), while the other two were not willing to share details. They just said that they have a license and all the documents, but were not willing to show them for notes to be taken.

As it was difficult to get known persons to accompany the researcher and to help interact with multiple retailers, and retailers were generally reluctant to cooperate with the study, this report is based on the information shared by the three retailers.

3. OBSERVATIONS

The present study attempted to collect various products (brands/trademarks) of paraquat dichloride being sold, licensing details of retailers, details on the packaging label and instruction leaflet, availability and provision of PPE and details of decanting paraquat dichloride.

3.1 Various paraquat products

Among the three retailers, one retailer sold six brands of paraquat, another retailer sold five and the third retailer sold three. A total of 10 different paraquat dichloride brands were found in the shops— refer Table

1 for these and their respective manufacturers. They belong to nine different manufacturers/formulators, namely Syngenta, Anu Products Limited, Insecticides India, Canary Agrochemicals, Crystal Crop Protection, United Phosphorous, Krishi Rasayan, Tropical Agro systems and Advance Pesticides. One company, the Canary Chemicals, has two brands of paraquat dichloride. Though smaller volumes, such as one litre, half litre, etc., are available for some brands, these retailers mostly procured product in five litre containers.

Table 1: Brands of paraquat dichloride found

Sl. No.	Trade name	Manufacturer
1	Allquit	Crystal Crop protection
2	Ginni	Anu Products Limited
3	Gramo	Canary Agrochemicals
4	Gramoxone	Syngenta
5	Kapiq	Krishi Rasayan
6	Kataar	Canary Agrochemicals
7	Milquat	Insecticides India
8	Spyker	Advance Pesticides
9	Tagquit	Tropical Agro systems (India)
10	Uniquat	United phosphorous



Various paraquat products noted in the study

Though there were 10 brands being sold, not all were being sold by all retailers (see Table 2). Retailer 1 sold seven brands (Allquit, Ginni, Gramo, Gramoxone, Kattar, Milquat and Uniquat); Retailer 2 sold six brands (Allquit, Gramoxone, Kapiq, Milquat,

Spiker and Uniquat); whereas Retailer 3 sold only three brands (Gramoxone, Kapiq and Tagquit). The most popular brand was Gramoxone, followed by Allquit, Kapiq, Milquat, and Uniquat.

Pesticide licensing In India : In India, all pesticides have to undergo the registration process with the Central Insecticides Board & Registration Committee (CIB&RC) before they can be made available for use or sale. Following the granting of registration, the manufacturers as well the retailers have to get licenses from the licensing authority to run their businesses. Retailers are required to get a license to sell, stock, or exhibit for sale or distribute any pesticide, and it needs to be renewed regularly. Applications are to be forwarded to the licensing officer, the Principal Agriculture Officer of the area, with relevant documents and prescribed fees. Along with this, the applicant is required to file a certificate from the principal (the Principal Certificate¹) whom he represents or desires to represent. This certificate is issued by the principal (importer or manufacturer), shall be addressed to the licensing officer of the concerned area and shall contain full particulars of the principal, including name and address, Principal Certificate number, details of pesticide manufacturing licences specific to manufacturing units with name and address of licensing authority, list of products they have licenses for (with common name, trademark and registration number), full name and address of the person proposed to be authorised (the applicant) either for wholesale or for retail. It should also contain the details of the sources (name of source and address, licence number and validity) from which the authorised person (applicant) would obtain the products mentioned. The principal certificate has to be obtained from each manufacturer whom the applicant wants to represent or whose product he wants to sell. After verification the licence is granted or renewed by the licensing authority.

Table 2 : Brands sold by different retailers

SL No	Paraquat brands	Retailer 1	Retailer 2	Retailer 3
1	Allquit	✓	✓	-
2	Ginni	✓	-	-
3	Gramo	✓	-	-
4	Gramoxone	✓	✓	✓
5	Kapiq	-	✓	✓
6	Kataar	✓	-	-
7	Milquat	✓	✓	-
8	Spyker	-	✓	-
9	Tagquit	-	-	✓
10	Uniquat	✓	✓	-

¹ "principal" means the importer or manufacturer of insecticides.

