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PESTICIDES USAGE PATTERN IN GUNTUR DISTRICT OF ANDHRA PRADESH

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ABSTRACT

The present study was done to pesticides usage pattern of cotton farmers in Guntur district of Andhra Pradesh. Guntur district ranks first in the production of cotton in the state. To conduct study two mandals were selected randomly, from which 100 cotton farmers were selected. The majority of the farmers were sourcing credit from the money lenders. Most of the farmer had smart phone for the communication. Greater percentage of farmers had 2.5-5 acres of land size. The mass media exposure was medium among the farmers group. Majority of the farmers were using pendimethalin 30% EC as herbicide, while monocrotophos 36% SL, acephate 75% SP as insecticides and carbendazim 12% + Mancozeb 63% WP as fungicide. The soluble liquids and solube powders were used maximum by the farmers.

KEYWORDS: Mass media, pesticides, money lenders, cotton farmers.

INTRODUCTION

Pesticides are chemicals that are used to kill weeds, insects, and illnesses that may cause up to 50, 30 and 20 per cent, respectively, of damage to crops. These were manufactured or natural made. These substances were categorised as herbicides, fungicides, rodenticides, etc. based on their nature. According to the UN Food and Agriculture Organization, 40 per cent of crops in developing nations suffer damage from pests. Around 2 million tonnes of pesticides are used globally, of which herbicides account for 47.50 per cent of usage, insecticides for 29.50 per cent, fungicides for 17.5 per cent and other pesticides for 5.5 per cent. India accounted for 0.3 per cent of the global usage of pesticides with its 62193 metric tonnes of plant protection chemical use.

On an area of 6.06 lakh hectares, Andhra Pradesh produces the most cotton, generating 19 lakh bales. Uneven pesticide use has led to low pesticide use, which has reduced agricultural yields. However, spraying pesticides excessively can harm both humans and crops. To avoid crop losses, farmers must use pesticides at the optimum rate and at the appropriate time. To achieve good yields with minimal crop losses, farmers must be knowledgeable about the product's usage, including the right pesticide to use, when to apply it, how to spray, etc.

The study helps to understand the pesticide usage pattern in cotton crop.

MATERIAL AND METHODS

The survey was done in the Andhra Pradesh district of Guntur, which ranked first in pesticide consumption, land area, and cotton production in the state. Out of 58 mandals, two were chosen at random for the study. A total of 10 villages were created by randomly choosing five from each mandal. A sample size of 100 farmers was obtained by randomly choosing 10 from each hamlet. The study's necessary information will be gathered from the farmers using a pre-tested timetable and numerous in-person visits.

TO STUDY THE SOCIO-ECONOMIC PROFILE OF FARMERS

Sources of Credit

The data pertaining to the source of credit was collected and categorized into five categories namely money lenders, neighbors/friends/relatives, government departments, input dealers, and commercial banks. The data was collected and presented in Table 1.

The above Table 1, shows that among sample cotton farmers, 34 per cent of respondents were depended credit on money lenders, 30 per cent were depended on commercial banks, 22 per cent were depended on input dealers, 8 per cent were depended credit on friends/ neighbors, and 6 per cent were depended on government departments. It shows that the majority of sample cotton farmers depended credit on money lenders.

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Table 1. Sources of credit categorization of sample cotton farmers

S. No.	Categories	Frequency	Percentage
1.	Money Lenders	**34**	**34.00**
2.	Neighbours/Friends/Relatives	8	8.00
3.	Government Departments	6	6.00
4.	Input Dealers	22	22.00
5.	Commercial Banks	30	30.00
	Total	**100**	**100.00**

Mobile phone usage

The data regarding mobile phone usage of sample cotton farmers was collected and classified into two groups namely smart phone and basic mobile. The data collected was analyzed and presented in Table 2**.**

A study of Table 2 shows that among sample cotton farmers, 78 per cent of sample cotton farmers had smart phones while 22 per cent of the sample cotton farmers had basic mobile for their daily communication and also for getting the information about production, marketing, post-harvest. This shows that majority of farmers were having smart phones.

