

Pesticides Usage Pattern by Cotton and Chilli Farmers in Kurnool District of Andhra Pradesh

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ABSTRACT

The present study intended to know the pesticides usage pattern by cotton and chilli farmers in Kurnool district of Andhra Pradesh. For the study Kurnool district was purposively selected as it occupies first place in gross area sown in Andhra Pradesh. Among the crops cultivated in Kurnool district, cotton and chilli were selected as the pesticide's consumption is high in these crops. The collected data was analyzed by using percentage and frequencies. From this investigation it was found that 92.5 per cent of the sample farmers used Monocrotophos 36% SL for cotton and used as the first spray of insecticide in cotton to control sucking pests by every farmer. In chilli Pendimethalin 30% EC by 97.5 per cent by sample farmers as it controls annual grasses and broad-leaved weeds.

Keywords: *Insecticide, Percentage and frequency, Sucking pests and Broad-leaved weeds.*

INTRODUCTION

Agriculture is primary source of livelihood up to 58 per cent of India's population (Indian agriculture and allied industries report, 2018). Pesticide consumption in India was accounted to 59543 metric tons, whereas in state of Andhra Pradesh it was accounted to 1432 metric tons (Indiastat, 2017-18). Pesticide usage increased rapidly for the last 2 decades at 12 per cent each year (Kumar et al., 2017). In India, vegetables are major constituents of diet as majority of Indians are vegetarian, with a per capita consumption of 135 g per day as

against the recommended 300 g per day (Kumari, 2008). Consumers generally demand for better quality vegetables. Quality vegetable to them means healthy, succulent and fresh looking vegetables with no visible rashes or holes caused by pests or diseases. To satisfy this demand, farmers have to tackle pest and disease problems by all means. The use of agrochemicals including pesticides has been found to be the immediate and cheaper way to produce unblemished vegetables and increased farm productivity.

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This practice has unfortunately created numerous problems associated with pesticide abuse such as accidental poisoning to man, upset of natural environment balance and toxic residues that are hazardous to health in the environment. But without pesticides, food production would be reduced from 15 to 80 percent depending on the crop and the pest causing the damage (Joshi & Thanki, 2010). In order to combat the insect pest problem, lot of pesticides is used by the vegetable growers. Higher pesticide applications lead to secondary pest outbreak, destruction of non-pest insects, soil, water and air contamination, and residues in primary and derived agricultural products that endanger both the environment and human health. Pesticides reduce soil wealth and also expose us to hazardous diseases that have effect on human beings in the longer run. They are found in everyday food and beverages includes instance cooked meals, water, wine, fruit juice refreshments and animal feed. Washing and peeling cannot remove the pesticide residues completely. Pesticide residues have also been detected in human breast milk sample, and there are concerns about prenatal exposure and health effects in children (Stamati et al., 2016). Though usage of pesticides in agriculture cannot be completely removed, optimum usage of the same can be made practical. Farmers' understanding on the optimum usage of plant protectant chemicals reduce the soil contamination, increase the yield and reduce the hazardous diseases.

Farmer worker's exposure to pesticides causes health effects like cancer and birth defect in hundreds of fatalities. Farmers are directly involved in handling of pesticides are at a high risk to exposure to pesticides through contact with pesticide residues on treated crops, unsafe handling storage and disposal practices poor maintenance of spraying equipment, and lack of protective equipment or failure to use it properly. This is due to lack of education and poor knowledge by farmers. In this context, the study is planned to understand the pesticides usage pattern by cotton and chili farmers in Kurnool district of Andhra Pradesh.

MATERIALS AND METHODS

Kurnool district was purposively selected for the study, as it occupies first place in gross area sown in Andhra Pradesh. Out of the various crops cultivated in the Kurnool district two crops viz cotton and chilli were selected as the pesticide's consumption is high in these crops. Two mandals for each selected crop based on the highest area under the crop was chosen for the study, thus making the total selected mandals to four. From the selected mandals, villages with maximum area under cotton and chilli cultivation were listed out and arranged in the descending order and top two villages from each mandal were selected to make total of eight villages. From the selected villages 10 farmers from each village were randomly selected for the study, to made sample size to 80 farmers. The required data collected with the help of a pre-tested schedule for the year 2019-20 using survey method.

