A MODIFIED CARROT WEEVIL (COLEOPTERA: CURCULIONIDAE) MONITORING TRAP

GERALD M. GHIDIU AND RICHARD W. VANVRANKEN[1]
Rutgers Research Center, 121 Northville Road, Bridgeton, NJ 08302

[1]Atlantic County Extension Office, 1200 W. Harding Highway,
Mays Landing, NJ 08330-1533

The carrot weevil, *Listronotus oregonensis* (LeConte), is an important pest of carrots, parsley and celery in the northeastern United States (Simonet & Davenport 1981) and can also be a pest of parsnips (Ryser 1975). Adults overwinter in or near fields where carrots or celery were grown the previous year, emerging in late April to early May. They feed directly on the roots, and females oviposit from the beginning of May until late June in carrot and parsley roots. Larvae tunnel extensively throughout the upper third of the roots. Carrot weevils may damage up to 40% of the crop in untreated fields (Boivin 1985). Pepper (1942) reported two full broods with a partial third in northern New Jersey, and three full broods with a partial fourth in southern New Jersey.

Until recently, growers generally used in-furrow granular insecticides or multiple soil-directed sprays of insecticides, such as azinphosmethyl, for control of carrot weevils. These materials killed the adults and larvae before they tunnelled into the roots. However, azinphosmethyl and parathion registrations on carrots were discontinued, and the management of carrot weevils is now obtained by repeated foliar applications of the pyrethroid esfenvalerate directed at the overwintered adults before they oviposit. However, the pyrethroids have a short residual period when exposed to the en-

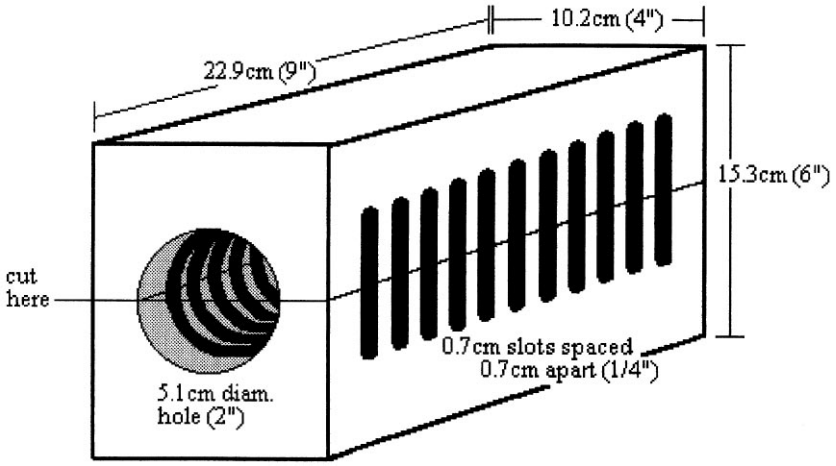

Figure 1. Schematic diagram of holes and cuts necessary to make two modified Boivin carrot weevil traps from one piece of pressure-treated post. English units are in ( ).

vironment, and an accurate population monitoring system is necessary to determine adult activity. In New Jersey, it is recommended that growers begin insecticide sprays when adult activity begins (Anonymous 1995). A monitoring system for the weevils, then, must provide reliable and timely captures of adults.

The traps currently used to monitor the adult carrot weevil activity include Mason[R] jars fitted with a funnel and baited with carrots or carrot baby food (Ryser 1975), raw carrots placed in the soil to observe oviposition scars (Stevenson 1981), and a trap consisting of wooden plates with a carrot as bait (Boivin 1985). Of these, the latter was more effective as a monitoring device for adult carrot weevils than either the Mason[R] jar type or the carrot in the soil (Boivin 1985). The Boivin trap, however, consisted of many small wooden plates, a wooden top and bottom, two long bolts with nuts, and several dozen washers. Even after assembly, the trap consisted of three major parts: the body, a top and a bottom plate.

In this note, we describe a modified Boivin trap constructed from a block of wood. The design is inexpensive, easy to construct, durable, and can be made from a single piece of pressure-treated post. In field comparisons, this trap was as effective as standard Boivin traps in catching carrot weevil adults in a parsley field in New Jersey.