Table 2. Mobile phone usage categorization of sample cotton farmers

S. No.	Categories	Frequency	Percentage
1	Smart phone	78	78.00
2	Basic mobile	22	22.00
	Total	**100**	**100.00**

Farm size

The data regarding the Farm size of the sample cotton farmers was collected and categorized into seven groups namely no land, less than 1 acre, 1-2.5 acres, 2.5-5 acres, 5-10 acres, 10-15 acres, and >15 acres. The data was collected and presented in Table 3.

From the above table 3, it reveals that 48 per cent of respondents were having land holdings between 2.5-5 acres, 17 per cent growers were having land holding between 1-2.5 acres, likewise 16 per cent of farmers were having land holdings between 5-10 acres, 12 per cent respondents were having less than 1 acre of land, 4 per cent of respondents were having land holding between 10-15 acres of land and 3 per cent of respondents were having more than 15 acres of land. Thus, it may be concluded that the maximum percentage of cotton growers *i.e.* (48%) have landholding between 2.5-5 acres.

Table 3. Farm size categorization of sample cotton farmers

S. No	Categories	Frequency	Percentage
1.	No land	0	0
2.	Less than 1 acre	12	12.00
3.	1-2.5 acres	17	17.00
4.	2.5-5 acres	48	48.00
5.	5-10 acres	16	16.00
6.	10-15 acres	4	4.00
7.	>15 acres	3	3.00
	Total	**100**	**100.00**

Mass media exposure

The data regarding mass media exposure of the sample cotton farmers were collected and grouped into three categories *viz.*, low, medium, high. The collected data was analyzed and shown in Table 4.

From the Table 4, it shows that 77 per cent of respondents were having medium level of mass media exposure and 13 per cent of respondents were having high level of mass media exposure, 10 per cent of the respondents were having low level of mass media exposure. Thus, it can be concluded that majority (77 per cent) of the cotton growers were having medium level of mass media exposure.

Major Occupation of Sample Farmer

The data regarding the major occupations of sample farmers were collected and divided into three groups *viz*.,

Table 4. Mass media exposure categorization of sample cotton farmers

S. No.	Categories	Frequency	Percentage
1.	Low	10	10.00
2.	Medium	77	77.00
3.	High	13	13.00
	Total	**100**	**100.00**

Agriculture and Horticulture and Animal husbandry. The data collected was analyzed and presented in Table 5.

From the above Table 5, Agriculture was the major occupation for 76 per cent of the sample cotton farmers, horticulture was the major occupation for 22 per cent of the sample cotton farmers and only 2 per cent of the farmers were having animal husbandry as their major occupation. This infers that agriculture was the major occupation for most of the farmers.

Table 5. Major occupation categorization of sample cotton farmers

S. No.	Categories	Frequency	Percentage
1.	Agriculture	76	76.00
2.	Horticulture	22	22.00
3.	Animal husbandry	2	2.00
	Total	**100**	**100.00**

PESTICIDES USAGE PATTERN IN COTTON CROP BY THE SAMPLE FARMERS

To understand the pesticide usage pattern of cotton farmers, broadly divided into three categories namely herbicides, insecticides, fungicides. The data collected was analyzed and presented with following sub heads.

Pesticides Usage Pattern in Cotton by the Sample Farmers

The information regarding pesticides to effectively control various weeds, pests, and diseases in the field was collected, analyzed and presented in Table 6.

From Table 6, it shows that the top two chemicals used by sample cotton farmers were Pendimethalin 30% EC, Glyphosite 40% SL which was used by 82 per cent, 56 per cent of the sample farmers respectively and the least two herbicides used by sample farmers were Propaquizafop 10% EC, Quizalofop ethyl 5% EC were used by 35 per cent and 28 per cent respectively.

The top three insecticides were Monocrotophos 36% SL, Acephate 75% SP, Chlorantraniliprole 18.5% SC SP were used by 100 per cent, 100 per cent, 77 per cent of the sample cotton farmers respectively. The least three insecticides used by the farmers were Imidacloprid 70% WG, Dicofol 18.5% EC, Emamectin benzoate 5% SG were used by 14 per cent, 21 per cent, 28 per cent of sample cotton farmers respectively.

