



## Use and Availability of Recommended Pesticides in District Kapurthala

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### ABSTRACT

In the light of observation that farmers are not using pesticides recommended by State Agricultural University, a market survey was conducted in district Kapurthala to ascertain the availability of recommended pesticides (insecticides and fungicides). Survey was conducted in five blocks of district choosing ten dealers per block using random sampling technique. Out of 262 brands of pesticides, 200 brands were those of insecticides and 62 brands were of fungicides available with the dealers. Of all the stock available with retailers, only 38 insecticides brands and 8 fungicides brands were recommended by State Agricultural University while rest of brands were non- recommended. In addition to this, there were certain brands (13 brands) available in the market whose active ingredients are yet to be tested. Certain mixtures (41 brands) were also found available in the market. Out of these, 9.54% brands (25 brands) were insecticides and 6.10% brands (16 brands) were fungicides.

**Key Words:** Insecticides, Fungicides, Availability, Survey, Kapurthala

### INTRODUCTION

Although various methods are used to control pests in different pest management systems, yet use of pesticides continue to be the major component of most of the pest control programmes and will probably remain so in the near future. However, several reports have highlighted the indiscriminate and excessive use of insecticides by the farmers. This large scale use of pesticides has caused many environmental problems like pesticide poisoning, insecticide resistance, resurgence of pests and effect on non-target organisms. One solution to combat these problems is to use recommended pesticide at the right time with the recommended dose and not to make use of banned or restricted pesticides at all. The reason being that the recommended pesticides are good as they are less persistent and more toxic to the target species than their natural enemies and provide required control of insect pest or disease.

It is pertinent to mention that before making any recommendation within a state, the State agricultural universities conduct a large number of experiments to test the brand developed by a

pesticide firm in the laboratory as well as at the farmers' field. Later on, these recommendations are passed on to farmers through various extension agencies including the Krishi Vigyan Kendras' (KVK) working at the district headquarter in a district. The availability, efficacy and suitability of pesticides for the control of insects and disease are major factors considered while providing solution to the problems of farmers. Farmers are advised by the KVK to use only recommended dosages of insecticides or fungicides. However, during several interactions with the farmers, it was observed that despite the efforts of KVK to educate farmers about the right use of pesticides, farmers are still using non-recommended insecticides. Thus as prelude to this study, an interview of hundred farmers was conducted and it was found that though they are aware of recommendations of various pesticides but only 7 per cent were using recommended brands of pesticides. The reason cited was non availability of recommended pesticides in the market. Thus the current study was planned to know the availability of recommended pesticides

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(insecticides and fungicides) in the district Kapurthala besides availability of banned or restricted pesticides and pesticide mixtures.

## MATERIALS AND METHODS

A survey was conducted to know the availability of different pesticides in the district. There are five blocks namely Dhilwan, Kapurthala, Nadala, Phagwara and Sultanpur in the district and 10 pesticide dealers per block were selected for the purpose of interview. A list of all recommended pesticide chemicals was prepared and the dealers were asked about the presence of various brands (recommended and non-recommended) corresponding to that chemical. The collected data were then analysed based on the groups of different pesticides available with the retailers in the market.

## RESULTS AND DISCUSSION

As discussed earlier that a list of all pesticide chemicals was prepared and the dealers were asked about the presence of various brands corresponding to that chemical. The following 22 chemicals having insecticidal nature were examined about the presence of various brands in the market.

### A) Availability of Recommended insecticides

1. **Chlorpyrifos:** It is recommended in wheat, paddy, sugarcane, pulses etc. for the control of stem borers, leaf folders and termites (Anonymous 2013a, b). Out of total 28 brands of chlorpyrifos available in the market, only 6 brands (21.4%) were recommended.
2. **Thiomethoxam:** It is recommended in wheat, paddy, cotton etc for the control of sucking pests particularly aphids and jassids. Its recommended brands are Actara and Extra super. Actara was found available in blocks Sultanpur Lodhi, Kapurthala and Phagwara whereas in the district 13 brands of Thiomethoxam were available but only one brand (7.7%) was found to be recommended.
3. **Imidachloprid:** It is recommended in wheat, paddy, cotton, citrus etc for the control of sucking pests particularly aphids and jassids. Its recommended brands are Crocodile,

