

Stone Fruit Disorder Guide

Dr Ian J Crouch



**Reference guide to
common South African
stone fruit disorders**



Acknowledgements

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The author acknowledges information sourced from the Postharvest Stone Fruit App, which can be found on Hortgro's webpage link below, and which supplements this guide by expanding on the causes and remedies for the different disorders.

<https://app.hortgro-science.co.za/>

Foreword

This booklet has been compiled to assist the South African stone fruit industry with a handy guide to common defects and disorders in stone fruit.

When identifying a problem fruit, it is important to have as much case history as possible to ascertain if the defect was already present on or in the fruit before harvest, resulted from poor handling during harvesting, is a progressive storage disorder, or an ailment that occurred through poor quality control during shipping and marketing. Many factors may provide valuable clues to the cause, such as a heat wave or rain just before harvest, fruit harvest maturity, the type of packaging used, breaks in the cold chain, the gas concentrations surrounding the fruit, or the length or type of storage.

This being said, the expression of disorders may result from more than one factor or a sequence of events. Some defects look very similar, but may be caused by very different factors, making the cause much harder to identify.

Generally, disorders may be grouped into mechanical, physiological, chemical, nutritional, pathological, or entomological defects. The latter two categories have not been extensively covered by this guide.

J. Louch

Key to symbols



Peaches and nectarines

Internal

Int



Plums

External

Ext



Apricots



Seasonal influence (Spring temperatures)



Mechanical damage (rub marks, wind marks, bruises etc.)



Weather damage (heat wave, rain, hail)



Chemical damage (spray, drench, flume)



Physiological disorder



Nutritional factors



Harvest maturity



Temperature factors (heat stress, chilling injury)



Gas concentrations (MAP, CA)



Pre-harvest



Postharvest



Progressive storage disorder



Pathological disorder

Layout

Chilling Injury (Pages 8-16)

- Gel Breakdown
- Gel Breakdown and Aerated Tissue
- Internal Browning
- Internal Browning Chart
- Woolliness
- Pulpiness
- Flesh Bleeding

Environmental Stress (Page 17)

- Aerated Tissue

Senescence (Pages 18-21)

- Overripeness (OR)
- Bladderiness
- Slip Skin

Extreme Weather (Pages 21-32)

- Sunburn
- Sunburn Index
- Severe Sunburn
- Heat Damage - Pit Burn
- Heat Damage Severe
- Heat Damage Slight
- Heat damage - Pitting
- Frost Damage

Carbon Dioxide Damage (Page 33)

- Carbon dioxide

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- Cork Spot Callus

Spring Temperature and Fruit Growth (Pages 35-40)

- Split Pit
- Broken Stones
- Visible Split-pip

External Coatings (Pages 41-43)

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- Cracking due to Coating
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Peel Cracking (Pages 44-48)

- Concentric Skin Cracks
- Skin Cracks
- Calyx-end Cracks

Moisture Loss (Pages 49-50)

- Shivel / Wilting
- Wilting

Mechanical Damage (51-59)

- Rub Marks - Slight
- Rub Marks - Severe
- Skin Punctures
- Damaged Tips
- Bruising
- Freezing Damage
- Rain / Water Damage

Pathological (Pages 60-66)

- Curly Leaf on Fruit
- Xanthomonas
- Lenticel Freckles
- Marbling (Viroid)



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Gel Breakdown (GB)

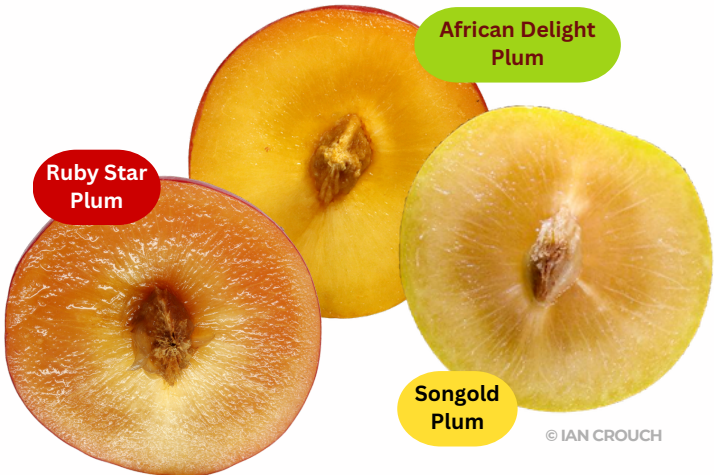
Chilling Injury



Diagnostic Features:

- Normal external appearance
- Gelatinous breakdown of the inner flesh tissue surrounding the stone, developing outwards toward the epidermis region
- Affected area has no free juice
- Outer flesh tissue healthy appearance, but turn brown in advanced stages with loss of juiciness
- Visible after a heatwave, after forced-air cooling following a heatwave, after long-term storage at low temperatures, or after too rapid forced-air cooling with extended storage

Int



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Gel Breakdown (GB)

