PESTICIDES USAGE PATTERN IN GUNTUR DISTRICT OF ANDHRA PRADESH

L. SRavan KUMAR*, N.T. KRISHNA KISHORE, P. BALA HUSSAIN REDDY AND B. RAMANA MURTHY

Institute of Agribusiness Management, S.V. Agricultural College, ANGRAU, Tirupati-517502.

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ABSTRACT

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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.

*Corresponding author, E-mail: sravankumar.iabm20@gmail.com
Table 1. Sources of credit categorization of sample cotton farmers

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Money Lenders</td>
<td>34</td>
<td>34.00</td>
</tr>
<tr>
<td>2.</td>
<td>Neighbours/Friends/Relatives</td>
<td>8</td>
<td>8.00</td>
</tr>
<tr>
<td>3.</td>
<td>Government Departments</td>
<td>6</td>
<td>6.00</td>
</tr>
<tr>
<td>4.</td>
<td>Input Dealers</td>
<td>22</td>
<td>22.00</td>
</tr>
<tr>
<td>5.</td>
<td>Commercial Banks</td>
<td>30</td>
<td>30.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smart phone</td>
<td>78</td>
<td>78.00</td>
</tr>
<tr>
<td>2</td>
<td>Basic mobile</td>
<td>22</td>
<td>22.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>S. No</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No land</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>Less than 1 acre</td>
<td>12</td>
<td>12.00</td>
</tr>
<tr>
<td>3.</td>
<td>1-2.5 acres</td>
<td>17</td>
<td>17.00</td>
</tr>
<tr>
<td>4.</td>
<td>2.5-5 acres</td>
<td>48</td>
<td>48.00</td>
</tr>
<tr>
<td>5.</td>
<td>5-10 acres</td>
<td>16</td>
<td>16.00</td>
</tr>
<tr>
<td>6.</td>
<td>10-15 acres</td>
<td>4</td>
<td>4.00</td>
</tr>
<tr>
<td>7.</td>
<td>&gt;15 acres</td>
<td>3</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low</td>
<td>10</td>
<td>10.00</td>
</tr>
<tr>
<td>2.</td>
<td>Medium</td>
<td>77</td>
<td>77.00</td>
</tr>
<tr>
<td>3.</td>
<td>High</td>
<td>13</td>
<td>13.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100.00</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Agriculture</td>
<td>76</td>
<td>76.00</td>
</tr>
<tr>
<td>2.</td>
<td>Horticulture</td>
<td>22</td>
<td>22.00</td>
</tr>
<tr>
<td>3.</td>
<td>Animal husbandry</td>
<td>2</td>
<td>2.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100.00</td>
</tr>
</tbody>
</table>

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, Glyphosate 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 classified 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 with -42.86 per cent.
### Table 6. Usage of pesticides in sample cotton farmers