Confidor, Confidence, Imidacel, Markdor and Extra super. Confidor was found available in blocks Sultanpur Lodhi, Dhilwan and Phagwara while Crocodile and Confidor were available in Kapurthala block but no recommended brand of imidachloprid was found available in Nadala block. A total of 30 brands of Imidachloprid were available, out of these only 3 (10%) were recommended while rest of the available brands were non-recommended (Table 1). For seed treatment purpose, recommended brand of imidachloprid is Gaucho 70 WS but the formulation available was Gaucho 600 FS.

4. **Lambda Cyhalothrin:** None of the brand of Lambda cyhalothrin is recommended yet, 19 brands of this chemical are being used by the farmers for the control of stem borer and leaf folder in paddy.
5. **Indoxacarb:** It is recommended in cotton, fruit plants and vegetables etc for the control of bollworms particularly American bollworm (Anonymous 2013c, d). Its recommended brand is only Avaunt which was found available in Sultanpur Lodhi (vegetable growing area) and Phagwara blocks only. Out of 4 brands available, only one is (Avaunt) recommended.
6. **Cypermethrin:** It is used in cotton, maize, pulses etc. for the control of bollworms particularly maize borer and American bollworm. Its recommended brands are Cymbush, Ripcord and Cyperguard. Cymbush was available in block Phagwara only whereas out of 11 brands of Cypermethrin, only one (9.1%) was recommended.
7. **Dichlorvos:** It is recommended in pulses for the control of leaf eating insects particularly hairy caterpillars and the recommended brand is Nuvan which was available in Sultanpur Lodhi and Phagwara blocks only. One recommended brand (7.7%) out of 13 brands was available in the district.
8. **Flubendamide:** It is recommended in cotton for the control of pink bollworm, spotted bollworm and American bollworm. Its recommended brand is NNI 001 which was

## Availability of recommended pesticides

**Table 1. Prevalence of recommended and non-recommended brands of insecticides in Kapurthala district.**

Sr. No.	Chemical Name	Brand's Name	
		Recommended	Non-recommended
1.	Chlorpyrifos	Lethal, Classic, Lethal, Coroban, Radar, Durmet, Dursban	TKS-CHLO, Clearout, Krishan, Super 777, Jailsan, Dhanvan, Massban, Jailsan, Krushan, Tricel, Laser, Unichban, Dhamaka 500, Dhanvan-20, Chlorocid, Pyrifex, Lethal Super 550, Aldrin TC 20, Tafaban, Rusban, Predator, Dhanwan, Massban, Golden, Aldrin RTU
2.	Thiomethoxam	Actara	Arrow, Kri-Oxam, Exaam, Jai-Oxam, Areva, Kri-oxam, Spike, Arrow, Gizmo, Dotara, Actor, Areva, Imexo, Capar, Areva, Shine star
3.	Imidachloprid	Gaucho 600 FS Confidor Crocodile	Immediate Plus, Tatkal, Anucida, Josh, Suju, Jaiprid Mida, Media, Josh, Victor, Jumbo, Super Spectra Touch, Active Super, Media, Admire 10 WG, Tata mida, Amida, Touch, Chemida, Atom, Imida, Super Spectra, Imidacare, M-con, Bildar, Victor, Dawn, Pectus
4.	Lambda cyhalothrin		Bravo 5000, Wrestler, Coro lambda, Metador, Hammer, Deva, Shakti, Loc 2.5, Loc 5, Fire, Dabang 4.9%, Khanjar 5.0%, Garud, Dhoom, Khanjar, Xylo S, King Kong, Belton, Lambrador, Metador, He man Super, Khanjar, Fire, Dabang 4.9%, Icon 10 WP, Metador
5.	Indoxacarb	Avaunt	Kare, Lashkar, King Doxa
6.	Cypermethrin	Cymbush	Kricyp, Jai cyperin-10, Anilofos 30%, Jai cyperin-10, Jackpot 25, Cypergun, CyperMass 10%, Super Fighter 20%, Cypermil, Super, Fighter 20%, Cypermil, Cyper Mass, Super Killer 25
7.	Dichlorvos	Nuvan	Teer, Anu Vista, Jai Dichlorvos, Dhruv Tara, Divap-100, Massvan, Univan 76%, DD Fea 76%, Decent 76%, Dhruv Tara 76%, Badal 76%, DD Fex, B Zoom
8.	Flubendamide	-	Fame, Takumi, Suraksha.
9.	Triazophos		Tarzan, Kranti, Ghatak
10.	Profenofos	-	Krifos, Ajanta
11.	Fipronil	Regent 5% SC Regent GR 0.3%	Fipro 0.3%, Urgent 0.3%
12.	Novaluron	Rimon	Rudra, Novel, Crazy
13.	Carbofuran	Furadan 3G	Carbogran, Touch 3G
14.	Cartap Hydrochloride	Nidan Caldan	Rickdan, Jaidan, Virat, Kritap, Capsi, Grip, Indan, Veeta power, Current, Sumo, Jaidan, Indan
15.	Buprofezin	Applaud	Kri March, Tribute, Chemrise, Blunt, Tribute, Apple
16.	Phorate 10% Granules		Furatox 10 G, Thimet 10 G
17.	Monocrotophos	Monocil	Zeephos, Shaktimaan, Anucron, Uniphos-36
18.	Malathion		Cythion, Milthion
19.	Quinalphos	Ekalux	Jaikalux, Vazra, Unilux 25, Dhanulux
20.	Thiodicarb	Larvin	-
21.	Chlorantraniliprole	Ferterra Coragen	-
22.	Dimethoate	Rogor	-

