

plum curculio

Conotrachelus nenuphar (Herbst)

INTRODUCTION

The plum curculio (PC), a native of North America, is a major pest of pome and stone fruits in the United States and Canada east of the 100th meridian. The PC has a single generation in most areas but may have a partial second generation in the southern areas of its range.

Most commercial orchards are free of resident PC populations and are infested by adults moving in from adjoining hedgerows and woodlands. Therefore, injury in most commercial orchards is normally heaviest close to these sites. The out-of-orchard sites should also be examined in scouting for first plum curculio activity in the spring.

THE ADULTS

Adult PC are typical snout beetles (Fig. 1). They are dark brown to steely gray in color with patches of white or gray. They have four humps on their wing covers (elytra) and measure 4-6 mm in length. The beak or snout is 1/4 the body length, with the mouth parts located at the end.

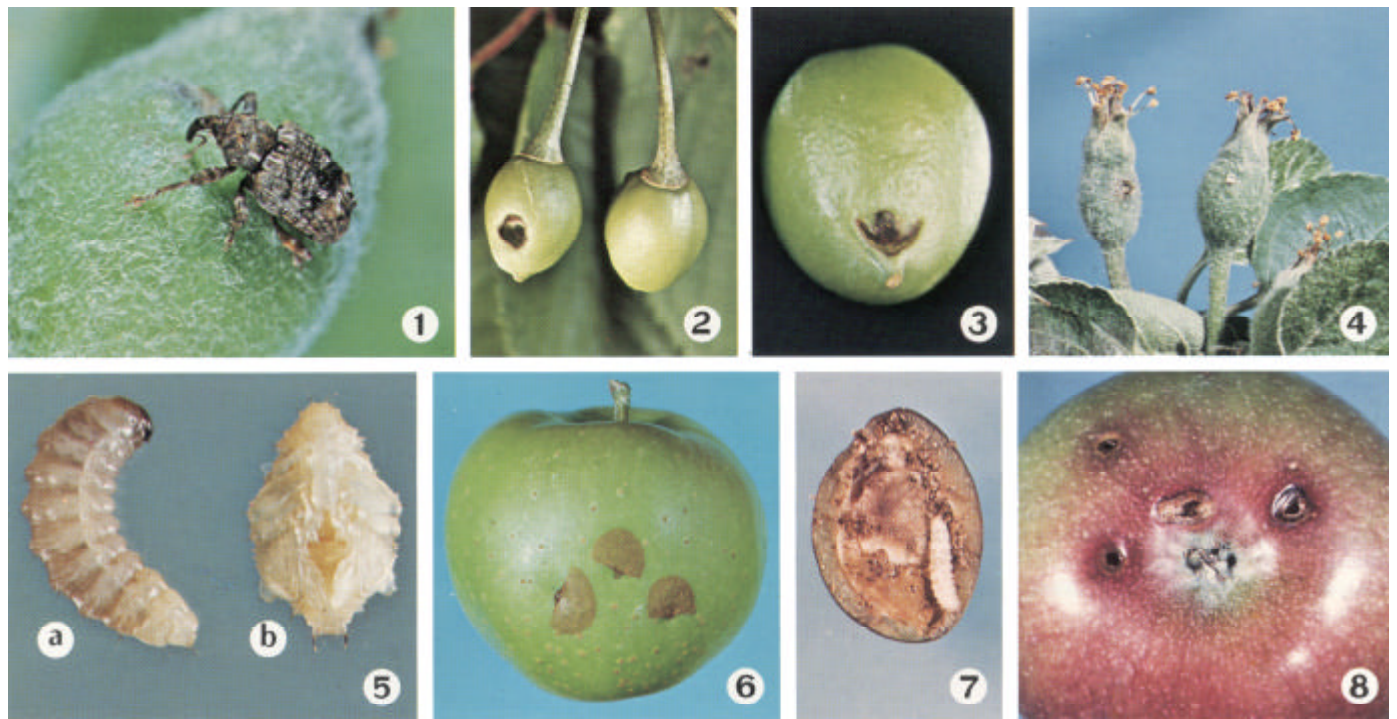
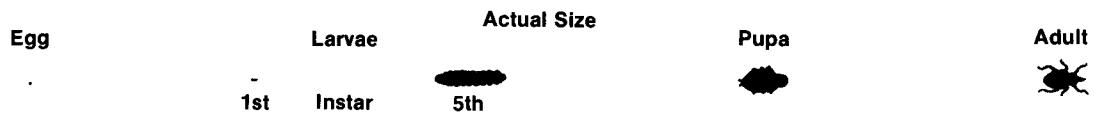
PC overwinter as adults in ground litter or the soil and