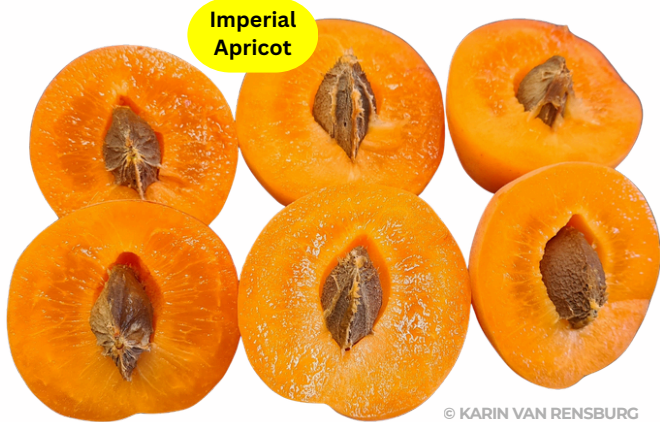
Chilling Injury



Diagnostic Features:

- Gel breakdown is a physiological disorder in apricots caused by chilling injury
- Results in a dry, gelatinous, and bland-tasting flesh that can be translucent or discolored
- Aggravated by cold storage, especially when temperatures are not managed properly, and can also develop in the orchard, especially during heatwave conditions
- Severity of gel breakdown is influenced by factors like the fruit's cultivar, extreme weather, maturity, and handling during storage and transit

Int



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GB + Aerated Tissue

Chilling Injury



Diagnostic Features:

- Normal external appearance
- Presence of numerous bubbles in the cortical tissue, extending from the pip to the epidermis
- Gelatinous breakdown of the inner flesh tissue surrounding the stone

Int



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Internal Browning

Chilling Injury



Diagnostic Features:

- Normal external appearance
- Brown discolouration of flesh tissue, becoming darker with increasing severity
- Associated with loss of juiciness, alcoholic taint
- Typically starts just below the fruit's skin and spreads inward towards the stone in plums
- In peaches and nectarines, associated with senescence, and usually visible in fruit stored for extended durations
- In plums, associated with chilling injury, and may co-occur with GB in the same fruit

Int



Fortune Plum

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Internal Browning

Chilling Injury



Diagnostic Features:

- Internal browning in stone fruit is a disorder where the flesh turns brown, often without any external signs
- Caused by a combination of factors like chilling injury from low-temperature storage for plums, and senescent breakdown due to extended storage of nectarines and peaches
- Symptoms include brown, firm, or mealy flesh, and other issues like flavor loss, lack of juiciness, and a black pit cavity can also occur

Int



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Internal Browning Chart

Chilling Injury



Industry Chart for Internal Browning

Plum

Int

DRAFT
SET PL.X



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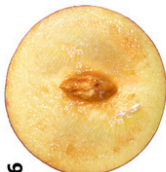


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PLUMS
INTERNAL BROWNING



3

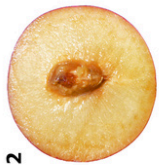


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DRAFT
SET PL.X



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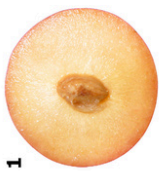


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PLUMS
INTERNAL BROWNING



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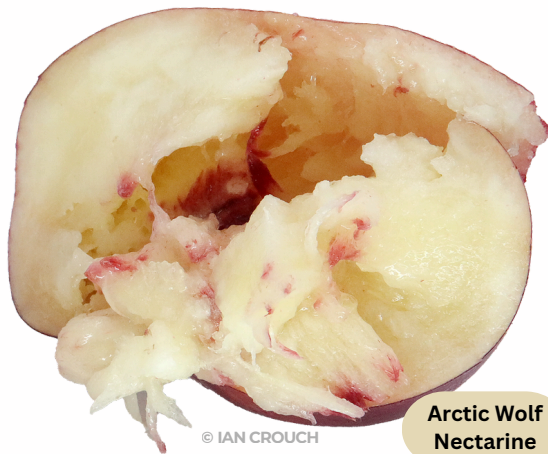
Woolliness

Chilling Injury



Diagnostic Features:

- Physiological abnormality that occurs during ripening of susceptible peach & nectarine fruit after prolonged cold storage
- Typical chilling injury
- Characterized by flesh tissue with a dry, mealy texture from which no juice can be squeezed
- Accompanied by a loss of flavour
- Cultivar dependent, although late-season cultivars are more susceptible
- Less mature fruit more susceptible after storage



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Arctic Wolf
Nectarine

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Pulpiness

Chilling Injury



Diagnostic Features:

- Less advanced form of woolliness
- Texture of flesh tissue is semi-dry, because while juice can be expressed by hand, there is very little free juice available
- Pulpiness often an indication that fruit are either still going to develop woolliness, or that fruit have passed through the woolly phase and are developing a normal tissue again

Int

Nectarine



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Flesh Bleeding

Chilling / Stress Induced Response



Diagnostic Features:

- Concentrated accumulation of red pigments, specifically around the fruit's pit
- Water-soluble anthocyanins migrate from the flesh towards the stone during cold storage
- Does not affect the taste or texture of fruit
- Sometimes accompanied by translucency or mealiness, but fruit texture normally remains normal
- Expresses when plums, peaches, and nectarines are grown under high light exposure or are stored at temperatures between 2-8 °C
- May occur on the tree