not available in any of the block of Kapurthala district. Two brands of this chemical namely Fame and Takumi manufactured by Bayer Crop Science and Tata Rallis, respectively were found available in different blocks. Farmers are using this chemical for the control of stem borer and leaf folder in paddy and on vegetables particularly on tomato and brinjal at their own level. As no recommended brand of Flubendamide was available, hence the availability of unrecommended brands of Flubendamide was 100 per cent. Moreover, cotton is not grown in this district still, this chemical was available under different non recommended brand names.

9. **Triazophos:** It is recommended in paddy for control of stem borer and leaf folder and white fly in cotton. Sutathion is its recommended brand which was not available in any of the block. Hence, percent availability of non-recommended brands was 100 per cent.
10. **Profenofos:** It is recommended in cotton for the control of pink bollworm, spotted bollworm, American bollworm and mealy bug. Its recommended brands are Curacron, Krina, Profex which were not available in the district because cotton crop is not grown in this area. However, 2 non recommended brands were available.
11. **Fipronil:** It is recommended in wheat for termite control and stem borer and leaf folder in paddy. Its recommended brands are Regent 5% SC and Regent GR 0.3%. Both the formulations of Regent were available but in block Sultanpur Lodhi, only Regent 5% SC was available while in block Nadala granular formulation of Regent was found available. Granular formulations of non-recommended brands were available in block Sultanpur Lodhi and Nadala. Out of total 4 brands of Fipronil available, 2 were found recommended and 2 non-recommended. Hence percentage of availability of recommended brands were 50.
12. **Novaluron:** It is recommended in cotton for the control of tobacco caterpillar. Its recommended brand is Rimon and was found available in block Phagwara. Four brands were found available in all the five blocks of

Kapurthala district but only one (25%) was recommended.

