

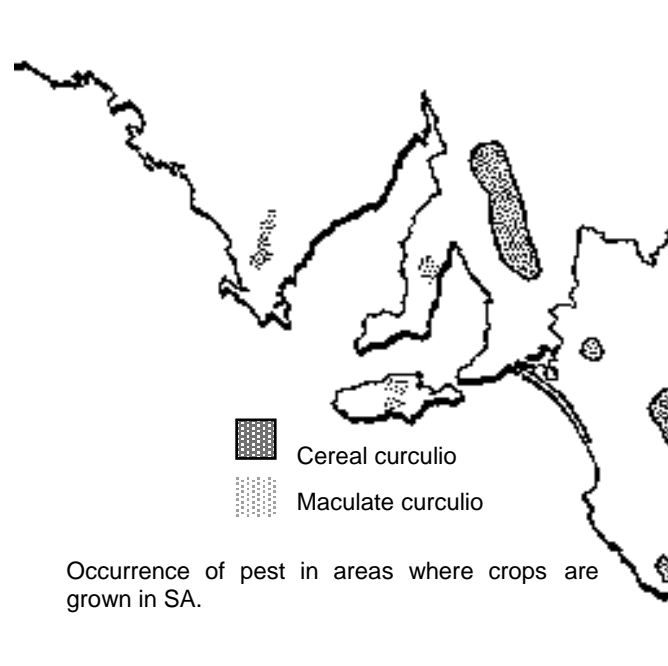


Cereal curculio and maculate curculio

The soil-dwelling larvae of cereal curculio¹, a weevil native to Australia, have been recognised as pests of germinating and seedling cereals in SA since the early 1950s - wheat, barley and oats are all susceptible to damage. This weevil first emerged as a pest when tillage practices before sowing cereal changed during the 1950s from long-term spring-prepared fallows to short-term autumn-prepared fallows. In SA, cereal curculio mainly damages crops in the northern agricultural areas and in the South East.

The larvae of the maculate curculio², a species closely related to cereal curculio, causes similar damage to young cereal crops on Eyre and Yorke Peninsulas and on Kangaroo Island.

The incidence of damage by both of these pests varies markedly from year to year and region to region; in some years crops can be severely damaged.



Identification

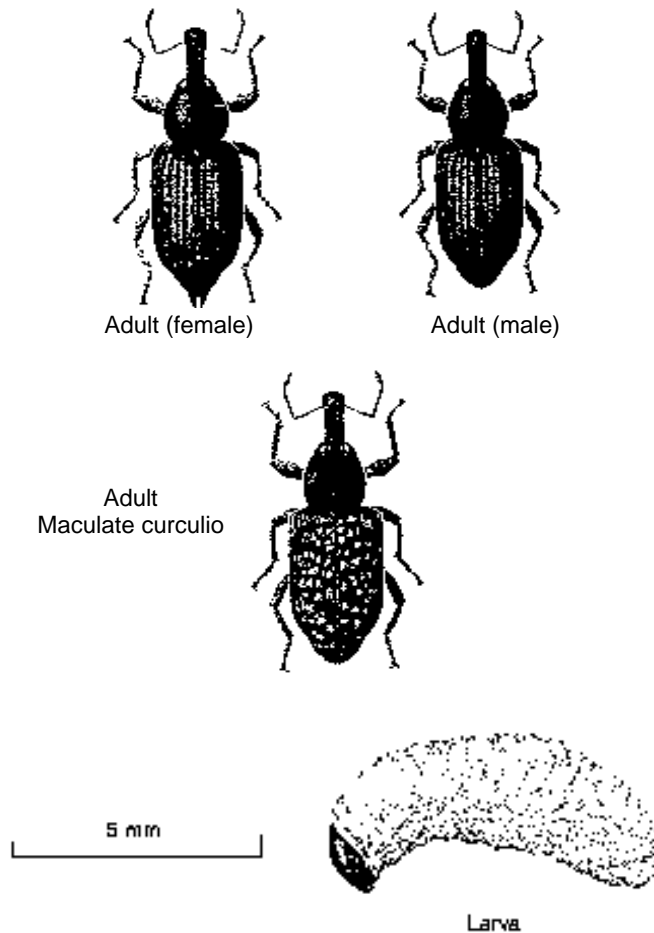
The adults of cereal curculio are greyish-black beetles up to seven millimetres long and with a definite weevil snout. The wing covers of the females are tapered at the ends to form two spines. Males lack these spines and usually are slightly smaller than females.