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Aerated Tissue

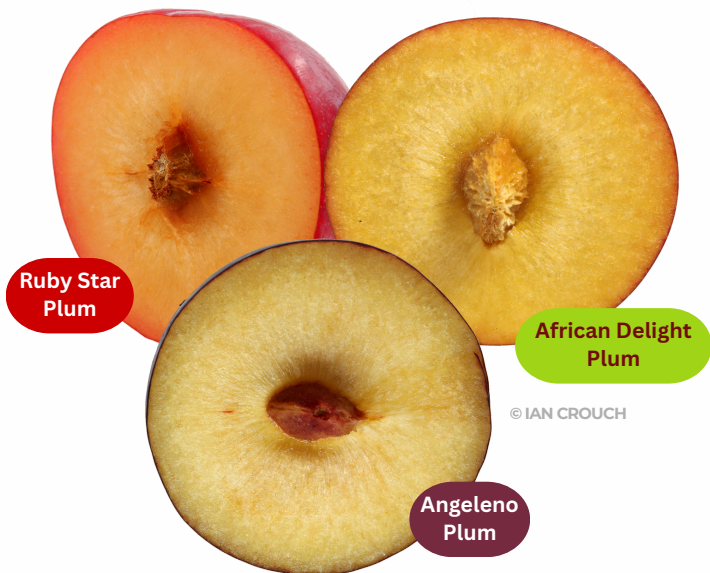
Environmental Stress



Diagnostic Features:

- Normal external appearance
- Presence of numerous bubbles in the cortical tissue, extending from the pip to the epidermis
- May be associated with stress factors like heat damage
- Often occurs in fruit from young orchards or orchards with more sandy soils or stress conditions
- Eating quality of fruit not affected

Int



Ruby Star Plum

African Delight Plum

Angeleno Plum

© IAN CROUCH

Overripeness (OR)

Senescence



Diagnostic Features:

- Ripe and soft external appearance
- Translucent breakdown of the flesh tissue below the skin, which spreads inwards towards the stone
- Cell fluids can be readily expressed
- Fruit abnormally soft to the touch with excessive amounts of juice
- When trying to wring open the halves of a cut fruit, it loses its shape with the flesh separating easily from the skin

Int



**Songold
Plum**

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Overripeness (OR)

Senescence



Diagnostic Features:

- Ripe and soft external appearance
- Translucent breakdown of the flesh tissue below the skin, spreading inwards towards the stone
- Cell fluids can be readily expressed
- Fruit abnormally soft to the touch with excessive amounts of juice
- When trying to wring open the halves of a cut fruit, it loses its shape with the flesh separating easily from the skin

Int

Ext

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Supergold
Apricot



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S

Slip Skin

Senescence



Diagnostic Features:

- A disorder where the fruit skin detaches easily (sloughs off) from the flesh during handling
- Peaches and nectarines are highly susceptible due to relatively weak adhesion between the skin and the flesh of the fruit, especially as the fruit ripens
- Caused by over-mature fruit at harvest, senescence caused by prolonged storage periods, or high humidity with free moisture on the fruit surface during storage. May start as small cracks
- Increases susceptibility to mechanical damage and decay

Ext



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Honey Treat
Nectarine

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Bladderiness

Senescence



Diagnostic Features:

- Translucent breakdown of the flesh tissue between the stone and the skin
- Occurs on the shoulders (stem-end) of the plum fruit
- Associated with excessive softness and juiciness

Sound plums on top and plums showing gel breakdown and translucency on the bottom



© DR. CARLOS H. CRISOSTO

Crisosto, C.H. Establishing a Consumer Quality Index for Fresh Plums (*Prunus salicina* Lindell). *Horticulturae* 2023, 9, 682.

Int



Sunburn

Extreme Weather



Diagnostic Features:

- Sunburn is a common defect of plums, usually occurring as a reddish discoloration of the skin
- The color of the sunburned area is permanently affected, and the color contrast increases as the fruit ripens
- Advanced stages may appear as flattened areas of the fruit, the skin may blister or crack, or the flesh beneath the affected skin may show a noticeable brownish discoloration



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Pre

Sunburn

Extreme Weather



Laetitia
Plum

Ext



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Ruby Sun
Plum

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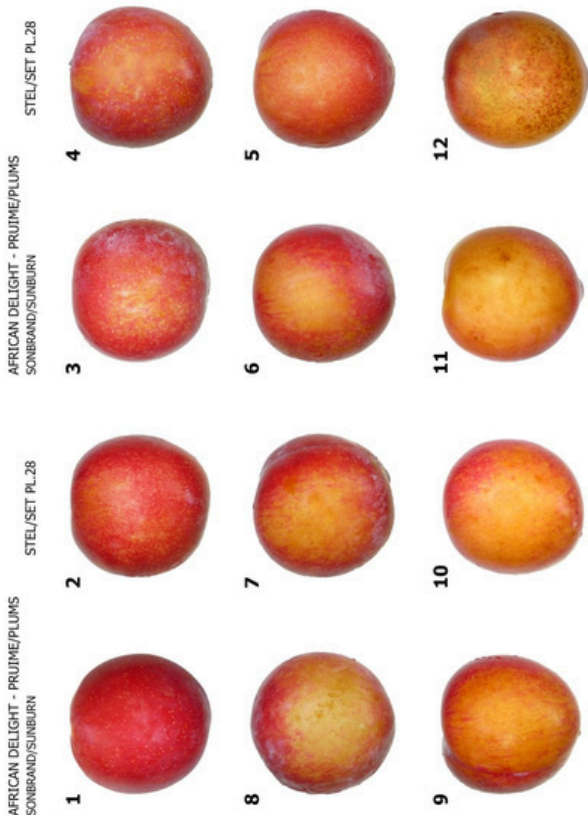
Sunburn Index

