

F. No. 21-1/2010-PP.II (MPRNL)
Government of India
Department of Agriculture & Co-operation
Plant Protection-II

Krishi Bhawan, New Delhi-110001.

Dated: 11th June, 2012.

OFFICE MEMORANDUM

Subject: Writ Petition (C) 7495/2010 Delhi High Court on its own motion versus Union of India & others regarding pesticide residues in vegetables etc.

The undersigned is directed to say that in pursuance of the Hon'ble High Court of Delhi Order dated 23rd February, 2012 in Writ Petition (C) No. 7495/2010- Court on its own motion Versus Union of India & others, this Department constituted a Committee of technical persons vide O.M. of even number dated 15th March, 2012 for framing a policy for periodic check to detect pesticide residues in vegetables and fruits. In its Order dated 20th March, 2012 in the aforesaid Writ Petition the Hon'ble High Court of Delhi suggested that a person outside the Government also be associated as a Member of Committee. The composition of the Committee was therefore revised vide O.M. of even number dated 23rd March, 2012.

2. The High Court vide order dated 27.3.2012 expressed a wish that Professor M.S. Swaminathan would be able to contribute to the report of such a Committee and desired that Prof. Swaminathan may be requested to be a part of the Committee. Prof. M.S. Swaminathan expressed his regret to join the committee in view of heavy commitment in Parliament, but agreed to give his inputs on the recommendations of the committee. Vide Order dated 16th April, 2012, the Court observed that Prof. M. S. Swaminathan may suggest some other alternative person to be on the committee. On the constitution of the full committee and the work being taken up, the committee will keep Prof. M.S. Swaminathan informed so that he is able to give his inputs. In response Prof. M.S. Swaminathan has suggested the name of Dr. Sandhya Kulshrestha, Consultant, Directorate General of Health Services (ex-Secretary, Central Insecticides Board & Registration Committee). The High Court of Delhi ordered on 1st May, 2012 that the Committee be accordingly reconstituted.

3. Now in pursuance to the High Court's order dated 1st May, 2012 and in supersession of this Department's O.Ms. of even number dated 15th March, 2012 and 23rd March, 2012 the competent authority in the Department of agriculture & Co-operation hereby orders reconstitution of the Committee consisting of the following technical persons for framing policy for periodic check to detect pesticide residues in vegetables and fruits:-

i. Dr. (Mrs.) Sandhya Kulshrestha, Consultant, Directorate General of Health Services (ex-Secretary, CIB & RC).

Chairperson

ii. Dr. (Mrs.) Sarita Bhalla, Specialist Grade-I (Medical Toxicology) & Joint Director, Dte. of PPQ & S, Faridabad.

Member

- iii. Dr. Dhir Singh, Director (QA & S), Food Safety & Standards Authority of India
Member
- iv. Dr. K.K. Sharma, Principal scientist & Project Co-ordinator, All India Network Project on Pesticide Residues, Indian Agriculture Research Institute, New Delhi.
Member
- v. Shri S.M. Bhardwaj, Food Analyst, Department of food Safety, Government of NCT of Delhi.
Member
- vi. Shri Vipin Bhatnagar, Joint Director (Chemistry), Dte. of PPQ & S, Faridabad
Member
- vii. Shri V.K. Rao, Senior advocate & Amicus Curiae, High Court of Delhi
Member
- viii. Dr. (Mrs.) Manjeet Aggarwal, Deputy Director, Analytical Science Division (Bio), Shriram Institute for Industrial Research, Delhi.
Member

4. The Committee may deliberate following suggestions for framing the policy as well as other suggestions:-

- (i) The number of vegetables and fruits to be tested should be enlarged, i.e. the test should be for all the fruits and vegetables in Delhi.
- (ii) The periodicity of checking should be increased so that there is constant monitoring in this behalf.
- (iii) There should be transparency in respect of flow of information to the public by loading the necessary data arising from such checking on the website and being published in the newspapers so that the public is aware of what it is purchasing and from where.
- (iv) There should be endeavour to have smaller labs in the vicinity of the *mandis* so that an immediate check may be possible as vegetables are being sourced in Delhi from different parts of the country. If, at the threshold, it is detected that a particular consignment is contaminated then a decision can be taken not only qua the consignment, but also the area from where it is being sourced to facilitate the concerned authorities to even take necessary steps in that area.
- (v) Methods to be evolved to control the flow of pesticides to farmer community so that at the user stage, only permissible pesticides are used.
- (vi) The test be also carried out for fruits being imported from abroad.
- (vii) Remedial measures be suggested for the user public to remove contamination and due publicity be given to the same.