3.2 Licence and authorisation details of retailers

All three retailers reported that they have licenses to sell, stock, or exhibit for sale pesticides (insecticides, fungicides and herbicides), issued by the Principal Agriculture Officer. However, it was verified for only one retailer (Retailer 1). He had a license valid till 31st December, 2015. He said that usually the licence has to be renewed within a period of two to three months after the validity date, and he had been preparing the required documents for renewal when the interview was conducted. The other two retailers (Retailers 2 and 3) claimed that they had licences valid until 31st December 2015 and had applied for renewal, but as they did not provide the documents it was not possible to verify the claims.

It was noted from the documents (copy of principal certificates obtained from manufacturers) shown by Retailer 1 that he was authorised by 14 companies (manufacturers) to sell their products. Of those, 11 companies had paraquat products. They are Agro Guard Lab, Anu Products Limited, Cheminova, Crystal Crop Protection Pvt. Limited, Dhanuka Agritech limited, Gharda Chemicals Ltd, Insecticides India, Krishi Rasayan, SDS Ramcides Crop science Pvt. Ltd, Rallis India Limited and United Phosphorous Limited (UPL).

Though Retailer 1 had been authorised by 11 manufacturers to sell their products including paraquat, it was noted that

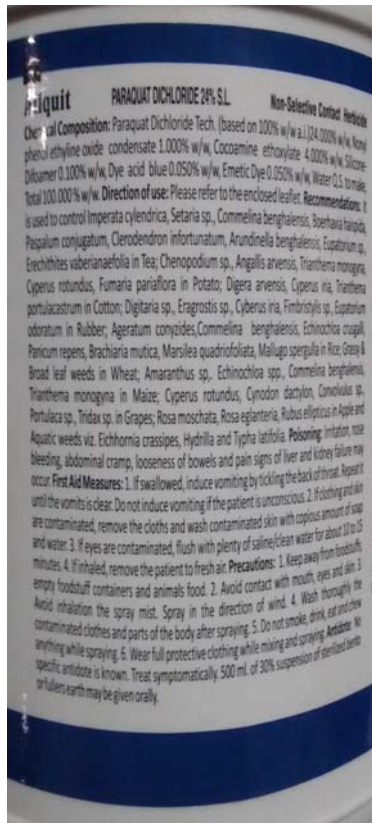
he was selling only seven brands of paraquat products from six manufacturers. However, of the seven, the retailer was authorised to sell only three brands. These are Ginni (Anu Products), Allquit (Crystal Crop Care), and Uniquat (UPL). The remaining four brands that he was selling were without authorisation documents from respective manufacturers. These are Gramo and Kattar of Canary Agrochemicals, Gramoxone of Syngenta and Milquat of Insecticides India. That is, this retailer was not legally permitted to sell these products as he was not licensed to sell them.

3.3 Packaging label and instruction leaflet

The labels pasted on the products listed in the table 3 and as shared by the retailers were analysed to check whether information was provided in the local language. The packaging labels of all the 10 brands did not contain information in the local language – Bengali – though it contained instructions in English, Hindi and some other Indian languages, which the farmers in West Bengal are unable to understand. As the label did not have information in Bengali, the farmers who buy such products would remain in ignorance of the product, the crops for which it can be used, the precautions to be followed, the type of PPE to be worn, what to do in an emergency situations like an exposure to paraquat and poisoning incident, what are the first aid treatments and antidote to be taken, etc.