Extreme Weather



African Delight
Plum

Sunburn Chart for African Delight Plums



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Pre

Severe Sunburn

Extreme Weather



Diagnostic Features:

- Sunburn necrosis is the most dramatic form of sunburn
- Affected fruit have dark brown or black areas of dead tissue on their surface
- The damage can penetrate the flesh for several millimeters and is the ideal growth medium for spoilage organisms

Ext



African Delight
Plum



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HM

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Pre

Heat Damage - Pit Burn

Extreme Weather



Diagnostic Features:

- External symptoms not always visible
- Develops during heatwave conditions, or if fruit are subjected to postharvest heat treatment
- Can be observed at time of harvest by cutting fruit
- Pit burn occurs when the fruit become so hot that the flesh cooks around the pit
- Susceptible cultivars: Laetitia and Fortune plums
- Also develops in apricots, peaches and nectarines

Int



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Fortune
Plum

Heat Damage - Pit Burn

Extreme Weather



Fortune
Plum

Int

Ext



°C

Pre

PH

S



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Heat Damage - Slight

Extreme Weather



Diagnostic Features:

- Discoloured areas on the surface of the fruit, typically caused by direct sun exposure
- Affected areas tend to sink in during storage
- Heat damage may manifest as yellow/red skin discolouration which can turn brown during cold storage
- Susceptible cultivars include Songold, Laetitia and Fortune plums

Ext



HM

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Pre



Laetitia
Plum

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Heat Damage - Severe

Extreme Weather



Diagnostic Features:

- Discoloured areas on the surface of the fruit, typically caused by direct sun exposure, or if the fruit receives a postharvest heat treatment
- Affected areas tend to sink in during storage
- Susceptible cultivars include African Delight, Laetitia, and Fortune plums

Ext



Laetitia Plum



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°C

Pre

Heat Damage - Severe

Extreme Weather



Diagnostic Features:

- Expressed as gel breakdown (GB) following heatwave conditions
- Not normally visible at harvest but can develop within 19 days cold storage at -0.5°C
- In severe cases, may be visible at harvest, or after forced-air cooling (FAC)
- Cut fruit at harvest and after FAC to determine incidence before export
- Mid and late season cultivars are more susceptible



Laetitia
Plum

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Int



Heat Damage - Pitting

Extreme Weather



Diagnostic Features:

- Small, dark, sunken pits on the surface of the fruit
- Not caused by direct sun damage, but rather by high temperatures within the tree canopy
- May also be found in bins when harvested fruit are not protected from direct sunlight
- Mid and late season cultivars can be more susceptible

Ext



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Pre

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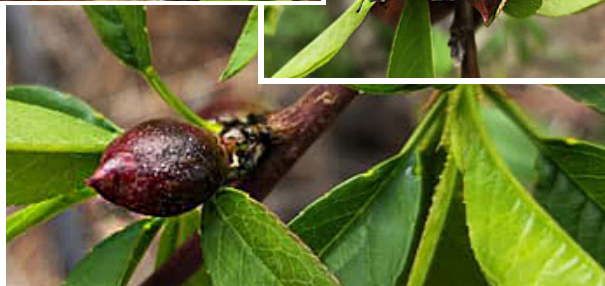
Frost Damage

Extreme Weather



Diagnostic Features:

- Occurs when freezing temperatures harm developing buds, flowers, or young fruit
- severity depends on the temperature, duration, and developmental stage of the plant
- Symptoms express as withered petals, blackened styles and ovaries within a flower bud, and young fruit dropping prematurely



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Ext



°C

Pre

Carbon Dioxide (IB)

Carbon dioxide



Diagnostic Features:

- Expressed as Internal Browning (IB)
- Breakdown of the flesh tissue between the skin and the stone
- Pre-optimum fruit may be more susceptible
- Susceptibility differs between cultivars
- Affects eating quality, including taste

Int

Ext



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Ruby Sun
Plum



GAS

PH

S

Cork Spot Callus

Mineral Deficiency



Diagnostic Features:

- Normal external appearance
- Reason for this is unclear and can be cultivar-specific
- Thought to be linked to a boron deficiency

Int



Laetitia
Plum



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Split-Pit

Spring Temperature and Fruit Growth



Diagnostic Features:

- Defect in plums, peaches and nectarines that occurs when rapid fruit growth commences before stones are completely hardened
- Peaches with split pits are flattened at the blossom end of the fruit
- The pit is torn apart or split along the dorsal-ventral suture
- In certain peach and nectarine varieties, it occurs more if thinning is done too severely and/or too early
- Often symptoms are not seen until the fruit is cut open

Int



**African Delight
Plum**



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Pre

PH

Broken Stones in Apricots

Spring Temperature and Fruit Growth



Diagnostic Features:

- Also known as pit shattering
- Caused by environmental conditions during the fruit's development
- Occurs during the rapid fruit growth period, especially if the fruit swells significantly before the pit has fully hardened
- Contributing factors include: Over-watering, late frosts during bloom, excessive thinning or fertilizing
- Some varieties more susceptible than others