The top three fungicides were Carbendazim 12% + Mancozeb 63% WP, Streptomycin sulphate 90% w/w, Copper oxychloride 50% WP used by 58 per cent, 45 per cent, 34 per cent of sample cotton farmers respectively. The least three fungicides used by the farmer were Carbendazim 50% WP, Mancozeb 75% WP, Pyraclostrobin 20% WG used by 29 per cent, 16 per cent, 11 per cent respectively by the sample cotton farmers.

Among herbicides the deviation was highest for pendimethalin 30% EC with 71.43 per cent and least for quizalofop ethyl 5% EC with deviation of 28 per cent of sample cotton farmers. Among insecticides the deviation was highest for 81.82 per cent Imidacloprid 17.8% SL, least deviation (negative) was Diafenthiuron 50% WP with -42.86 per cent.

Usage of pesticides according to the form of pesticide

The data regarding the usage of pesticides according to the form pesticide was classifies as soluble powders, soluble liquids, soluble concentrates, emulsifying concentrates, wettable powders, water granules, soluble granules. The data was collected and presented in the below table.

From the table 7 it shows that 100 per cent of the sample were using soluble powders, soluble liquids as the form of pesticide, followed by 85 per cent of the sample farmers use emulsifying concentrates, 73 per cent of the sample farmers used wettable powders, 71 per cent of the sample farmers used water granules and 28 per cent of the sample farmers used soluble granules. This shows that majority of the farmers used soluble powders and soluble liquids form of pesticides.

Among herbicides the deviation was highest for pendimethalin 30% EC with 71.43 per cent and least for quizalofop ethyl 5% EC with deviation of 28 per cent of sample cotton farmers. Among insecticides the deviation was highest for 81.82 per cent Imidacloprid 17.8% SL, least deviation (negative) was Diafenthiuron 50% WP

Table 6. Usage of pesticides in sample cotton farmers

a. Herbicides usage pattern in sample cotton farmers

S. No.	Type of pesticide	Name of pesticide	Recommended dosage per hectare	Average quantity used per hectare	Variation in pesticide usage	Deviation (%)	Target for	Number of sample farmers used	Per cent
1	Herbicide	Pendimethalin 30% EC	800 ml	2800 ml	2000	71.43	Broad leaved weeds and grassy weeds	82	82
2	Herbicide	Quizalofop ethyl 5% EC	400 ml	1200 ml	800	66.67	Broad leaved weeds and grass weeds	28	28
3	Herbicide	Propaquizafop 10% EC	450 ml	620 ml	170	27.42	Broad leaved weeds and grass weeds	35	35
4	Herbicide	Glyphosate 41% SL	1200 ml	2500 ml	1300	52.00	Non selective herbicide	56	56

b. Insecticides usage pattern in sample cotton farmers

1	Insecticide	Monocrotophos 36% SL	400 ml	1250 ml	850	68.00	Sucking pests	**100**	**100**
2	Insecticide	Acephate 75% SP	500 gms	1625 gms	1125	69.23	Sucking pests	**100**	**100**
3	Insecticide	Imidacloprid 17.8% SL	100 ml	550 ml	450	81.82	Sucking pests	53	53
4	Insecticide	Imidacloprid 30.5% SC	210 ml	250 ml	40	16.00	Sucking pests	38	38
5	Insecticide	Imidacloprid 70% WG	150 gms	187.5 gms	37.5	20.00	Sucking pests	14	14
6	Insecticide	Acetamiprid 20% SP	200 gms	500 gms	300	60.00	Sucking pests	72	72
7	Insecticide	Thiamethoxam 25% WG	180 gms	375 gms	195	52.00	Sucking pests	62	62
8	Insecticide	Fipronil 5% SC	1500 ml	1500 ml	0	0.00	Sucking pests	85	85
9	Insecticide	Diafenthiuron 50% WP	1250 gms	875 gms	-375	-42.86	Sucking pests	73	73
10	Insecticide	Flonicamid 50% WG	75 gms	200 gms	125	62.50	Sucking pests	71	71
11	Insecticide	Profenofos 50% EC	320 ml	1250 ml	930	74.40	Lepidopteran insects	33	33
12	Insecticide	Spinosad 45% SC	75 ml	150ml	75	50.00	Sucking, lepidopteran and coleoptera	48	48
13	Insecticide	Spinetoram 11.7% SC	188 ml	500ml	312	62.40	Thrips and lepidopteran insects	46	46
14	Insecticide	Quinalphos 25% EC	625 ml	1875 ml	1250	66.67	Lepidopteran insects	34	34
15	Insecticide	Chlorpyrifos 20% EC	750 ml	1875 ml	1125	60.00	Lepidopteran insects	48	48

