

Impacts of Volcanic Ashfall on Agriculture

How does volcanic ash affect agriculture?

Volcanic ash, scientifically known as tephra, can significantly impact agriculture through its effects on crops, livestock, soil and ecosystems. The effects of ash can be categorised as physical or chemical.

How ash is harmful to crops

- Root crop leaves are burned and damaged.
- Fruit tree leaves and fruits are burned and damaged.
- Leaves heat up due to reduced transpiration (movement of water vapour).
- Photosynthesis (the process of making food in the plant leaf) is reduced due to the ash layer on leaf surface.
- Crops are slow to produce new shoots after ash damage.
- Seeds sown in raw ash will not germinate.
- Low pollination in crops.
- Plants are poor quality due to delayed maturity and reduced sugar.

Ashfall impact on crops depends on the following.

- Type of crop.
- Development stage of crop.
- Time of the year (determines crop season).
- Duration of the volcanic eruption.
- Climate (dry, wet).

Effects on livestock

- Dehydration and hunger due to feed shortage.
- Ingestion of large quantity of ash will cause gut blockage and accelerated tooth wear.
- Respiratory discomfort from ash inhalation.
- Death, if they feed on ash-covered grass.



Effects on soil

- The ash forms a crust on the soil surface that prevents water movement into the soil.
- An ash layer on soil surface reduces soil aeration.
- It may reduce soil biodiversity.
- It changes soil characteristics, making it difficult for crops to survive.

Ecological effects on insects

- Pest populations increase.
- Can lead to a low population of natural enemies.
- Bees and other insect pollinators die from exposure to ash.
- Plant disease occurrence can increase.

How to respond after ashfall

Rehabilitation strategies can be both short and long term. The following strategies are recommended.

- Remove ash from leaves with a sprayer or irrigation or naturally through rainfall.
- Prevent animals from eating contaminated grass.
- Seek veterinary advice when required.
- Mix the ash into soil.
- Collect soil samples and test to determine pH and available soil nutrients.
- Assess the depth of ash to determine crop damage and relevant actions to take.
- Select root and vegetable crops less susceptible to ash damage.
- Request disease free planting materials for root and tree crops from the SPC Centre for Pacific Crops and Trees.
- Incorporate organic matter into the soil to improve soil structure.
- Implement good agricultural practices (crop rotation, add organic matter to soil).
- Develop an integrated pest and disease management approach to control pests and diseases.

Ash benefits in the medium term

- Testing of subsoil samples and trials on how to utilise ash in soil management need to be conducted.
- The ash may increase soil fertility in the medium term when it turns into soil.

Who can farmers contact for further information?

Farmers may contact staff of the local Ministry of Agriculture or SPC Land Resources Division staff. For additional technical assistance, contact the SPC Land Resources Division at: gibsons@spc.int

