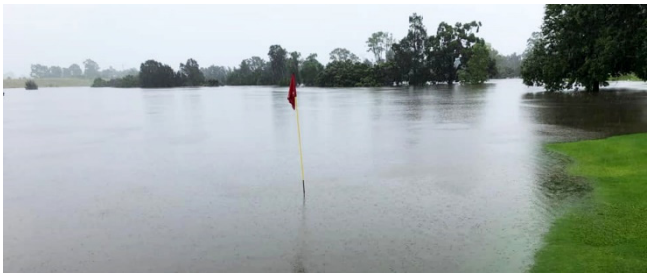
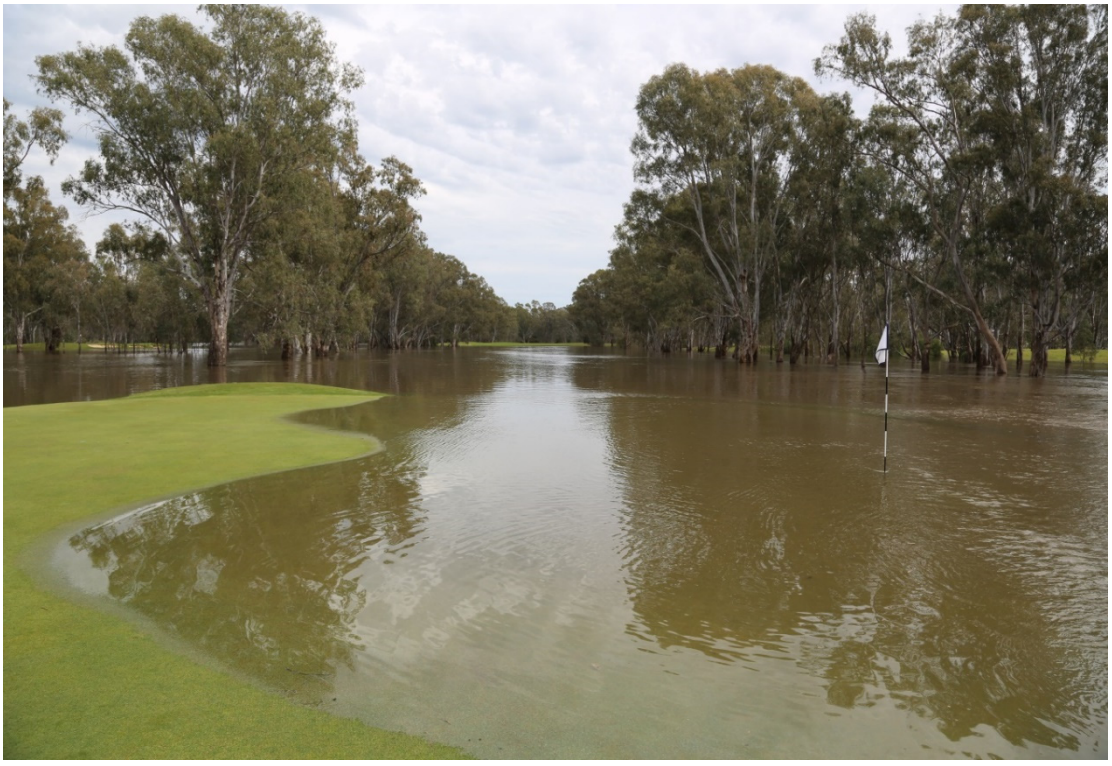
Australian
Sports Turf Managers
Association

EAST COAST EXTREME WEATHER AND FLOODING: RECOVERY AND CONSIDERATIONS



The past few days have seen some dramatic footage of the widespread rains and resultant floods impacting communities along Australia's eastern seaboard. Many golf courses, sporting grounds, racetracks and turf farms have been inundated by flood waters, with some experiencing their second major flood event inside the past 12 months. These facilities will be experiencing varying degrees of damage and below is a short summary of some of the potential problems likely to be faced and solutions which may assist turf managers in getting their facility back into play with minimal long-term issues.



SPORTS FIELDS

As with all sports turf facilities, there is no one size fits all solution. Each venue will have to be treated individually and the solutions will be wide and varied dependent on the level of damage, period of inundation and silt deposits left behind. There are many issues which can affect how long a turf surface may sit prior to getting some much-needed attention. Access to power, clean water and equipment may limit what can be achieved when flood waters subside.

