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Protection of Seeds of *Sorghum* from Infestation by the Weevil, *Sitophilus oryzae* Linn.

by

N. V. RADHA¹, C. RAMAKRISHNAN², R. SIVAGAMI³
and T. GOVINDARAJAN⁴

Introduction: Among the various insects that infest *cholam* seeds, the weevil, *Sitophilus oryzae* L., is considered to be the most important one. Both the grubs and adults bore into the grains reducing them to fragments and dust. To find out an effective insecticide for the control of the pest in storage, experiments were conducted and the results are presented.

Materials and Methods: Four trials were conducted in the Entomology Section, Agricultural College and Research Institute, Coimbatore during the years 1961-62 and 1963-64 to 1965-66, by using CO 18, CO 1, CO 20 and CO 19 varieties of *cholam* seeds respectively. The seeds were kept in cloth bags at 500 g in each bag. The insecticidal treatments were dusts of Aldrin 5%, Dieldrin 1.5%, DDT 10% and Toxaphene 10% in the first two trials and Carbaryl (Sevin) 10%, Malathion 4%, DDT 10% and Toxaphene 10% in the third and fourth trials. The variants were replicated thrice. The seeds were mixed with the insecticides at the rate of 100:1 by weight and compared with a suitable control (without insecticides). Twenty live weevils, *Sitophilus oryzae* L. were introduced into each lot at the beginning of the trial and

1 & 4. Assistants in Entomology and 2 & 3. Assistant Entomologists, Agricultural College and Research Institute, Coimbatore-3.

at the end of every month after recording the population of live and dead weevils, the dead weevils were removed. The experimental lots were kept upto twelve months for observation. At the end of the twelfth month the viability of the seeds was estimated by conducting germination tests.

Results: The data on the population of live weevils under the different treatments have been recorded every month. The average percentage of germination of seeds at the end of each experiment was also noted. Apart from this, the mean population of live weevils under different treatments for the four experiments was calculated and presented graphically in the Figure. All these data are furnished in the Table.

i) *1961-62:* The observations revealed complete mortality of the weevil in DDT 10% treated lots even a year after storage. Aldrin and Dieldrin treated lots showed a very high incidence of the pest while the seeds treated with Toxaphene showed only a stray incidence of live weevils. In the untreated control the whole lots have been powdered due to the heavy population of the weevils. The average percentage of germination revealed that DDT 10% was the best having 89% germination followed by Toxaphene 10% (81%), Dieldrin (64%) and Aldrin 5% (63%).

ii) *1963-64:* The results of the trial were in agreement of the results of the first trial. Further the average of percentage of germination was 91% in DDT treated lots, 87% in Toxaphene, 50% in Dieldrin and 31% in Aldrin.

