

Helpful pointers on how to manage water in a drought



This information has been developed by Cranfield University in partnership with Sport England and is provided for the purposes of general drought guidance only. You should always seek independent professional advice when considering drought mitigation actions for specific locations.

Drought areas not subject to Temporary Use (Hosepipe) Bans

In drought areas it is particularly important to use water as efficiently as possible and to minimise waste as this will help reduce the impact of drought on the environment, on others – including us in our homes, and will extend the period before hosepipe bans have to be introduced. These steps could help you reduce your water consumption:

- 1. Encourage deeper plant roots by removing compaction** – both at the surface and deeper in the profile. Take a core or use a spade to look for compacted layers and at how dry the soil is at depth. Increasing the depth of rooting increases the volume of water (and nutrients) available to the plant – allowing the plant to reach deeper water that is less affected by evaporation.

Regular spiking can help roots to get deeper into the soil but be aware if conditions remain dry aeration can increase the rate at which a soil dries out – so **do not do aeration if rain or irrigation is likely to be unavailable.**

- 2. Increase your mowing height** – this helps to reduce water consumption and encourages deeper rooting by the plant.
- 3. Reduce your mowing frequency** – this helps to reduce stress on the plant and helps to reduce compaction.
- 4. Return clippings** (do not collect clippings) where possible – this returns both nutrients and water to the turf and also provides a bit of a mulch to reduce soil evaporation.
- 5. Manage your wear** – look at closing parts of school playing fields on prime pitches to avoid wear and pay attention to high traffic areas. Normal wear recovery rates will be slower as the plant's growth rate slows as it becomes hotter and short of water.
- 6. Service your irrigation equipment** to ensure that it is leak free, blockage and scale free, and all moving parts are free to move through complete arcs etc. Check distribution uniformity by putting buckets out to ensure water is being distributed evenly.
- 7. Never leave a static, hose-fed sprinkler system unattended** (one where the sprinkler head does not move across the pitch). Always be prepared to monitor and move it regularly.
- 8. Apply water in larger amounts on fewer occasions** rather than applying the same amount of water little and often. This is to get the water deeper into the soil – this limits losses due to evapotranspiration and encourages deeper rooting.
- 9. Only apply the amount of water needed** – take a spade or corer and check the depth to which water is penetrating. If you have very sandy soils or well drained soils then do not over apply water – if the drains start to flow then you have applied too much. If you have heavily

cracked clay soils, apply water slowly otherwise water will simply flow down the cracks and away from the turf plants.

- 10. Do not allow water to pond or run-off** – this wastes water and can cause pollution. If irrigation is not going into the profile then consider spiking and look for compaction. Reduce your application rate and increase the irrigation period – this will reduce wastage.
- 11. Never irrigate during the heat of the day.** Ideally water should be applied late evening or overnight. When the sun is down, evapotranspiration is reduced which allows more water to get deeper into the soil – it is much more efficient. Most of the water applied during the heat of the day will evaporate or transpire.
- 12. Look for signs of water repellency (hydrophobicity)** – this is extremely common on dried out sandy or thatch soils. Water repellency isn't just when water ponds on the surface – it can cause water to flow down just narrow parts of the soil and other parts to remain dry – take cores or use a spade to look where water is going in the profile. Be aware that although thatch in soils can stay wetter for longer, once they do dry out the organic compounds released can make them difficult to wet up. An analogy is the plant grown in compost in a pot on your window sill – when it dries out, you water it, the water runs off the surfaces and down the cracks around the outside – water is wasted.

Products called wetting agents can help breakdown this water repellency and to get a more uniform, deeper distribution of water in the soil – speak to your turf supplies company about suitable products.

- 13. Limit evapotranspiration.** For small areas you could consider using nets/meshes and covers to help reduce evapotranspiration but be sure to avoid overheating during hot periods and ensure that the plant gets enough light.
- 14. Consider only watering the minimum number of pitches possible** – it could be that keeping one or two pitches well watered is better than watering 3-4 pitches insufficiently. Look at your fixture load and any potential closure periods such as summer holidays.
- 15. Consider water retaining amendments.** Polymer and aggregate materials are available from the turf management industry. These can be injected or incorporated into the ground but check the durability of the product and weigh this up against the application rates and cost – some products can be costly and relatively short-lived. Note that consistent, independent reliable evidence of product effectiveness is limited – try before you buy large quantities.

Good practice in drought areas with Temporary Use (Hosepipe) Bans

When water restrictions are in place then note the advice on how to limit water demand above and the following:

- 1.** Limit stress to the grass plant to an absolute minimum
 - a.** Limit wear – close access to primary sports pitches if necessary
 - b.** Avoid applications of fertiliser and pesticide which could cause scorch or stress the grass.
 - c.** Limit machinery use to essential turf maintenance.
- 2.** Be prepared to make sacrifices
 - a.** Cricket outfielders will brown – but generally they will recover when rainfalls (recall what happened in Summer 2011) – so focus on the square. Educate players on diving and stopping on hard ground – where risk of impact injuries and abrasions will increase.
 - b.** Wear areas will develop – try to minimise this as much as possible. It will be difficult to renovate large areas without availability of irrigation so defer this to autumn/winter when rainfall is more likely (but not guaranteed).
 - c.** It may not be possible to prevent pitches getting hard over summer – this could affect fixtures in contact sports, depending on how rainfall develops – make a plan for disruption.
- 3.** Make the most of any rainfall that does occur
 - a.** Try to encourage as much of this rain to infiltrate as possible – but avoid aeration which can speed the drying of a soil.
 - b.** React to rainfall with water sensitive operations such as rolling in cricket – when it has stopped raining – think about which pitches can be rolled.
 - c.** If rainfall falls on seeded areas – help germination with germination sheets.
 - d.** Capture rainfall off roof surfaces by installing water butts on downpipes (make sure they are installed with diverters and that when the water butt is full, water continues to flow to sewers/soakaways as before). This captured water can then be used to water small renovation areas.
 - e.** Think about the deployment of covers – if it is not possible to allow the surface to get wet, see how much of the water you can collect from the covers – particularly if they have guttering. Use covers to shade turf but avoid heat stress.

4. Look for alternative sources of water

- a. It is currently possible¹ to abstract up to 20 m³ a day from a watercourse or borehole without a licence. Note that permission is required to disturb or alter the bank of a watercourse however so you should be careful not to do this. You also need the landowner's permission to access the watercourse. But this could be a potential supply of water.

Where flows allow, it might be possible to pump water from a river using a small diesel pump or similar (be aware of the risk of electrocution – do not use electricity near water – do not run extension leads to an electric pump). The abstracted water should be stored in temporary tanks (such as recycled intermediate bulk containers –IBCs) and used as necessary. Be sure to filter the water before it goes into the pump and do not trail the inlet at the bottom of the watercourse. It is advisable to get the water quality tested for irrigation suitability as poor water quality can actually increase drought stress. Note that you should not abstract water from a river/pond where flows are low and harm could be caused to the river/pond environment.

Where groundwater tables are high it might be possible to sink a shallow borehole. Or look into deeper borehole exploration for water in aquifers. This will depend on the geology beneath your facility and is a technical undertaking.

You should seek advice from properly qualified consultants or contractors when considering surface or groundwater abstraction. Permit requirements are dependent upon design and can be complex.

- b. It might not be possible to install a grey water recycling facility at such short notice but capturing water from kitchens and showers etc (providing it does not have detergents or dangerous wastes in it) could be a small scale source of water.

5. Make regular assessments on safety.

- a. Match officials and facilities managers should be making regular assessments of pitch safety due to hardness – just as they would for frozen or waterlogged ground. Make routine assessment of pitch hardness in light of the sport being played and consider risk of injuries which can range from blisters to bone breakages and head injuries. Fixtures should be postponed / cancelled where appropriate.

¹ This limit is subject to review under a non-essential use drought order or other restriction by the Environment Agency which may come into force. It is not permissible to abstract water when it could cause harm to the environment of the water body or neighbouring water bodies. This limit is also subject to review (downwards) in future legislation currently being considered as a white paper.

6. Consider applying for an exemption to the hosepipe ban
 - a. It is possible to appeal to your Water Company for an exemption to the hosepipe ban but this should be a last resort and needs to be a reasonable case as any exemption needs to be considered in the light of other demand for water – including water for drinking.
 - b. Possible grounds for an exemption could be on the basis of maintaining safe participation in sport – which has associated health benefits and is important for the sustainability of clubs. Keeping the grass green is not justifiable.
 - c. Any exemption will have to consider the amount of water to be used – you need to calculate how much water you would normally use and how much this could be reduced to as a minimum.
 - d. Any exemption granted will restrict watering times in terms of length and time of day and will be likely to occur between dusk and dawn to limit evapotranspiration.
 - e. Be aware that neighbours and the wider community might not support the use of water for irrigating sports pitches when their gardens are suffering and drinking water supplies are at risk. It is important to avoid conflict by being considerate and explaining the benefits of water application in terms of safe participation and the benefits that brings.

When the drought passes

As soon as drought conditions are lifted then it should be possible to start renovations. Look to re-establish grass if temperatures allow by seeding. Consider seeding with more drought resistant varieties and species if possible/appropriate.

Help infiltration by loosening capped and compacted soils and wetting agents can help overcome water repellency (hydrophobicity) that can occur in some soils – particularly sandy and thatch soils. Review how you have managed the drought and causes of problems with water supply and look at what you can do differently in the short and medium term to help maintain your facility.

Other guidance

The following guidance is also available of the drought from Sport England:

[FAQs about Drought](#)

[Drought Report](#)

Further information can also be found

[The ECB website](#)

[The IOG website](#)

Partners

This guidance has been developed by Sport England in partnership with the following governing bodies of sport (NGBs):

[The Football Association](#)

[The England and Wales Cricket Board](#)

[The Lawn Tennis Association](#)

[The Rugby Football Union](#)

[The Rugby Football League](#)

[The England Hockey Board](#)

Research

The guidance has been developed from research work carried out by Cranfield University for Sport England on the impact of Climate Change and this work will be published in Spring 2012.

Advice and consultation

Sport England and the NGBs have also been supported and advised by the following:

[The Institute of Groundsmanship \(IOG\)](#)

[TGMS Ltd](#)

[STRI](#)

[Professional Sportsturf Design \(NW\) Ltd](#)

[Total Turf Solutions Ltd](#)

[Materials Science Consultants Limited](#)

[Labosport](#)