As with all disasters, assessing the level of damage and coming up with a recovery program is a priority. Where there has been minimal flooding, a simple verti-drain to assist with the movement of water and the re-introduction of oxygen into the profile may be all that is required. Sports fields which have been flooded and large deposits of silt and debris left behind will take significantly more effort to return the surface to pre-flood conditions.

Removal of silt and debris deposits smothering turf should be a priority. Turf facilities with a sand-based profile have the potential to be greatly affected with a layer of silt building up within the turf canopy, effectively sealing off the surface. Long-term there will be issues with infiltration and aeration, ultimately leading to a poor-quality surface unless action is taken to remove or limit the effects of the silt layer. Where possible, as much of the silt layer should be physically removed as possible. On a large-scale sports field there are fewer options for removal of silt from the canopy such as blasting with water, which can be highly effective on a smaller scale such as a golf green. Dislodging the silt and either blowing, vacuuming or brushing out of the canopy will be the preferred options. Each venue may have a preferred option which is effective in their circumstances. It may be a case of try it and see with the equipment you have at your disposal.

The key areas to address first should be the high traffic areas such as goals and centre corridors followed by outfields where time may not allow an intense clean up to occur. The following options could be tried on a large scale clean up.

- Removal of bulk silt and debris using posi-track or front-end loader.
- Power broom or asphalt road sweeper to brush debris out of canopy.
- If the surface has dried, a vacuum or tow behind blower may be effective at moving silt out of the canopy.
- Scarifying or a light rake may loosen the dry silt allowing it to be blown or brushed from the surface.
- Additional hollow coring with large diameter tines (5/8) and removal of the cores will be required to physically break up the layers on the surface.
- Top dressing with sand matching that of the profile and back filling holes will assist with improving infiltration and aeration.
- Progress can be checked by taking a vertical sample of the profile and observing the effectiveness of your program or the extent of silt layers present within the canopy.

GOLF COURSES

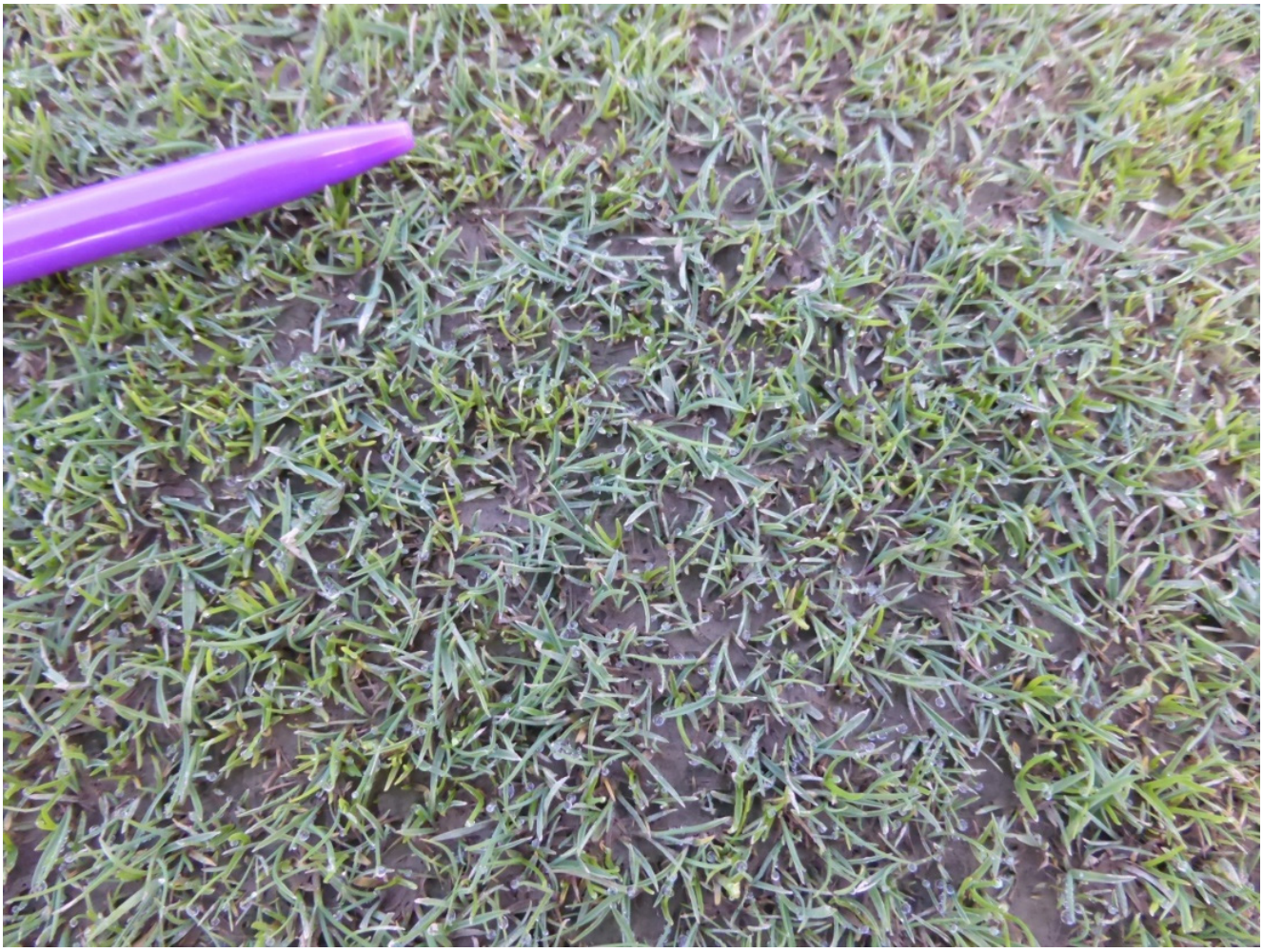
Depending on location and proximity to waterways, golf courses can expect to experience varying degrees of damage from light inundation of playing surfaces with water to strong flows of water scouring turf and leaving behind debris including layers of silt deposited into the turf profile, which can have a long-lasting negative effect.

