

Agriculture Victoria

Blue-green algae: Frequently Asked Questions:

WHAT ARE BLUE-GREEN ALGAE?

Blue-green algae, also known scientifically as Cyanobacteria, are a group of photosynthetic bacteria. These accumulations are frequently referred to as 'blooms'.

Blue-green algae blooms are likely to occur more often when the water is warm and enriched with nutrients like phosphorus or nitrogen. Under certain conditions, blue-green algae can accumulate in thick layers at the surface or water's edge.

Blooms are most often blue-green in colour but can also be blue, green, reddish-purple, or brown.

CAN BLUE-GREEN ALGAE MAKE HUMANS SICK?

Yes. It is possible for blue-green algae (BGA) to cause illness in humans and animals. The symptoms in humans include: rashes, headaches, fevers, gastroenteritis, seizures and respiratory failure. Animals most often contact contaminated water from affected farm dams. People may be exposed to these toxins through contact with the skin (e.g. when swimming), through inhalation of water containing toxins (e.g. when close to irrigation sprays, motor boating or water skiing), or by swallowing contaminated water. It is also possible for blue-green algae to contaminate the surface of leaves and the surfaces of fruit and vegetables which, if not washed off, may cause illness.

CAN BLUE-GREEN ALGAE MAKE ANIMALS SICK?

Yes. Depending on the toxicity of the bloom and the concentration of the toxin, between a few mouthfuls and many litres of water may be ingested before livestock show signs of poisoning. Animals that have consumed the toxin may appear unwell very quickly. They may initially appear depressed and weak, show signs of tremors, have a staggering gait, and then become recumbent, convulse and die. Acutely affected animals will often die within 24 hours of ingesting the toxin.

WHERE CAN I GET MY WATER TESTED?

Water samples can be tested for blue-green algae at a number of laboratories. It is recommended to use a NATA (National Association of Testing Authorities) accredited laboratory.

HOW DO I KNOW IF ANIMALS HAVE DIED FROM BGA POISONING?

Laboratory testing of the water supply for the presence of blue-green algae, and a postmortem examination of affected animals by a veterinarian will assist to confirm the diagnosis. Externally, the muzzles, feet and legs of deceased animals may be stained green by algae. Typical post-mortem findings include clumps of greenish algae in the oesophagus and stomach, severe liver damage and internal bleeding.

HOW DO I PROTECT LIVESTOCK FROM BLUE-GREEN ALGAE?

If an algal bloom is suspected, access to the contaminated water source should be removed immediately, and an alternate supply of water provided. Animals that have consumed the toxin will often appear unwell very quickly. There is no specific treatment for BGA toxicity but veterinary advice should be sought regarding supportive treatment for affected animals. Sick animals should be given clean water and provided with shade as they may be prone to becoming sunburnt (photosensitised).

CAN I TREAT A DAM OR TANK CONTAMINATED WITH BGA?

Chemical water treatments that kill algae are an option but are generally not recommended as these treatments allow the release of preformed toxins into the water, potentially making the water even more toxic. If an algaecide is used, manufacturers' instructions must be followed carefully, and stock removed from the water source until toxin is no longer present in the water. Treating water with copper sulfate is not recommended as it can increase the risk of copper toxicity, particularly in sheep.

WHEN CAN I REINTRODUCE ANIMALS TO WATER THAT HAS BEEN CONTAMINATED WITH BGA?

Water may remain toxic (poisonous) for a period after an algal bloom has visibly disappeared. Generally, stock should not be allowed access to affected water for at least two weeks after a bloom is no longer present. Stock should be monitored closely when re-introduced to such a water source.

CAN I GRAZE PASTURE WITH WATER CONTAMINATED WITH BGA?

Care should be taken if using blue-green algae affected water for irrigation purposes. Contaminated irrigation water should only be used if an alternative water source is not available. Livestock should not graze pastures that have been irrigated with blue-green algae contaminated water for seven to fourteen days after irrigating the pasture. Stock should be closely monitored for signs of blue-green algae poisoning.

