

Treatment of Flooded Turfgrass

Impact of Floodwaters on Turfgrass

Floodwaters affect turfgrass in a number of ways:

1. Reduced oxygen supply to the root system
2. Presence of toxic substances
3. Physical barriers to plant growth and photosynthesis after flood waters have receded
4. Erosion
5. Altered soil nutrient availability
6. Changed soil physical properties; including compaction and layering of silt within the soil profile



Flooding can kill turfgrass. Even after floodwaters have subsided anaerobic soil conditions can still cause “wet wilt”. In hot weather, shallow water lying on turfgrass can scald shoots and leaves.

Soil nitrogen reserves may also be depleted. Under waterlogged conditions soluble nitrate is converted to forms that can't be used by plants. Turf may show signs of yellowing due to nitrogen deficiency.

Yellowing due to iron deficiency can also occur, particularly on blue couch and broadleaf carpet grass.

Foliar feeding can be a helpful interim measure to “nurse” turfgrass until the soil has dried out and the rootzone has recovered.

Factors Impacting on the Extent of Damage

The extent of damage increases with:

- Depth of submersion (complete submersion causes more damage than partial submersion)
- Higher water temperatures
- Longer periods of inundation
- Repeat flooding.



Plants that are actively growing are more vulnerable to damage than dormant plants. Healthy well fertilised plants are more likely survive than plants which have already been weakened.

Submerged grasses survive flowing water more readily than stagnant water.

Treatment

Deposited debris

Remove heavy objects such as wood, metal and other material as soon as possible.

Deposits exceeding 5 cm or more should be removed quickly. If a substantial delay occurs in the removal of deposits the area may need to be rotary hoed and replanted. Areas of buried turfgrass can form a black layer within the soil profile that impedes root growth. Different turfgrasses vary in their tolerance to burial; however there is little data on this.

FACT SHEET

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Thin depositions of silt and sand can be irrigated off leaves. All deposits can cause serious injury at higher temperatures, so wash these off as soon as possible.

Flood depositions can cause the formation of compacted soil layers which cause soil structure to deteriorate. Flood affected soil will benefit from coring, spiking or verti-cutting to improve aeration. These techniques, along with raking, are also useful where an algal surface layer has formed. Silt layers can cause significant problems with water infiltration and soil aeration if left untreated.

Soil

Submersion and the resultant lack of oxygen can "poison" soil and produce toxic by-products within plant tissues. Soil toxins include soluble iron and manganese, hydrogen sulphide, ethylene, methane and organic acids.

Beard (1973) suggests that 1.0–1.5 kg of calcium hydroxide (hydrated lime or builders lime) per 100 square meters is useful to neutralise accumulated toxic substances and check algal growth. Algae can form a scum barrier on the surface of a waterlogged area, smothering emerging new shoots.

Apply hydrated lime dry mixed with sand or sprayed on with water. Repeat applications may be needed for persistent problems. Check for excessively acid soil pH readings post-flood.

Turn off irrigation for a time after washing off silt deposits to allow the soil to dry out. Avoid over-irrigation. Match watering to soil infiltration rates. This will be low on a saturated profile!

Floodwaters in coastal areas may have a high salt content. Affected soils should be tested for total dissolved salts and sodium. Saline soils may need specialised treatment including leaching and gypsum applications.

Post-Flood Monitoring

In the longer term watch for:-

Soil problems:

1. Depleted nutrients on sandy soils due to excessive leaching.
2. Problems with fertiliser utilisation on compacted clay soils. These will require de-compaction by coring, verti-cutting or spiking.
3. Water running off the surface, rather than infiltrating into the soil due to depositional layers or compaction.

Turf problems:

1. reduced vigour and quality
2. shallow root system
3. specific nutrient deficiencies such as nitrogen and iron, which cause turf yellowing.
4. generalised nutrient deficiencies due to death of parts of the root system or depletion of soil nutrients
5. increased disease activity
6. excessive dead layer (thatch) after regrowth - weeds e.g. chickweed, sedges (nutgrass, Mullumbimby couch)

Reference

Beard, J. B. (1973) Turfgrass: Science and Culture, Prentice Hall, New Jersey pp.658.

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It is recommended that a qualified turfgrass consultant be approached and advice sought prior to purchasing or applying any product

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