An attempt was made to get the instruction leaflet supposed to be supplied with each container or package of the products. However, the instruction leaflet of

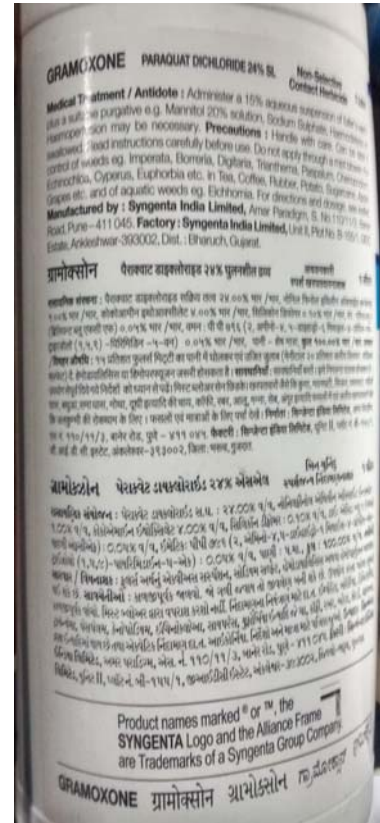
only one product was obtained from the retailers, and that was for Gramoxone (1 Litre container) from one retailer; leaflets were not available in the shops for other products.



Label on Allquit container (English)



Label on Allquit container (Hindi)



Label on Gramoxone bottle

3.4 Crops recommended for paraquat use by manufacturers (as per labels)

The crops recommended by the manufacturers for the use of paraquat have been compiled from labels provided with the products by eight manufacturers, summarised in Table 4 below, and compared with the uses approved by CIB&RC (as on 30th June 2016). Crop recommendations were not given on the label of Uniquat, manufactured by United

Phosphorous Limited (UPL), but were on the labels of all other seven brands. Eleven crops, as well as aquatic weed control, were included on two products, Kataar (Canary Agrochemicals and Tagquit (Tropical Agrosystems). Of the 11 crops noted on these products, all except tapioca are approved for paraquat use by the CIB&RC. Two of the eight companies had recommended the use of paraquat beyond the directive laid down by CIB&RC.

Table 3 : Details of labels / leaflets for products

SL no	Product	Manufacturer	Label in Bengali	Languages on label	Instruction leaflet languages
1	Gramoxone	Syngenta	No	English, Hindi, and some languages other than Bengali, in some cases south Indian languages (such as Tamil on Tagquit)	12 languages, including Bengali
2	Ginni	Anu Products Limited	No		Leaflet not available for other products from the retail points
3	Milquat	Insecticides India	No		
4	Kataar	Canary Agrochemicals	No		
5	Gramo	Canary Agrochemicals	No		
6	Allquit	Crystal Crop Protection	No		
7	Uniquat	United Phosphorous	No		
8	Kapiq	Krishi Rasayan Tropical	No		
9	Tagquit	Agrosystems (India)	No		
10	Spyker	Advance Pesticides	No		

3.5 Information on safety measures and PPE on labels

The labels of all the products carried precautionary warnings such as keep away from foodstuffs, empty foodstuff containers and animal food; avoid contact with mouth, eyes and skin; wash thoroughly contaminated clothes and parts of the body after application; do not smoke, drink, eat and chew anything while application is being done; and avoid inhalation while using the product. Though the labels mentioned these

measures, they did not give a clear picture about the use PPE.

The labels of three products (Allquit, Ginni and Spiker) stated “wear full protective clothing while mixing and spraying”, while those of two products stated “wear full protective clothing while broadcasting”, whereas that of Kapiq (Krishi Rasayan) simply mentioned “wear protective clothing”. However, it is important to note that the manufacturers have not specified what is the