The ASTMA, through its technical division AGCSATech, has been involved in an advisory role in a number of similar instances, in particular the Queensland floods of 2010 where there were a significant number of golf courses affected along the Brisbane River, and more recently in 2016 where Yarrawonga Mulwala Golf Club was flooded (pictured above).

Greens: Each course and green location will vary in the level of damage your facility experiences. Greens that were inundated with water for a short period of time with little silt or debris may require very little other than time to dry out. Greens which have been in the path of water flows and silt laden water can result in layers of silt deposited on the green surface which can be observed when looking at the profile with a hole changer. Where there has been a distinct layer form on the surface, works will be required as soon as possible to limit the long-term damage or performance of that surface as the silt layer is often difficult to remove.

Experience has shown that the following problems have been consistently experienced after flooding, including;

- Increased incidence of root and leaf lesion diseases such as Pythium sp. Rhizoctonia sp.
- Softening of the surface during wet weather periods, increased damage from ball marks.
- Reduced infiltration/drainage rate due to silt layer.
- Increased incidence of dry patch during summer.
- Increased incidence of black layer due to silt sealing the surface.
- Difficulty in producing a high-quality surface.
- Increased weed populations due to weed seed being carried onto surfaces in water.



A layer of silt imbedded in a green surface post flood. This will have a major impact on drainage and future management of this green. Once waters have subsided, removal of silt and debris deposits smothering turf should be a priority

The biggest challenge in many instances is effectively tackling the silt layer deposited on fine turf surfaces (pictured above). There are a wide range of options which can assist in removing a large percentage of the silt layer, however, nothing is completely effective and greens which have experienced a significant layer will require an ongoing program to break up and remove this layer.

The following program is recommended to be implemented immediately after water has subsided enough to gain access to the greens.

- Trial pressure blasting the silt layer off affected greens with a hose and fish mouth nozzle held on a 30^0 degree angle to the surface, working from the centre of the green out to the edge in all directions. This may assist in moving a large portion of material out of the turf canopy.
- When green surface is dry, verticut or scarify just into the surface to break up silt layer.
- Blow or power broom scarifyings and silt off green, once again working from the centre of the green out to the edge in all directions.
- Core greens using 1/2 - 5/8 inch tines to assist in silt layer removal.
- Lightly topdress after coring.
- A preventative application of a broad-spectrum fungicide should be applied immediately after renovations to assist in reducing potential disease outbreaks associated with increased stress.
- Greens not affected by flood water may also benefit with hollow coring, as this will help to provide a uniform playing surface across all greens.
- Applications of turf growth regulator may also assist with managing unwanted growth over the coming months.