#### a. Herbicides usage pattern in sample cotton farmers

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

#### b. Insecticides usage pattern in sample cotton farmers

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of pesticide</th>
<th>Name of pesticide</th>
<th>Recommended dosage per hectare</th>
<th>Average quantity used per hectare</th>
<th>Variation in pesticide usage</th>
<th>Deviation (%)</th>
<th>Target for</th>
<th>Number of sample farmers used</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insecticide</td>
<td>Monocrotophos 36% SL</td>
<td>400 ml</td>
<td>1250 ml</td>
<td>850</td>
<td>68.00</td>
<td>Sucking pests</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Insecticide</td>
<td>Acephate 75% SP</td>
<td>500 gms</td>
<td>1625 gms</td>
<td>1125</td>
<td>69.23</td>
<td>Sucking pests</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Insecticide</td>
<td>Imidacloprid 17.8% SL</td>
<td>100 ml</td>
<td>550 ml</td>
<td>450</td>
<td>81.82</td>
<td>Sucking pests</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>4</td>
<td>Insecticide</td>
<td>Imidacloprid 30.5% SC</td>
<td>210 ml</td>
<td>250 ml</td>
<td>40</td>
<td>16.00</td>
<td>Sucking pests</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>5</td>
<td>Insecticide</td>
<td>Imidacloprid 70% WG</td>
<td>150 gms</td>
<td>187.5 gms</td>
<td>37.5</td>
<td>20.00</td>
<td>Sucking pests</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>Insecticide</td>
<td>Acetamiprid 20% SP</td>
<td>200 gms</td>
<td>500 gms</td>
<td>300</td>
<td>60.00</td>
<td>Sucking pests</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>7</td>
<td>Insecticide</td>
<td>Thiamethoxam 25% WG</td>
<td>180 gms</td>
<td>375 gms</td>
<td>195</td>
<td>52.00</td>
<td>Sucking pests</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>8</td>
<td>Insecticide</td>
<td>Fipronil 5% SC</td>
<td>1500 ml</td>
<td>1500 ml</td>
<td>0</td>
<td>0.00</td>
<td>Sucking pests</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>9</td>
<td>Insecticide</td>
<td>Diazinon 50% WP</td>
<td>1250 gms</td>
<td>875 gms</td>
<td>-375</td>
<td>-42.86</td>
<td>Sucking pests</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>10</td>
<td>Insecticide</td>
<td>Flicanicam 50% WG</td>
<td>75 gms</td>
<td>200 gms</td>
<td>125</td>
<td>62.50</td>
<td>Sucking pests</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>11</td>
<td>Insecticide</td>
<td>Profenofos 50% EC</td>
<td>320 ml</td>
<td>1250 ml</td>
<td>930</td>
<td>74.40</td>
<td>Lepidopteran insects</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>12</td>
<td>Insecticide</td>
<td>Spinosad 45% SC</td>
<td>75 ml</td>
<td>150 ml</td>
<td>75</td>
<td>50.00</td>
<td>Sucking, lepidopteran and coleoptera</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>13</td>
<td>Insecticide</td>
<td>Spinetoram 11.7% SC</td>
<td>188 ml</td>
<td>500 ml</td>
<td>312</td>
<td>62.40</td>
<td>Thrips and lepidopteran insects</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>14</td>
<td>Insecticide</td>
<td>Quinalphos 25% EC</td>
<td>625 ml</td>
<td>1875 ml</td>
<td>1250</td>
<td>66.67</td>
<td>Lepidopteran insects</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>15</td>
<td>Insecticide</td>
<td>Chlorpyrifos 20% EC</td>
<td>750 ml</td>
<td>1875 ml</td>
<td>1125</td>
<td>60.00</td>
<td>Lepidopteran insects</td>
<td>48</td>
<td>48</td>
</tr>
</tbody>
</table>

Cont...
## Table 6. Cont...

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

## c. Fungicides usage pattern in sample cotton farmers

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of pesticide</th>
<th>Name of pesticide</th>
<th>Recommended dosage per hectare</th>
<th>Average quantity used per hectare</th>
<th>Variation in pesticide usage</th>
<th>Deviation (%)</th>
<th>Target for</th>
<th>Number of sample farmers used</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fungicide</td>
<td>Carbenazim 12% + Mancozeb 63% WP</td>
<td>300 gms</td>
<td>625 gms</td>
<td>325</td>
<td>52.00</td>
<td>Leaf spot</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>2</td>
<td>Fungicide</td>
<td>Metalaxyl 35% WS</td>
<td>350 gms for 100 kg seed</td>
<td>500 gms for 100 kg seed</td>
<td>150</td>
<td>30.00</td>
<td>Seed borne diseases</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>Fungicide</td>
<td>Copper oxychloride 50% WP</td>
<td>750 gms</td>
<td>1875 gms</td>
<td>1125</td>
<td>60.00</td>
<td>Root rot and wilt</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>Fungicide</td>
<td>Carbenazim 50% WP</td>
<td>250 gms</td>
<td>1250 gms</td>
<td>1000</td>
<td>80.00</td>
<td>Leaf spot and wilt</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>5</td>
<td>Fungicide</td>
<td>Mancozeb 75% WP</td>
<td>625 ml</td>
<td>1250 gms</td>
<td>625</td>
<td>50.00</td>
<td>Leaf spot</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>Fungicide</td>
<td>Pyraclostrobin 20% WG</td>
<td>500 gms</td>
<td>500 gms</td>
<td>0</td>
<td>0.00</td>
<td>Leaf spot</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Bactericide</td>
<td>Streptomycin sulphate 90% w/w</td>
<td>120 gms</td>
<td>250 gms</td>
<td>130</td>
<td>52.00</td>
<td>Broad spectrum antibiotic</td>
<td>45</td>
<td>45</td>
</tr>
</tbody>
</table>
Table 7. Usage of pesticides according to the form

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

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.

**LITERATURE CITED**

