DIAGNOSTIC CHARACTERISTICS OF QUARANTINE PESTS CONCERNING APPLE FRUIT IMPORTED FROM USA

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QUARANTINE PESTS CONCERN TO APPLE FRUIT IMPORT FROM USA

Ceratitis capitata (Mediterranean fruit fly)

	
Ceratitis capitata (Mediterranean fruit fly) adult	*Ceratitis capitata* on Apple
	
Damage due to Mediterranean fruit fly	Maggot of Mediterranean fruit fly

Visible Symptoms: Affected fruit usually shows signs of oviposition punctures and there may be laboratory evidence of fungal growth. Very sweet fruits may produce sugary exudates.

Cydia pomenalla (Codling moth)

Symptoms on fruits

Larvae appeared on inside of the fruit

Pupa and Adult

Visible Symptoms: Codling moth caterpillars tunnel to the fruit's core; it may be rendered inedible. The caterpillar usually leaves before the damage is discovered as there is generally no obvious sign of its presence on the outside of the fruit.

Epiphyas postvittana (Light brown apple moth)

	
Symptoms on apple	
	
Symptoms on Grapes	Symptoms on tomato
	
Eggs are pale green and are laid in flat, masses on the upper surface of the leaves	Young larvae feed under silken shelters
	
Larvae	Adult
Visible Symptoms: The greatest economic impact comes from larval feeding on the fruit. Quite often this feeding causes irregular brown areas on the surface.	

Erwinia amylovora (Fire blight of Apple)

Exudates of Erwinia amylovora on Apple

Symptoms of fireblight on apple fruit and twig

Symptoms of fireblight on Pear

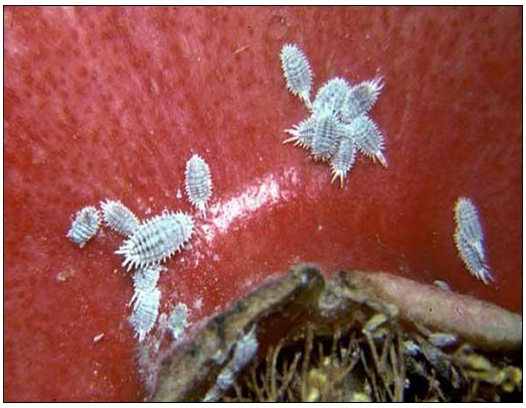
Exudates of Erwinia amylovora on Apple

Pearly white colonies of *E. amylovora* on PDA medium

Erwinia amylovora bacteria (rod shaped)

Visible Symptoms: Fruit blight: infected fruits turn brown to black, shrivel and, taking on a mummified appearance.

Pseudococcus calceolariae (scarlet mealy bug)

	
Symptoms on apple	
	
Symptoms on fruits	
	
Mealy bugs eggs	Adult

Visible Symptoms: More commonly, the presence of mealybugs in other perennial fruit crops leads to unacceptable growth of sooty mould fungi on honeydew deposits on the fruit, either as a deposit on the cheek (which is difficult to remove at packing) or around the stalk, calyx or sepals. For growers producing fresh fruit for export markets, the presence of mealybugs or sooty mould

Pseudococcus comstocki (Comstock mealy bug)

Symptoms on Fruits

Infestation

Symptoms and adult

Adults

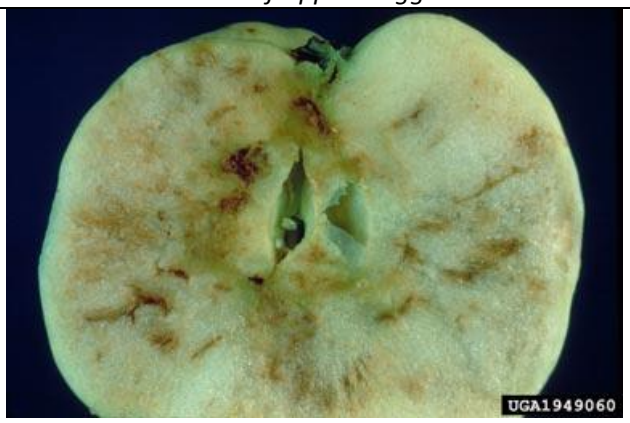
Visible Symptoms: Mealy bugs infest the calyx end of fruit, and their honeydew secretions serve as a substrate for growth of sooty molds, which results in downgrading of fruit.

Rhagoletis pomonella (Apple maggot)

Rhagoletis pomonella (Apple maggot) Adult

Larva of Apple maggot

Apple maggot damage on Apple



Damage inside Apple

Apple maggot damage on Apple

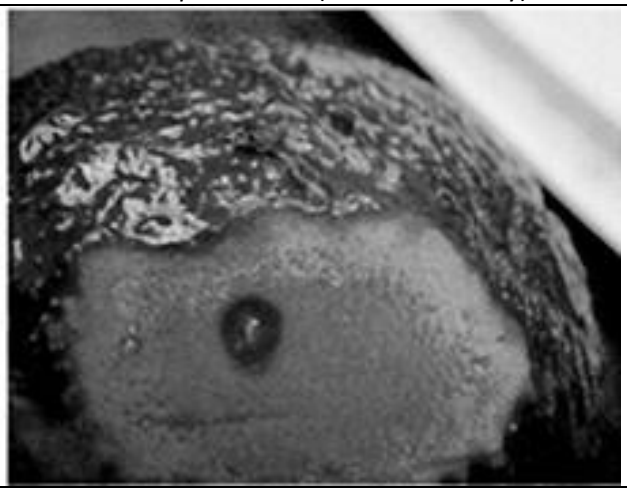
Visible Symptoms: *Apple maggot burrow in all directions through the flesh of apples feeding on the pulp and leaving brown channels. When a single fruit is infested with several larvae, the pulp will be honeycombed with their burrows until it finally breaks down. Infested fruit are usually misshapen. Attacked fruit are pitted by oviposition punctures, around which some discoloration usually occurs.*

