Injury to Strawberry Crowns Caused by European Corn Borer Larvae

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Abstract. Larvae of several insects injure and kill strawberry (*Fragaria xananassa* Duchesne) plants by burrowing into and hollowing out plant crowns. Occasionally, these infestations are serious enough to cause heavy economic losses to fruit producers and nursery plant growers. In 1997 in Beltsville, Md., we observed wilting and dying mature plants and unrooted runner plants in two experimental strawberry plantings. Injury by larvae was extensive; large cavities occurred in crowns, and the central pith tissues were removed from stolons and leaf petioles. Often, insect frass was seen at entrance holes. Larvae removed from hollowed-out parts of injured plants were identified as the European corn borer (*Ostrinia nubilalis* Hübner) in their fifth instar stage. Their presence in this instance also was associated with a cover crop of millet [*Setaria italica* (L.) P. Beauv., 'German Strain R'] planted between the strawberry rows for weed suppression. This is the first published report of the European corn borer attacking strawberry. Although this insect may occur only sporadically in strawberry plantings, it may become important in the future. Growers and other professionals should become aware of this new strawberry pest and recognize that its management in strawberry will be different from management of other crown-boring insects.

In Oct. 1997, strawberry plants in 1997 advanced selection and evaluation plantings on raised beds mulched with black plastic on the USDA North Farm in Beltsville, Md., and in the seedling evaluation planting on the East Farm, ≈1 km distant, began to wilt, collapse, and die. Both plants transplanted from the greenhouse in late August and unrooted runner plants were affected. Examination of wilting plants showed no symptoms of root disease. Entrance holes surrounded by insect frass were observed in leaf axils of crowns (Fig. 1A) and at the first nodes of stolons. Extensive hollowing out of crowns was apparent when they were sectioned lengthwise (Fig. 1B). In many instances, larvae, 12–15 mm long, were observed in hollowed-out crowns and stolons (Fig. 2).

Materials and Methods

Larvae-affected plants and plant parts containing larvae were collected and immediately delivered to the U.S. Dept. of Agriculture Systematics Entomology Laboratory in Beltsville, Md., where the insects were identified as the European corn borer (ECB), Order Lepidoptera, Family Crambidae. Based on head

capsule morphology and by comparison with authenticated third, fourth, and fifth instar stage ECB larvae, larvae were determined to be in the fifth instar stage (R.L.H.). Larvae likely would have overwintered in the fifth instar stage, pupated the following spring, and emerged as adults.

We did not determine if eggs were deposited directly on strawberry leaves or if the larvae migrated from other hosts to the strawberry plants. Corn (*Zea mays* L.; maize) was planted ≈50 m from each strawberry planting, but this distance may exceed the range of larvae. Foxtail millet was seeded between rows in each planting in August for weed suppression and allowed to grow throughout the season. The millet was managed by occasionally cutting it back with a string trimmer, causing it to produce tillers and become more dense as a groundcover. Millet is considered a suitable host for ECB (Hudon and LeRoux, 1986), and we did find evidence that the millet plants had been host to ECB larvae. Maryland is near the border of ranges of the northern bivoltine and southern multivoltine ECB biotypes (Hudon and LeRoux, 1986), suggesting that two or more generations of ECB could occur in Maryland and that late-season adult females, probably from the nearby corn plantings, may have oviposited on the millet or strawberry plants. Baker and Bradley (1948) observed that where bi- or multivoltine biotypes occur, adults may deposit eggs on various host species as the growing season progresses. The unusual drought conditions experienced in Maryland in 1997 may have contributed to the occurrence of ECB in the strawberry plantings.

Results and Discussion

The ECB has become widely distributed in North America since its introduction in 1914 (Vinal, 1917). Although corn is commonly

Fig. 1. Injuries to (A) a strawberry leaf petiole of a young runner plant caused by the feeding activities of a European corn borer larva and (B) a mature strawberry plant crown.

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Fig. 2. European corn borer larva (arrow) in a hollowed-out portion of a stolon near the crown.

one of its food plants, ECB will attack many herbaceous plants large enough for the larvae to enter, including many weeds, grasses, ornamental plants, and vegetable crops (Hodgson, 1928; Hudon and LeRoux, 1986). ECB also will occasionally infest flowers, vegetables, and fruit. Although several crown-boring insects are acknowledged strawberry pests in North America (Maas, 1998), this is the first documented report of injury to strawberry

caused by ECB larvae. Strawberry crown borers in general weaken and kill plants, reducing fruit yields (Maas, 1998). However, this is the first observation that a crown-boring insect also may reduce runner-plant production.

Sporadic occurrences of ECB larvae have been observed in strawberry crowns in North Carolina (C. Cantaluppi, pers. comm.), leaf petioles in Nova Scotia (L.M. Crozier, pers.

comm.), and fruit in Maine (J. Dill, pers. comm.). Despite the low incidence of ECB in strawberry, growers and extension personnel should be aware of the potential damage that ECB may cause, and be able to differentiate ECB larvae from those of other strawberry crown-boring insects that may require different management strategies (Howard et al., 1985; Maas, 1998; Poling, 1995). Although strawberry does not seem to be a preferred food plant (Hodgson, 1928), the ECB should be recognized as a potential insect problem in strawberry plantings, especially if suitable hosts are interplanted or planted in close proximity to strawberry plants.

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