13. **Carbofuran:** It is recommended in maize for the control of maize shoot fly. Its recommended brand is Furadan 3G which was available in 3 blocks. Two non-recommended brands i.e. Carbogran and Touch were also found available in block Nadala and Kapurthala, respectively.
14. **Cartap hydrochloride:** It is recommended in basmati rice for the control of stem borer and leaf folder. Its recommended brands are Padan, Nidan, Caildan, Regent, Dursban 10G etc. Availability of Nidan was found in all the blocks of Kapurthala district. In Nadala block, 8 non-recommended brands of cartap hydrochloride were found against only 1 recommended brand. In block Dhilwan, 2 non-recommended brands and in block Kapurthala and Phagwara, only 1 non-recommended brand of cartap hydrochloride was found. Of the total 14 brands of cartap hydrochloride available, 2 were found recommended and 10 non-recommended. Hence percentage of availability of recommended brands were only 16.7 in whole of Kapurthala district.
15. **Buprofezin:** It is recommended in cotton for the control of mealy bug. Its recommended brands are Applaud and Tribune. In Nadala and Dhilwan block, only non-recommended brands Krimarch and Tribute, respectively were found while in rest of the blocks, recommended brands were found available. In whole of the district, 5 non-recommended brands were available against the availability of 1 recommended brand. Hence percentage of availability of recommended brands was 16.7 per cent.
16. **Phorate granules:** This chemical is used for the control of bollworm in sugarcane, rice root weevil in paddy, shoot fly in maize and stem fly in peas. Its recommended brands are Thimet and Furatox which were found in all the blocks and no non recommended brand was there in the district.
17. **Monocrotophos:** Being systemic in nature, this chemical is used in paddy for the control



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of stem borer and leaf folder, pink bollworm, spotted bollworm and American bollworm. Only one brand of monocrotophos has been recommended in paddy namely Monocil while 10 brands have been recommended in cotton. Availability of Monocil was found in all the blocks of Kapurthala . Hence, percent availability of recommended brand was 100.

18. **Malathion:** Being systemic in nature, this chemical is widely used in agricultural crops for the control of aphid in rapeseed and mustard, thrip in summer moong and mash, red pumpkin beetle in cucurbits, to disinfect the walls of godowns. No specific brand name of Malathion has been listed in package of practices for Rabi and Kharif crops, hence this chemical cannot be graded as recommended and non-recommended. Only brand Cythion is recommended for disinfecting the walls of godowns which was found available in block Kapurthala only. In block Sultanpur Lodhi, Kapurthala and Phagwara, brand Milthion was available manufactured by Insecticide India Limited . Due to the availability of more effective and alternative brands of malathion, its use is decreasing in farmers.

19. **Quinalphos:**It is the chemical which is recommended in cotton for the control of Pink bollworm, spotted bollworm and American bollworm, in wheat for the control of hairy caterpillars, American bollworm and pink bollworm and in some vegetables for the control of above mentioned insect pests. Its recommended brands are Ekalux and Quinguard. Ekalux was found available in block Kapurthala and Phagwara only. In block Nadala and Dhilwan, no brand whether recommended or non-recommended was available. In block Sultanpur Lodhi, Jaikalux was the brand name manufactured by the Jai Farm Chemicals Pvt. Ltd. was found available.

20. **Thiodicarb:** This chemical is recommended in cotton for the control of pink bollworm, spotted bollworm and American bollworm. Its recommended brand is Larvin. This brand was found available in blocks Sultanpur Lodhi, Kapurthala and Phagwara. No non-recommended brand of this chemical was

available in whole of the district Kapurthala .Hence, in terms of recommended brands, its availability was 100 per cent.

21. **Chlorantraniliprole:** This chemical is recommended in cotton for the control of tobacco caterpillar and for the control of stem borer and leaf folder in basmati rice. Its recommended brands are Coragen and Ferterra. Coragen and Ferterra is recommended in basmati rice. Coragen alone is recommended in cotton and Ferterra alone is recommended in Sugarcane for the control of bollworms. Brands Coragen and Ferterra were available in blocks Sultanpur Lodhi, Dhilwan, Kapurthala and Phagwara while these brands were not available in Nadala block.

22. **Dimethoate:** It is the chemical which is recommended in wheat and pulses for the control of aphid. Its recommended brand is Rogor. Rogor was found available in all the blocks of district Kapurthala except Nadala. No non-recommended brand was found available in any of the block of district Kapurthala. Hence, the availability of recommended brand of Dimethoate was 100 per cent.

