



Recovery from Fire Damage in Rubus Crops

Fire damage in Rubus (raspberry and hybrid blackberry) crops can affect plants in various ways, depending on the stage of development of the crop and the intensity of the fire:

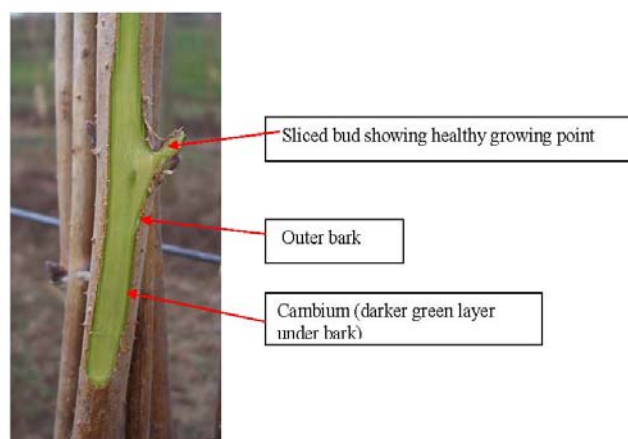
- Fruit is scorched or baked
- Leaves are scorched and die, but canes and buds survive
- Canes are affected by radiant heat, partially killing the cambium layer on the more exposed side
- Canes and buds are burnt and die, but the crown is not killed
- Crowns and roots may be damaged through embers lodging on the base of the plant or in the mulch
- Crowns are burnt directly or by burning vegetation around the base of the plants
- Root systems are damaged by burning organic matter or heat in the rootzone
- Root systems may survive even though the tops have been killed
- Irrigation lines and drippers are damaged or destroyed

Assessing the damage

Although a crop affected by fire and radiant heat looks severely damaged, affected blocks and plants may fully or partially recover. The extent of damage and crop loss depends on the degree of heat generated by the fire passing over the crop, the time of year of the fire and the number of rows actually burnt out or damaged. The worst affected plants are most likely to be on the border/edge closest to the fire front.

If plants have been killed outright, assessing the damage is straight forward – the canes, crown and roots will be blackened or brown and dry. However, if canes are still alive (or appear to be alive), it may take several weeks for symptoms to fully develop and fully assess the extent of the damage.

Blackened and defoliated canes do not necessarily indicate that the entire plant is dead or dying. It is important to take into account damage to the cambium layer (found just beneath the bark). The cambium is the layer of growing cells that produces the vascular system which conducts water and nutrients through the canes.



Dormant red raspberry floricanes with bark scraped away to show cambium and sections of xylem (conductive tissue) underneath (Photo courtesy of Dr Bernadine Strik)

Cambium damage can be assessed by carefully scraping away the thin bark on the cane with a knife. If the tissue under the bark is slightly moist and a bright green colour, the cambium is still alive and the plant may recover. You will need to assess many canes to determine the extent of the damage. You can check the base of canes, near the crown, to assess any crown damage. Dead or damaged cambium will be dry and reddish/brown to black in colour. In this case, the crown and roots should be checked by scraping away some of the tissue from the crown and examining the roots. Live roots will show a creamy coloured centre when the bark is carefully scraped away. Healthy tissue in the crown or roots indicate there is potential for the plant to survive and produce more primocanes next spring.

The degree of damage to the cambium, crown and/or roots will lead to decisions on how to prune.

Radiant heat and fire stressed plants may respond by reshooting or growing new primocanes in the autumn; do not prune out these new canes during the growing season as this will further weaken the plant. If there is sufficient primocane growth to train, you will see a partial crop next season. Burnt primocanes or those with desiccated leaves may suffer from poor growth and flower bud development for next year's crop, significantly reducing yields. During autumn, healthy canes would normally send photosynthates to the crown and roots for storage. Loss of leaves due to fire damage will prevent this process, weakening plant growth and potentially reducing the initiation of flower buds that happens in late summer/autumn.

The proportion of plants that have been killed outright should be assessed to determine whether the whole block is still commercially viable.

Managing plants that show signs of life

If plants show signs of life (new shoots starting to emerge from canes or from crown), the irrigation system needs to be re-established so that rows can be irrigated to ensure good top and root growth before autumn leaf fall.

Remaining fruit should be removed to prevent pest and disease build-up and unwanted stress on the plants. The easiest way to do this is by pruning off any remaining floricanes or the top of primocanes in primocane-fruiting cultivars. Pruning should be delayed until regrowth has been established. Fertiliser should also be withheld until there is sufficient growth to utilise it. It is essential not to force growth with extra fertiliser.

Pruning

Timing of pruning will depend on the degree of damage to the canes, assuming that the crown and roots are showing signs of life. For canes that are reshooting, wait until mid autumn (April/May) then cut the canes to the crown using a whipper snipper with a metal blade. For severely damaged canes, cut to the crown as soon as practical then allow new canes to develop. This applies to both primocanes and floricanes.

Long term viability of fire damaged crops

Experience from fire damage to a raspberry crop in eastern Tasmania indicated that where the roots are still healthy and the crown not severely damaged, the plants survived even though the mulch had burnt. The blackened canes were removed and the plants irrigated as soon as practical after the fire. Canes grew back strongly the following year, with reduced fruit yield. Two years after the fire, both summer and autumn raspberries appeared to have fully recovered. The degree of recovery will depend on the severity of the fire damage.

Decisions about long term block viability and possible replacement strategies should be made in consultation with technical specialists and your insurance company. Decisions should take into account the severity of the damage through

the block, age of plants, variety and number of productive plants in the block. This may be the opportunity to renovate the block.

Key Messages for Fire Affected Rubus Crops:

- Assess whether the block is worth saving as soon as possible, based on the extent of damage and signs of regrowth.
- Assess whether damaged plants still have a healthy cambium (layer of tissue beneath outer bark), crown or roots
- If block is judged viable, repair or replace the irrigation system and irrigate as soon as possible.
- Remove any remaining fruit to prevent pest and disease build-up and unwanted stress on the plants
- Withhold fertilizer until there is sufficient growth to utilise it. Do not force growth with extra fertilizer
- Do not prune out damaged canes until regrowth has been established.

Contact/Services available from DPI

If you require one on one technical advice regarding fire damaged Rubus crops, please contact Alison Brinson at the Department of Primary Industries in Knoxfield (03) 9210 9308 or alison.brinson@dpi.vic.gov.au

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