5. The Committee may co-opt experts as and when required. The Committee will keep Prof. M.S. Swaminathan informed so that he is able to give his inputs.

6. The Secretariat of CIB & RC will extend all secretarial assistance to the Committee. The Committee should frame the policy at the earliest possible and submit it.

Sd/-

(N.K. Sinha)

Under Secretary to the Government of India

Seal

Distribution:

1. Secretary (Health & Family Welfare), Room No. 156-A, Nirman Bhawan, New Delhi.
2. Chief Executive Officer, Food Safety and Standards Authority of India, FDA Bhawan, Near Bal Bhawan, Kotla Road, New Delhi.
3. Dr. Arun Kumar Panda, Joint Secretary, Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi.
4. Director General of Health Services, Room No. 446-A, Nirman Bhawan, New Delhi.
5. Shri Anshu Prakash, Principal Secretary, Health & Family Welfare, Govt. of NCT of Delhi, 9th Floor, Delhi Secretariat, I.P. Estate, New Delhi.
6. Dr. A.K. Sinha, Plant Protection Adviser, Dte. of PPQ&S, Faridabad.
7. Dr. T.P. Rajendran, ADG(PP), ICAR, Krishi Bhawan, New Delhi.
8. Dr. (Mrs.) Sandhya Kulshreshtha, Consultant, Directorate General of Health Services, Room No. 405-B, 'A' Wing, Nirman Bhawan, New Delhi.
9. Dr. Smt. Sarita Bhalla, Joint Director (Medical Toxicology), DPPQ&S, Faridabad.
10. Chairman, Shriram Institute for Industrial Research, 19, University Road, Delhi – 110 007.
11. Dr. Dhir Singh, Director (Quality Assurance), Food Safety & Standards Authority of India, FDA Bhawan, Near Bal Bhawan, Kotla Road, New Delhi.
12. Dr. K.K. Sharma, Project Coordinator, All India Network Project on Pesticide Residues, IARI, Pusa, New Delhi.
13. Sh. Vipin Bhatnagar, Joint Director (Chemistry), DPPQ&S, Faridabad.
14. Sh. V.K. Rao, Senior Advocate & Amicus Curiae, High Court of Delhi.
15. Dr. (Mrs.) Manjeet Aggarwal, Deputy Director, Analytical Science Division (Bio), Shriram Institute for Industrial Research, 19, University Road, Delhi – 110 007.
16. Sh. S.M. Bhardwaj, Food Analyst, Department of Food Safety, Government of NCT of Delhi.

Copy to: PS to JS(PP)
Director (PP.II)

Sd/-
(N.K. Sinha) Seal

Monitoring of Pesticide Residues at National Level
Data on food commodities and environmental samples
During April, 2011-March, 2012

Commodity	Samples analyzed	Samples with detected residues above PFA MRL	Samples with detected residues above CODEX MRL	Samples above MRL
Animal feed	468	0	0	0
Crustacean	216	0	0	0
Egg	216	0	0	0
Fish	494	1	0	1
Fruits	2170	9	7	12
Honey	36	0	0	0
Meat	288	0	0	0
Milk	647	0	0	0
Pulses	726	0	1	1
Rice	802	5	0	5
Soil	60	0	0	0
Spices	654	38	12	41
Tea	192	5	0	5
Vegetables	6441	205	47	208
Water	2857	0	0	0
Wheat	681	7	13	17
Total	16948	270	80	290

Consumption of pesticides at National level and in National Capital Territory
During 2007-08 and 2011-2012

S. No.	Year	Consumption (MT Technical Grade)		
		All India	Delhi	% of all India
1.	2007-08	41637.30	57.00	0.14
2.	2008-09	43860.07	57.00	0.13
3.	2009-10	41821.40	49.00	0.12
4.	2010-11	55539.65	48.00	0.09
5.	2011-12	50583.47	46.00	0.09

[Source: Statistics as on 27.02.2012, as provided by the State in the Zonal Conference on Inputs (Plant Protection)]