#### B) Available insecticide brands whose chemical is yet to be tested

**Thiacloprid:** Thiacloprid, a neonicotinoid insecticide with novel mode of action, is found to be effective against several lepidopteran as well as hemipteran pests. It belongs to imidachloprid and Thiomethoxam like chemicals belong. It is the chemical which has not been recommended for the control of any of the pest till now. This chemical is being used by the farmers on vegetables particularly tomato and brinjal. During the survey, 2 brands of Thiacloprid were found available in whole of the Kapurthala distric. These brands were Alanto and Splendour. Alanto was found available in blocks Sultanpur Lodhi, Dhilwan and Phagwara whereas brand Splendour was available in Kapurthala block. In Nadala block, no brand of this chemical was available.

#### C) Available Recommended fungicides

As for as the fungicides were concerned, the

following 5 chemicals were examined in context the presence of various brands pertaining to that chemical in the market.

- 1. Pencycuron:** It is recommended for the control of sheath blight in paddy and for seed treatment in potato. Its recommended brand is Monceren and was found available in all the blocks except the Nadala block. The availability of recommended brand was 100 per cent.
- 2. Carbendazim:** This chemical is widely used in agricultural crops to disinfect the seed in order to kill the soil borne fungi. It is used in wheat for seed treatment, for the control of sheath blight in paddy, for seed treatment of gram, maize, basmati rice, etc. Only one brand of carbendazim is recommended namely Bavistin and was found available in block Kapurthala and Phagwara only. In Kapurthala block, 5 non-recommended brands of carbendazim were found against one recommended brand. 10 non-recommended brands of carbendazim were found available in whole of the Kapurthala district against only 1 recommended brand. Hence, the availability of bavistin was 9.0 per cent (Table 2).
- 3. Mancozeb:** It is a contact fungicide which is recommended in almost all the agricultural

crops. For the control of late blight in potato and tomato, downy mildew in cucurbits, Ascochyta blight in gram and leaf spot diseases in maize etc. Only 1 brand of Mancozeb is recommended i.e. Indofil M-45 and was found available in all the blocks except Nadala. During the survey, 3 non-recommended brands of Mancozeb namely Marlet, Manzate, Luzem were found available in block Kapurthala and 4 non-recommended brands namely Leo M-45, Abic, RM-45 and M-Guard 45 were found available in Phagwara block. Hence, the availability of Indofil M-45 was 9.0 per cent.

- 4. Propinconazole:** It is recommended in paddy, wheat, citrus, sugarcane etc. for the control of yellow rust, brown rust in wheat, sheath blight and sheath rot in paddy, pathological fruit drop in citrus and for treating seed of sugarcane. Its recommended brands are Tilt, Shine and Bumper and were found available in all the blocks except Nadala where non-recommended brands like Zerox and Sona were available. 11 brands of propiconazole were there in the market out of which only 3(27.2%) were recommended.
- 5. Tebuconazole:** It is recommended in paddy and wheat for the control of yellow rust, brown rust in wheat and sheath blight and sheath rot

**Table 2. Availability of recommended and non-recommended brands of fungicides in district Kapurthala.**

Name of chemical	Recommended Brand Name	Non-recommended Brand Name
Carbendazim	Bavistin	Batista, Fungy, Pearl, Sriston-50, Carzim, Adrin, G-zim, Pearl, Histastin, Sahara, Batista
Pencycuron	Monceren	
Mancozeb	Indofil M-45	Emzeb-45, Marlet, Manzate, Luzem, Leo M-45, Abic, RM-45, M-Guard 45, Benfil
Propinconazole	Tilt 25 EC, Bumper 25 EC Shine 25 EC	Bonus, , Kontrol, Result, Zerox, Sona, Kilt, Zerox, Swift, Cobler
Tebuconazole	Folicur, Raxil 2%	

**Table 3. Availability of recommended and non-recommended brands of fungicides whose chemical is yet to be tested.**

Active ingredient	Recommended Brand Name	Non-recommended Brand Name
Difenoconazole	-	Dividend, Score 25 EC
Validamycin	-	V-3
Hexaconazole	-	Jaizole Plus, A-one Plus, Coroheplus, Krizole++5, Krizole++5, Avon Plus, Revolt Plus, Nector Plus, Hexstar Plus
Tricyclazole	-	Tric

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in paddy. Its recommended brand is Folicur 25 EC. Folicur was found available in all the blocks except Nadala. The interesting fact about this very chemical was that no non-recommended brand was found available in all the five blocks of the district. Hence, the percentage of availability of recommended brand over non-recommended brands was 100 per cent.

