



FACT SHEET

AUGUST 2009

VOLCANIC ERUPTION

Ash fall presents the biggest volcanic threat to New Zealand's primary production industry. Pastoral effects are generally reduced. Animal weight gain and pasture growth are reduced and this effect can continue for extended periods. Fine volcanic ash is generally more damaging and can be transported further than coarse ash, sometimes up to hundreds of kilometers.

GeoNet (the Government's volcanic monitoring network) monitors volcanic activity in New Zealand; but predicting the timing, magnitude and distribution of volcanic eruptions is not an exact science – so be prepared for false alarms.

PEOPLE

Volcanic ash impacts on human health and wellbeing include:

- respiratory effects causing irritation to nose, throat and airways;
- eye irritation including painful scratches in the front of the eye and conjunctivitis;
- skin irritation (particularly if ash fall is acidic);
- contamination of domestic water supplies (especially roof-fed household water tanks);
- clean-up dangers (risk of injury during activities such as roof cleaning).

PRECAUTIONS

- Wear a mask and goggles when operating in an ashy environment.
- Reduce ash in your household by keeping doors and windows closed, and stopping draughts with damp towels.
- Take extreme care, especially when cleaning up, as ash will make surfaces slippery.

In a major eruption it may be necessary for everyone on a farm to be evacuated. In this instance, remember to take pets and working dogs. If possible, move livestock into covered yards or barns to protect them from direct ash fall but do not turn stock loose onto roads as they may hinder evacuation procedures and emergency services.

LIVESTOCK

The main concern for farmers will be the immediate physical impacts on stock, contamination of stock water and pastures.

Expect clean water to be in short supply, with natural water supplies and dams contaminated, and pump functions severely reduced by the abrasive nature of the ash.

PHYSICAL IMPACTS ON LIVESTOCK INCLUDE:

- eye and skin irritation;
- respiratory distress;
- abrasion of teeth and hooves;
- contamination of fleeces;
- blockages of the gastrointestinal tract if quantities of ash are consumed.

Following ash falls from Ruapehu in 1995 and 1996, farmers noted that animals were readily put off their feed by 2-5 mm ash deposits.

Ash can put stock off eating/ drinking, so if possible, locate stock in areas with access to clean water supplies close to the homestead, and with access to supplementary feed and water. Protect supplementary feed supplies by ensuring they are fenced off and covered. If practical, cover stock water troughs for the duration of an ash fall.

- confine stock to a few small paddocks close to supplementary feed reserves to reduce their exposure to heavier ash fall.

Close-grazing animals such as sheep and deer are more likely to be affected by light ash showers, with young stock being more at risk than mature animals.

An eruption in early spring would have the greatest impact on both sheep and beef farms. Lamb and calf survival/thrift would be poor as ewes and beef cows reduce/stop lactating. Livestock losses from the eruption of Ruapehu in 1995 were greatest in lactating ewes, grazing short pasture. Wool quality is likely to be severely affected when sheep are close to shearing.

The physical effects of ash usually predominate over chemical impacts. However, toxic effects due to the presence of fluoride, selenium and sulphur can also be a problem. Of these, fluoride toxicity is the most common problem. High sulphur concentration in the ash may also induce copper and cobalt deficiencies.

FLUORIDE TOXICITY

ACUTE SYMPTOMS INCLUDE :	CHRONIC SYMPTOMS INCLUDE:
livestock collapsing on their front legs	impaired tooth development in young animals resulting in mottling and erosion of enamel and excessive tooth wear
lesions in the nose and mouth	lameness;
hair falling out around the mouth	skeletal deformity
nutritional and stress-related disorders	reduced feed and water intake
tooth condition known as “spiking” may cause outgrowths to develop on molars and make chewing difficult	lower weight gain and milk production
convulsive seizures, pulmonary oedema, kidney and liver changes	

If you are concerned about toxic effects of ash on livestock, seek veterinary advice as soon as possible. Symptoms of chronic fluorosis usually take weeks or months to appear.

WATER SUPPLIES

Groundwater-fed supplies are relatively resilient to ash fall contamination. However, extraction equipment such as electric pumps and windmills is vulnerable. Springs offer a source of uncontaminated water and should be fenced off from livestock following an ash fall.

Surface water supplies such as dams and streams are vulnerable to ash fall contamination.

MAJOR EFFECTS ON RURAL WATER SUPPLIES ARE LIKELY TO INCLUDE:

- turbidity (high levels of suspended ash in water) causing clogging and accelerated wear and tear on equipment such as pumps;
- physical blockages of pipes, drains and channels;
- water sourced from roof-fed household water tanks becoming undrinkable;
- heavy water demand for clean-up operations;
- power cuts affecting electrically-powered water supplies.

In general ash fall is likely to make water undrinkable (metallic-tasting and discoloured) before it presents health risks. Livestock are likely to tolerate short-term consumption.

PASTURE

Damage to pasture and the soils on which they depend will vary with thickness and composition of the ash.

Ash falls greater than 150 mm result in sterile soil, as it is deprived of oxygen, resulting in necrosis.

Survival of plants will be influenced by the timing of the next rainfall (within 2-3 days), as the ash will compact to approximately one-third its original depth.

OTHER POSSIBLE ISSUES

- Volcanic ash is conductive when wet and deposits of ash on electrical equipment can cause widespread damage and disruption to electricity distribution networks.
- Vehicle radiators and filters may clog with ash; bearings and seals may wear prematurely.
- Electrical equipment will be susceptible to arcing if damp volcanic ash penetrates seals.
- Driving during ash falls should be avoided.
- Disruption to telephone and radio communications is likely.

AFTER AN ERUPTION

- Prioritise necessary farm activities versus optional operations.
- Clean-up of roofs, roads, tracks.
- Be careful to conserve water supplies.
- Regularly check pumps, filters and water intake structures for blockages and signs of damage.
- Use a soil test to determine soil fertility status.

LONG-TERM PLANNING

- Stock up on general emergency supplies such as water, food, batteries, candles, and gas/fuel for at least three days.
- Ensure farm insurance covers crops, livestock, pasture insurance for volcanic impacts.
- Check power lines and poles are in good working order and free from overhanging branches, have backup generator: tractor power take-offs petrol or diesel.
- Keep water distribution systems well maintained; connect distribution systems with separate sources into a single network, have maximum storage in covered water supplies where possible and ensure sumps, drainpipes and drain grills are clear.
- Ensure farms have adequate tank water storage and that stored water can be distributed if pumping facilities are disrupted, by locating tanks on top of topographic highs so water can be gravity-fed.
- Take steps to protect the farm's household water supply by installing a disconnect valve on roof-fed rainwater tanks and stockpiling bottled water.
- Have a good supply of engine filters, lubricating oil, brake and hydraulic fluids, and seals.
- An air compressor in good working order is useful for cleaning ash from machinery.
- Stock up on preventative masks and goggles.

ACKNOWLEDGEMENTS AND MORE INFORMATION

This document is based on information contained in the Ministry for Primary Industries booklet: Volcanic Eruption!: Impacts and hazard mitigation for New Zealand's primary production industries.

FOR MORE INFORMATION GO TO

Ministry for Primary Industries
www.mpi.govt.nz/

Massey University: www.massey.ac.nz "Vulnerability of farm water supplies to volcanic ash."

Fluoride toxicity:
www.fertresearch.org.nz/faq/what-is-fluorosis

Hawkes Bay Emergency website: Volcanic impacts
www.cdemhawkesbay.govt.nz

Volcanic alerts <http://www.geonet.org.nz/volcano/>

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