Basic statistics/information in respect of Azadpur Yard and Okhla Sub-yard

S. No.	Description	Azadpur Yard	Okhla Sub-yard
1.	Area of New SabziMandi (NSM)	43.65 Acre	9.98 Acre
2.	Area of Cement Godown	03.50 Acre	---
3.	Area of New Fruit Market, SaraiPipalThala	29.18 Acre	---
4.	No. of Big Shops (Size)	438 (12'x53')	50 (12'x53')
5.	No. of Small Shops (Size)	928 (10'x18')	218 (12'x12')
6.	Covered Auction Sheds A Block NSM C Block NSM Potato & Onion Shed Grower Shed Cement Godown Area NFM Phase-I NFM Phase-II Total	No. (Area, sqm) 1 (3272) 1 (3272) 1 (6000) 1 (2900) 3 (7766) 8 (29214) 7 (19618) 22 (72042)	No. (Area, sqm) 1(1536) 1 (832) 1 (832) 3(3200)
7.	Rate of Commission	6%	6%
8.	Rate of Marketing Fee	1%	1%
9.	No. of Notified Commodities (All Fruits & Vegetables) Fruits Vegetables	 50 68	 50 68
10.	No. of Licenses (As on 31.03.2011) Commission Agents "B" Wholesale Traders "A" Farmers I-Cards	 1977 1390 129	 198 146 Nil
11.	No. of Banks	6	2
12.	Total No. of Employees	573	75
13.	No. of Cold Storage (AzadpurMandi)	7	---

1. Arrival (in MT) during 2006-2011 in mandis of Delhi (including sub-yards)

Year	Fruits	Vegetables	Total
2006-07	2156145.4	2122959.3	4279104.7
2007-08	2428091.8	2138698.0	4566789.8
2008-09	2265244.5	2162844.6	4428089.1
2009-10	2041758.3	2179323.8	4221082.1
2010-11	2292619.6	2239825.8	4532445.4

2. Arrival of Six Major Commodities (in MT) during 2006-2011 in Delhi (including sub-yards)

Commodity	2006-07	2007-08	2008-09	2009-10	2010-11
Apple	572605.5	849736.6	756086.2	633893.4	823770.3
Banana	243501.4	215392.5	219544.7	156144.4	155017.7
Mango	262289.7	260432.9	192388.6	179882.8	224255.0
Potato	527758.4	533499.5	592115.0	519096.7	545664.6
Onion	421010.2	412474.9	406037.6	427014.6	400548.9
Tomato	194291.9	213243.2	211416.3	209404.2	198690.9

3. Average Daily Arrival of Vehicles (No.) in mandis of Delhi

Type of Vehicle	Loaded	Empty	Total
Trucks	416	234	650
Tempo	835	1858	2693
Rehra/Rickshaws	59	1941	2000
Total	1310	4033	5343

Annexure-VII

Number of randomly selected primary samples required for a given probability of finding at least one non-compliant sample in a lot of fruit or vegetable, for a given incidence of non-compliant residues in the lot

Incidence of non-compliant residues in the lot	Minimum number of samples (n_o) required to detect a non-compliant residue with a probability of:		
	90%	95%	99%
%			
90	1	-	2
80	-	2	3
70	2	3	4
60	3	4	5
50	4	5	7
40	5	6	9
35	6	7	11
30	7	9	13
25	9	11	17
20	11	14	21
15	15	19	29
10	22	29	44
5	45	59	90
1	231	299	459
0.5	460	598	919
0.1	2302	2995	4603

Notes: (a) The table assumes random sampling.

(b) Where the number of primary samples indicated in the Table is more than about 10% of units in the total lot, the number of primary samples taken may be fewer and should be calculated as follows:

$$n = \frac{n_o}{1 + (n_o - 1)/N}$$

where n = minimum number of primary samples to be taken

n_o = number of primary samples given in the table

N = number of units, capable of yielding a primary sample, in the lot.

(c) Where a single primary sample is taken, the probability of detecting a non-compliance is similar to the incidence of non-compliant residues.

(d) For exact or alternative probabilities, or for a different incidence of non-compliance, the number of samples to be taken may be calculated from:

$$1 - p = (1 - i)^n$$

where p is the probability and i is the incidence of non-compliant residues in the lot (both expressed as fractions, not percentages), and n is the number of samples.