Table 4 : Manufacturers, products and recommended uses

CIB&RC approved Use	Anu Products	Syngenta	Krishi Rasayan	Tropical Agrosystems	Advance Pesticides	UPL	Crystal Crop Protection	8. Canary Agro chemicals
	Ginni	Gramoxone	Kapiq	Tagquit	Spyker	Uniquat	Allquit	Kattar
Apple	Apple	Apple	-		Apple	-	Apple	-
Coffee	-	Coffee	Coffee	Coffee	-	-	-	Coffee
Cotton	Cotton	-	-	Cotton	Cotton	-	Cotton	Cotton
Grape	Grape	Grape	Grape	Grape	Grape	-	Grape	Grape
Maize	Maize	-	-		Maize	-	Maize	-
Potato	Potato	Potato	-	Potato	Potato	-	Potato	Potato
Rice	Rice	-	-	Rice	Rice	-	Rice	Rice
Rubber	Rubber	Rubber	Rubber	Rubber	Rubber	-	Rubber	Rubber
Sugarcane	-	Sugar Cane	-	Sugar Cane	-	-	-	Sunflower
Sunflower	-	-	-	Sunflower	-	-	-	Sugarcane
Tea	-	Tea	Tea	Tea	-	-	Tea	Tea
Wheat	Wheat	-	-	Wheat	Wheat	-	Wheat	Wheat
-	-	-	-	Tapioca	-	-	-	Tapioca
Aquatic weed control	Aquatic weeds	Aquatic weeds	-	Aquatic weeds	Aquatic weeds	-	Aquatic weeds	Aquatic weeds

“full protective clothing” required to be worn while applying paraquat. Surprisingly, information on protective clothing was not found on the labels of two products - Gramoxone (Syngenta) and Uniquat (United Phosphorous Limited).

3.6 Decanting and selling paraquat in plastic carry bags

All three retailers were found to decant paraquat, irrespective of the brands. Decanting has been in practice for a long time, as most of the customers are small-scale farmers who require only a small volume to be sprayed on the small land area or patches of land where crops are grown. Therefore, for them the requirement is for 200 ml, 100 ml or 50 ml. As most of the brands are not

packaged in these smaller volumes, retailers sell the quantity farmers require by decanting. Either empty pesticide bottles or plastic carrying bags are used for the purpose. It is extremely important to note that the retailers do not provide instruction leaflets or labels with the paraquat sold in refill or empty bottles and plastic carrying bags.

As noted, all ten brands were being decanted and sold either in empty pesticide bottles or plastic carry-bags. However, mostly the retailers decant cheaper products. Often retailers stock five litre containers of paraquat dichloride of various brands (although retailers said they prefer to get those which have higher margins) and sell the quantities required by farmers. It was noted that the

Table 5 : Information about PPE on the label

SL No	Trademark	Manufacturer	Text about PPE on packaging label
1	Ginni	Anu products	Full protective clothing while mixing and spraying
2	Gramoxone	Syngenta	[No info on protective clothing]
3	Kapiq	Krishi Rasayan	Wear protective clothing
4	Tagquit	Tropical Agrosystems (India)	Wear full protective clothing while broadcasting
5	Spyker	Advance Pesticides	Wear full protective clothing while mixing and spraying
6	Uniquat	United phosphorous	[Recommended crops and PPE use and safety measures not found]
7	Allquit	Crystal Crop protection	Wear full protective clothing while mixing and spraying
8	Kattar	Canary Agrochemicals	Wear full protective clothing while broadcasting

retailers were charging different prices for decanted brands or products sold in plastic bags or bottles. Generally, the price ranged between Rs 40 and Rs 45 for 100 ml of product, depending on the brand and retailer.

3.7 Provision of PPE and safety measures

It was noted by the researcher that one of the retailers himself did not observe any safety measures while decanting and filling plastic carry bags or bottles with paraquat. He was undertaking the most hazardous practices handling paraquat containers and refilling with the utmost carelessness and

often in front of the farmers who came to buy it. Often after decanting there would be some leftover - either smeared around the containers or dropped on to the floor or table from where the decanting was done. Such leftovers are usually collected and poured into the containers or refill articles using bare hands. He washed his hands after this process and shared with the researcher that he had been doing the same for a long time and so far nothing has happened.