TOOLS OF ANALYSIS

The data collected were subjected to appropriate set of statistical tools to arrive at valid conclusions. Data was statistically analysed using SPSS program.

Frequencies and Percentages

Some of the data were also interpreted in terms of their frequencies and percentages wherever necessary to know the distribution pattern of respondents according to variables.

RESULTS AND DISCUSSIONS

Pesticides usage pattern in cotton by the sample farmers

Farmers in the study area used a wide range of pesticides in cotton to control weeds, insects, fungal and bacterial organisms. The analysis of the same is presented in Table 1.

An observation of Table 1 unveils that 92.5 per cent of the sample farmers used Monocrotophos 36% SL for cotton. Next to follow were Pendimethalin 30% EC by 90 per cent, Lamda-cyhalothrin 2.5% EC by 75 per cent, Validamycin 3% SL by 72.5 per cent, Acephate 75% SP 65 per cent, Chlorpyrifos 20% EC and Azoxytobin 11% + Tebucanazole 18.3% w/w SC by 65 per cent and Fipronil 5% EC by 62.5 per cent of

farmers. Monocrotophos 36% SL were used as the first spray of insecticide in cotton to control sucking pests by every farmer in the study area. Least percentage 12.5 per cent of

farmers used Flonicamid 50 % WG in minute quantity for cotton crop. The above results are similar with the findings of Sreekanth, 2018.