Pesticides which have been Refused Registration

S.No.	Name of Pesticides
1.	Calcium Arsenate
2.	EPM
3.	Azinphos Methyl
4.	Lead Arsenate
5.	Mevinphos (Phosdrin)
6.	2,4, 5-T
7.	Carbophenothion
8.	Vamidothion
9.	Mephosfolan
10.	Azinphos Ethyl
11.	Binapacryl
12.	Dicrotophos
13.	Thiodemeton / Disulfoton
14.	Fentin Acetate
15.	Fentin Hydroxide
16.	Chinomethionate (Morestan)
17.	Ammonium Sulphamate
18.	Leptophos (Phosvel)

Pesticides which have been restricted for use

S.No.	Name of Pesticides
1.	Aluminium Phosphide
2.	DDT
3.	Lindane
4.	Methyl Bromide
5.	Methyl Parathion
6.	Sodium Cyanide
7.	Methoxy Ethyl Mercuric Chloride (MEMC)
8.	Monocrotophos
9.	Endosulfan*
10.	Fenitrothion
11.	Diazinon
12.	Fenthion
13.	Dazomet

* Banned vide an interim order of Hon'ble Supreme Court for manufacture, import, sale, distribution and use in India. Final Order is yet to come.

Pesticides which have been banned for use

A.	Pesticides Banned for manufacture, import and use (28 Nos.)	
	1.	Aldrin
	2.	Benzene Hexachloride
	3.	Calcium Cyanide
	4.	Chlordane
	5.	Copper Acetoarsenite
	6.	Cibromochloropropane
	7.	Endrin
	8.	Ethyl Mercury Chloride
	9.	Ethyl Parathion
	10.	Heptachlor
	11.	Menazone
	12.	Nitrofen
	13.	Paraquat Dimethyl Sulphate
	14.	Pentachloro Nitrobenzene
	15.	Pentachlorophenol
	16.	Phenyl Mercury Acetate
	17.	Sodium Methane Arsonate
	18.	Tetradifon
	19.	Toxafen
	20.	Aldicarb
	21.	Chlorobenzilate
	22.	Dieldrine
	23.	Maleic Hydrazide
	24.	Ethylene Dibromide
	25.	TCA (Trichloro acetic acid)
	26.	Metoxuron
	27.	Chlorofenvinphos
	28.	Lindane (Banned vide Gazette Notification No S.O. 637(E) Dated 25/03/2011)- Banned for Manufacture,Import or Formulate w.e.f. 25th March,2011 and banned for use w.e.f. 25th March,2013.
B.	Pesticide / Pesticide formulations banned for use but their manufacture is allowed for export (2 Nos.)	
	29.	NicotinSulfate
	30.	Captafol 80% Powder
C.	Pesticide formulations banned for import, manufacture and use (4 Nos)	
	1.	Methomyl 24% L
	2.	Methomyl 12.5% L
	3.	Phosphamidon 85% SL
	4.	Carbofuran 50% SP

