cinium, but no larvae were collected on this host in the Okanagan. *R. berberis* Curran was commonly encountered on traps and was recorded from nearly all the areas under study. *R. berberis* attacks the fruit of Oregon grape. *Mahonia nervosa* pursh, and larvae were found in large numbers in the berries. Although pupae were readily obtained in the laboratory, adults did not emerge under laboratory conditions.

The emergence period of the six species of *Rhagoletis* trapped on yellow sticky boards is shown in Figure 2. *R. ribicola*, *R. berberis*, and *R. tabellaria* emerge at about the same period as *R. indifferens*, but the peak of emergence is about two weeks later. *R. zephyria* emerges later than the other species with peak emergence in mid-July. This adult activity coincides with the development of fruit on the snowberry plants. There were too few *R. fausta* taken to draw conclusions on adult emergence. In other areas, it appears earlier than *R. indifferens* and the emergence period is shorter.

DISCUSSION

The lack of wild hosts for the western cherry fruit fly in the Okanagan Valley may mean that control of this major pest of cherries will be easier than in other areas. Trapping has shown that most of the flies occur in neglected trees, and the spraying or removal of these trees should significantly reduce fruit fly populations. Indications are that *R. indifferens* has been in the Okanagan for some time, since it is distributed over most of the cherry growing area. Yellow sticky boards seem to be reliable traps for determining whether chemical treatment is necessary. The presence of 6 species of *Rhagoletis* in the Okanagan indicates that the area is favorable for fruit fly development. Whether *R. indifferens* can become a serious pest in the Okanagan may depend on its ability to survive on cultivated cherries in the absence of a native host.

References

Barnes, M. M. and H. F. Madsen. 1963. Analyzing the threat of the husk fly. Diamond Walnut News **45**(3): 5-7.

Bush, Guy L. 1966. The taxonomy, cytology and evolution of the Genus **Rhagoletis** in North America (Diptera, Tephritidae). Bull. Mus. comp. Zool. Harv. **134**: 433-521.

Frick, Kenneth E., Harold G. Simkover and H. S. Telford. 1954. Bionomics of the cherry fruit flies in eastern Washington. Wash. Agr. Expt. Sta. Tech. Bull. **13**: 1-66.

Midsen, H. F. and J. C. Arrand. 1966. The recognition and biology of orchard insects and mites in British Columbia. Brit. Columbia Dept. Agr. Bull. **66**-2: 1-41.

Peters, W. S. and J. C. Arrand. 1968. The control of cherry fruit flies in the Kootenay area of British Columbia. Brit. Columbia Dept. Agr. Bull. **68**-6: 1-6.

Wilde, W. H. A. 1962. A note on colour preference of some Homoptera and Thysanoptera in British Columbia. Can. Entomol. **94**: 107.

NOTES ON DIAPAUSE IN THE TOMATO HORNWORM (LEPIDOPTERA: SPHINGIDAE), IN BRITISH COLUMBIA

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INTRODUCTION

The tomato hornworm, *Manduca quinquemaculata* (Haworth), is a sporadic economic pest in commercial and home garden plantings of tomatoes in the southern dry-belt regions of British Columbia, particularly, in the Thompson, Okanagan and Similkameen Valleys (Banham and Arrand 1970). It also occurs on related Solanaceous plants, including egg plant, pepper and potato.

At Summerland, B.C., in 1968 and 1969, there were up to 2 generations of hornworms each year. First generation moths emerged about mid-June and second-generation moths about mid-August. As in southern Ontario (McClanahan 1955), some moths did not emerge from first generation pupae until the following year. In the laboratory, 1 of 12 pupae and 2 of 17, respectively, diapaused from larvae collected in the field in late June or July in 1968 and 1969. Both years, moths emerged from the remainder of the non-diapausing pupae after about 3 weeks. Insufficient numbers of tomato hornworm larvae were collected and reared to indicate the actual incidence of faculative diapause in the pupal stage. In North Carolina, Rabb (1966), reported a faculative diapause in the pupal stage of the closely related tobacco hornworm, *Manduca sexta* (Johannson), with the incidence of diapause increasing from less than 5% in June to more than 95%

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in late fall. Diapause was initiated in the larval stage of the tobacco hornworm by photoperiodic day length cycles of 5 to 13 hours. In contrast, temperature rather than photoperiod was the major factor influencing diapause induction in the tomato hornworm in southern Ontario (Svec, 1964). Diapause was induced by exposing prepupal and pupal stages to temperatures of 22°C or lower.

References

Banham, F. L. and J. C. Arrand. 1970. Recognition and life history of the major insect and allied pests of vegetables in British Columbia. Brit. Columbia Dep. Agr. Entomol. Br. (In press).

McClanahan, R. J. 1955. Control of hornworms on tobacco. Can. Dep. Agr. Publ. **951**.

Rabb, R. L. 1966. Diapause in **Protoparce sexta** (Lepidoptera: Sphingidae). Ann. Entomol. Soc. Amer. **59:** 160-165.

Svec, H. J. 1964. Induction of diapause in the tomato hornworm, **Protoparce quinqemaculata** (Haw.). Proc. Entomol. Soc. Ontario **94**: 68-70.

INCONGRUITY BETWEEN LARVAE AND ADULTS IN THE ACCEPTABILITY OF HIGHBUSH BLUEBERRY CULTIVARS BY THE BLACK VINE WEEVIL

W. T. CRAM

Laboratory observations have shown that adults of the black vine weevil, *Otiorhynchus (Brachyrhinus) sulcatus* (F.), do not oviposit or survive when fed exclusively on excised leaves of the blueberry cultivars Cabot and Weymouth (Cram, 1970). To test the acceptability of 4 cultivars by larvae, rooted cuttings were potted in peat soil and grown in the greenhouse. Twenty 8-day-old viable eggs were placed on the soil of each of 5 replicates. Fifteen weeks later the pots were dumped and the soil was searched for larvae with the following results:

Cultivar	Replicates 1	2	3	4	5	Total
Rancocas	0*	1*	4*	2*	0*	7
Pemberton	0	2*	3*	1	0	6
June	0	1*	0	0*	2*	3
Weymouth	5*	1	3*	0*	5*	14

*Plant dead-stem girdled below soil.

Although there was very low recovery of larvae the evidence of severe damage was present in all the cultivars. The largest number of late instar larvae were recovered from Weymouth which indicates that there is no congruity between the acceptability of this cultivar by larvae feeding on roots and adults feeding on leaves. Hence, from an economic standpoint, Weymouth cannot be considered to be an immune cultivar. In practice, a heavy infestation of larvae severely damaged and even killed many young Weymouth plants in an 8-acre nursery row planting. Reproductively mature adults probably walked into the area and deposited their eggs around these plants.

Reference

Cram, W. T. 1970. Unacceptability of cultivars of highbush blueberry by adult black vine weevils (Col.:Curculionidae). J. Entomol. Soc. B.C. **67**:3-6.