Trap Construction. The materials needed to construct the trap are listed below. All measurements are reported in both metric and english units because the lumber supply companies of the United States sell their materials based on english units:

1 - Pressure-treated pine post, 10.2 × 15.3 cm (4 × 6 in)

1 - 5.1 cm diam drill (2 in)

1 - Table saw, 25.4 cm diam (10-in saw)

Cut the pressure-treated post into 22.9-cm (9 in) long sections. Drill a 5.1-cm diam hole through the center of each post section (Fig. 1). With the table saw, cut the post section lengthwise through the center to yield two 10.2 × 7.6 cm (4 × 3 in) pieces (Fig. 1). Then cut 0.7 cm (1/4 in) grooves 4 mm apart and 5 cm deep from the face of the post that was cut down the center (the face with the semicircular cut) for the length of the block (Fig. 2). Although not necessary for trap function, a bottom plate of 0.7 mm thick

Figure 2. Completed trap, with a bottom plate.

plywood can be made for each trap to allow the trap to sit flat in the soil (Fig. 2) and to provide a surface to bang the trap against to shake free the weevils hiding within the slats.

Trap Effectiveness. Traps were compared for trapping effectiveness in a parsley field in Buena, NJ from 31 May through 30 June 1994. A total of three Boivin (1985) traps and two modified Boivin traps were randomly placed approximately 3 m apart within the edge rows of the parsley field. The edge rows bordered a 1.5-m wide row of privet (*Ligustrum ovalifolium* L.), commonly used as a windbreak in vegetable fields throughout NJ. The weevils overwinter in hedgerows, such as privet (Ryser 1975), and migrate into the field from these hedgerows. A fresh, whole carrot was placed in each trap when set out. The traps were emptied twice weekly by banging the trap on a wood board to shake loose the weevils. Adult carrot weevils were counted, collected, and removed from the field, and the old carrot was replaced with a fresh carrot in each trap. Traps in the field were maintained until 30 June 1995.

The standard Boivin trap caught an average of 6.3 weevils per trap, and the modified Boivin trap caught an average of 11.0 weevils per trap (Table 1) during the 4 wk trial.

TABLE 1. AVERAGE WEEKLY TRAP CATCH OF ADULT *L. OREGONENSIS* PER TRAP IN BOIVIN AND SLOTTED WOOD (MODIFIED BOIVIN) TRAPS IN PARSLEY, BUENA, NJ 1994.

Trap Type	31 May-7 Jun	8-13 Jun	14-21 Jun	22-28 Jun	Total per Trap
Boivin	0.9	2.5	0.3	2.6	6.3
Modified Boivin	1.0	4.5	0.0	5.5	11.0

We thank D. Collins for monitoring and identifying the weevils from the traps. This work was funded by the Campbell's Soup Company, the New Jersey Agricultural Experiment Station publication No. D-08130-10-95, and by the United States Hatch Act.

SUMMARY

An inexpensive and simple method is described for constructing a modified Boivin (1985) carrot weevil trap. It is constructed from a single piece of pressure-treated post 22.9 cm in length. The trap is as effective as the Boivin trap in catching adult carrot weevils.

REFERENCES CITED

ANONYMOUS. 1994. Commercial vegetable production recommendations for New Jersey. Rutgers Coop. Ext. Bull. EO-001J. 144 pp.

BOIVIN, G. 1985. Evaluation of monitoring techniques for the carrot weevil, *Listronotus oregonensis* (Coleoptera: curculionidae). Canadian Entomol. 117: 927-933.

PEPPER, B. B. 1942. The carrot weevil, *Listronotus latiusculus* (Bohe.) in New Jersey and its control. New Jersey Agric. Expt. Sta. Bull. 693. 20 pp.

RYSER, B. W. 1975. Investigations regarding the biology and control of the carrot weevil, *Listronotus oregonesis* (LeConte) in New Jersey. M.Sc. thesis, Rutgers Univ., New Brunswick, NJ.

SIMONET, D. E., AND B. L. DAVENPORT. 1981. Temperature requirements for development and oviposition of the carrot weevil. Ann. Entomol. Soc. America. 74: 312-315.

STEVENSON, A. B. 1981. Carrot insects. Min. Agric. Food, Ontario, Fact Sheet 81-007. Agdex 258/605. 4 pp.