

Blue-green algae and irrigation water

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Irrigation water is vulnerable to blue-green algae blooms particularly during the peak summer months. This agriculture note describes how blue-green algae may affect human health and what irrigators can do if they think their irrigation water is contaminated with blue-green algae.

What are blue-green algae?



Figure 1. Water contaminated with 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 and animals sick?

It is possible for blue-green algae to cause illness in humans and animals. Certain species of blue-green algae are capable of producing several different toxins that can affect the skin, liver, heart, gastrointestinal tract, nerves and muscles. 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 (e.g., when near 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, could cause illness.

Does my irrigation water contain blue-green algae?

If you suspect your irrigation water source contains blue-green algae you can contact an analytical laboratory to have the algae identified by an expert.

Signs of blue green algae include:

- a sudden change in water colour overnight due to a mass of vivid green algae floating to the surface
- the formation of scum which looks like green acrylic paint and leaves sky blue marks on rocks or plants around the edge of the dam, particularly on the leeward side of the dam or backwater of a stream
- blooms can be green, blue-green or khaki green, and can turn brown/green or white once it is dying off
- blooms may appear at dusk or dawn over several days and disappear during the day
- there may be a strong earthy smell, or if the bloom is breaking down it may produce a strong rotting smell
- in the early stages of a 'bloom', small green flecks may appear in the water

Avoid skin contact with the water. Figure 1. Water contaminated with algae

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 alteration to the quality and the productivity of crop plants.

Can plants accumulate blue-green algal toxins?

Toxins may be absorbed through the roots of plants which then move into the shoots, but the concentration is very much determined by the type of plant. For leafy products and fruits, toxins may remain viable on surfaces for long periods but there is no evidence that fruit and vegetables take up and store toxins. 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.

Irrigating crops with blue-green algae contaminated water

Vegetables and fruit

We recommend that irrigation water contaminated with blue-green algae should **not** be spray irrigated 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 unlikely to be a problem.

Pasture

Keep stock off pasture irrigated with blue-green algae-contaminated water for at least seven days after irrigation.

Blue-green algae toxins may remain on dry pasture for a long time following irrigation, often until there is a rain event or further irrigation with uncontaminated water.

Turf

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.

Cautions when using spray- and micro-irrigation

Avoid spray drift that may affect both humans and neighbouring properties. Spraying when the wind speed is low (less than 15 kph) is best to reduce the risk of spray-drift.

The use of activated charcoal filters is recommended to absorb toxins.

Algae contaminated water can block irrigation equipment including: pipes, filters, sprinklers, micro-outlets etc reducing irrigation system efficiency. Protective equipment, particularly gloves, should be used when cleaning systems blocked with algae.

Consumer advice

Consumers should note that, before use, all fruit and vegetables, particularly salad vegetables which are consumed raw, should be thoroughly washed and rinsed with fresh, clean water. Washing the fruit and vegetables in clean water will remove the blue-green algae easily, as the toxins are water-soluble. The fruit and vegetables will then be safe to consume.

What are the key messages for irrigating crops with blue-green algae contaminated water?

The key messages for irrigating edible plants are:

- 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.

Contact us

Contact Customer Service Centre 136 186.

Acknowledgements

NSW Department of Primary Industries