The retailers did not sell or exhibit PPE in their shops. None of the retailers sold or freely distributed it, as is required by international and national standards. One



A pesticide decanting table noted from a retail point



Paraquat smeared on floor after decanting



Paraquat in plastic carry bag inside a bag containing fertilizer

Table 6 : Details of decanted paraquat products

Sl. no.	Product	Refill / empty bottles	Plastic carry bags	Whether leaflets given	Cost / 100 ml
1	Gramoxone	✓	✓	x	Rs. 40 to 45
2	Ginni	✓	✓	x	
3	Milquat	✓	✓	x	
6	Allquit	✓	✓	x	
7	Uniquat	✓	✓	x	
8	Kapiq	✓	✓	x	
9	Tagquit	✓	✓	x	
10	Spyker	✓	✓	x	

retailer shared that some companies used to provide gloves and goggles a couple of years back, but nowadays no companies provide it. In addition, retailers neither provided advice on safety measures nor instruction leaflets or labels along with decanted products.

3.8 Variation in prices of different brands

The data collected from three retailers show that there is wide variation in the prices of various brands; details are given in Table 7. The cost stated by the retailers and the maximum retail price (MRP) on the product label are given in the table. The unit cost shared by the retailers ranged from Rs. 320 to Rs. 425 per litre of product, while much more variation was noted in the MRPs on five litre containers. The cost for a five-litre container varied from Rs. 1,650 to Rs. 2,425 from the table, it is evident that the costlier

product was Uniquat (United Phosphorous) and the cheapest one was Gramo (Canary Agrochemicals).

3.9 Disposal of containers

Retailers shared that there is no system in place for proper disposal of the paraquat (or other pesticide) containers. Additionally, the retailers do not collect back the paraquat containers from farmers or facilitate safe disposal as required. As retailers sell paraquat in refill or empty bottles and plastic carry bags in addition to selling properly package products, and as they do not have a mechanism in place to collect and dispose of them after use, farmers may not have been disposing these properly. It was observed that several empty five-litre containers of paraquat were noticed inside retailer premises.

Table 7 : Price variation for various paraquat products

SL No	Brand name	Manufacturer	Cost / L Rs. (shared by retailers)	MRP Rs
1	Allquit	Crystal Crop protection	320	-
2	Ginni	Anu Products Limited	-	2370 (5L)
3	Gramo	Canary Agrochemicals	-	1,650 (5L)
4	Gramoxone	Syngenta	400	540 (1L)
5	Kapiq	Krishi Rasayan	360	-
6	Kataar	Canary Agrochemicals	-	2,325 (5L)
7	Milquat	Insecticides India	320	-
8	Spiker	Advance Pesticides	320	-
9	Tagquit	Tropical Agrosystems (India)	425	425 (1L)
10	Uniquat	United phosphorous	340	2,425 (5L)



Pesticide bottles piled up in a corner of a farmer's kitchen



A farmer showing pesticide bottles stored in his house

4. ANALYSIS AND DISCUSSION

4.1 Implications of retailers' practices

Nationally, the Indian Insecticides Act and Rules framed there under provide a set of mandatory legal requirements for registration, licensing, packaging and labelling, provisions on safety and protective clothing, etc. And globally, the voluntary standards set by the UN FAO and WHO in the International Code of Conduct on Pesticides Management adopt a life cycle approach in the management of pesticides to address all major aspects related to development, registration, production, trade, packaging, labelling, distribution, transport, storage, handling, application, use, disposal and monitoring of pesticides and pesticides residues. The Code also addresses management of pesticide waste and pesticide containers. This section is an attempt to highlight violations of national legal requirements and international standards with regard to observation of the current study. The various practices of retailers, as well as those related to labelling, are found to have serious legal implications, as many of them are not complying with legal requirements laid down in India and with the international standards.

4.2 Selling products not authorised by manufacturers

The study has noted that a total of 10 brands belonging to nine manufacturers were being sold in the three retail points from which the data was collected (Tables 1 and 2). Though all the three retailers reported having the required licenses and authorisation details, these were verified for only one retailer (two retailers did not give access to documents). Retailer 1 was selling seven brands of paraquat dichloride, but he was authorised to sell only three brands while the remaining four brands he was selling without authorisation. This is a violation of Insecticides Rules 9 sub-rule (4A) (i) and (ii), which state that the person has to get a license or renew an existing licence to sell, stock or exhibit for sale or distribute pesticides, and is required to file the principal certificate from the manufacturer along with the application. The principal certificate shows the person is authorised to sell (wholesale or retail) the products as listed on it and also the sources from which he collects or procures the products. Retailer 1 was selling four brands without having the requisite approvals. In