Fairways: As with greens, the level of damage will vary greatly dependent on topography and extent of flooding. The main problem observed on fairways during previous flood events was the deposits of silt smothering turf. Removal of bulk layers of sand and silt smothering turf should be a priority. Bunker rakes with a blade on the front can be very effective along with front-end loaders, positracks etc.

As we have observed elsewhere, weeds are a major problem on most of the flooded golf courses and it would be expected that there will also have been a large seed population deposited with the silt and that weed germination is likely to continue to occur for some months. This will require an extensive pre- and post-emergent weed spraying program to control introduced weeds.

Sections of fairway that have been inundated for long periods may start to deteriorate particularly if very hot weather is experienced immediately after a flood event. Disease and heat stress on a plant with a damaged root system sitting in saturated soil can be the tipping point and areas of fairway which are low lying will need to be monitored closely. In some instances, replanting may be required.

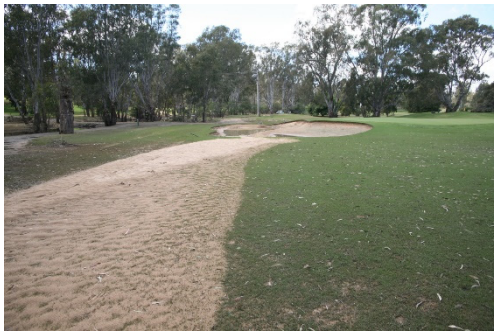
The following works should be implemented to assist with recovery.

- Where possible the layer of silt should be washed off with the assistance of a fire pump and a hose with a fish mouth nozzle.
- When dry, turf should be scarified and material blown off with a tow-behind leaf blower.
- Dragging a steel mat or brushes over dry turf can loosen silt which can then be then blown.
- Affected areas should be cored to assist with removal of silt layer.
- Verti-draining of affected areas will also assist with moving water and introducing oxygen back into the profile.

Tees: Tees affected by silt deposits will require similar treatments to the greens and fairways. Where required, removal of any bulk silt build up should be a priority to uncover turf. Water or a leaf blower could also be utilised to assist with silt removal from tee surfaces. Other options include;

- Scarify tees in two directions to help break up silt layer.
- Blow silt from surface.
- Core tees with ½ inch tynes.
- Trial of a power broom to sweep silt and debris from surface.

Bunkers: The damage to bunkers is quite often extensive where water has flowed through a course. Sand is often scoured out of bunkers and deposited on the adjacent turf surfaces (as pictured) and layers of silt are left behind contaminating what sand remains within the bunker.



- Where possible silt deposits can be scrapped from the sand and potentially it can be re-used.
- Physically removing silt deposits before pushing sand around can salvage large volumes of sand for re-use, both within bunkers and from turf areas.
- Whilst time consuming, it is recommended to remove by hand approximately 50mm of contaminated sand form each affected bunker and replenish with fresh clean sand, which can then be blended in to the existing material.

PRIORITY REQUIREMENTS

From past observations from flood events, the priorities for turf surfaces should be:

- Removal of silt layer on affected fine turf areas such as greens.
- Weed control in fairways, tees and greens surrounds. Once turf has recovered, some post control may be required, getting a suitable pre-emergent herbicide on and maintaining a program will be beneficial in reducing the number of seeds emerging over the next 12 months.
- Renovation of greens in the spring including scarifying, hollow coring and sanding.
- Renovation of fairways (coring to break up silt layer).

FINAL THOUGHTS

As mentioned above, there is no one solution which will be suitable for every situation. Turf managers are a resourceful bunch and think outside the box. Utilise what you have at your disposal. What other local industries can assist you with equipment? Power brooms mounted on the front of a posi-trac and used for road sweeping, can be highly effective at removing debris from the turf canopy. The cost of engaging the local road contractor may free you staff up for much needed fine detail work whilst the larger areas affected are being treated efficiently using outside contractors. Speak to others in your area for support and ideas on what has worked.

If you require any advice or just wish to have a chat, feel free to contact AGCSATech staff on (03) 9548 8600 or email senior agronomist Bruce Macphee bruce@agcsa.com.au or Tim Fankhauser tim@agcsa.com.au

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