Int

Imperial
Apricot



Pre

PH

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Broken Stones in Plums

Spring Temperature and Fruit Growth



Diagnostic Features:

- Defect in plums, peaches, and nectarines
- Caused by environmental conditions during the fruit's development
- Occurs during the rapid fruit growth period, especially if the fruit swells significantly before the pit has fully hardened
- Contributing factors include: Over-watering, late frosts during bloom, excessive thinning, or fertilizing
- In susceptible cultivars, incidence is usually higher in seasons with warm spring temperatures
- Symptoms are not seen until the fruit is cut open

Int



Pre

PH

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Broken Stones in Plums

Spring Temperature and Fruit Growth



Int



Sapphire Plum



Pre

PH

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Visible Split-pit

Spring Temperature and Fruit Growth



Diagnostic Features:

- Defect in peaches and nectarines that occurs when rapid fruit growth commences before stones are completely hardened
- The pit is torn apart or split along the dorsal-ventral suture
- In certain peach and nectarine varieties, it occurs more if thinning is done too severely and/or too early, or if crop load is light

Ext



Pre

Alpine
Nectarine



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Visible Split-pit

Spring Temperature and Fruit Growth



Nectarine



Ext



Pre

Amber Crest
Peach

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Pitting due to Coating

External Coatings



Diagnostic Features:

- Small, dark, sunken pits on the surface of the fruit following coating application
- Actual cause not clear, may be lenticel burn or barrier over-modification

Ext



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African Delight
Plum

Cracking due to Coating

External Coatings



Diagnostic Features:

- Cracked skin caused by coating application
- Caused by over modification and breakdown of skin tissue

Ext



Tiffany
Nectarine

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Scalding due to Coating

External Coatings

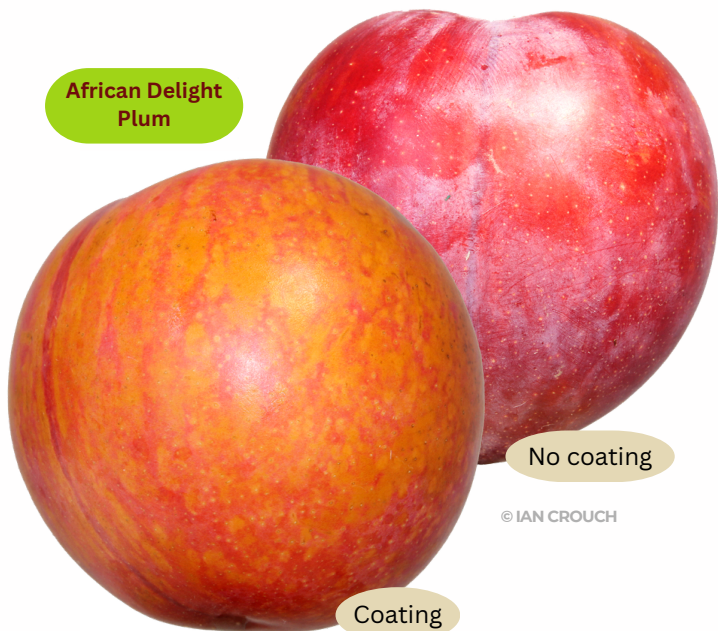


Diagnostic Features:

- Application of coating results in over modification of internal atmosphere and skin damage expressed as orange mottled scalding

Ext

African Delight
Plum



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GAS

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Concentric Skin Cracks

Peel Cracking



Diagnostic Features:

- The cause of concentric skin cracks is not known but is mostly cultivar specific
- May be due to an imbalance between wax production, growth of the fruit pulp, and the cuticle, especially following rapid fruit growth
- Usually visible at the stem-end of fruit
- Micro-cracks may lead to secondary infection, spoilage, and moisture loss

Ext

African Delight
Plum



Pre

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Concentric Skin Cracks

Peel Cracking



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African Delight
Plum

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Pre

Skin Cracks

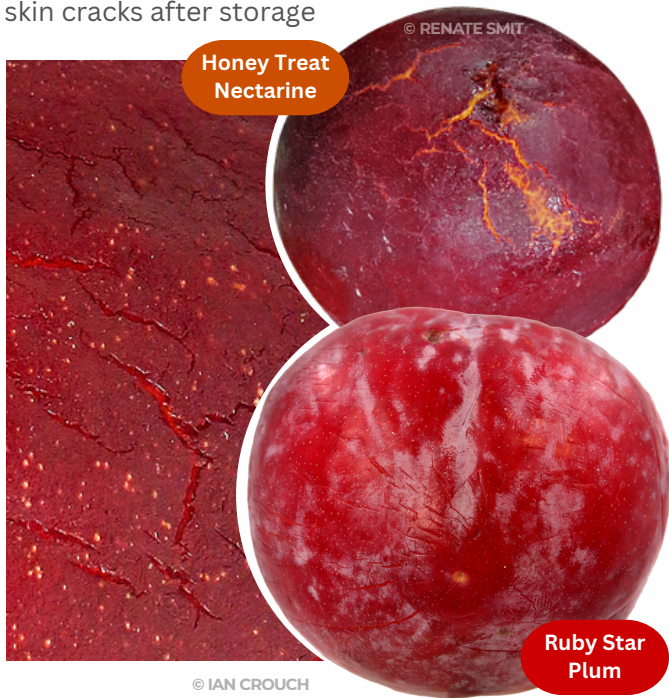
Peel Cracking



Diagnostic Features:

- Skin cracks caused by rain before harvest, or high relative humidity/ free moisture in unperforated or micro-perforated bags, especially after extended storage durations
- CA storage of susceptible cultivars may lead to skin cracks after storage

Ext



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Calyx-End Cracks

Peel Cracking



Diagnostic Features:

- Calyx-end cracks on stone fruit are caused by rapid, uneven growth, often triggered by inconsistent watering or high humidity, which puts too much stress on the fruit's skin
- Contributing factors include over-maturity, poor nutrition (especially calcium deficiency), and high crop load
- Creates entry points for fungi and pests in apricots

Ext



Pre



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Calyx-End Cracks

Peel Cracking



Diagnostic Features:

- Calyx-end cracks on plum is a common physiological disorder
- Caused by the fruit rapidly absorbing a large amount of water after a dry period, which forces the skin to burst at its weakest point
- Cracks typically appear during the final rapid growth stage (Stage III) of fruit development

Ext



Plum



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S

Shrivel / Wilting

Moisture Loss



Diagnostic Features:

- Wrinkled skin caused by loss of moisture which is visible on the shoulders and/or cheeks of fruit
- More prominent on the shoulders where it typically appears as lines radiating out from the stem onto the shoulders
- In severe cases stretches over the shoulders onto the cheeks
- In the case of plums, some varieties are more susceptible than others

Ext



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HM

PH

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Wilting

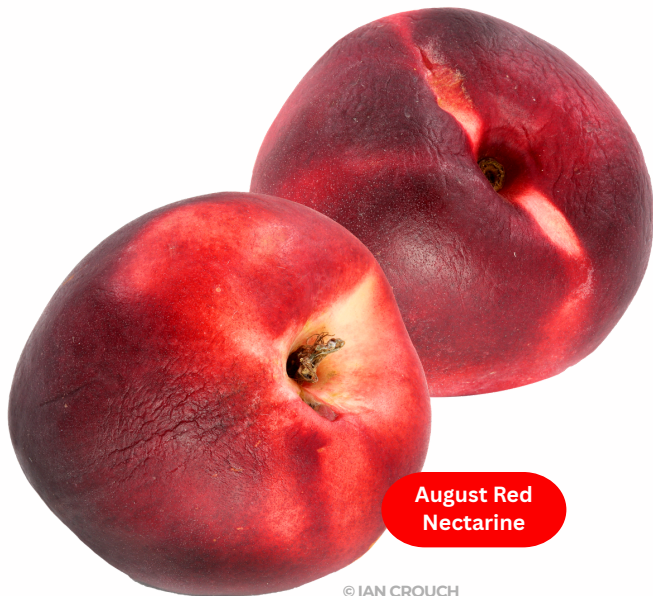
Moisture Loss



Diagnostic Features:

- Water loss results in wilting of the fruit and in severe cases may be expressed as extensive shriveling on the surface of the fruit
- Fruit harvested too immature are more susceptible to wilting as their cuticles have not developed sufficiently to protect against moisture loss.

Ext



August Red
Nectarine

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Rub Marks (Slight)

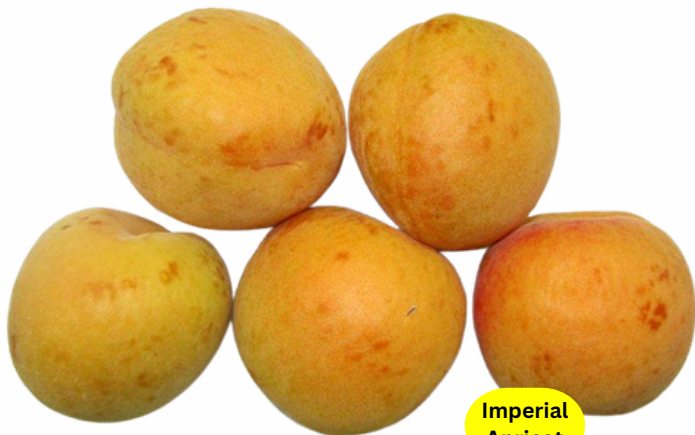
Mechanical damage



Diagnostic Features:

- Cosmetic defect
- Rub marks are typically caused by physical friction during harvest, packing, and transportation, especially if the turgor of the fruit is high after wet conditions in the orchard
- Certain environmental and physiological issues can also weaken the fruit's skin and contribute to scuffing

Ext



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Imperial
Apricot

Rub Marks (Severe)

Mechanical damage



Pioneer
Plum



Ext



Imperial
Apricot



HM

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Pre

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Skin Punctures

Mechanical damage



Diagnostic Features:

- Cosmetic defects caused during harvesting and packing process
- May express as rub marks or skin punctures caused by fingernails or stems
- May develop and become more visible during storage

Ext



Pioneer
Plum



PH

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Skin Punctures

Mechanical damage



Ext

Sun Supreme
Plum



Laetitia
Plum



Pre

PH

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Damaged Tips

Mechanical damage



Diagnostic Features:

- Cosmetic defect
- Mechanical damage to the fruit tip, most likely occurring during packing
- Wounded tissue is susceptible to pathogen infection, resulting in decay
- Susceptible peach and nectarine cultivars may develop a prominent tip under swarm winter conditions
- Special handling and packing requirements for injury prone fruit