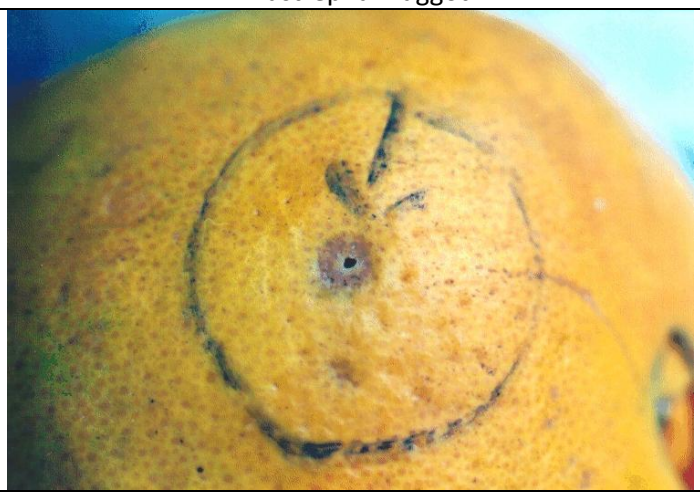
Anastrepha spp. (Fruit flies)

(*Anastrepha fraterculus (South American Fruit fly)*, (*Anastrepha ludens (Mexican Fruit fly)*)
(*Anastrepha serpentina (Sapodilla Fruit fly)* & (*Anastrepha suspensa (Caribbean Fruit fly)*)

Anastrepha ludens (Mexican fruit fly)

Anastrepha maggot





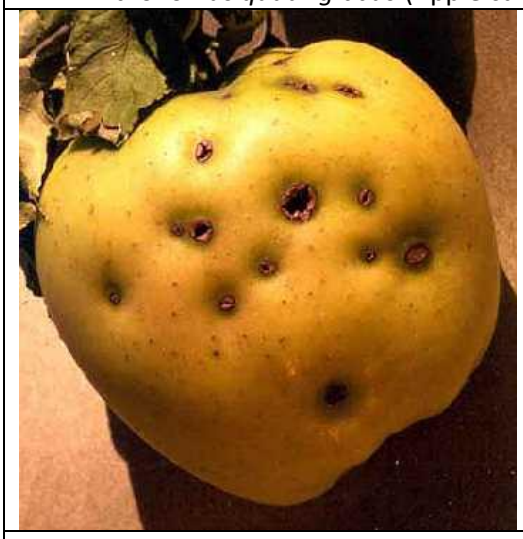
Anastrepha spp. Symptom on fruit

Visible Symptoms: Attacked fruit can show signs of oviposition punctures, but these, or any other symptoms of damage, are often difficult to detect in the early stages of infestation. Much damage may occur inside the fruit before external symptoms are seen, often as networks of tunnels accompanied by rotting. Very sweet fruits may produce a sugary exudate.

Anthonomus quadrigibbus (Apple curculio)

Anthonomus quadrigibbus (Apple curculio) adult

Symptoms of infestation of Apple Curculio on Pear



Symptoms of infestation of Apple Curculio on Apple

Visible Symptoms: Initially tiny punctures through the skin of the fruitlets are noticed, which, as the fruit grows are left at the bottom of funnel-shaped pits and the fruit becomes misshapen. The punctures associated with oviposition are wider towards the bottom. Larvae, pupae and adults can be found in mature fruit. Feeding on maturing fruit (apples in particular) by the new generation of adults produces collapsed brown spots that can coalesce to form areas up to 2.5 cm diameter. Rots and other pests may enter through punctures.

Epidiaspis leperii (European pear scale / Grey scale)

Epidiapis leperii (European pear scale / Grey scale)

European pear scale- symptoms on Apple & Pear

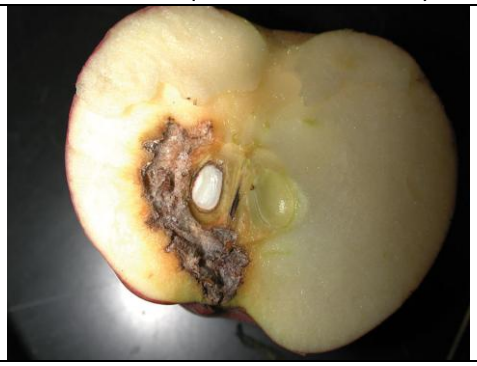
Epidiapis leperii (European pear scale) symptoms on Pear

Visible Symptoms: Abnormal shapes of fruits, scales on fruits, circular pitting marks of scale infestation on fruits.

***Grapholita* spp.**

(*Grapholita molesta (Oriental fruit moth)*), (*G. packardi (Cherry fruitworm)*) & (*G. prunivora (Plum moth)*)

Grapholita molesta (Oriental fruit moth) – *G. packardi (cherry fruitworm) - G. prunivora (plum moth)* Adults



Larval damage on Apple

Figure 12. CFW (Left) enter fruit in the calyx, and CBFW (right) enter near stem (arrow).

Cherry fruitworm infestation symptom

Grapholita infestation inside apple fruit (larva)

Visible Symptoms: Fruit damage is caused by entrance at the stem, and occurs when the fruit is almost fully grown. This injury is caused by newly hatched larvae that go directly to the fruit. The surface indications of the presence of maggots in the fruit are frequently obscure and occasionally lacking, and only a small part of such injured fruit can be detected.