Table 1: Pesticides usage pattern in cotton by the sample farmers

Type of pesticide	Name of Pesticide	Average quantity used per hectare	Used for	Number of farmers used	Per cent (%)
Herbicide	Pendimethalin 30% EC	2500ml	Annual grasses and broad-leaved weeds	36	90.0
Herbicide	Quizalofop Ethyl 5% EC	1000ml	Annual and perennial grass weeds	15	37.5
Herbicide	Pendimethalin 38.7% CS	1750ml	Annual grasses and broad-leaved weeds	8	20.0
Herbicide	Oxyflurofen 33.6% W/W EC	250ml	Annual broad leaf and grassy weeds	11	27.5
Insecticide	Acephate 75% SP	1625gms	Sucking pests	26	65.0
Insecticide	Monocrotophos 36% SL	1250ml	Sucking pests	37	92.5
Insecticide	Imidacloprid 70% WG	187.5gms	Sucking pests	28	70.0
Insecticide	Acetamiprid 20% SP	250gms	Sucking pests	17	42.5
Insecticide	Thiamethoxam 25% WG	375gms	Sucking pests	24	60.0
Insecticide	Fipronil 5% SC	1000ml	Sucking pests	25	62.5
Insecticide	Diafenthiuron 50% WP	875gms	Sucking pests	15	37.5
Insecticide	Flonicamid 50 % WG	200gms	Sucking pests	5	12.5
Insecticide	Profenofos 50% EC	1250ml	Lepidopteran insects	15	37.5
Insecticide	Chlorpyrifos 20% EC	1875ml	Lepidopteran insects	26	65.0
Insecticide	Flubendiamide 20 % WG	250gms	Lepidopteran insects	14	35.0
Insecticide	Chlorantraniliprole 18.5 % SC	200ml	Lepidopteran insects	17	42.5
Insecticide	Lamda-Cyhalothrin 2.5% EC	875ml	Lepidopteran insects	30	75.0
Insecticide	Dinotefuron 20% W/W SG	150-200gms	Sucking pests	16	40.0
Insecticide	Dimethoate 30%EC	650ml	Sucking and caterpillar pests	19	47.5
Insecticide	Spinosad 45% SC	150ml	Pests belonging to Sucking, lepidopteran and coleoptera	17	42.5
Insecticide	Fipronil 80 WG	100gms	Thrips	10	25.0
Insecticide	Spinetoram 11.7% SC	500ml	Thrips and lepidopteran insects	11	27.5
Insecticide	Deltamethrin 11% W/W EC	250ml	Pests belonging to chewing, sucking and Lepidoptera	9	22.5
Insecticide	Dichlorovos 76% EC	625-875ml	Pests belonging lepidopteran and coleopteran	15	37.5
Insecticide	Bifenthrin 10% W/W EC	1000ml	Sucking and lepidopteran pests	18	45.0
Insecticide	Thiodicarb 75% WP	250gms	Lepidopteran insects	15	37.5
Insecticide & acaricide	Ethion 50% EC	250gms	Sucking pests and mites	14	35.0
Insecticide & acaricide	Fenprothrin 10% EC	875-1000ml	Pests belonging to diptera, heteroptera and Lepidoptera	17	42.5
Insecticide	Fipronil 5% EC	1000ml	Sucking and lepidopteran pests	25	62.5
Insecticide	Alpha Cypermethrin 5%EC	500-750ml	Bollworms in cotton	21	52.5
Insecticide	Acetamiprid 20%SP	250gms	Sucking pests	17	42.5
Insecticide	Diafenthiuron 25% + Pyriproxfen 5% SE	1000ml	Sucking pests	21	52.5
Insecticide	Profenophos 40% + Cypermethrin 4% EC	1000-1500ml	Pests belonging to sucking, lepidopteran and coleopteran	15	37.5
Insecticide	Buprofezin 20% + Acephate 50% WP	1000gms	Chewing and sucking pests	11	27.5
Insecticide	Monocrotophos 36% SL + Acephate 75% SP	1000ml+250gms	Chewing, sucking and boring pests	12	30.0
Insecticide	Imidacloprid 40% WG + Fipronil 40% WG	200gms	Sucking pests and	15	37.5
Insecticide	Profenphos 50% EC + Thiamethoxam 25% WG	1250ml+250gms	Sucking and lepidopteran pests	18	45.0
Insecticide	Lamda Cyhalothrin 4.6 W/W + Chlorantraniliprole 9.3% W/W	200-250ml	Pink bollworm and army worm in cotton	22	55.0
Fungicide	Carbendazim 12% + Mancozeb 63% WP	625gms	Leaf spot	23	57.5
Fungicide	Azoxystrobin 23 % SC	500ml	Controls fungal diseases	10	25
Fungicide & bactericide	Validamycin 3% SL	1750ml	Antibiotic and antifungal	29	72.5
Fungicide	Propineb 70% WP	1000gms	Die back of chilli, early & late blight of potato, downy mildew of grape and scab of apple	18	45.0
Fungicide	Metalaxyl 35% WS	500-700gms per 100 kg seed treatment	Seed borne diseases	13	32.5
Fungicide	Captan 70% + Hexaconazole 5% WP	375-750gms	Fruit rot (anthracnose) of chillies and early & late blight of potato	22	55.0
Fungicide	Tebucanazole 50% + Trifloxystrobin 25% W/W WG	375gms	Broad spectrum fungicide	14	35.0
Fungicide	Azoxystrobin 11% + Tebucanazole 18.3% W/W SC	750ml	Controls fruit rot, die-back and powdery mildew disease	26	65.0
Acaricide	Fenpyroximate 5% EC	625gms	Mites, bugs and hoppers	19	47.5
Miticide	Propargite 57% EC	1000ml	Effective control of mites	14	35.0
Bactericide	Streptomycin Sulphate 9% +Tetrocyclin 1% W/W	250gms	Broad spectrum antibiotic	18	45

Pesticides usage pattern in chilli by the sample farmers

Chilli is another crop for which pesticides were used extensively, the details of which were presented in Table 2.

A look through the Table 2 unveils that major pesticides used by the sample farmers in chilli crop were Pendimethalin 30% EC by 97.5 per cent, Fipronil 5% SC by 92.5 per cent, Spinosad 45% SC by 90 per cent,

Monocrotophos 36% SC by 80 per cent, Diafenthiuron 50% WP and Lamda-cyhalothrin 2.5% EC by 77.5 per cent Azoxystrobin 11% + Tebuconazole 18.3% SC by 70 per cent and Profenophos 50% EC, Propineb 70% WP, Zineb 68% + Hexacanozole 4% WP and Propargite 57% EC

by 62.5 per cent of farmers. Pendimethalin 30% EC was used by highest per cent of farmers as it controls annual grasses and broad-leaved weeds. Least percentage 10 per cent of farmers used Kresoxim methyl 44.3% SC in minute quantity for chilli crop.