addition, this violates Articles six and eight of the International Code of Conduct on Pesticides Management. This is clearly a case of a lack of stringent monitoring and / or an inefficient verification process from the licensing authority (Agriculture Department). The licensing authority, before issuing/ renewing a license, should ensure that retailers have been selling only those products that they are authorised to sell by the respective manufacturers. Additionally, they should implement an effective system to track illegal trade by frequent inspections, otherwise such practices would certainly encourage trade of substandard or spurious products, which has serious implications for the economy and contribute to greater risk for the users and traders.

4.3 Label information not provided in local language

The Insecticides Rules 19 (7) states that the packaging label shall be printed in Hindi, English and in one or two regional languages in use in the areas where the said packages are likely to be stocked, sold or distributed. The packaging labels of all the 10 brands showed the information was in English, Hindi and some other Indian languages (Table 3), while none of them show information printed in the local language, Bengali. Therefore, Insecticide Rules 19 (7) is violated by the manufacturers. It is important that labels are in the local language to facilitate access to relevant information on hazard, use, precautions, safety measure, etc. by the farmers and workers. Similarly, the

2015 study showed that two paraquat brands had labels printed only in English and Hindi, without Bengali. The report also stated that farmers in the study area were unable to read these two languages so, obviously, they could not understand what was written on the label.

4.4 Manufacturers recommended the use of paraquat for crops beyond the CIB&RC directive

In India, the use of pesticides is supposed to be in line with the uses (pesticide-crop-pest/weed combination) approved by CIB&RC. Paraquat has been approved for weed control in 12 crops and for aquatic weed control. However, the recommended uses on the packaging label of eight products (Table 4) included uses beyond the CIB&RC directive. Two brands, Tagquit (Tropical Agrosystems) and Kataar (Canary Agrochemicals), had recommended paraquat uses for weeds in the crop tapioca, which is not a CIB&RC approved use. Thus, these two manufacturers have violated the CIB&RC directive on approved use of paraquat. The 2015 report, *Conditions of paraquat use in India*, also revealed that manufacturers, especially Syngenta and Canary Agrochemicals have violated the CIB&RC directive of approved uses. According to the report, out of the 12 crops and one non-crop uses recommended by Syngenta, four were not approved by CIB&RC. In the same way, of the 12 uses recommended by Canary Agrochemicals, five were not approved.

4.5 Inadequate information on PPE on labels

Though the packaging labels found on some of the products mention some precautionary and safety measures, these were not found for two products: Gramoxone (Syngenta) and Uniquat (United Phosphorous Limited). For those products that have some precautionary and protective measure information on the label, a few of them stated “wear full protective clothing”, whereas others simply state “wear protective clothing”. From this, it is clear that the use of paraquat requires wearing of PPE. However, these product labels neither give clarity as to what is full protective clothing nor do they mention the required PPE. The Insecticides Rules 39 and 40 describe the complete suite of protective clothing and respiratory devices required to be used during pesticide manufacture, formulation, transport, distribution or application. In the 2015 study, it was reported that though manufacturers have mentioned protective clothing on the labels, they did not specify the full protective clothing that is required while working with paraquat.

As evident from the labels, the manufacturers have not given complete details of the required PPE, as set by the national regulatory agency. Consequently the end users (farmers or applicators) remain uninformed or misinformed about the inherent risks of not using the required PPE, and this is likely to be contributing to higher

risk to the end users. The 2015 study also mentioned that the majority of the farmers and workers were not aware of appropriate safety instructions and did not use PPE. The report stated that less than 15 % of the farmers and a few farm workers were using PPE, and the majority of the farmers, farm/plantation workers use either partial or incomplete PPE or do not use it at all. It could also be that farmers and farm workers may not be aware of the complete PPE required to be worn while handling paraquat. Additionally, it could be due to the fact that the PPE is not available at retail points.