#### D) Available fungicide brands whose chemical is yet to be tested

- 1. Difenconazole:** It is the chemical which has not been recommended for the control of any of the disease till now but the farmers of the area is using on paddy and vegetables. During the survey, 2 brands (Score and Dividend) of Difenconazole were found available. Score was available in Kapurthala and Phagwara block while Dividend in Sultanpur Lodhi block.
- 2. Validamycin:** It is the chemical which has not been recommended but is being used by the farmers on potato for seed treatment purpose for the control of black scurf and potato scab. It is also being used on paddy for the control of sheath blight disease. Only 1 brand of Validamycin namely V-3 manufactured by Krishi Rasayan Export Pvt. Ltd. was found available but the availability of this brand was found in all the five blocks.

**3. Hexaconazole:** It is the chemical which has not been recommended but is being used by the farmers on paddy and basmati rice for the control of sheath blight disease. 8 brands of Hexaconazole were found available in all the five blocks except Dhilwan.

**4. Tricyclazole:** It is the non recommended chemical being used by the farmers on basmati rice for the control of blast disease. This is the chemical which was responsible for rejection of basmati rice consignment for export purpose. This chemical is banned in foreign countries for use on agricultural crops. During the survey programme, only 1 brand of Tricyclazole namely Tric manufactured by Krishi Rasayan Export Pvt. Ltd. was found available.

#### E) Available brands of Pesticides mixtures

During the survey, a number of brands (41 brands) were also found available in the market whose formulation is a mixture of two active ingredients. Out of these brands, 9.5% brands (25 brands) were of insecticides and 6.1% brands (16 brands) were of fungicides (Table 4).

A total of 262 brands were studied. Out of these brands, availability of recommended insecticides (30 brands) was 11.5 per cent and of non-recommended insecticides (143 brands) was

**Table 4. Brands of insecticides and fungicides whose formulation is a mixture of two active ingredients.**

Sr.No.	Active ingredients in the mixture	Brand name
1	Deltamethrin 1% + Triazophos 35%	Tiger, Clark, Corobill, Trizo plus, Shark, Tridelter, Jadu, Jalva
2	Profenofos 40%+ Cypermethrin 4% EC	Googly, Cypro, Rocket 44 EC, Banjo super, Blast 44, Deck, Ceres, Profit plus, Smash, Kilcron plus, Power plus 404, Krifos super
3	Chlorpyrifos 16%+Alpha cypermethrin 1%	Junoon
4	Chlorpyrifos 50 + Cypermethrin 5%	Nurocombi, Dhamaka 500, Tatex 505
5	Cypermethrin 18%+Alphacypermethrin	Naat
6	Cymoxanil +Mancozeb	Elpis, Delmix, Combi, lus, CM 75, Dost, Gomeda, Sure, Starlet, Companion
7	Carbendazim 12% +Mancozeb 63%	
8	Matalazyl 8%+ Mancozeb 64% WP	Krilazyl MZ 72% WP, Master, Kemoxyl
9	Captan 70%+ Hexaconazole 5% WP	Kick, Taqat
10	Carbendazim 1%+Mancozeb 0.3%	Stump
11	Fenamidone 10%+Mancozeb 50%	Sixer

Table 5. Summary of all the available recommended and non-recommended pesticides in the market.