Table 2: Pesticides usage pattern in chilli by the sample farmers

Type of pesticide	Name of pesticide	Average quantity used per hectare	Used for	Number of farmers used	Per cent (%)
Herbicide	Pendimethalin 30% EC	2500ml	Annual grasses and broad-leaved weeds	39	97.50
Insecticide	Monocrotophos 36% SC	1000ml	Sucking pests	32	80.00
Insecticide	Acetamidiprid 20% SP	200gms	Sucking pests	19	47.50
Insecticide	Diafenthiuron 50% WP	875gms	Sucking pests	31	77.50
Insecticide	Spinosad 45% SC	150ml	Thrips and helicoverpa	36	90.00
Insecticide	Fipronil 5% SC	1250ml	Thrips	37	92.50
Insecticide	Quinalphos 25% EC	1875ml	Lepodopteran insects	21	52.50
Insecticide	Lamda-cyhalothrin 2.5% EC	1875ml	Lepodopteran insects	31	77.50
Insecticide	Profenophos 50% EC	1875ml	Lepodopteran insects	25	62.50
Insecticide	Carbosulfan 25% EC	750-1000ml	Sucking and lepidopteran pests	22	55.00
Insecticide	Spinetoram 11.7% SC	500ml	Thrips and lepidopteran insects	18	45.00
Insecticide	Dinotefuron 20% SG	150-200gms	Sucking pests	7	17.50
Insecticide	Carbaryl 50% WP		Sucking and lepidopteran pests	12	30.00
Insecticide	Dimethoate 30% EC	180-750gms	Sucking and caterpillar pests	16	40.00
Insecticide	Cartap hydrochloride 50% SP	500-100gms	Stem borer and leaf folder in rice	13	32.50
Insecticide & acaricide	Ethion 50% EC	250gms	Sucking pests and mites	15	37.50
Insecticide, acaricide & nematocide	Carbofuron 3G	10-12kgs	Insects, mites, nematodes and field pests	15	37.50
Insecticide & acaricide	Profenophos 40% EC	875ml	Chewing, sucking and lepidopteran pests	13	32.50
Insecticide	Ethion 40% + Cypermethrin 5% EC	875-1000ml	Spotted & pink boll worm and whiteflies	21	52.50
Fungicide	Azoxystrobin 23% SC	500ml	Broad spectrum fungicide	21	52.50
Fungicide	Azoxystrobin 11% + Tebuconazole 18.3% SC	750ml	Broad spectrum fungicide	28	70.00
Fungicide	Tebuconazole 50% + Trifloxystrobin 25% SG	375gms	Broad spectrum fungicide	10	25.00
Fungicide	Kresoxim methyl 44.3% SC	375ml	Downy and powdery mildew diseases of grape	4	10.00
Fungicide	Myclobutanil 10% WP	1000gms	Powdery mildew disease of grape and chillies	15	37.50
Fungicide	Propineb 70% WP	1000gms	Die back of chilli, early & late blight of potato, downy mildew of grape and scab of apple	25	62.50
Fungicide	Zineb 68% + Hexacanozole 4% WP	1000-1250gms	Sheath blight, brown spot and blast in rice	25	62.50
Fungicide	Azoxystrobin 16.7% + Tricyclazole 33.3% SC	500ml	Paddy blast and sheath blight	16	40.00
Fungicide	Captan 70% + Hexacanozole 5% WP	600-700gms	Fruit rot (anthracnose) of chillies and early & late blight of potato	15	37.50
Acaricide	Propargite 57% EC	625ml	Mites	25	62.50
Acaricide	Abacin 1.9% EC	250ml	Red mites and leaf miners	9	22.50
Bactericide	Streptomycin	250gms	Controls fungal and bacterial diseases	16	40.00

CONCLUSION

Majority of farmers 92.5 per cent used Monocrotophos 36% SL and Pendimethalin 30% EC by 90 per cent for cotton. Monocrotophos 36% SL was used as the first spray of insecticide in cotton to control sucking pests by every farmer in the study area. In chilli major pesticides used by the sample farmers in were Pendimethalin 30% EC by 97.5 per cent and Fipronil 5% SC by 92.5 per cent. Pendimethalin 30% EC was

used by highest per cent of farmers as it controls annual grasses and broad-leaved weeds.

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