

Soil erosion and runoff from agriculture

At certain times of the year, we receive reports of water running off fields, carrying topsoil which can either pollute rivers or flood properties. This can sometimes be a natural event with no adverse environmental implications; alternatively, this can be a sign of poor land management practices.

This information sheet explains how to tell the difference and when and how the Environment Agency should be informed.



What causes runoff and soil erosion?

Surface water runoff occurs when rainfall cannot infiltrate into the soil and flows across the surface. Many soil types (not all) across Britain are able to drain the rainfall that occurs throughout the year. This water should filter down through the soil profile and recharge the water table before exiting the ground in the form of springs to flow into streams and rivers. When the soil's condition is poor, it is not able to drain all the rainwater that falls. This water flows across the surface taking pollutants with it and, in some cases, can cause flooding.

Natural runoff

Water will naturally run across the surface of the ground when a heavy soil type is present, such as clay. Clay soils are fine textured so are less able to absorb rainfall during heavy showers. This water cannot infiltrate quickly into the ground so will run across the surface and fill up watercourses quickly.

Un-natural runoff

The ability for soil to drain rainwater is reduced when the soil is compacted. Heavy machinery travelling over the soil surface, especially when the soil is wet, compresses the soil particles together. This forms an impermeable layer which rainfall cannot infiltrate. This is called soil compaction. Rainfall falls on this compacted ground and runs off across the surface, often taking valuable topsoil with it.

Is surface water runoff a problem?

Unnatural surface water runoff can pollute rivers, lakes and streams and can also cause flooding of property. This runoff carries large amounts of soil out of fields and into rivers, where it will smother the gravel on the riverbed that fish use to reproduce. Runoff can also carry harmful chemicals and animal manure into our rivers. The loss of soil is also a huge cost for farmers as their fields will become less fertile.

Flooding of property is also a major result of unnatural surface water runoff. Often rural homeowners are affected when this runoff leaves surrounding fields and ends up entering their homes causing damage and emotional trauma. The average household cost of clean-up following a flood is £33,000.



How can I tell if runoff is natural or unnatural?

It is difficult to know whether runoff is natural or unnatural without assessing the condition of the soil in the field and understanding the type of farming, the soil type and its properties and the crops the farmers choose to grow. Below are a few differences between natural and unnatural runoff.

Natural runoff



- Will usually be clear water
- Found mostly next to wetlands, marshes, or valley bottoms
- No sediment in the water
- Often constant discharge due to underlying soil wetness
- Might run constantly even during dry periods

Unnatural runoff



- Will usually be brown in colour due to soil presence
- Often observed exiting gateways or through hedges from farmed fields
- Occurs after heavy rainfall events
- No problems in dry weather
- Fields might have been recently cultivated
- Often occurs during the winter months when rainfall is increased

When and where am I most likely to see unnatural runoff?

You are most likely to see unnatural runoff events from crop fields during the winter months and after heavy rainfall events. Farmers like to use their fields all year round and these events often happen in the period between one crop being harvested and another being established in the field. If this change in cropping occurs during a time when higher rainfall is expected, then problems can occur.

What do I do if I see what I think to be unnatural runoff?

It is important that if you suspect a runoff event to be unnatural, you inform the Environment Agency as soon as possible.

Please use the Incident Hotline and provide as many details as possible.

In an emergency or to report an incident call 0800 80 70 60 (24 hours)

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