

# Managing horticulture crop recovery after floods and waterlogged soil

Waterlogged soils are deficient in oxygen because the oxygen between soil particles is replaced by water. Oxygen is essential for healthy root growth insufficient oxygen in soils over time causes cell, root and eventually plant death.

Tree crops are able to survive without oxygen to the roots for longer than most vegetables and flowers. The longer soils remain saturated, the more likely root death will occur. Usually, as long as water drains within 24 hours, the impact on plant health is minimal.

Stagnant water, particularly if it is shallow, can heat up in hot sunny weather and kill plants in a few hours, so removing excess water as soon as possible after flooding is critical to plant survival.

Soils with a high clay content can become compacted and form a surface crust after heavy rainfall and flooding. Flood waters also deposit a fine clay layer or crust on top of the soil which prevents oxygen penetration into the soil (aeration). This layer should be 'broken up' and incorporated into the soil profile as soon as possible. Cultivate between vegetable rows as soon as possible to aerate the soil and improve its oxygen content. In some circumstances flood waters may contain chemical and biological contaminants, however they will reduce over time and with follow-up rainfall and sunny weather. Soil tests are advisable before replanting or harvesting crops if chemical contamination is suspected.

After heavy rain or inundation there is an increased risk of breakdown of fruit and vegetables, before and after harvest, particularly of underground crops e.g. potatoes or sweet potatoes. Ensure that wash water contains a postharvest treatment to reduce the risk of breakdown. Change water regularly, immediately as soon as it gets dirty.

## Vegetables

On-farm runoff water causing local flooding should not cause a safety problem as long as the aboveground portions of the plants remain healthy. Do not use produce from plants that have yellowed.

Discard vegetable crops flooded with off-farm water that may have been contaminated, particularly leafy vegetable crops. Product developed after water subsides, crops such as tomatoes, capsicums, chillies, eggplants, sweet corn, squash, cucumbers and similar non-leafy vegetables, should be safe as long as the fruit is not cracked or soft. Wash vegetables thoroughly before packing.

## Trees

Tree crops differ markedly in their ability to withstand flooding and most trees will maintain health if floodwaters recede within a few days. Some tree deaths can be expected if flood waters remain for extended periods, especially on less well drained soils which remain waterlogged after floods have receded. Avocado roots are especially sensitive and may die after only 48 hours of flooding. Flowing water contains more oxygen than stagnant water, so trees may survive for longer where water has been moving.

Discard produce flooded with off-farm water that may have been contaminated. Remove dying or dead branches that may become an entry point for disease organisms or insect pests.

## **Crop symptoms**

Crops stressed by water-logging may wilt, leaves may turn yellow due to iron chlorosis or nitrogen deficiency, tree branches may dieback and in some cases crops will die.

Vegetables and young or newly planted trees are most at risk as they lack an extensive root system. Flood damaged crops may have extensive root death, so irrigation timing is vital to recovery and to avoid ongoing plant stress. Apply small amounts often until the root system has recovered.

## **Pests and diseases**

Many diseases are more active in wet, humid conditions and pests can also cause problems. Apply suitable disease control measures as soon as possible and monitor for pests.

A complete list of pesticides with registrations or permits is available on the APVMA website [www.apvma.gov.au](http://www.apvma.gov.au)

## **Fertiliser replacement**

### **Vegetables**

Gradual replacement of fertilisers is critical for recovery of a healthy root system. Heavy applications may cause further root damage. Foliar applications of soluble major and trace element mixtures may help 'kick start' plants until their root systems re-establish.

### **Tree crops**

Three of the important nutrients for tree crops: nitrogen, potassium and boron are prone to leaching from the soil and as a result of the high rainfall are likely to be low. Adjust their fertiliser applications to make up for expected shortfalls, typically rates are increased by up to 20% above normal. Be very careful with boron (especially on light sandy soils) not to overdo the rates since this element can easily reach toxic levels.

With the likelihood of continued heavy rain, fertiliser rates are best split into frequent applications of small amounts. This means the amount that can potentially be lost with each rainfall event will be lower and the levels will be topped up sooner with the next application.

## **Advice**

It is advisable that producers under personal stress seek professional crop advice before making decisions about removing or replacing crops damaged due to waterlogging.

## More information

Peter Rigden

Development Horticulturist

Agri-Science Queensland

Department of Agriculture and Fisheries

Ph: 13 25 23 or visit [www.daf.qld.gov.au](http://www.daf.qld.gov.au)

For essential information on important diseases affecting fruit and vegetable crops grown across Australia, pick up a copy of Diseases of fruit crops in Australia or Diseases of vegetable crops in Australia, both available for purchase from CSIRO at [www.publish.csiro.au](http://www.publish.csiro.au)

© The State of Queensland, Department of Agriculture and Fisheries, 2016.

Enquiries about reproduction, including downloading or printing the web version, should be directed to [SAFTRSCopyright@daf.qld.gov.au](mailto:SAFTRSCopyright@daf.qld.gov.au) or telephone 13 25 23 (Queensland residents) or +61 7 3404 6999.