Ext



Laetitia
Plum

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Bruising

Mechanical damage



Diagnostic Features:

- Damage to fruit caused by impact or compression
- Leads to cell breakdown and often resulting in discoloration and softer texture
- Bruises can accelerate ripening, increase moisture loss, and make the fruit more susceptible to microbial spoilage and rot, compromising its quality

Ext



Sun Kiss
Plum

PH

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Freezing Damage

Mechanical damage



Diagnostic Features:

- Postharvest storage disorder that can occur if the pulp temperature drops below -0.5°C
- Freezing temperature depends on the TSS (%) of fruit. The higher the TSS (%), the lower the freezing temperature to cause damage
- Results in poor texture and flavor loss
- Symptoms often become more apparent after the fruit has been removed from cold storage and exposed to room temperature (shelf life)

Int



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PH

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Freezing Damage

Mechanical damage



Diagnostic Features:

- Occurs when ice crystals form and rupture the cell walls, causing a loss of texture and moisture
- Leads to a mushy, watery consistency after thawing, along with potential browning and discoloration due to enzymatic oxidation
- While taste and nutritional value are often preserved, physical changes may make fruit unappetizing
- Fruit is more susceptible to decay

Ext

Apricot



°C

PH

S

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Rain / Water Damage

Mechanical damage



Diagnostic Features:

- Preharvest skin streaking in peaches and nectarines is linked to rain falling one to two weeks before harvest, followed by a dry period of about 10 days
- Appears as faint yellow, solid yellow, or brown (necrotic) streaks on the skin, typically running from the stem end to the tip of the fruit
- May result in secondary decay
- Risk depends on the cultivar and the stage of ripeness at the time of the rain event

Ext



**September Bright
Nectarine**

© IAN CROUCH

**Honey Delight
Nectarine**

© KALINKE ROSSOUW

HM

SC

HM

Pre

Pre



Curly Leaf on Fruit

Pathological



Diagnostic Features:

- Most commonly caused by an infestation of the leaf curl plum aphid, a pest that sucks fluids from new leaves, causing them to curl and deform
- Less likely causes include adverse weather conditions and water stress

Ext

Plum



© KARIN VAN RENSBURG



Pre



Xanthomonas

Pathological

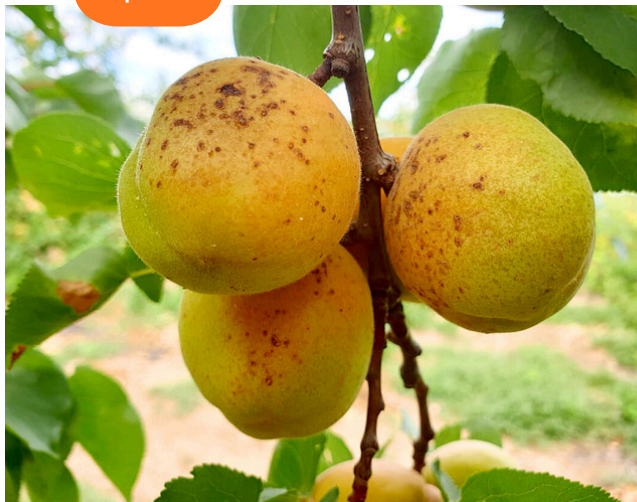


Diagnostic Features:

- Bacterial spot or bacterial canker
- Most Dark brown to black, sunken spots with a water-soaked margin that often crack
- A yellow halo may surround these spots
- Small, sunken, cracked spots on the fruit surface
- Symptoms similar to *Pseudomonas* spp

Ext

Apricot



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Pre



Lenticel Freckles

Pathological



Diagnostic Features:

- Fungal (*Cladosporium carpophilum*) or bacterial infection early in spring or after fine ice rain
- Dark brown to black, sunken spots with a water-soaked margin that often crack
- A yellow halo may surround these spots
- Small, sunken, cracked spots on the fruit surface
- *Pseudomonas*-like symptoms

Int

Ext



Apricot



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Pre



Marbling (Viroid)

Pathological



Diagnostic Features:

- Irregular skin colouration or marbling on infected plums
- Symptoms range from light marbling to severe unmarketable fruit
- Plums small and hard with irregular shape and uneven surface
- Fruit may not ripen and exhibit dry, corky flesh

Int

Ext



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Pre



Marbling (Viroid)

Pathological



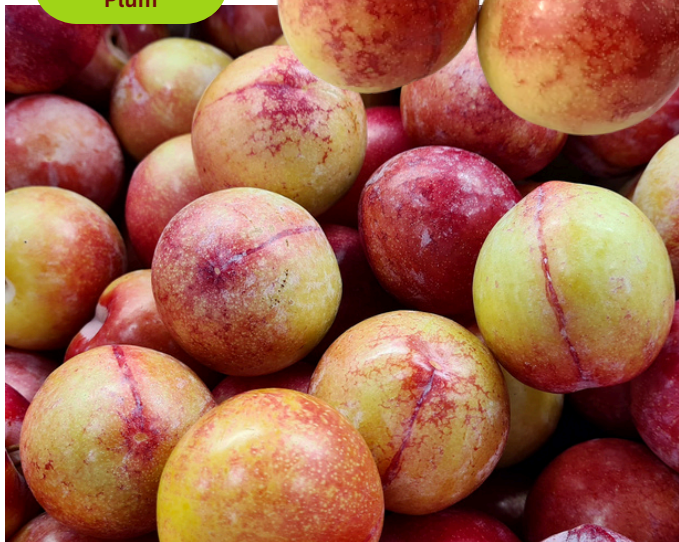
Diagnostic Features:

