EFFECT OF SOIL APPLICATION OF ALDRIN & DIELDRIN ON YIELD AND CHEMICAL COMPOSITION OF GROUNDNUT (*ARACHIS HYPOGAEA* L.)

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There are several reports in literature regarding the effect of insecticides on the yield of various crops but little is known about their effect on quality aspect (*Agarwala, 1955; Chatterji and Sarup, 1960*). Bogdanov (1963) reported an increase in amino acid content of leaves and beans when bean plants were sprayed with thiometon and parathion. Spray of menazon increased the yield and improved the quality of groundnut (*Davies and Kasule, 1964*). Aldrin and dieldrin are commonly used for the control of termites in various crops. Present investigations were undertaken to study their effect on the yield and quality of groundnut, an important crop of semi-arid zones.

Aldrin and dieldrin were applied in soil with irrigation water after one month of sowing, at the rate of 0.625, 1.250, 1.875 and 2.500 kg a.i. per hectare. There were three replications for each treatment in randomized block design. Groundnut variety C 501 was used for the experiment. At maturity, the yield data were recorded and composite samples from each treatment were analysed in duplicate for oil, protein and mineral matter by AOAC (1960) methods. The reducing sugars and total soluble sugars were determined by the methods described by Thomas (1924) and Dubois *et al* (1956) respectively.

The application of aldrin and dieldrin significantly increased the pod yield of groundnut (Table 1). There was a gradual increase in the yield with increasing doses of insecticides. A yield of 27.65 qtls/ha was obtained from the control plots and the percentage increase in yield over control with 2,500 kg a.i. per hectare doses of aldrin and dieldrin was 64.8 and 48.3 respectively. Oil content of the kernels was adversely affected by the application of the insecticides. There was a progressive decrease in oil content with the increasing doses of both the insecticides.
Shelling percentage of pods was determined and therefrom the production of oil per hectare calculated. All the treatments gave higher oil yield per hectare as compared to control. The increase in yield of oil per ha was due to higher seed yield obtained with the application of these insecticides.

Application of dieldrin up to 1.875 kg a.i. per hectare resulted in a corresponding increase in crude protein content. However, there was a relative decrease in the protein content with 2.500 kg a.i. per hectare dose of dieldrin. Nandra and Chopra (1969) also reported an increase in protein content of groundnut kernels with the application of thiometon. It was interesting to note that aldrin at the rate of 0.625 and 1.250 kg a.i. per hectare decreased the protein content as compared to control. Reverse was, however, true with the higher doses of aldrin.

Total sugar content increased progressively with the increasing doses of dieldrin. However, application of aldrin resulted in decreased sugar content. No specific effect of these insecticides could be observed on reducing sugars and mineral matter content.

REFERENCES


Table 1. Effect of soil application of aldrin and dieldrin on the yield and chemical composition of groundnut

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatments (kg. a. i./ha)</th>
<th>Pod yield (qtls/ha)</th>
<th>Increase in yield over control (%)</th>
<th>Oil (%)</th>
<th>Production of oil (qtls/ha)</th>
<th>Crude protein (%)</th>
<th>Reducing sugar (%)</th>
<th>Total sugar (%)</th>
<th>Mineral matter (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aldrin 0.625</td>
<td>36.01</td>
<td>28.8</td>
<td>48.42</td>
<td>10.088</td>
<td>24.48</td>
<td>0.57</td>
<td>6.26</td>
<td>2.27</td>
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<tr>
<td>2.</td>
<td>-do- 1.250</td>
<td>38.19</td>
<td>30.9</td>
<td>47.87</td>
<td>10.968</td>
<td>25.86</td>
<td>0.54</td>
<td>6.63</td>
<td>2.32</td>
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<td>3.</td>
<td>-do- 1.875</td>
<td>39.57</td>
<td>43.1</td>
<td>47.40</td>
<td>11.254</td>
<td>26.94</td>
<td>0.60</td>
<td>7.42</td>
<td>2.39</td>
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<td>4.</td>
<td>-do- 2.500</td>
<td>45.57</td>
<td>64.8</td>
<td>46.90</td>
<td>12.823</td>
<td>27.94</td>
<td>0.58</td>
<td>6.81</td>
<td>2.32</td>
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<td>5.</td>
<td>Dieldrin 0.625</td>
<td>32.71</td>
<td>18.3</td>
<td>48.25</td>
<td>9.470</td>
<td>26.63</td>
<td>0.65</td>
<td>7.81</td>
<td>2.24</td>
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<td>6.</td>
<td>-do- 1.250</td>
<td>33.58</td>
<td>21.4</td>
<td>47.08</td>
<td>9.485</td>
<td>27.81</td>
<td>0.64</td>
<td>8.17</td>
<td>2.33</td>
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<tr>
<td>7.</td>
<td>-do- 1.875</td>
<td>37.98</td>
<td>37.3</td>
<td>46.45</td>
<td>10.585</td>
<td>29.12</td>
<td>0.64</td>
<td>8.73</td>
<td>2.45</td>
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<tr>
<td>8.</td>
<td>-do- 2.500</td>
<td>41.01†</td>
<td>48.3</td>
<td>45.70</td>
<td>11.245</td>
<td>26.88</td>
<td>0.60</td>
<td>8.81</td>
<td>2.25</td>
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<td>9.</td>
<td>Control</td>
<td>27.65</td>
<td>-</td>
<td>48.80</td>
<td>8.096</td>
<td>26.19</td>
<td>0.55</td>
<td>7.25</td>
<td>2.23</td>
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</table>

C. D. at 5% 130.6 – – – – – – –


The book is the result of many years of painstaking research by Dr. I. Gindel on the water relations of trees in the arid area of Israel.

The book starts with an account of the environmental conditions and of the flora of the three climatic zones (subtropical, semi-desert and desert) where research was conducted by the author. The second chapter deals with the effects of environment on the morphological, anatomical and physiological properties of forest trees. A good deal of new information on the structure of wood under different habitats has been presented. The author is of the opinion that the gravimetric method is superior to the neutron scatter method in studying the soil moisture status of forest land. Desert trees in their natural habitat do not, according to the author, undergo any conspicuous dehydration during drought. The role of atmospheric water in maintaining cell turgor in the leaves and roots of trees has been discussed in some detail. We are told, for example, that the cut-leaf, quick weighing method is quite satisfactory for calculating water loss. Interested readers will be benifitted from the detailed experimental technique employed by the author. The importance of dew in crop production under arid conditions seems indeed to have been known to the ancients and the author has quoted verses from the Bible to emphasise this point. In the Atacama desert of northern Chile and Peru, the annual rainfall may be as low as 50 mm but the heavy mist occurring there for 6 months of the year provides moisture equivalent to 300-400 mm of rain. The roots of cacti penetrate only up to a few decimeters and continue to absorb mist and dew. This is one means of their successful desert adaptation. Dew and mist contain both anions and cations some of which have nutritional significance, the ion content being comparatively higher under a forest canopy than in an open area.