Cont...

Table 6. Cont...

S. No.	Type of pesticide	Name of pesticide	Recommended dosage per hectare	Average quantity used per hectare	Variation in pesticide usage	Deviation (%)	Target for	Number of sample farmers used	Per cent
16	Insecticide	Indoxacarb 15.8% EC	250 ml	500 ml	250	50.00	Lepidopteran insects	30	30
17	Insecticide	Emamectin benzoate 5% SG	125 gms	375 gms	250	66.67	Lepidopteran insects	28	28
18	Insecticide	Flubendiamide 20% WG	120 gms	200 gms	80	40.00	Lepidopteran insects	28	28
19	Insecticide	Chlorantraniliprole 18.5% SC	75 ml	225 ml	150	66.67	Lepidopteran insects	77	77
20	Insecticide	Novaluron 10% EC	250 ml	925 ml	675	72.97	Lepidopteran insects	28	28
21	Insecticide	Lamda-cyhalothrin 25% EC	250 ml	875 ml	625	71.43	Lepidopteran insects	75	75
22	Acaricide	Dicofol 18.5% EC	220 ml	625 ml	405	64.80	Mites	21	21

c. Fungicides usage pattern in sample cotton farmers

1	Fungicide	Carbendazim 12% + Mancozeb 63% WP	300 gms	625gms	325	52.00	Leaf spot	58	58
2	Fungicide	Metalaxyl 35% WS	350 gms for 100 kg seed	500 gms for 100 kg seed	150	30.00	Seed borne diseases	33	33
3	Fungicide	Copper oxychloride 50% WP	750 gms	1875 gms	1125	60.00	Root rot and wilt	34	34
4	Fungicide	Carbendazim 50% WP	250 gms	1250 gms	1000	80.00	Leaf spot and wilt	29	29
5	Fungicide	Mancozeb 75% WP	625 ml	1250 gms	625	50.00	Leaf spot	16	16
6	Fungicide	Pyraclostrobin 20% WG	500 gms	500 gms	0	0.00	Leaf spot	11	11
7	Bactericide	Streptomycin sulphate 90%w/w	120 gms	250 gms	130	52.00	Broad spectrum antibiotic	45	45

Table 7. Usage of pesticides according to the form

S. No.	Formulations of pesticides	Name of the pesticide	Number of sample farmers used
1	Soluble powders	Acephate 75%	100
2	Soluble liquids	Monocrotophos 36% Imidacloprid 17.8%	100
3	Soluble concentrates	Imidacloprid 30.5% Spinosad 45% Spinetoram 11.7% Chlorantraniliprole 18.5%	85
4	Emulsifying concentrates	Pendimethalin 30% Quizalofop ethyl 5% Propaquizafop 10% Profenofos 50% Quinalphos 25% Chlorpyrifos 20% Indoxacarb 15.8% Novaluron 10% Lamda-cyhalothrin 2.5% Dicofol 18.5%	82
5	Wettable powders	Diafenthiuron 50% Carbendazim 12% + Mancozeb 63% Copper oxychloride 50% Carbendazim 50% Mancozeb 75%	73
6	Water granules	Imidacloprid 70% Thiamethoxam 25% Flonicamid 50% Flubendiamide 20% Pyraclostrobin 20%	71
7	Soluble Granules	Emamectin benzoate 5%	28

with -42.86 per cent. 100 per cent of farmers were using monocrotophos 36% SL and Acephate 75% SP. Majority of the farmers used soluble powders and soluble liquids form of pesticides.

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