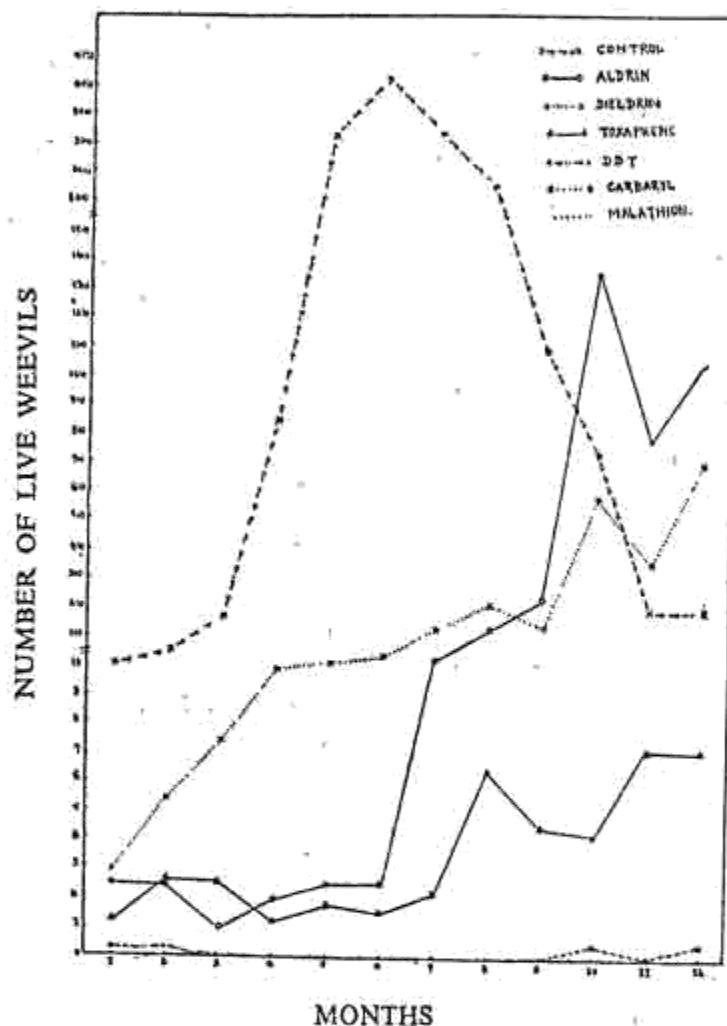
iii) *1964-65:* The results revealed that the lots treated with Malathion 4% and DDT 10% were completely free from the pest attack. Live weevils were noted in the lots treated with Toxaphene 10% and Carbaryl 10% from fifth and the tenth month respectively. The number of live weevils were less in the lots treated with Carbaryl than Toxaphene. In the untreated control the whole lots have been powdered even in the eighth month of storage.

The average percentage of germination revealed that DDT 10% was the best having 90% germination followed by Carbaryl 10% and Malathion 4% with 88% and 89% germination respectively. In Toxaphene it was 86% only.

iv) *1965-66:* Complete mortality of the pest in the lots treated with DDT, Carbaryl and Malathion was noted even a year after storage. Stray live weevils were noted in the lots treated with Toxaphene. In the untreated control the whole lots have been powdered. The germination test revealed that the average percentage of germination was high in the lots treated with Carbaryl (86%) followed by Malathion (84%) and DDT (83%). In Toxaphene it was 80% only.

Discussion: The results of the four experiments conducted from 1961-62 and 1963 to 66 have been shown in the Figure. It shows that the population of the live weevils was higher in the control lots followed by Aldrin, Dieldrin and

FIG. Mean Population of live weevils, *Sitophilus oryzae* L. under different treatments.



Toxaphene. It also reveals that the seeds treated with dusts of Malathion 4%, Carbaryl 10% and DDT 10% remained free from the attack of the weevil, *Sitophilus oryzae* L. upto a period of twelve months. In this connection it may be mentioned that Kalek Abd (1963) has found Carbaryl to be effective in controlling *Tenebrio molitor*, *Tribolium confusum* and *Sitophilus oryzae* L. Malathion 5% dust has been recommended for the control of *Sitophilus oryzae*, *Rhizopertha dominica* and *Tribolium castaneum* by Yong Ho Bang and Floyd (1962) and Walt (1962). Previous experience in this State have also shown the effectiveness of DDT 10% in the control of *Sitophilus oryzae* L. infesting *chulam* seeds (Ramakrishnan and Narayanaswamy, 1963).

As far as the germination of the seeds in the treated lots is concerned the germination was higher ranging from 83 to 91% in DDT, 84 to 89% in Malathion, 86 to 88% in Carbaryl as against 80 to 87% in Taxaphene.

When the cost of the chemical required for the preservation of 1000 kg (one tonne) of seeds was worked out, it came to Rs. 16.00 for Malathion 4% dust, Rs. 27.50 for Carbaryl 10% and Rs. 8.00 for DDT 10% dust.

Conclusion: Dusts of Malathion 4%, Carbaryl 10% and DDT 10% when mixed with the *cholam* seeds at the ratio of 1:100 by weight are found to be effective in controlling the weevil, *Sitophilus oryzae* L., upto a period of twelve months. The above chemicals are recommended for the preservation of the seed materials only and not for storing grains intended for consumption.

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