FSSAI Authorized Laboratories located in Delhi/Delhi NCR

1.	Sh. Pradeep Gupta Sr. Business Manager (Food & Agri) - Certification, Testing & Inspection TUV SUD, Delhi C-153/1, Okhla Ind. Estate, Phase-I, New Delhi – 110 020 Tel.: 011-30889611, Mob: 0971712445 Email: info@tuv-sud.in	7.	Sh. Atul Kumar FICCI FRAC, Delhi FICCI Research & Analysis Centre, Plot No. 2A, Sector-8, Dwarka, New Delhi – 110077 Tel: 011-25360791 – 95,45333500-520 Email: frac@ficci.com
2.	Dr. N.C. Basantia Director Technical Avod Food Lab (Pvt.) Ltd., C-35/23, Lawrence Road, Industrial Area, Delhi – 110 035.	8.	Sh. Vishal Arora Director, AES Lab., Noida AES Labs, B-118, Phase-II, Noida – 201 304 Tel: 0120-3047900, Fax: 0120-3047914
3.	J.S. Chadha (Director) Sophisticated Industrial Materials Analytical Labs Pvt. Ltd., Delhi A-3/7, Mayapuri Indl. Area, Ph-II, New Delhi-110 064 Tel: 011-43854300-29 Email: simalabs@simalab.co.in ; testing@simalab.co.in	9.	Sh. M.C. Goel Director Delhi Test House, Delhi A-62/3, G.T. Karnal Road, Industrial Area, Opp. Hans Cinema, Azadpur, New Delhi – 110 033 Tel: 011-47075555 Email: info@delhitesthouse.com
4.	Sh. Kamal K. Mehta (Senior VP) Spectro Analytical Labs Ltd., E-41, Okhla Industrial Area, Phase-2, New Delhi – 110 020 Tel: 011-40522000, 41611000 Mob.: 09999704001 Email: kkm@spectro.in , care@spectro.in	10.	Dr. Saurabh Arora, Executive Director, Arbro Pharmaceuticals Limited, Analytical Division, 4/9 Industrial Area, Kirti Nagar, Delhi – 110 015 arbrolab@arbropharma.com 011-45754575
5.	Sh. Neeraj Kumar Kishra, CEO, Advance Research and Analytical Services, Ghaziabad, S,C-8, Sector 12, C Block, Pratap Vihar, Ghaziabad – 201009 info@arasindia.com 0120-2740390	11.	Dr. Imran Khan (Manager-Food Testing & Analytics) Intertek India Pvt. Ltd. (Food Services), Plot No. 68, Udyog Vihar, Phase-I, Gurgaon, Haryana – 122016 Tel: 0124-4840603, Mob.: 09650601103 Email: imran.khan@intertek.com
6.	Sh. D. Mathur, Director Fare Labs Pvt. Ltd., P-94, Sector-30, Gurgaon – 122002, Haryana Tel: +91-124-4223207-08, 4034205 Fax: +91-124-4036038 Email: farelabs@farelabs.com		

NABL Accredited Private Laboratories for Testing Pesticide Residues

S.No.	Name of the Company	Address
1.	Shriram institute For Industrial Reseach	19, University Road Delhi-110007
2.	Delhi Test House	G.T. Karnal Road Delhi
3.	FICCCI FRAC Delhi	Dwarka Delhi-110077
4.	TUV SUD	Okhla Ind. Estate Delhi-110020
5.	AES Lab	Noida Phase- II
6.	Intertek India Pvt. Ltd.	Gurgaon
7.	Arbro Pharmaceutical Ltd.	Delhi-110015
8.	Spectro Anaqlytical Lab Ltd.	Delhi-110020

Annexure-XIII**List of Pesticides Commonly Used/Misused/Detected on Various Commodities**

Organochlorines	Organophosphates	Synthetic Pyrethroids	Carbamates & others
α -HCH	Chlorpyrifos	α -Cypermethrin	Carbaryl
β -HCH	Acephate	Bifenthrin	Carbofuran
γ -HCH	Dichlorvos	Deltamethrin	3-hydroxy carbofuran
δ – HCH	Dimethoate	Fenpropathrin	Imidacloprid
Endosulfan-I	Omethoate	Fenvalerate	Thiodicarb
Endosulfan-II	Ethion	λ -Cyhalothrin	Thiacloprid
Endosulfan sulphate	Malathion	Fluvalinate	Carbosulfan
Dicofol	Malaoxon		Imidacloprid
p,p'-DDE	Methamidophos		Thiamethaxam
p,p'-DDD	Monocrotophos		Acetamiprid
p,p'-DDT	Parathion-methyl		Spinosad
	Phorate		Flubendiamide
	Phorate sulphoxide		Indoxacarb
	Phorate sulfone		Emamectin benzoate
	Phosphamidon		Chlorantraniliprole
	Quinalphos		Cartap hydrochloride
	Triazophos		Methomyl
	Profenophos		Abamectin
	4-bromo-2-chlorophenol		
	Chlorpyrifos-methyl		

Ways & Means to Minimize them on Fruit & Vegetables before Consumption

At the time of purchasing fruits and vegetables, these may appear clean and attractive. However, it is not feasible to tell the amount of pesticide residue, besides bacteria, dirt, etc that may still remain after these have been harvested, stored and transported. There are several ways & means to reduce pesticide residues on fruits & vegetables before consumption, as under:-