4.6 Decanting and selling in refill or empty bottles and plastic carry bags, with no labels or instruction leaflets

Practices of paraquat decanting and selling in refill or empty bottles as well as in plastic carrying bags, as noted in the study area, pose risks to farmers as well as to retailers. Since labels or instruction leaflets are not provided along with such purchases, this further aggravates the risk of using paraquat as the end users remain ignorant about the important information such as toxicity class of the active ingredient, recommended dosage, dilution and crops in which it can be applied, required precautions and PPE, warnings, poisoning symptoms, first aid and antidote, etc. Thus, the end users are being denied relevant information and therefore they are vulnerable to the risks inherent in the hazards of paraquat dichloride use.

As paraquat decanting is being done without observing safety measures and without wearing the required PPE, and as these practices are being done in front of the farmers who come to buy paraquat at the retail point, it makes the farmers less sensitive to the risks and they may develop a notion that it is not necessary to follow the required precautions. This could contribute to negligence and risky behaviour among farmers and applicators while handling (mixing, spraying, etc.) hazardous pesticides including paraquat.

The 2015 report *Conditions of Paraquat use in India* brought out an important observation from the State of West Bengal that paraquat was sold in plastic carry bags as well as in empty bottles of other pesticides as farmers require paraquat in smaller volumes.

Decanting, selling in bottles and in plastic bags is a violation of Insecticide Rules 16, which states 'no person shall stock or exhibit for sale or distribute any pesticide unless it is packed and labelled in accordance with the provisions of the Insecticide Rules 1971'. Additionally, these practices are in violation of the Article 8 and 10 of the International Code of Conduct on Pesticides Management. Therefore, it is very clear that decanting of paraquat is an illegal activity, and use of plastic carry bags and refill bottles are inappropriate and dangerous.

4.7 PPE are not provided at retail points and farmers are not advised

Farmers and workers do not have access to PPE or information on it, as retailers do not exhibit or sell it in their sales points.

The International Code of Conduct on Pesticide Management states, in article 10.4, that:

Governments should take the necessary regulatory measures to prohibit the repackaging or decanting of any pesticide into food, beverage, animal feed or other inappropriate containers and rigidly enforce punitive measures that effectively deter such practices.

The India Insecticide Rules 1971, in its Rule 16 on prohibition of sale or distribution unless packed and labelled, states that *no person shall stock or exhibit for sale or distribute [or cause to be transported] any insecticide unless it is packed and labelled in accordance with the provisions of these rules*"; and the Rule 17 on packaging of insecticides, states that *"every package containing the insecticides shall be of a type approved by the Registration Committee"*.

It is extremely important that farmers and workers are provided with required PPE and are properly aware of safety aspects in order to ensure their safety. Additionally, as paraquat has been sold in plastic carry bags and refill or empty containers, farmers or workers are always at risk from increased likelihood of exposure and spillage. It is noted that the government and manufacturers have failed to ensure availability of PPE to end users in the villages.

According to the *Conditions of Paraquat use in India*, retailers admitted that

neither the manufacturers supply nor they sell PPE at the retail points, and that most respondents lacked awareness about its availability and use. It reports that retailers and agents of distributors promised the farmers they would ensure the availability of PPE in the village, but it has not happened. The 2015 report points out that, as paraquat is being decanted and sold in plastic carrying bags and refill bottles, it is more than probable that the retailers and farmers have contact with and are inhaling paraquat, increasing their risk of poisoning. Ironically, none of the retailers use protective measures when decanting.