- Plum marbling is an infectious disease on Japanese plums caused by the plum viroid l (PVd-l)
- A viroid is a small circular RNA molecule that replicates and circulates throughout the host plant

Int

Ext

African Delight
Plum



Pre



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Marbling (Viroid)

Pathological



plum MARBLING

Int

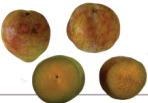
Ext

Symptoms of plum marbling only occur on fruit.

All parts of infected trees contain the viroid, but no other abnormalities have been observed.

LIST OF SYMPTOMS:

- Irregular skin colouration or marbling seen on infected plums. The plums can differ in their symptom expression ranging from light marbling to very severe where the fruit are completely unmarketable.
- Plums can be small and hard with an irregular shape and uneven surface.
- Plums may have so-called corky flesh (in both yellow-skinned and red-skinned fruit).

AFRICAN DELIGHT SYMPTOM DESCRIPTION: - Mild to severe marbling - Often small fruit and, in some cases, hard fruit - One report of corky flesh 	BLACK PEARL SYMPTOM DESCRIPTION: - Moderate to severe marbling - Irregular fruit surface 	LADY RED SYMPTOM DESCRIPTION: - Severe marbling - Often smaller fruit 	AFRICAN ROSE SYMPTOM DESCRIPTION: - Mild to severe marbling - Sometimes irregular surface 
LAETITIA SYMPTOM DESCRIPTION: - Mild to moderate marbling - Fruit often hard 	RUBY CRUNCH SYMPTOM DESCRIPTION: - Severe marbling 	RUBY STAR SYMPTOM DESCRIPTION: - Severe corky flesh - Almost always associated with small and hard fruit - Often with irregular fruit surface 	FORTUNE SYMPTOM DESCRIPTION: - Moderate to severe marbling - Irregular fruit surface 
SUN BREEZE SYMPTOM DESCRIPTION: - Very mild marbling - Severe corky flesh - Fruit small and hard - Often with an irregular surface 	SONGOLD SYMPTOM DESCRIPTION: - Very mild marbling - Severe corky flesh - Fruit small and hard - Often with an irregular surface 	RUBY SUN SYMPTOM DESCRIPTION: - Severe marbling - Often with irregular fruit surface 	PIONEER SYMPTOM DESCRIPTION: - Severe marbling 

Plum marbling is an infectious disease of Japanese plums caused by plum viroid I (Pvd-I). A viroid is a small circular RNA molecule that replicates and circulates through the host plant.

Pictures by H. Maree. Information compiled by H Maree and R Bester, with input by C Stander.



Pre



Marbling (Viroid)

Pathological



Int

Ext

FRUIT SYMPTOMS					
Cultivar	Marbling	Corky Flesh	Hard	Small	Irregular
African Delight	*** ***	*	*	**	-
Black Pearl	***	-	-	-	***
Lady Red	***	-	-	**	-
Laetitia	***	-	**	-	-
Pioneer	***	-	-	-	-
Ruby Crunch	***	-	-	-	-
Ruby Star	-	***	***	***	**
Ruby Sun	***	-	-	-	**
Songold	***	***	***	***	**
Sun Breeze	***	***	***	***	**

* Indicates the approximate frequency of the symptom. (* <25%, ** 25-75%, *** >75%)
Colour indicated the severity of the symptom (Mild, Moderate, Severe)



TRANSMISSION - HOW IS IT TRANSMITTED?

- Plum viroid I is not transmitted through seed. This is important as it means that it cannot be transmitted by the fruit.
- Primary spread of marbling is through the planting of infected plant material.
- Mechanical transmission of PVD-I during routine practices, such as pruning, is also highly probable.

CONTROL STRATEGIES

- Mark, remove and burn all infected trees.
- Disinfect pruning equipment.
- Purchase nursery trees from tested mother blocks (certified material under the Deciduous Fruit Plant Certification Scheme identified by a blue label).
- For any on-farm budding or grafting, secure certified and tested material from a Plant Improvement Organisation.

TESTS – CONTACT POINTS

The presence of PVD-I can be confirmed by laboratory testing at SAPO Trust or the Plant Disease Clinic at Stellenbosch University.

SAPO Trust

021 887 6823

Contact person:

Wendy Bailey - wendy@saplant.co.za

Plant Disease Clinic

Department of Plant Pathology Stellenbosch University

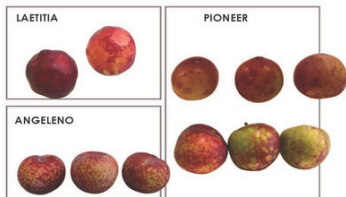
Contact person:

Sonja Coertze

- 021 808 3222

- Plantsiektekliek@ Stellenbosch.onmicrosoft.com

SIMILAR SYMPTOMS BUT NOT CAUSED BY PVD-I



Pre