become active in the spring following several days of either a mean temperature above 15.5C (60F) or maximum temperatures above 24C (75F). This time period normally coincides with the blossom period of apples. If temperatures drop and conditions become unfavorable the adults may return to hibernation sites. Although the emergence period for PC lasts for several weeks, 40-60% of the total emergence occurs on a single day.

Upon emerging in the spring, the PC fly to the trees where they feed on the buds, flowers, and newly set fruit. In feeding, the adult cuts a hole in the skin of the fruit and hollows out a cavity about 3 mm deep (Fig. 2).

The beetles then mate. The length of the preoviposition period, following hibernation, is temperature-dependent and varies from 6-17 days. In egg laying, a female cuts a cavity under the fruit's skin with her snout. She then turns around and deposits an egg in the hole. Turning around again, she pushes the egg into the cavity with her snout. In front of the hole in which she has laid her egg, the female cuts a crescent-shaped slit which extends beneath the egg cavity so as to leave the egg in a flap of flesh (Fig. 3). This protects the egg from being crushed by the rapidly developing fruit. Feeding and oviposition wounds on apples frequently exude sap that dries to a white crust (Fig. 4).

The progeny of the adults that emerged in the spring appear as adults in July or August. They fly to the trees and feed on the developing fruit but do not reproduce in most instances. They are the adults that find hibernation sites in which to overwinter and produce their offspring the following year.



THE EGGS

PC eggs are laid singly in the newly developing fruit. The white, oval eggs measure about 0.35 by 0.6 mm and hatch in 2-12 days.

THE LARVAE

Upon hatching, the young larvae bore into the fruit. On stone fruits, the larvae will feed to but not on the seed. Larvae will feed on the seeds of pome fruits. Larvae are killed in apples by the pressure of the growing fruit cells and can only complete their development in dropped fruit.

PC larvae are grayish-white, legless grubs with curved bodies and brown heads (Fig. 5a). The newly hatched larvae are about 1 mm long, while full grown larvae measure between 6-9 mm in length. The larval developmental time spent within the fruit is between 2-3 weeks. Upon becoming full grown, the larvae burrow an inch or two into the soil and construct a pupal chamber. It is normally 12-16 days before the larvae pupate after leaving the fruit.

THE PUPAE

The pupae are white and measure 4.5-7 mm long (Fig.

5b). Two to 3 weeks are spent in the pupal stage before PC become adults. Several additional days pass before the cuticle of the adults harden and they emerge from the ground.

PLANT INJURY

PC injury to fruit falls into several categories: surface feeding and oviposition wounds from overwintered beetles that can scar (Fig. 6) and/or misshape the fruit by harvest; internal injury produced by burrowing larvae (Fig. 7); premature drop of the fruit; and feeding punctures made by adults in the late summer and fall (Fig. 8).

CONTROL

In the spring, PC control can be obtained with 1-3 insecticide applications, depending upon the spray timing and severity of the problem. The first spray should be applied at about petal fall. Consult your local recommendations for the best materials to use in your area.

Sprays directed specifically at late summer and fall control of PC are normally not needed. Materials directed at other pests at this time normally provide control.

GUIDE TO STAGES

STAGE	TIMING	WHERE TO LOOK
Adults	Spring when temperatures exceed 15.5C (60F)	In orchard adjacent to hedgerow. Feeding wounds are frequently the first sign of adult presence.
	Late July to hibernation (temperatures below 15.5C (60F))	Same as above
Eggs	Petal fall and 30 days thereafter	On developing fruit within crescent shaped oviposition wounds.
Larvae	Early June through mid-July	Within injured, dropped fruit.
Pupae	Mid-July through mid-August	In soil within 25 mm (1 in.) of surface.