Sr. No.	Chemical name	No. of available recommended brands	No. of available non-recommended brands	Total no. of available brands	Percentage availability of recommended brands
<b>Recommended Insecticide Chemical</b>					
1.	Chlorpyrifos	6	22	28	21.4
2.	Thiomethoxam	1	12	13	7.7
3.	Imidachloprid	3	27	30	10.0
4.	Lambda cyhalothrin	0	19	19	0.0
5.	Indoxacarb	1	3	4	25.0
6.	Cypermethrin	1	10	11	9.1
7.	Dichlorvos	1	12	13	7.7
8.	Flubendamide	0	3	3	0
9.	Triazophos	0	3	3	0
10.	Profenofos	0	2	2	0
11.	Fipronil	2	2	4	50.0
12.	Novaluron	1	3	4	25.0
13.	Carbofuran	1	2	3	33.3
14.	Cartap hydrochloride	2	10	12	16.7
15.	Buprofezin	1	5	6	16.7
16.	Phorate	2	0	2	100.0
17.	Monocrotophos	1	4	5	20.0
18.	Malathion	2	-	2	100.0
19.	Quinalphos	1	4	5	20.0
20.	Thiodicarb	1	0	1	100.0
21.	Chlorantraniliprole	2	0	2	100.0
22.	Dimethoate	1	0	1	100.0
<b>Total</b>		<b>30</b>	<b>143</b>	<b>173</b>	<b>-</b>
<b>Insecticide chemical yet to be tested</b>					
	Thiacloprid	0	2	2	0
<b>Total</b>		<b>0</b>	<b>2</b>	<b>2</b>	
<b>Recommended fungicide Chemicals</b>					
23	Pencycuron	1	0	1	100.0
24	Carbendazim	1	10	11	9.1
25	Mancozeb	1	9	10	10.0
26	Propiconazole	3	8	11	2.7
27	Tebuconazole	2	0	2	100.0
<b>Total</b>		<b>8</b>	<b>27</b>	<b>35</b>	
<b>Fungicide Chemicals yet to be tested</b>					
28	Difenoconazole	0	2	2	0
29	Validamycin	0	1	1	0
30	Hexaconazole	0	7	7	0
31	Tricyclazole	0	1	1	0
<b>Total</b>		<b>0</b>	<b>11</b>	<b>11</b>	
<b>Available brands of Pesticides mixtures</b>					
32	Deltamethrin + Triazophos	0	8	8	0
33	Profenofos + Cypermethrin	0	12	12	0
34	Chlorpyrifos + Alpha cypermethrin	0	1	1	0
35	Chlorpyrifos + Cypermethrin	0	3	3	0
36	Cypermethrin + Alphacypermethrin	0	1	1	0



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37	Cymoxanil +Mancozeb	0	1	1	0
38	Carbendazim 12% +Mancozeb 63%	0	8	8	0
39	Mataxyl+ Mancozeb	0	3	3	0
40	Captan+ Hexaconazole WP	0	2	2	0
41	Carbendazim 1%+Mancozeb 0.3%	0	1	1	0
42	Fenamidone +Mancozeb	0	1	1	0
<b>Total</b>		<b>0</b>	<b>41</b>	<b>41</b>	
<b>Grand Total</b>		<b>262</b>			

54.6 per cent, recommended fungicides (8 brands) was 3.1 per cent, non-recommended fungicides (27 brands) was 10.3 per cent, insecticide brands whose chemical is yet to be tested (2 brands) was 0.7 per cent, fungicide brands whose chemical is yet to be tested (11brands) was 4.2 per cent, insecticide mixture (25 brands) was 9.5 per cent and fungicide mixture (16 brands) was 6.1 per cent.

### CONCLUSION

This can be concluded that very few recommended brands of pesticides are available while large number of non-recommended pesticides were prevalent in the market. Thus, the farmers were forced to use non-recommended insecticides. Also it could be due to the reason that farmers are being influenced by the aggressive campaign of the manufacturers and the commission agents. Also some industries push their molecules directly to the market with combination of formulations where one of the

constituents' acts as insecticide and other as hormone which increases the crop yields in addition to control of disease making the farmers happy. Another reason for non availability of recommended pesticides in market is that some old recommendations are no longer effective. Also the cost of the recommended brands is another factor. Thus all the stakeholders mainly the Registration Committee for pesticides, state agricultural universities, farmers, manufacturers and dealers need to be look into it.

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