The adults of the maculate curculio are similar in size to those of the cereal curculio, but they are a distinctly mottled black/grey colour and the wing covers of the females are not tapered to form spines

The larvae of both pests appear the same; they are small, white legless grubs up to eight millimetres long with yellow head capsules.

1 *Desiantha caudata* Pascoe (Coleoptera: Curculionidae)

2 *Desiantha diversipes* Pascoe (Coleoptera: Curculionidae)



Damage

Cereal curculio mainly damages cereal crops sown after at least three to four years of grass-dominant pasture without a spring prepared fallow. Short-term, autumn-prepared fallows and, more recently, minimum-tillage practices favour damage by this pest. They allow the survival through summer of enough adults to lay enough eggs in autumn for high numbers of larvae in winter. Adults do not survive the summer in paddocks that are free of green weeds during late spring and summer.

Cereal curculio damage has not been recorded in successive crops in SA even though the first crop following a pasture might have been infested.

By contrast, maculate curculio damage has occurred in successive crops on Yorke Peninsula. The reason for this difference is not known.

The larvae of both pests attack cereal plants at three different times during the growth of the crop. They may eat out swelling seeds soon after sowing; they may bore into the underground part of the stem of seedlings causing them to wither and die; or they may bore into one or more tillers of plants causing those tillers to wither and die. Seed or seedling death results in thinned or bare patches in crops.

The damage caused by 100 or more larvae a square metre usually results in a complete loss of the crop. By contrast, thinning of a crop by much lower densities of larvae may not greatly reduce the grain yield because extra tillering by surviving plants and larger heads can compensate for the damage.

High densities of both pests occur in grass-dominant pastures without apparent damage to the pasture, probably because of the much higher density of plants in pastures than in cereal crops.

Life cycle

Cereal curculio has one generation a year. Sexually immature adults emerge from soil in November, feed on early summer annual weeds (for example, wire-weed), then shelter under stones or clods on the surface of the soil during summer. Autumn rain stimulates the adults to resume feeding and to begin laying eggs. The adults cannot fly and usually lay eggs close to where they emerge. The larvae hatch from the eggs within two to three weeks and feed on germinating seed, grass seedlings and tillers. Larvae may also feed and grow on particles of decayed organic matter. The larvae are fully developed and pupate in the soil mainly during October and early November.

The timing of the life cycle of the maculate curculio is similar to that of cereal curculio, but the behaviour of adult maculate curculio is not known.

Control

Cultural control

Eliminating weed growth during late spring/summer/early autumn before sowing cereals prevents cereal curculio damage in crops. This reduces the survival rate of adults during summer minimising the likelihood of high numbers of eggs and subsequent larvae during the following winter.

Crop rotations which include only one or, at the most, two years of pasture between cereal crops also prevent damage. Such rotations do not provide a long enough pasture phase for the number of cereal curculio larvae to increase to damaging numbers - cereal curculio adults do not fly, so invading adults do not cause a rapid increase in larval numbers in the year of the crop.

Shorter pasture phases also reduce the numbers of other soil-dwelling insect pests of young cereal crops.

The effectiveness of these cultural measures against maculate curculio is not known.

The density of cereal curculio and maculate curculio in a pasture may be lessened if the grass component of legume pastures is kept low.

Biological control

There are no known predators, parasites or pathogens that effectively control cereal curculio or maculate curculio in cereal crops or pastures.

Chemical control

The chemical control of cereal curculio relies on an insecticidal seed dressing. The decision to treat seed can be difficult because it relies on the detection of small larvae or adults in the paddock before seeding. If untreated seed is sown in infested paddocks, damage cannot be avoided and reseeding with treated seed is necessary. Treatment is usually warranted when the density of larvae before sowing is 10 or more per square metre.

The recommended seed dressing causes high mortalities of larvae; however, the larvae can cause damage before they die. For this reason, a higher than normal seeding rate is recommended. In paddocks with 100 or more larvae per square metre, trials have shown that a seeding rate of 100 kg per ha compensates for the seed loss caused by the larvae before they are killed.

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