- (a) Procure fruits and vegetables from the market (local or produce stands) as far as possible.
- (b) Dry produce with a clean cloth towel or paper towel reduces residues.
- (c) Scrub firm fruits and vegetables, like, melons, root vegetables, like, carrot and tubers, like potatoes. Soft brush can be used to scrub the fruits and vegetables for five to ten seconds before rinsing with slightly warm water.
- (d) Discard outer layer of leafy vegetables, like, cabbage, lettuce, etc before washing as they grow close to the ground where soil could be tainted.
- (e) Peeling reduces residues considerably. Peeling and trimming fruits, like, mango, citrus, apple, pear, peach and kiwi and vegetables, like, gourds reduces pesticide residues.
- (f) Washing in clean running, preferably drinking, water reduces pesticide residues as it has abrasive effect.
- (g) Washing of vegetables, like, cauliflower, broccoli, cabbage, spinach and green beans with hot water containing 2 per cent common salt removes residues.
- (h) Carrot, okra, brinjal, cabbage and cauliflower, can be washed with 1 per cent tamarind solution.

- (i) Salad spinner can be used to wash and dry lettuce or leafy greens. Colander can be used, followed by drying with a paper towel.
- (j) Don't use any soap, detergents, chemicals, which could leave their own harmful residues.
- (k) Cut away damaged or bruised areas on fresh fruits and vegetables before eating/cooking. Discard any portion that appears rotten.
- (l) Vegetables and some of the fruits, which are consumed along with the peel, can be soaked in water for half-an-hour to one hour and rinsed a few times before use. Soaking fruits and vegetables five to ten minutes in a solution of diluted form of hydrochloric acid with four tablespoons of salt and juice of half a fresh lime and rinsing thoroughly with clean water helps in reducing residues. Use of dilute vinegar/acetic acid followed by thorough rinsing is also recommended.
- (m) Vegetables can be kept in boiling water just for a minute and rinsed in running water thereafter to reduce pesticide residues.
- (n) Steaming and cooking of vegetables eliminate most of the residues that are not removable by washing or peeling.
- (o) Variety of fruits and vegetables helps in maintaining a balanced diet and also avoiding excessive consumption of pesticide residues from a small range of food items.
- (p) Juicing of fruits, like, grapes reduces the residue level. Clarification processes, such as centrifugation and filtering, further reduce the residues.

(q) Highly concerned individuals may opt for fruits and vegetables grown under Certified Organic Methods. However, even organically grown fruits and vegetables cannot be guaranteed for total freedom from pesticide residues though they might help in reducing the intake of pesticide residues. They are expensive too.

(r) Lemon/Baking Soda Wash

1Tbsb. lemon juice – (natural disinfectant), 2 Tbsp. baking soda (neutralizes the pH level of pesticides), 1 cup (250 ml) of water.

Put the mixture in a spray-topped bottle. Spray the fruit or vegetables, leave it to sit for 5-10 minutes, then rinse well.

(s) Lemon/vinegar Wash

1 Tbsp. Lemon juice – (natural disinfectant), 2 Tbsp. white vinegar (distilled works best) (cleans the fruits and vegetables and neutralizes most pesticides), 1 cup (250 ml) of water in a spray-topped bottle.

Spray the fruits or vegetables, wipe and eat.

(t) Vinegar/Salt Wash

¼ cup vinegar (cleans the fruits and vegetables and neutralizes most pesticides)
2 Tbsp. salt (draws out dirt and insects).

Just fill a sink or a large bowl with water and the above ingredients (depending on the method you choose) and let the vegetables sit for about 20 minutes, then rinse or else you can fill an empty water bottle and spray onto your produce and then rinse and wipe.

(u) For particularly waxy fruit and vegetables:

1 cup (250 ml) water, ½ a cup (115 ml) vinegar), 1 Tbsp. baking soda and Dash of grapefruit seed extract. Spray onto the produce and leave for an hour before rinsing and eating.

(v) Exposure to ozone gas (O_3) and dipping in ozonated water helps in reduction of pesticide residues. Gaseous ozone treatment during storage degrades contemporary pesticides. Ozone sanitation method does oxidize pesticide residues. An extended wash in clean water can help further reduction in pesticide residues. Some companies have started marketing the equipment for ozone sanitation.

(w) Some of the Commercial Fruit cleaners available on the market are made up of 100% natural produce – normally some form of citric acid. These claim to remove wax, pesticides and 99% bacteria. However, ammonia-based products to be avoided.
