

AT A GLANCE

THE FIRST 48 HOURS

AFTER THE WATER IS GONE

ONGOING MANAGEMENT

LONGER TERM CONSEQUENCES

REDUCING CONTAMINATION RISK



THE FIRST 48 HOURS

Kiwifruit vines are relatively tolerant to many environmental impacts, but one thing they don't cope well with is having their root systems waterlogged. Previous flooding events have shown that vine health outcomes are not good if roots are waterlogged and/or there is surface water for more than 48 hours. After this time, the roots begin to die due to lack of oxygen. Bruno and Hayward rootstocks are particularly prone. Bounty 71 has shown much greater resistance.

This means that the first 48 hours are a critical period when, if possible, the orchard should be drained of water. In some cases, this drainage will occur naturally, but for some sites this will mean pumps need to be used to pump the water out. These are best placed in the lower parts of blocks to ensure as much of the shallow rooting zone is drained as well.

AFTER THE WATER IS GONE

In some situations, flooding can deposit significant volumes of silt across the orchard. Kiwifruit roots are very sensitive to lack of oxygen. Silt is very fine with little structure and effectively seals off the soil surface – so roots that were deprived of oxygen by excess water may continue to be sealed off from the atmosphere and still not able to access oxygen.

Identifying a good way to manage this silt can be difficult as it is not recommended to use any heavy machinery on the soil until it has dried out. The longer-term impacts of compaction are significant and should not be disregarded especially in clay and/or compacted silt loams. Getting oxygen to the finer roots is critical. Root density is typically higher closer to the trunk.

Digging silt away from trunks will help air flow back into the soil. While this is a heavy,

manual job it can help roots survive. The sooner it is done the more effective it will be.

Once the silt has dried out, it has a lot less volume and it may be possible to push it away. However, this is often impractical. A 15cm covering of silt over a hectare is equivalent to 3000m³ or a pile 3m x 2m x 250m long when removed. If silt removal is impractical and there vine recovery is likely, sowing a deep-rooted crop such as rye or fescue may help to break up the silt layer and add structure. Incorporating thinner silt layers into the soil before sowing may also be beneficial.

Take care with the removal and storage of silt which may have been contaminated by flood waters, to avoid food safety and worker health risks.

ONGOING MANAGEMENT

Even if vines are only under water for 24 hours, significant root death may have occurred. This places the vines under considerable stress especially if it happens during the growing season. A separate management plan should be put in place for affected vines/blocks, which should look to reduce stress for the current and future season. Refer to [KiwiTech Bulletin N101 - Management of stressed vines](#).

Key considerations should be on reducing or eliminating girdling, cropload and oil applications. Removal of fruit is likely to reduce vine stress. The level to which this is done will depend on factors such as inherent vine health, severity of water logging, and time of year.

Experience has shown a good recovery technique for struggling vines is, in subsequent seasons, to continue to reduce overall cropload. But to do this by maintaining a full canopy and reducing cropload by removing all the flowers/fruit from every second cane.

MATURITY AREAS

Where orchards have varied levels of waterlogging and or silt deposits, fruit monitoring is essential to understand fruit maturity and fruit quality. Fruit from vines showing obvious stress (e.g. significant leaf loss or wilting) should not be harvested and ideally they should be dropped and mulched before harvest.

Fruit from less affected areas should be tested separately and different maturity areas set if required.

Placing compromised fruit in with good fruit is likely to compromise all fruit.

Be sure your postharvest facility is involved in all maturity testing and harvesting decisions to get the best possible outcome.

Experience has shown that fruit from vines that have experienced waterlogging will not have the same storage potential as that from healthy vines.

LONGER TERM CONSEQUENCES

Waterlogged soil creates ideal conditions for root diseases like *Pythium* and *Phytophthora* which further compromise root health. Improving drainage, soil structure and soil health will be critical if vine health is to improve and be maintained. For more information refer to the KiwiTech Bulletins [E15 Drainage](#), [E04 Improving Soil Quality](#) and [N95 Soil Ripping](#).

Driving on wet soil creates compaction, so is best avoided. Aerating the soil once it has dried out is likely to be beneficial.

REDUCING CONTAMINATION RISK

Flood water contains silt and may contain chemical and biological contaminants from farm and human effluent treatment systems.

If contaminated flood water travels through an orchard it can contaminate the orchard water supply, soil, and pose a food safety and worker welfare risk. Attention to food and worker safety is paramount. **Follow the advice of Zespri and local agencies.**

Fruit may become contaminated through direct contact between the fruit and flood water, or when contaminated soil, equipment or other objects such as gloves come into contact with the fruit during picking or post-harvest operations.

As a result, extra precautions such as water supply testing, notification of potential contamination, and (if close to harvest) fruit testing, clean-up sprays and special picking and bin handling protocols may be necessary.

If you have any concerns about the impacts of flooding on your fruit or worker safety check with Zespri staff. Information is also available on the [flooding page on Canopy](#) for more information, and contact the Zespri Quality Team for further guidance.

FIND OUT MORE

For more information refer to the [flooding page](#) on Canopy or contact extension@zespri.com