DOES BLUE-GREEN ALGAE CONTAMINATED IRRIGATION WATER AFFECT PLANTS?

It is not certain what the full effect of the use of irrigation water contaminated with blue-green algae is on plants although scientific research suggests that the use of contaminated irrigation water can impact plants through:

- a reduction of the germination rate of seeds and the growth,
- reduced development of the seedlings, and
- there may also be an impact on the quality and the productivity of crop plants.

CAN PLANTS ACCUMULATE BLUE-GREEN ALGAL TOXINS?

For plants with edible parts that exposed above the ground surface (e.g. leafy products such as lettuces and fruits such as tomatoes and grapes), toxins may remain present and concentrated as a residue on surfaces for long periods after irrigation with contaminated water. It is important to note that toxins produced by blue-green algae are heat-stable and may take many weeks to degrade, particularly on a hard relatively-dry surface. Absorption of toxins by the roots, leaves/shoots and fruits is not well understood. Recent research indicates it is possible for toxins to be absorbed through the roots of plants which then move into the shoots and the concentrations vary with the type of plant. Fruits and vegetables with enclosed edible portions (e.g. oranges) are not known to directly absorb toxins.

CAN I IRRIGATE VEGETABLES AND FRUIT WITH BLUE-GREEN ALGAE CONTAMINATED WATER?

We recommend that irrigation water contaminated with blue-green algae should not be spray irrigated directly on vegetables and fruit, or come in contact with plants being grown for food. This is particularly important for fruit and vegetables that are likely to be eaten raw such as apples, grapes, tomatoes, strawberries, cabbages, lettuce and other salad greens.

Where there is no direct water contact with the edible parts of the plant, for example where under-tree sprinklers are used (for example, for stone fruit), or with a drip irrigation set-up where water does not touch the edible parts of the crop, irrigating with BGA-contaminated water is less likely to be a problem. Keep in mind that cooling sprays should not be used even though under- tree sprinklers are in use.

The scum from algal blooms can cause chronic problems on turf greens, especially those with poor air circulation, compacted soils and wet areas. Algal scum can slow water infiltration, keep thatch wet for extended periods, and impede oxygen and other gas diffusion into and out of soils.

SHOULD I TAKE ANY PRECAUTIONS WHEN USING BGA CONTAMINATED WATER FOR SPRAY AND MICRO-IRRIGATION?

Growers need to avoid spray drift as it may affect both humans and neighboring properties. Spraying when the wind speed is low (less than 15 kph) is best to reduce the risk of spray-drift.

Algae contaminated water can block irrigation equipment including pipes, filters, sprinklers, and micro-outlets that reduced irrigation system efficiency. Protective equipment, particularly gloves and face masks should be used when cleaning systems blocked with algae.

WHAT ARE THE KEY MESSAGES FOR GROWERS IRRIGATING EDIBLE PLANTS?

- Don't use water you know or suspect is contaminated with blue-green algae if you have an alternative supply.
- If you have no other supply, don't use direct overhead spray irrigation on the edible parts of the plant.

AS A LIVESTOCK PRODUCER, HOW CAN I PREPARE FOR BLUE-GREEN ALGAE IMPACTING MY WATER SUPPLY?

There are a number of steps that livestock producers can take to prepare for blue-green algae impacting and potentially cutting off a water supply.

Livestock farmers should consider:

1. Developing a plan for managing the situation where water availability becomes limited;
2. Completing a stock-take of the quantity and quality of water currently available on-farm that will be toxin free;
3. Calculating the water requirements for animals that may need to be provided water if current sources become toxic, and therefore how many days' supply is available;
4. Planning for additional on-farm storage should you need to quickly access alternative water supply;
5. Planning for how sufficient water will be provided to livestock in the medium term, which may include additional reticulation systems, finding agistment or selling stock.

The Agriculture Victoria website provides a range of calculators and fact sheets to assist producers calculate water availability and animal demand. To access this information go to <https://agriculture.vic.gov.au/farm-management/water/farm-water-solutions/how-much-water-does-my-farm-need>