

3. The fertility of the eggs of the two strains did not differ; nor did the capacity of the two stains of larvae to penetrate non-sprayed fruits.
4. DDT-resistance is evidently fairly widespread in the orchards of the South Okanagan area, but the degree of resistance is variable.

Acknowledgments

Much of the work in this experiment was done by these members of the staff of the Summerland Entomology Laboratory: Dr. M. D. Proverbs, Messrs. K. Williams, J. Newton and J. Ogilvie, and by Mrs. Bernice McDonald.

References

1. Barnes, M. M. 1958. A strain of codling moth in California resistant to DDT. *J. Econ. Ent.* 51: 693-694.
2. Cutright, C. R. 1954. A codling moth population resistant to DDT. *J. Econ. Ent.* 47: 189-190.
3. Glass, E. G., and B. Fiori. 1955. Codling moth resistance to DDT in New York. *J. Econ. Ent.* 48: 598-599.
4. Hamilton, D. W. 1956. Resistance of the codling moth to DDT sprays. *J. Econ. Ent.* 49: 866-867.
5. Hough, W. S. 1934. Colorado and Virginia strains of codling moth in relation to their ability to enter sprayed and unsprayed apples. *J. Agr. Res.* 48: 533-553.
6. Marshall, J. 1952. Applied entomology in the orchards of British Columbia. *Proc. Ent. Soc. British Columbia* (1951). 48: 25-31.
7. Marshall, J. 1958. Concentrate spraying in deciduous orchards. *Canada Dept. Agr. Pub.* 1020. pp. 1-47.
8. Smith, L. C. 1955. DDT-resistant codling moth. *J. Dept. Agr. South Australia* 59: 12-15.

OUTBREAKS OF GRANARY WEEVILS IN HOMES

G. J. SPENCER

University of British Columbia, Vancouver, B.C.

I have twice encountered two remarkable outbreaks of *Sitophilus granarius* Linn. the granary weevil, in homes in Vancouver; in both cases the telephoned reports were so alarming that I made special trips to investigate and in neither instance could I account for the situation.

In the first case, beetles had been issuing from under the quarter-round on the north and east sides of a first-floor back-bedroom for two days and were still streaming southwards and spilling over into the hall. Across the hall in the living room, beetles were slowly crawling around having apparently issued from under the quarter-round on the south side. Most remarkable of all, was a sheet of beetles some four feet across, in the grass of the lawn on the west side, between the houses. There was no indication where these lawn insects came from; they were slowly crawling around and around in a black carpet-like mass.

I enquired of the people if they had any shelled corn or grain stored in the basement or any forgotten sack of cereal of any kind; they had never had anything of the sort in the two years that they had lived there. I inspected the whole basement with greatest care and found no trace of any possible breeding material. I asked if they had ever kept chickens; they said they had not but the previous owners had kept poultry in the garage at the back of the lot, adjoining the lane, two years ago.

The only explanation I could give for this black horde of weevils was that the previous owners had kept sacks of corn or other grain in the basement as poultry feed, that rats or mice had stolen the feed and stored it somewhere in the walls, that the weevils had infested the feed until it was exhausted and were finally issuing from their breeding place in the huge populations which they had at-

tained in two years time.

In no way could I account for the black mass of weevils in the isolated mass on the lawn; they had not been seen travelling there—they just appeared there.

The second instance occurred in the home of an airman who had been in a rented house for about six months; a steady trickle of granary weevils was issuing from under the quarter-round in the hall upstairs and slowly crawling southwards down the hall; they had been emerging for two days before I inspected the house. Again I examined the basement with greatest

care; there was no sign of grain anywhere and the floors and walls were sound and without cracks; moreover there was no place in the garden where anybody could have kept poultry. In this case, I could not even suggest the breeding place of the weevils and recommended the continuous use of the vacuum cleaner for their removal; there was no place to apply insecticides; the wall extended only to the floor below and not to the basement: there was no indication how any material for breeding could have been introduced into the wall from which the beetles were issuing.

A NOTE ON ENGINE VACUUM FOR ASPIRATING INSECTS¹

W. H. A. WILDE²

Studies on vectors of stone fruit virus diseases often require test insects in large numbers. Usually these are Homoptera such as leafhoppers, psyllids, spittle bugs or aphids. Various methods have been devised (1) for aspirating large numbers of these. In my previous collecting with conventional mouth aspirators, minute particles of sand, plant and animal matter had appeared in the sputum, indicating that there was risk of permanent damage from irritation or myiasis (2). This note describes a well-proved method using part of the vacuum of 18 to 20 inches of mercury, available in most truck and car engines. The method differs in details from that of Moore (3) for collecting grasshoppers.

For vehicles with vacuum-operated windshield wipers, cut the wiper vacuum hose under the dashboard, insert a $\frac{3}{8}$ in. brass T-shaped connection into the two cut ends, and attach an aspirator supply hose to the third outlet. The aspirator supply hose should be long enough to come through, or up to the level of, the dashboard to which it is attached for easy connection with the aspirator tubing.

For vehicles with electrically-operated wipers, bore a hole in the intake manifold below the carburetor for a source of vacuum. Thread the hole and insert a stop cock with a $\frac{3}{8}$ in. hose connection for the vacuum line which is then taken through the fire wall to the interior of the vehicle and attached to the dashboard. This takes about 4 ft. of $\frac{3}{8}$ in. windshield wiper hose. By inserting extra T-shaped connections more than one aspirator may be used from the vacuum line.

Window screens of 32/in. mesh should be used. The screens are not absolutely necessary, but the temperature on a hot, sunny day in a closed cab is often fatal to the insects and always uncomfortable for the operator. Connect a conventional straight aspirator (1) to the aspirator tubing. Start the motor and set it to run at medium idling speed. Attach the vacuum gauge to the nozzle of the aspirator and adjust for the required vacuum with a Hoffman clamp on the tubing close to the aspirator. For leafhoppers $2\frac{1}{2}$ to 4 in. of vacuum is required, for spittle bugs 3 to 6 in.

Even where it is not possible to drive a vehicle close to the collecting site, time can still be saved by sweeping with 3 or 4 conventional nets, then returning to the vehicle to aspirate the catch. Release the catch inside

¹ Contribution No. 21, Regional Research Station, Department of Agriculture, Summerland, British Columbia.

² Entomologist.