4.8 Container disposal is not done properly

Information as shared by the retailers, that there is no system in place for proper disposal of containers of paraquat (and other pesticides), is extremely important. According to the Insecticides Rules 44, it is the duty of the manufacturers, formulators of insecticides and operators to dispose of packages or surplus materials and carry out washing in a safe manner so as to prevent environmental or water pollution. However, as evident from the study, retailers do not have a mechanism to take back containers or left over pesticide and dispose of them properly. As retailers decant and sell paraquat in refill or empty bottles and plastic carrying bags, in addition to selling properly packed products, and as these containers are not collected back, farmers are simply throwing the bottles and plastic bags into the field or near human habitation, or these are kept within the residential areas, or sold to scrap dealers as evident from the 2015 report

Conditions of Paraquat Use in India. Thus, the manufacturers are in violation of the Insecticide Rules 44 and Article 4 of the International Code of Conduct and Pesticides Management. The ground reality shows that the industry has failed to bring in a system for safe disposal of containers; and the government has also failed to realise such a functional system.

The *Conditions of Paraquat use in India* reported that most of the farmers simply throw the empty containers of paraquat into the farm fields or neighbouring area. Burning and burying were also reported. Additionally, some strange practices were reported including containers being sold to scrap dealers, used as toilet and bathroom vessels, used for buying paraquat and other pesticides in smaller volumes, and sold to ice cream vendors. This last practice can endanger the lives of many people especially children.

4.9 Quality of various brands

It has been noted that there is wide variation in the prices of different brands (Table 7). The maximum retail price (MRP) varied from Rs. 1,650 to Rs. 2,425, for five litre containers. Variation in prices as noted here poses a serious question whether the cheapest one in the list in the Table 7 is of substandard quality or a spurious one. This is an important fact to be noted and the possibility of intrusion of substandard or poor quality products cannot be ignored, as there were reports that nearly 30% of pesticides sold in Indian markets are either of substandard quality or spurious ones and highlight the regulatory failure in India.

5. CONCLUSION

The study has noted a range of issues with regard to the retailing of paraquat dichloride in West Bengal. It ranges from selling products not authorised by the manufacturers, absence of mandatory labelling on certain products, recommendations for the use of paraquat on crops not included in the CIB&RC directive, inadequate information on PPE on the label, PPE not given or sold at the retail points and farmers not advised of its requirement, to decanting and selling in refill or empty bottles and plastic carry bags, without labels or instruction leaflets. Additionally, label information is not provided in the local

language and there were wide variations in the cost of various brands, raising concerns about quality. Retail sale of paraquat and related practices noted in West Bengal are in violation of the Indian Insecticides Act and Rules as well as the International Code of Conduct on Pesticides Management. Central Insecticides Board and Registration Committee, the Central and State Agriculture Departments, manufacturers and retailers are responsible for enforcement of rules. However, these violations indicate lack of stringent regulation as well as monitoring and gross failure of the current regulatory mechanisms.

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This report presents kind of practices being pursued in selling paraquat dichloride, a toxic chemical, in India. Data collected from the State of West Bengal shows that practices are casual and basic, violating Indian national laws as well as the International Code of Conduct on Pesticides Management. Illegal practices illustrated in the report reveal gross failure of the Indian pesticide regulatory system to rein in sellers and buyers. In a scenario of lax regulatory system and totally ignorant users, this report recommends immediate ban on the production, import, sale and use of paraquat dichloride in India, and adoption of non-chemical methods of weed management and agro-ecology.

About Pesticide Action Network (PAN) India

PAN India is a public interest non-profit organisation working to make India a world leader in agro-ecology. This organisation is being developed as a regional centre and works in collaboration with Pesticide Action Network (PAN) International community to eliminate the human and environmental hazards caused by pesticides. The organisation focuses on bringing changes to the way chemical pesticides are used, harming life and the environment. It aims to help farmers reduce dependence on toxic chemicals and to increase the use of sustainable alternatives to chemical pest control, based on scientific knowledge. Primarily, PAN India focuses on generating and sharing knowledge related to chemical pesticides such as farm level actual practice, health and environmental effects, as well as on alternatives to hazardous chemicals. PAN India is committed to support efforts of farming communities to promote ecological agriculture, conserving traditional knowledge and agro biodiversity towards ensuring sustainable food production systems and toxic free living. PAN India supports sustainable options in all human endeavours and living, based on participatory research and sound science, achieving social and environmental justice to replace toxic substances in our society.

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